Speed Sensor

Model 60-12
Operating and Service Manual

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ThermoFisher SCIENTIFIC

Model 60-12
Speed Sensor

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About this Manual

This manual provides the information you need to install and maintain a Model 60-12 Speed Sensor

Read this manual before working with the system. For personal and system safety, and for the best product performance, make sure you thoroughly understand the manual before installing, operating, or maintaining this machine.

Who Should Use this Manual?

The Model 60-12 Speed Sensor Operating and Service Manual is a learning resource and reference for anyone concerned with installing, operating, or maintaining the Model 60-12 Speed Sensor.

Documentation Conventions

The following conventions are used in this manual to help easily identify certain types of information.

- *Italic type* is used for references to other sections of the manual. *Italic* is also used to introduce new terms and for emphasis.
- The names of setup and calibration displays and variables are shown in FULL CAPITALS.

Safety Messages

Instructions in this manual may require special precautions to ensure the safety of the personnel performing the operations.

Please read the safety information before performing any operation preceded by this symbol.

There are two levels of safety messages: warnings and cautions. The distinction between the two is as follows:

 **WARNING**
Failure to observe could result in death or serious injury.

 **CAUTION**
Failure to observe may cause minor injury or damage the equipment

General Precaution

Do not install, operate, or perform any maintenance procedures until you have read the safety precautions presented.

WARNING

Failure to follow safe installation and servicing procedures could result in death or serious injury.

- Make sure only qualified personnel perform installation and maintenance procedures in accordance with the instructions in this manual.
- Allow only qualified electricians to open and work in the electronics cabinest, power supply cabinest, control cabinets, or switch boxes.
- Covers over the electronics and rotatingpartsmust always remain in place during normalooperation Remove only for maintenance, with the machine's power OFF. Replace all covers before resuming operation.
- During maintenance, a safety tag (not supplied by the facotry) is to be displayed in the ON/OFF switch areas instructing others not to operate the unit (ANSI:B157.1).

WARNING

High voltage that may be present on leads could cause electrical shock.

- All switches must be OFF when checking input AC electrical connections, removing or inserting printed circuit boards, or attaching voltmeters to the system.
- Use extreme caution when testing in, on, or around the electronics cabinet, PC boards, or modules. There are voltages in excess of 115 V or 230 V in these areas.

CAUTION

Keep hands and clothing away from all moving or rotating parts.

CAUTION

Do not operate this equipment at more than the specified production rate or utilize in applications other than those stated in the original order.

WARNING

Use only the procedures and new parts specifically referenced in this manual to ensure specification performance and certification compliance. Unauthorized procedures or parts can render the instrument dangerous to life, limb, or property.

CAUTION

Do not place or store objects of any kind on the machine.

Occupational Safety and Health Act (OSHA)

The Occupational Safety and Health Act clearly places the burden of compliance on the user of the equipment and the act is generalized to the extent that determination of compliance is a judgment decision on the part of the local inspection. Hence, *Thermo Fisher Scientific* will not be responsible for meeting the full requirements of OSHA in respect to the equipment supplied or for any penalty assessed for failure to meet the requirements, in respect to the equipment supplied, of the Occupational Safety and Health Act, as interpreted by an authorized inspector. Thermo Fisher Scientific will use their best efforts to remedy such violation at a reasonable cost to the buyer.

European Directives

Thermo Fisher Scientific products sold in Europe are compliant with *European Directives* relating to *CE* marking and all heads or systems (head, product transport, and rejecting mechanisms) are labeled in accordance with the directives. Product labeling is affixed securely, visible to the user and contains the following information:

- Warnings of any residual risk (nip points, reject mechanisms, inside PSU areas).
- Name and address of *Thermo Fisher Scientific,* year of manufacture, product type, and serial number.
- Supply voltage and frequency. Maximum rated current, value, and type of fuses in PSU.
- Identification of the protective earth terminal.
- CE mark on machines.

Thermo Fisher Scientific Warranty

The seller agrees, represents, and warrants that the equipment delivered hereunder shall be free from defects in material and workmanship. Such warranty shall not apply to accessories, parts, or material purchased by the seller unless they are manufactured pursuant to seller's design, but shall apply to the workmanship incorporated in the installation of such items in the complete equipment. To the extent purchased parts or accessories are covered by the manufacturer's warranty, seller shall extend such warranty to buyer.

Seller's obligation under said warranty is conditioned upon the return of the defective equipment, transportation charges prepaid, to the seller's factory in Minneapolis, Minnesota, and the submission of reasonable proof to seller prior to return of the equipment that the defect is due to a matter embraced within seller's warranty hereunder. Any such defect in material and workmanship shall be presented to seller as soon as such alleged errors or defects are discovered by purchaser and seller is given opportunity to investigate and correct alleged errors or defects and in all cases, buyer must have notified seller thereof within one (1) year after delivery, or one (1) year after installation if the installation was accomplished by the seller.

Said warranty shall not apply if the equipment shall not have been operated and maintained in accordance with seller's written instructions applicable to such equipment, or if such equipment shall have been repaired or altered or modified without seller's approval; provided, however, that the foregoing limitation of warranty insofar as it relates to repairs, alterations, or modifications, shall not be applicable to routine preventive and corrective maintenance which normally occur in the operation of the equipment.

"EXCEPT FOR THOSE WARRANTIES SPECIFICALLY CONTAINED HEREIN, SELLER DISCLAIMS ANY AND ALL WARRANTIES WITH RESPECT TO THE EQUIPMENT DELIVERED HEREUNDER, INCLUDING THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR USE. THE SOLE LIABILITY OF SELLER ARISING OUT OF THE WARRANTY CONTAINED HEREIN SHALL BE EXCLUSIVELY LIMITED TO BREACH OF THOSE WARRANTIES. THE SOLE AND EXCLUSIVE REMEDY FOR BREACH OF THE WARRANTIES SET OUT ABOVE SHALL BE LIMITED TO THE REPAIR OR REPLACEMENT OF ANY DEFECTIVE ACCESSORY, PART OR MATERIAL WITH A SIMILAR ITEM FREE FROM DEFECT, AND THE CORRECTION OF ANY DEFECT IN WORKMANSHIP. IN NO EVENT SHALL SELLER BE LIABLE FOR ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES."

Purchaser agrees to underwrite the cost of any labor required for replacement; including time, travel, and living expenses of Thermo Fisher Scientific Field Service Engineer at closest factory base.

