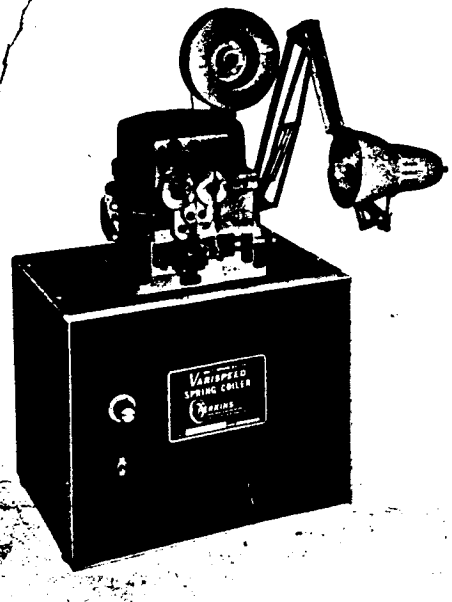
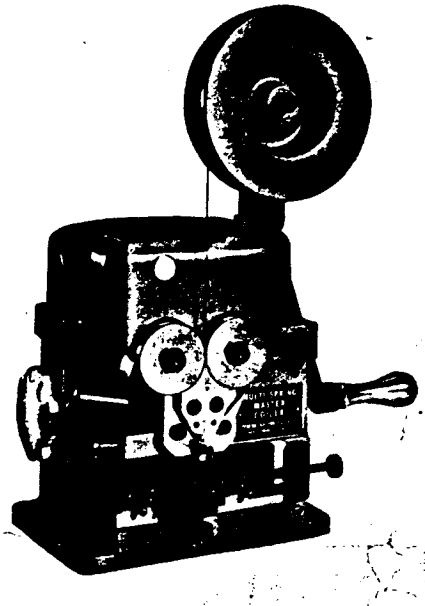
OPERATING INSTRUCTIONS

FOR

PERKINS WIRE COILERS

MODELS: VARISPEED, MS-1 & MS-2





GENERAL INFORMATION

1. WIRE SIZE AND MATERIALS WHICH CAN BE COILED—Perkins Varispeed, MS-1, and MS-2 Wire Coilers will coil .005″ through .125′ diameter round wire of the following materials: aluminum, annealed soft iron wire, bead, brass, copper, gold, heating element wire, nickel alloy, oil tempered music, phosphor bronze, silver, silver solder, steel music wire and many others. Wire should have temper at least ½ hard or equivalent in order to form consistent coils. Certain materials such as resistance wires and other materials having a tendency to scratch or flatten while moving through the coiler may require replacing the standard coiling point with a special coiling roll. This type of special tooling, available at extra cost, is described more completely in the section entitled, SPECIAL TOOLING.

2. WIRE WITH CROSS-SECTION SHAPE OTHER THAN ROUND—Wires with a flat, diamond, square, rectangular or other similar cross section shape can be coiled with special tooling (feed rolls, guides and coiling point or roll). See section entitled, SPECIAL TOOLING.

3. COIL DIAMETERS—Depending upon wire size, coils as small as a fraction of an inch and up to 12″ in outside diameter can be made on Perkins coilers. The position of the horizontal slide and vertical adjustment screw with the large knurled head, located below the coiling point, determines coil diameter. A guide for determining the smallest diameter coil which can be made with wires or different diameters is shown in the following table. Soft wires or wires with inconsistent hardness may not conform to this formula or may not produce consistent coils in any diameter.

Wire Diameter	Minimum Coil Diameter (O.D.)
Up to .055	5 times wire diameter
.056″ - .090″	5½ times wire diameter
.091″ - .100″	6½ times wire diameter
.100″ - .125″	10/11 times wire diameter

4. LONG LENGTHS OF CONTINUOUS COILS—As wire is coiled on a coiling point or roll rather than around an arbor, Perkins coilers will make continuous coils of unlimited lengths. When coils are to be longer than a few inches, a suitable support should be provided to prevent coil from sagging, which can cause distortion. A simple sheet metal or angle iron trough or a section of rod or pipe ending at the coiling point for larger continuous coils is satisfactory. Coils several feet in length can be made by this method.

5. RIGHT-HAND AND LEFT-HAND COILS AND SPRINGS—Either left-hand or right-hand coils can be made. See sections entitled, SET-UP PROCEDURE—RIGHT AND LEFT HAND COILS.

6. COILER OPERATORS—Perkins Wire Coilers are extremely versatile machines. Most users designate one or two men in each department to operate the coiler. With minimum practice they rapidly become expert in turning out springs or coils quickly, accurately and at low cost.