THERMO FISHER SCIENTIFIC
501 90TH AVE NW
MINNEAPOLIS, MN 55433
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FAX: (763) 783-2525

Disclaimer

Though the information provided herein is believed to be accurate, be advised that the information contained herein is *not* a guarantee for satisfactory results. Specifically, this information is neither a warranty nor guarantee, expressed or implied, regarding performance, merchantability, fitness, or any other matter with respect to the products, and recommendation for use of the product/process information in conflict with any patent. Please note that *Thermo Fisher Scientific* reserves the right to change and/or improve the product design and specifications without notice.

Chapter 1
Introduction

1.1 Overview

The Thermo Scientific Model 60-12 Speed Sensor is designed and constructed for direct connection to a conveyor tail pulley, snugging roll, or large diameter return roller.

The speed sensor employs a brushless pulse generator producing a stream of pulses, each pulse representing a unit of belt travel. Frequency of the pulse stream is proportional to true belt speed.

Figure 1-1
Model 60-12
Speed Sensor

1.1.1 Application

The speed sensor is coupled to a rotating shaft which drives a generator inside the housing. the Model 60-12C Speed Sensor has a useable range between 20 and 200 RPM. The 60-12F is used for speeds from 3 to 30 RPM, and the 60-12G is used for speeds from 10 to 200 RPM. The 60-12 ENC Speed Sensor has a 500 pulse per revolution encoder inside, typically is used on slow RPM applications, and has a range of 0 to 200 RPM. The frequency of the speed sensor output signal is exactly proportional to shaft speed and provides the required speed input to a Thermo Scientific Integrator/Totalizer.

1.2 Unpacking and Inspection

The Model 60-12 Speed Sensor has been properly packaged and inspected prior to shipment. Before unpacking, be certain to check the package for external damage, as the carrier may often times be held responsible for shipping damage.

1.3 Storage

The Model 60-12 Speed Sensor can be safely stored indoors, with hole plugs installed, between -50 and +70 degrees C (-58 to +158 degrees F). The unit must be protected against moisture.

Chapter 2
Installation

2.1 Overview

The Models' 60-12C, F, G and ENC Speed Sensor must be attached to a pulley shaft which turns at true conveyor belt speed. Normally, the tail pulley shaft or a snubbing roll shaft satisfies this requirement. In installations where the tail pulley or snubbing roll shaft is not accessible, an additional pulley must be installed specifically for the speed sensor (see Section 2.4).

2.1.1 Coupling Installation

Two methods of coupling the speed sensor to the pulley shaft are shown in Figures 2-1 and Figures 2-2. Other methods may work as well, The most important requirement is that the speed sensor remains free floating and not rigidly coupled to the conveyor frame.

Note

Never mount speed sensor on a driven pulley

Use the following procedures for coupling installation

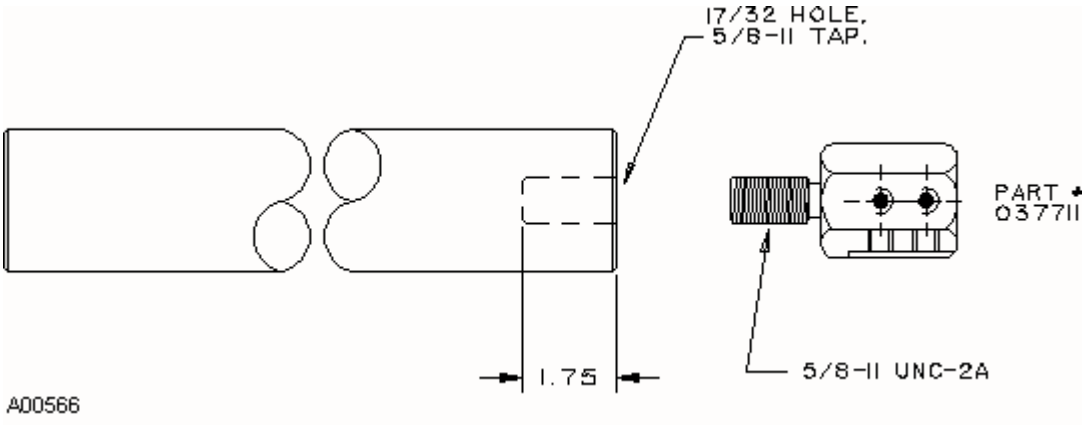
2.1.1.1 Method "A"

Locate the *exact* center of tail pulley or snubbing roll shaft. *Figure 5-1* may be cut out and used as a centering guide. (Refer to *Figure 2-1*.)

1. Locate circle guide over tail pulley shaft and punch center. Drill a 1-3/4" deep hole using a 17/32" drill. (Drilling a smaller pilot hole is helpful in assuring correct centering.)
2. Tap this hole using a 5/8"-11 tap.
3. Clean out oil and dirt with an appropriate solvent and apply a thread lock retaining compound, such as "LOCKTITE thread locker 262".
4. Thread in supplied stub shaft coupling (part #037711) so that coupling collar bottoms out against tail pulley or snubbing shaft. See Figure 2-1.
5. Insert 60-12 speed sensor into coupling. Be sure to align shaft flat spot with set screws on coupling. *Tighten all set screws securely*.

Figure 2-1

Method A Installation



2.1.1.2 Method "B"

If customer's tail pulley shaft has a 5/8" diameter stub shaft extending from it and is concentric with the centerline of the driving shaft, use part #002931 to couple 60-12 speed sensor to tail pulley shaft. (Refer to *Figure 2-2*.) This coupling is not supplied with the speed sensor but may be purchased separately from Thermo Fisher Scientific.

It would be advisable to provide two flat surfaces, 90º apart, on the stub shaft for a good set screw holding power.

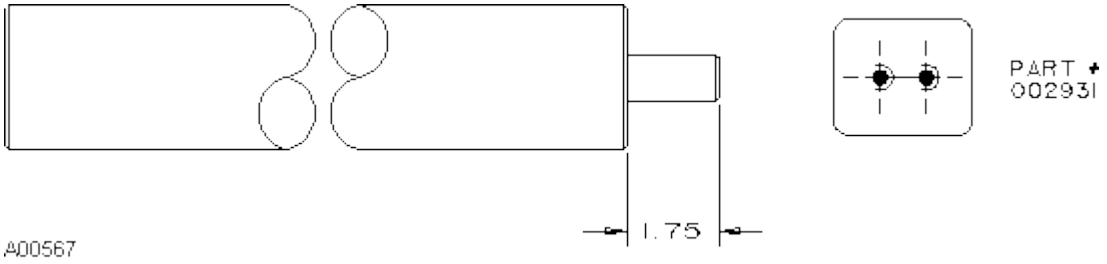
NOTE

If possible, weld coupling to tail pulley shaft. Do not weld to any part of 60-12 speed sensor.

Align shaft flat spots with set screws on coupling. See *Figure 2-2. Tighten all set screws securely.*

Figure 2-2

Method B Installation



2.2 Restraint Arm Installation

1. Attach restraint arm to speed sensor with two (supplied) 5/16” x 1-1/4” bolts. See *Figure 2*-3. The restraint arm should be mounted in a direction that will allow the sensor restraint arm to twist against the mechanical stop and in the direction of belt travel.
2. Weld or otherwise secure an appropriate mechanical stop such as a piece of scrap iron (or a bolt) to the conveyor frame. Rotate restraint arm to let it rest on the stop. See *Figure 2-3*. Make the mechanical stop large enough to accommodate some lateral movement of the restraint arm.
3. Fit one end of the supplied restraining spring through the hole in the end of the restraint arm. Attach the other end to the conveyor frame. *Location should be such as to give a 1/2 inch spring stretch.* Do not over-tighten spring as this may cause premature failure. See *Figure 2-3*.
4. Although not required, it is recommended that a rock or step shield be fabricated and installed around the speed sensor.
5. Do *not* connect power to the machine or turn on the unit until you have read and understood this entire chapter. The precautions and procedures presented in this chapter must be followed carefully to prevent equipment damage and protect the operator from possible injury.

NOTE

The purpose of this mounting arrangement is to allow the speed sensor to “float” and accommodate any slight misalignment of the coupling. Therefore, no resultant bearing stress is applied due to misalignment, nor will a slight “wobble” of the device result in electrical errors.

2.3 Alternate Sensor Location

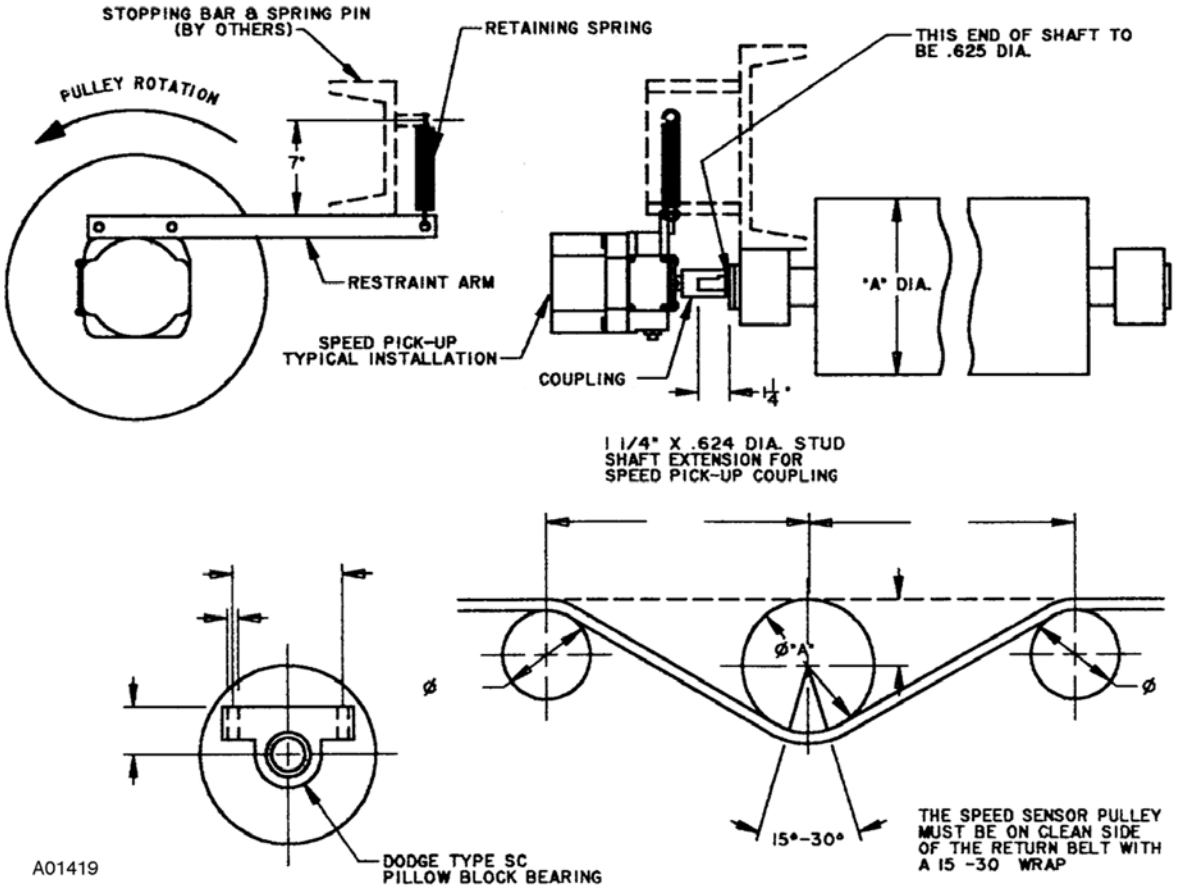
In installations where the tail pulley or snubbing roll shaft is not accessible and additional pulley must be installed specifically for the speed sensor. When using an additional pulley for the speed sensor, the following requirements are essential:

1. Select the proper pulley diameter to provide a shaft RPM within the range of the speed sensor (at rated belt speed or over the range of belt speeds that are of concern).
2. Locate the pulley on the clean side of the return belt to minimize material build up on the pulley.
3. Install the unit in such a manner as to provide 15 to 30 degrees contact wrap on the pulley. Any slippage between belt and pulley will decrease the belt scale accuracy.