OPERATING YOUR PERKINS COILER

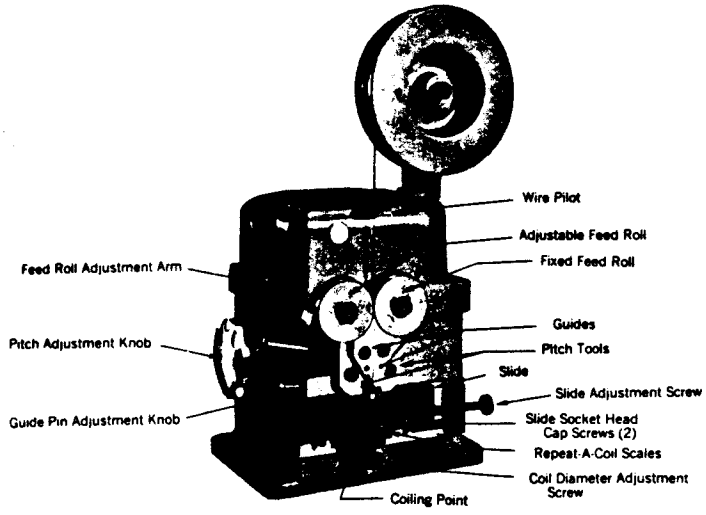


Figure 3

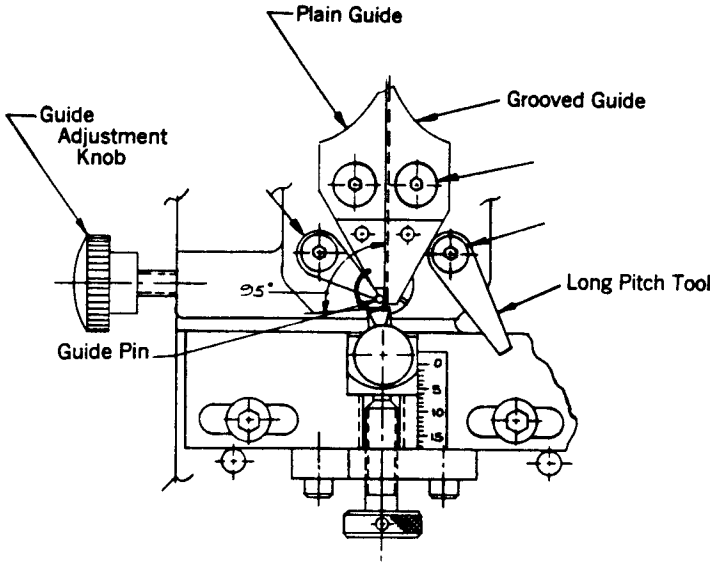


Figure 4

PRINCIPLE OF OPERATION (All Models)

During coiler operation (See Figure 3), wire is forced downward by rotation of the two feed rolls through two wire guides, to a coiling point. The coiling point deflects the wire upward into an extremely accurate round coil. The position of the coiling point relative to the guides determines coil diameter.

Consecutive coils are close together with no space between them when the Pitch Adjusting Knob is at zero. For open coils set the Pitch Adjustment Knob to a point which produces the desired "pitch," or space between the coils.

SET-UP AND OPERATING PROCEDURE

FOR MAKING LEFT-HAND COILS FROM .031" THROUGH .070" DIAMETER ROUND WIRE

When shipped from the factory, all coilers are assembled with tooling to make left-hand coils from round wire of any diameter between .031" and .070". The plain (not grooved) feed roll and guide are on the left; the .031"-.070" grooved feed roll and guide are on the right. To install wire and operate coiler:

1. Loosen Feed Roll Adjustment Arm (Figure 3) one or two full turns and manually move plain feed roll to the left. Loosen the button head screws which hold the guides to the coiler body. Move coiling point, holder and block downward by turning Coil Diameter Adjust-Screw. Loosen the two Slide Socket Head Cap Screws and move slide assembly to the right as far as it will go. Pull old wire (if present) down through guides and discard. You are now ready to install new wire.
2. When using one-pound capacity wire reel, feed wire through Wire Pilot down through guides until about ⅜" of wire emerges below guides. See section entitled LOADING WIRE REEL AND BRACKET ASSEMBLY for wire loading instructions. **If wire is fed from a commercial pay off reel be sure wire will remain reasonably straight and under a slight tension between reel and feed rolls. If a change in direction is necessary, use a pulley 4" or larger in diameter.**