CAUTION

Unless the installation is consistent with the illustrations shown in *Figure 2-1, Figure 2-2, Figure 2-3,* and as described above, the warranty on the device is void

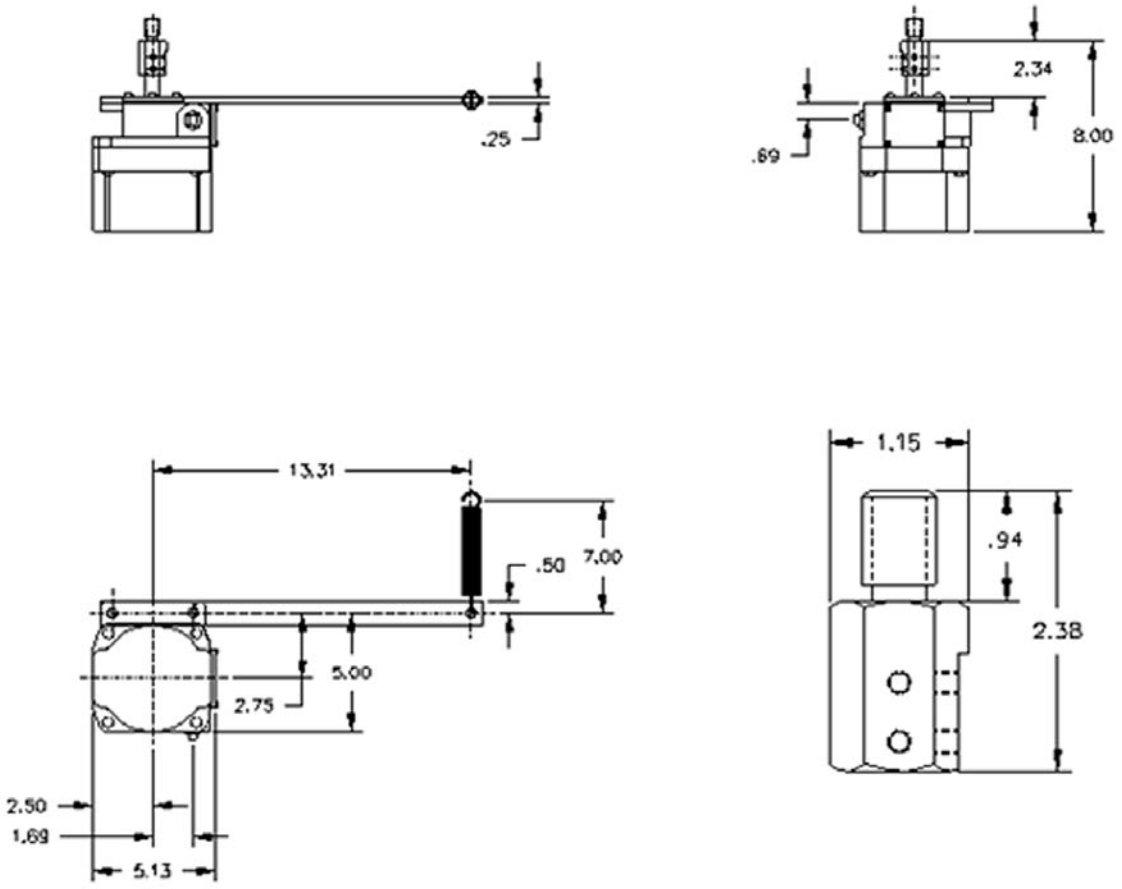
Figure 2-3
Mounting Illustration



1. Speed Sensor must not be mounted rigid. Use restraint arm and retaining spring. Mechanical stop and spring mount are by others.
2. Attach spring in location such as to give 1/2” spring stretch.
3. All wiring by others in accordance with system field wiring diagram and applicable codes.

Speed	Minimum “A”	Maximum “A”
100 FPM	2”	14”
200 FPM	4”	36”
300 FPM	6”	48”
400 FPM	8”	60”
500 FPM	10”	60”
600 FPM	12”	60”
700 FPM	14”	60”
800 FPM	16”	60”
900 FPM	18”	60”
1000 FPM	20”	60”

Figure 2-4
Outline and
Mounting Dimensions



Notes:

1. Speed Sensor to be driven by conveyor tail pulley shaft or by special return roll.
2. Unit must be directly coupled to driving shaft. **Do not** drive with chains, belts, gears, etc.
3. Customer to provide tapped hole 1.75” deep.
4. Do not rigid mount speed sensor.

2.4 Electrical Wiring

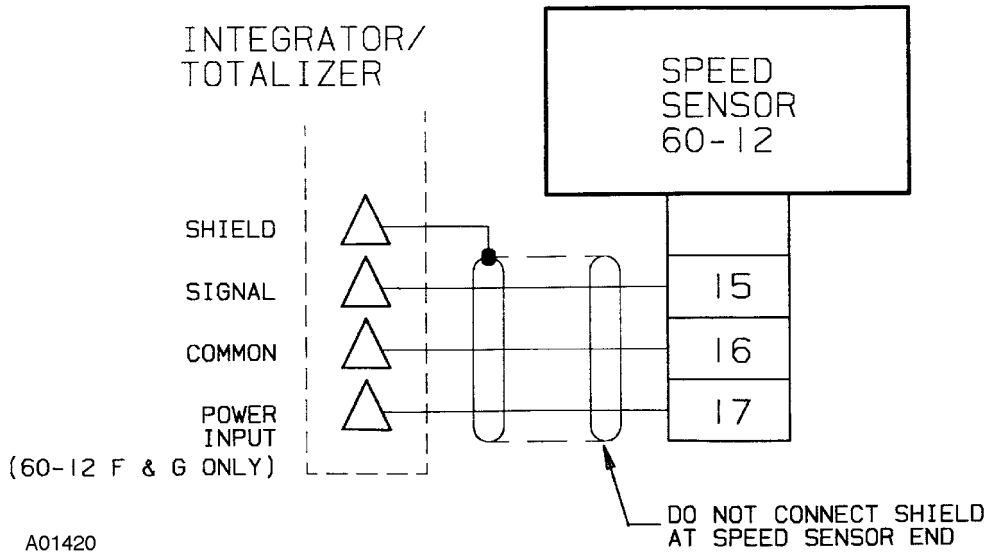
Use the following procedures to make electrical connections:

1. Remove the terminal strip cover (*Figure 1-1*) and the dust plug from the threaded conduit aperture in the speed sensor housing.
2. Install 1/2 inch flexible conduit to the speed sensor housing.
3. For 60-12C speed sensor, use Beldon 8760 or equivalent, 2 conductor, 18 AWG, shielded, when total length between speed sensor and totalizer is 200 feet or less. Use Beldon 8780, 2 conductor, 16 AWG, shielded when total length is 201 to 3,000 feet.

   For 60-12F, G, or ENC models, use Beldon 8772 or equivalent, 3 conductor, 20 AWG, shielded. Maximum distance is 200 feet.
4. Do not put speed sensor cables in the same conduit as power wiring.
5. Connect one wire to each of terminals 15, 16, and 17 as shown in Figure 2-4. (No connection is needed to terminal 17 for 60-12C speed sensor.) Replace the terminal strip cover.

CAUTION

The three wires connecting the speed sensor to the integrator/totalizer must be shielded. Refer to system wiring diagram for proper shield termination.



Chapter 3
Operation

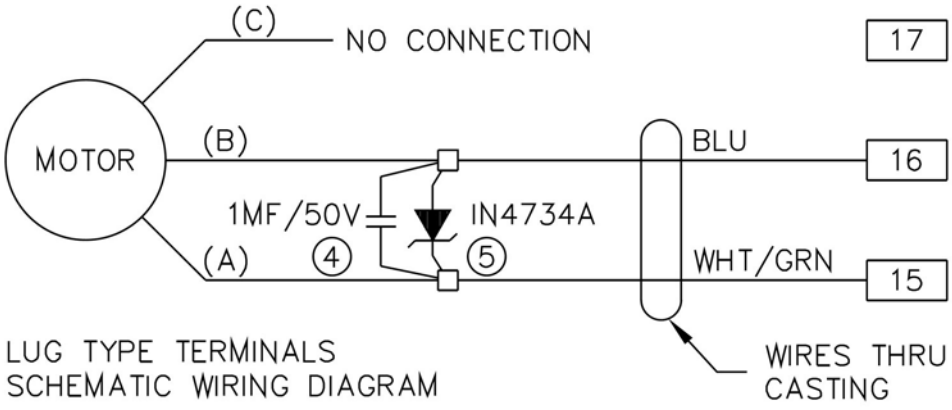
3.1 Overview

The speed sensor element employs a brushless, pulse generator which produces a stream of pulses, each pulse representing a unit of belt travel. The frequency of the pulse stream is proportional to true belt speed. The pulse output signal is fed to the Integrator/Totalizer..

3.2 Model 60-12C

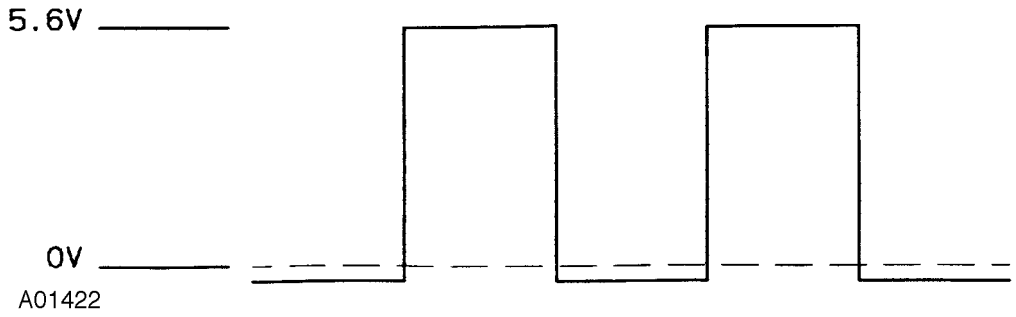
The Model 60-12C supplies the output of the generator directly to the totalizer for high speed operation (20-200 RPM).

Figure 3-1
Schematic Model
60-12 Speed Sensor



Motor MFG	**Color**		
	A	**B**	**C**
Superior SS25	Red	White	Black
Oriental 2CSM	Red	White	Black
Source Eng. 57TYG002	Blue	White (2)	Red

Figure 3-2
60-12C Output
Voltage



3.3 Model 60-12F

Speed sensor Model 60-12F is designed for use in low speed systems (3 to 30 RPM). The 60-12F outputs 200 pulses per revolution, and requires and external power source of 15 to 30 VDC to operate. It contains a two-phase servo generator. The rotor is a 50-slot permanent magnet that is rotated in the stators. This results in two AC signals that are out of phase with each other. The output frequency is determined by the follows: RPM x 3.33 = Hz. The output signal is approximately equal to the supplied voltage at terminal 17. Operation is as follows.

1. Referring to Figure 3-4, the two AC signals are applied to R-1 and R-5 while the common is connected to 2-2, pin 1.Z-2, pin 1 supplies a center reference voltage for Z-2 pins 9 and 13. As the voltage signal from the generator moves Z-2, pins 10 and 12 above and below the center reference voltage the outputs of Z-2, pins 8 and 14 switch from one state to the other. They are maintained in these states by the action of the two feed back resistors, R-4 and R-8.
2. The exclusive or gate that these two outputs feed into merely serves to combine them. The portion of Z-2 connected to pins 1 and 2 of Z-1 serves to provide some integration that will eliminate most signal jitter caused by vibration.
3. Due to the sensing of the signal level changes of the two phase generator, the output of this model is increased/ RPM x 3.333 = Hz, or 200 pulses per revolution.

Figure 3-3
60-12F, 60-12G, or
60-12 ENC Output
Voltage Waveform

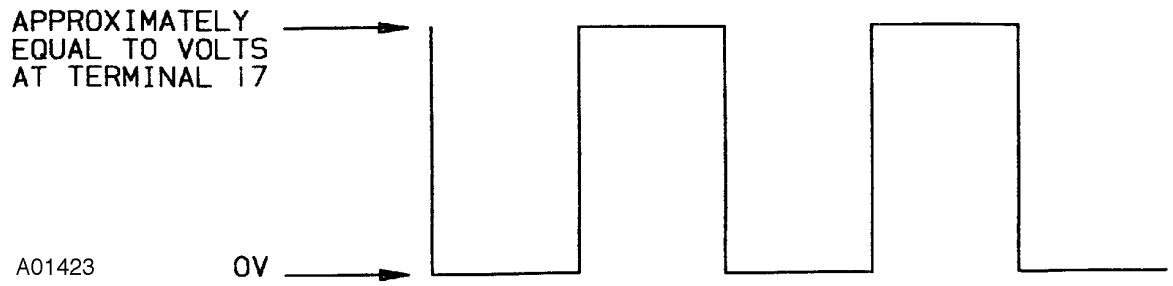
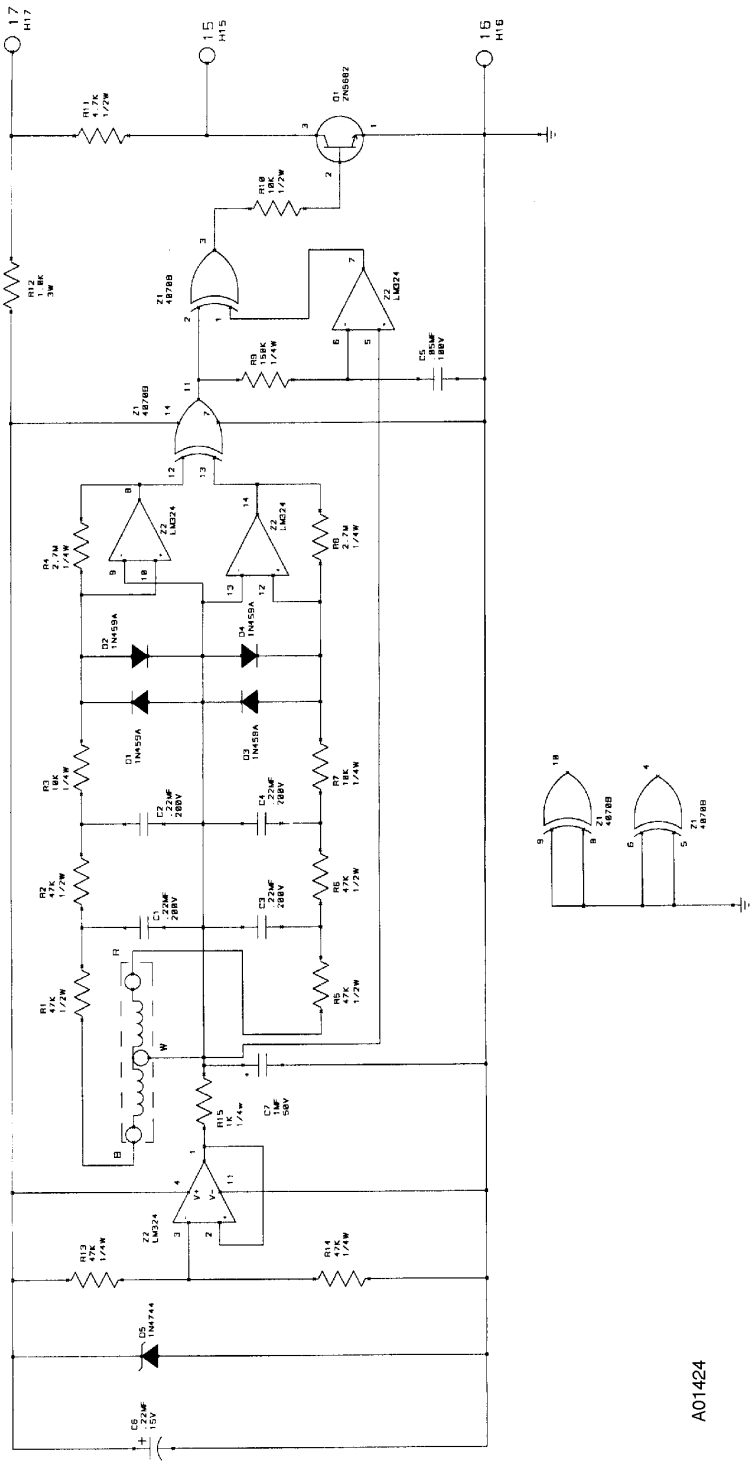


Figure 3-4
Schematic, Model
60-12F Speed Sensor



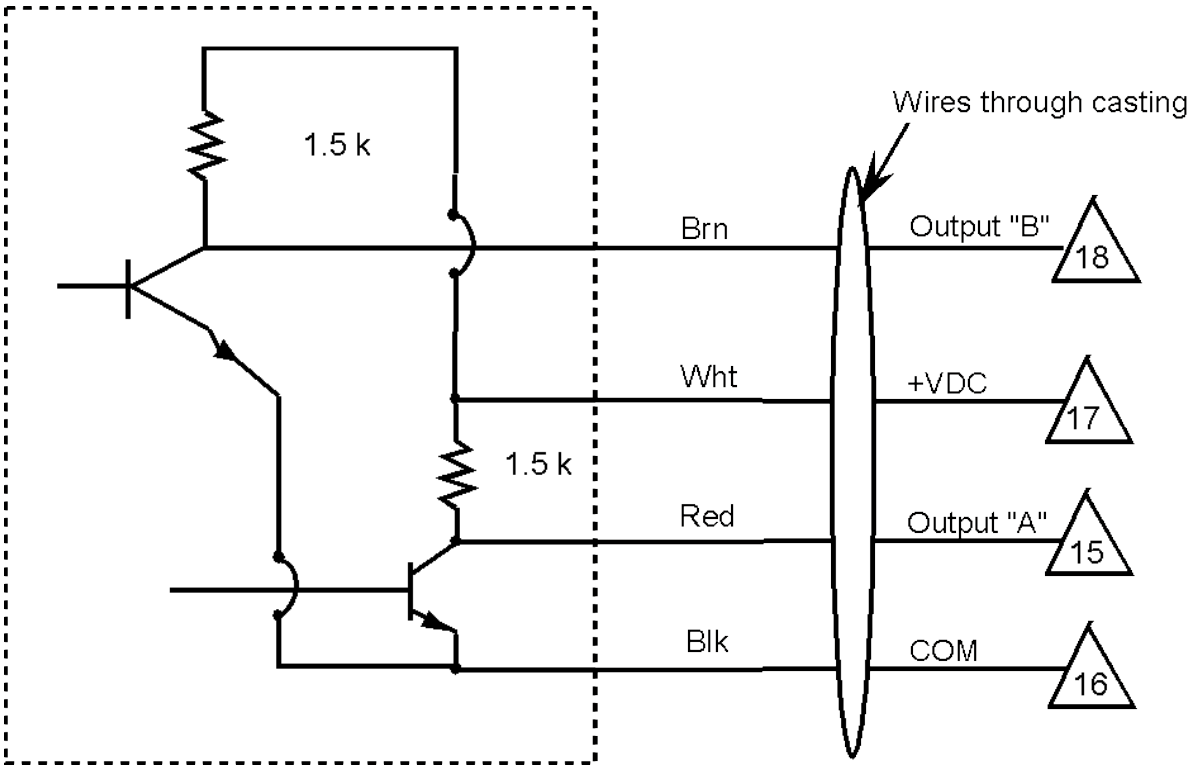
3.4 Model 60-12G

The Model 60-12G is a modified 60-12F, in which C5 has been jumpered out. See Figure 3-4. The 60-12G puts out 100 pulses per revolution, and has an RPM range of 10 to 200 RPM. The output frequency is determined as follows: RPM x 1.666 = Hz. As with the 60-12F, the 60-12G puts out approximately the voltage supplied at terminal 17. See Figure 3-3. The 60-12G requires an external power source of 15 to 30 VDC to operate.

3.5 Model 60-12 ENC

The Model 60-12 ENC (500) has a 500 pulse per revolution encoder with an internal pull up resistor. The output is approximately the voltage supplied at Terminal 17. See Figure 3-3. The 60-12 ENC requires an external power source of 5 to 24 VDC at 60 mA to operate.

Figure 3-5
Schematic Model
60-12 ENC



Chapter 4
Maintenance

4.1 Overview

When performing scale calibration, it is a good practice to inspect the shaft coupling for tightness. Also verify that the restraint arm is free to move. If arm has worn a slot in the restraint stop and the restraint bar cannot float back and forth as well as against the spring, corrections should be made.

4.2 Calibration

No adjustment or calibration of the device is necessary. Operating Temperature range is -20º F to 130º F.

4.3 Troubleshooting

4.3.1 60-12C

1. Place AC voltmeter across field terminals 15 and 16 of 60-12C speed sensor.
2. With conveyor stopped, output should be 0.0 VAC.
3. Start conveyor belt; output should be approximately 3 VAC.
4. If no voltage is present, check the sensor with the wire from terminal 15 disconnected.
5. If no voltage is present while running, repair or replace the speed sensor.
6. If approximately 3 VAC is present, check field wiring.

4.3.2 60-12F or G

1. Place a DC voltmeter across field terminals 17(+) and 16(-) of 60-12F or G speed sensor.
2. Depending on Model of scale integrator, reading should be 20, 24 or 30 VDC.
3. If no voltage present, check at integrator terminals (see scale integrator manual).
4. If voltage is present, check field wiring. If no voltage present, repair or replace integrator.
5. Place AC voltmeter across field terminals 15 and 16 of 60-12F speed sensor.
6. With conveyor stopped, output should be 0.0 VAC.
7. Start conveyor belt; output should be approximately 3 VAC.
8. If no voltage is present, check the sensor with the wire from terminal 15 disconnected.
9. If no voltage is present while running, repair or replace the speed sensor.
10. If approximately 3 VAC is present, check field wiring.

4.3.3 60-12 ENC

1. Place a DC voltmeter across field terminals 17 (+) and 16 (-) of 60-12 ENC speed sensor.
2. Depending on Model of scale integrator, reading should be 20, 24 or 30 VDC.
3. If no voltage present, check at integrator terminals (see scale integrator manual).
4. If voltage is present, check field wiring. If no voltage present, repair or replace integrator.
5. Check output of speed sensor using an oscilloscope or frequency meter. Place meter across terminals 15 (+) and 16 (-) of speed sensor (channel “A”) or terminal 18 (+) and 16 (-) of speed sensor (channel “B”).
6. With conveyor stopped, there should be no pulse output.
7. With conveyor running, output frequency should increase with an increase of belt speed. Amplitude of pulse should be equal to voltage input (see step 2).
8. If no output, repair or replace speed sensor.

Chapter 5
Service Repair and Replacement Parts

This chapter provides information about service, repair, and replacement parts for your Model 60-12 Speed Sensor. It includes the telephone numbers for various departments at *Thermo Fisher Scientific*. The procedure for ordering replacement parts, a Return Material Authorization form on page 3, and the parts list for the 60-12 Speed Sensor is included in this chapter.

5.1 Service and Repair Information

The maintenance information in this manual is designed to meet your service needs. If you should encounter a problem that requires technical assistance, you may call *Thermo Fisher Scientific* Product Service at 1-800-445-3503

Thermo Fisher Scientific also provides on-site service technicians to assist customers with installation, setup, initial calibration, customer training, maintenance, and repair. Contact the *Thermo Fisher Scientific* Field Service department at the number given below for current rates and scheduling.

Thermo Fisher Scientific has repair centers located at our plant in Minneapolis, Minnesota. Products that need system checkout or repair can be returned to the plant with the Return Material Authorization (RMA) form. Contact our Repair and Return department 1-800-445-3503 to get an RMA number to use on the form.

Note: Have your machine model number and serial number available when you call.

PHONE	1-800-445-3503
FAX	(763) 783-2525
Technical Assistance	1-800-445-3503
Field Service	1-800-445-3503
Return Material Authorization & Repair	1-800-445-3503

5.2 Parts Ordering Information

For the fastest service when ordering parts, telephone or FAX the *Thermo Fisher Scientific* Parts Department at the numbers given below. Your regional field service representative can also assist you with parts orders, but this may delay shipment of your parts.

The recommended procedure for ordering parts is:

1. Determine the broken or faulty part.
2. Locate the part in the Parts List.
3. Find the part number(s) for the item(s) you need.
4. Before you contact *Thermo Fisher Scientific* for your parts, make sure you have the following information:
   - Machine model and serial number
   - Purchase Order number
   - Date Required
   - Preferred shipping method
   - Part number(s), descripto9in, and quantity needed.
5. Telephone or FAX:

   Thermo Fisher Scientific
   Customer Service Department
   501 90th Ave NW
   Minneapolis, MN 55433

   FAX: (763) 783-2525
   Phone: 1-800-445-3503
   Return Material Authorization and Repair: 1-800-445-3503

5.3 Contact Information

Listed below is the contact information for Thermo Fisher Scientific offices worldwide.

Australia
+61 (0) 8 8208 8200
+61 (0) 8 8234 3772 fax

Canada
+1 (905) 888-8808
+1 (905) 888-8828 fax

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+56 (0) 2 378 8050
+56 (0) 2 370 1082 fax

China
+86 (0) 21 6865 4588
+86 (0) 21 6445 7830 fax

Germany
+49 (0) 208-824930
+49 (0) 208-852310 fax

India
+91 (20) 6626 7000
+91 (20) 6626 7001 fax

Italy
+39 02-959514-1
+39 02-953200-15 fax

Netherlands
+31 (0) 76-579-5555
+31 (0) 76-571-4958 fax

South Africa
+27 (0) 11-609-3101
+27 (0) 11-609-3110 fax

Spain
+34 (0) 91-484-5965
+34 (0) 91-484-3597 fax

United Kingdom
+44 (0) 1788-820300
+44 (0) 1788-820301 fax

United States
+1 (800) 445-3503
+1 (763) 783-2525 fax
+1 (763) 783-2500 direct

5.4 Return Material Authorization

ThermoFisher SCIENTIFIC

501 90th Avenue N.W.
Minneapolis, MN 55433
12/9/2008

1-800-445-3503
Fax: 763.783.2525
www.thermo.com

Dear Customer,

Thank you for using our in-house repair service. To expedite your repair, control costs, and ensure that safety requirements are met please follow these simple steps.

1. Send in a copy of this completed form with a copy of your PO to the fax or email listed above. An RMA will not be issued without a hard copy PO on file.
2. Once an RMA has been issued, you will be sent a shipping label noting your RMA number and the address to ship the parts back to. The assigned RMA number is valid for 30 days from the date of issuance. If your part(s) is not received within 30 days, your PO will be cancelled and a new RMA will be required. All parts for repair MUST reference a valid RMA number or the part will be returned at your cost.
3. Please do not ship partial shipments. Your return must be complete. Any parts received separately will require a separate RMA and PO. Return only those products which are authorized by the RMA. Additional products that are sent without approval may be returned to you.
4. If a product is determined to be a "no defect found" then an evaluation fee of $250.00 per part ($500.00 per full system) sent in will be charged.

Thank you for giving Thermo Fisher Scientific the opportunity to satisfy your service needs. You can contact me by sending an e-mail to _____ or by calling 1-800-445-3503.

Return Material Authorization (RMA) Form

Note: Thermo Fisher Scientific safety policy requires a decontamination form for any package being received into our building. Please complete the following paperwork and send it to the fax or email noted above. Failure to do so will cause delays. If the unit is not decontaminated as required, there will be a $300.00 minimum charge.

CONTACT INFORMATION

Contact Name: _____
Phone Number: _____
Fax Number: _____
Email: _____

SHIPPING INFORMATION

Company Name: _____
Address: _____
City: _____ State: _____ Zip: _____

BILLING INFORMATION (If different from above):

Company Name: _____
Address: _____
City: _____ State: _____ Zip: _____
A/P Contact Name: _____
Phone Number: _____
Fax Number: _____
Email: _____
TAX EXEMPT: ☐ Yes ☐ No

PAYMENT INFORMATION (Choose One):

☐ **Credit Card** (If you wish to pay via credit card, please call 800-227-8891, opt.2. In order to protect our customers from accidental data compromise, Thermo Fisher Scientific dba Thermo Ramsey Inc does not accept credit card numbers via email or fax.)

☐ **Purchase Order** (If you wish to pay via PO, please send an official hard copy PO with this form)
PO Number: _____

☐ **Warranty** (All warranties need to be pre-approved by our tech support representatives prior to an RMA being issued. If this box is checked then a tech support rep will be contacting you shortly)

ThermoFisher SCIENTIFIC
501 90th Avenue N.W.
Minneapolis, MN 55433
12/9/2008

1-800-445-3503
Fax: 763.783.2525
www.thermo.com

PRODUCT INFORMATION:

Part number: _____
Part Description: _____
Problem description:

_____

Part number: _____
Part Description: _____
Problem description:

_____

Part number: _____
Part Description: _____
Problem description:

_____

Part number: _____
Part Description: _____
Problem description:

_____

ThermoFisher SCIENTIFIC
501 90th Avenue N.W.
Minneapolis, MN 55433
12/9/2008

1-800-445-3503
Fax: 763.783.2525
www.thermo.com

DECONTAMINATION FORM

Please complete all areas of the Decontamination Declaration below.

- **Orders without a Decontamination Declaration will not be processed and the instrument will be returned to the sender via collect freight.**
- **Please send this form with a hard copy of your PO to the above email or fax number to obtain an RMA number for shipping. Retain a copy for your records.**

Please provide a specific description of your system's use:

Describe type of product run on your equipment:

_____
_____
_____
_____

Please describe all cleaning and/or decontamination performed:

_____
_____
_____
_____

Check all that apply:

☐ Out of Box Failure ☐ Non-Hazardous Materials only ☐ **Hazardous Material** (See Below)

Hazardous Materials:

☐ Carcinogen	☐ Bacteria	☐ Fungus	☐ Pathogen	☐ Toxic Substance
☐ Radioactive	☐ Virus	☐ Corrosive Chem. Hazard	☐ Flammable Chem. Hazard	☐ Reactive Chem. Hazard
☐ Animal/ Plant/ Mineral (Explain) _____ _____ _____			☐ Other (Explain) _____ _____ _____	

To the best of my knowledge, this equipment is free of harmful or hazardous chemical, biological or radioactive contamination. I understand that if the equipment is found to be contaminated, regardless of the signature on this document, the equipment will be returned at my company's expense.

Signature: _____ Title: _____ Date: _____

5.5 Parts List

This list provides part numbers and descriptions of the replacement parts.

ITEM DESCRIPTION	PART NO.
60-12C Speed Sensor	003968
Diode, Zener 1N4734A, 5.6-V	001303
Capacitor, Tant 1-mf, 50-V	001173
60-12F Speed Sensor	002916
PCBA, Speed Sensor, 60-12F	002917
60-12G Speed Sensor	005905
60-12 ENC-500 Speed Sensor	045047
Encoder, 60-12 ENC-500	045050
Misc.	
Clamp Bar (Restraint Arm)	002920
Coupling, Stub Shaft, Speed Sensor	037711
Coupling Shaft, .625 Bore	002931
Spring, Extension for Clamp Bar	001988
Motor Support	040736
Cover, Junction Box	004156
Motor, Step, AC	001522

Figure 5-1
Centering Template
for Speed Sensor