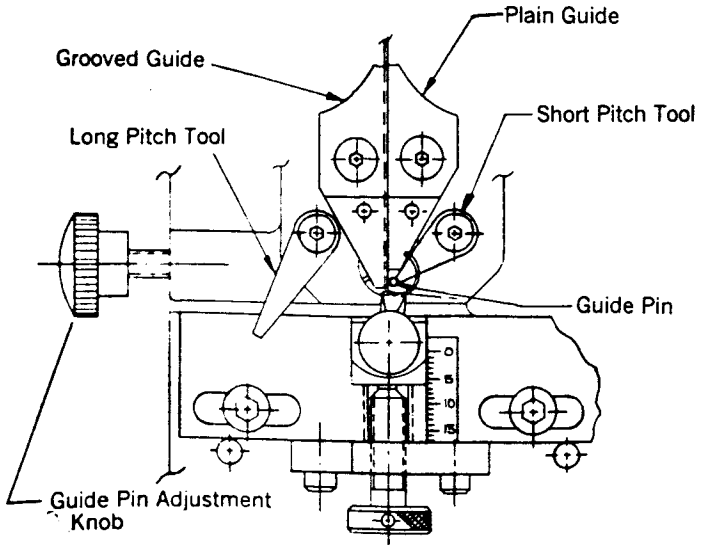


Figure 5

3. Tighten Feed Roll Adjustment Arm just enough to cause wire to move downward when feed rolls turn. Too much tension has a tendency to flatten wire.
4. Push guides tightly together (Figure 4) with a slight upward pressure. Hold in that position and firmly tighten guide screws.
5. Bend wire approximately 90° around guide pin (Figure 4), then turn Guide Pin Adjustment Knob clockwise until wire just touches both the grooved guide and pin. **CAUTION: Too much tension will bind wire feed or break guide pin.** Always use the largest possible guide pin—change to a smaller pin only when making coils having extremely small inside diameter.
6. Turn horizontal Slide Adjustment Screw clockwise until center of tool holder is directly under wire (See Figure 4). Use medium size coiling point and adjust in tool holder so groove on top surface is parallel to front surface of machine. Rotate point to an approximate 95° angle as shown in Figure 4. Finger tighten slide socket head cap screws.
7. Raise coiling point by turning Coil Diameter Adjustment Screw until bent wire rests in coiling point groove. Start coiler (hand-crank or power) and use Coil Diameter Adjustment Screw to obtain coil diameter desired. As coil diameters are increased move the slide to the left so the wire will stay approximately in the center of the coiling point groove. For large coil diameters rotate coiling point counterclockwise in tool holder as required.

LOADING WIRE REEL AND MOUNTING BRACKET ASSEMBLY

LOADING WIRE REEL AND MOUNTING BRACKET ASSEMBLY

To install a 1-pound roll of wire in the reel assembly, remove the rotating reel face from the body casting. Insert the wire in the base cavity. **Do not cut the wire loops which keep the wire in a coil until later.** Locate the inner end of the wire and insert it through the hole in the reel face. Bend the wire over to keep it in place. Locate the outer wire end and pull it out through the opening in the base casting, bend it over so it will not retract into casting. Install the reel face into the body casting and tighten the screw until the reel face is snug against the body, but will rotate with only slight force. Lock the spherical shaped nut firmly against the base casting.

Rotate the reel face until a loop around the wire is visible in the body opening. Cut it with pliers and pull it out. Repeat to remove the remaining wire retaining loops. The wire is now ready for insertion through the wire pilot and between the feed rolls.

FOR MAKING RIGHT-HAND COILS FROM .031" THROUGH .070" WIRE

Install plain feed roll and guide on right side of machine and grooved feed roll and guide on left side. Follow same basic procedure as outlined above, except locate coiling point in position shown in Figure 5.

FOR MAKING RIGHT OR LEFT HAND COILS FROM .005" THROUGH .010" WIRE

Follow same procedure as shown for .031"-.070" wire, except use feed roll and guide marked .005"-.010", the coiling point with the smallest groove and the 1/32" diameter guide pin. When coiling small diameter wire, care must be taken that the coiling point does not contact and bind wire around guide pin—thus obstructing free wire movement or causing guide pin breakage. (Note: .005"-.010" feed roll and guide are supplied only with Model MS-2 coiler. They are available for the Varispeed and MS-1 at nominal extra cost.)

FOR MAKING RIGHT OR LEFT HAND COILS FROM .011" THROUGH .030" WIRE

Use same procedure as described for .031"-.070" wire, except use feed roll and guide marked .011"-.030". If wire is .011" through .020", use coiling point with smallest groove; for .021" through .030" wire, use coiling point with medium size groove.

Again, as stated above, use guide pin having largest diameter possible for the particular diameter coil being made.

FOR MAKING RIGHT OR LEFT HAND COILS FROM .071" THROUGH .125" WIRE

Use same procedure as described previously, except as follows:

1. For wire .071" through .090", use grooved feed roll and guide marked .071"-.125", the large ⅛" diameter guide pin and the coiling point with the largest groove.
2. For wires .091" through .125" remove the plain (not grooved) guide and **use only one guide, the guide marked .071"-.125".** Music wire and other hard wires need only one guide. Should these large wires be so soft that the wire will not stay in contact with the groove in the .071"-.125" guide, a special grooved short nose guide may be ordered from the factory.

   If the non-grooved adjustable feed roll cannot be tightened sufficiently to feed these large wires, replace the plain feed roll with the grooved feed roll marked .031"-.070" or .011"-.030". This will increase wire contact with the rolls and provide a more positive drive.

MAKING CLOSE WOUND COILS

Tension springs and many other coiled wire products require tightly wound coils, with or without varying amounts of pretension. Usually small diameter coils, ½" O.D. or smaller can be close wound on the coiler as shipped from

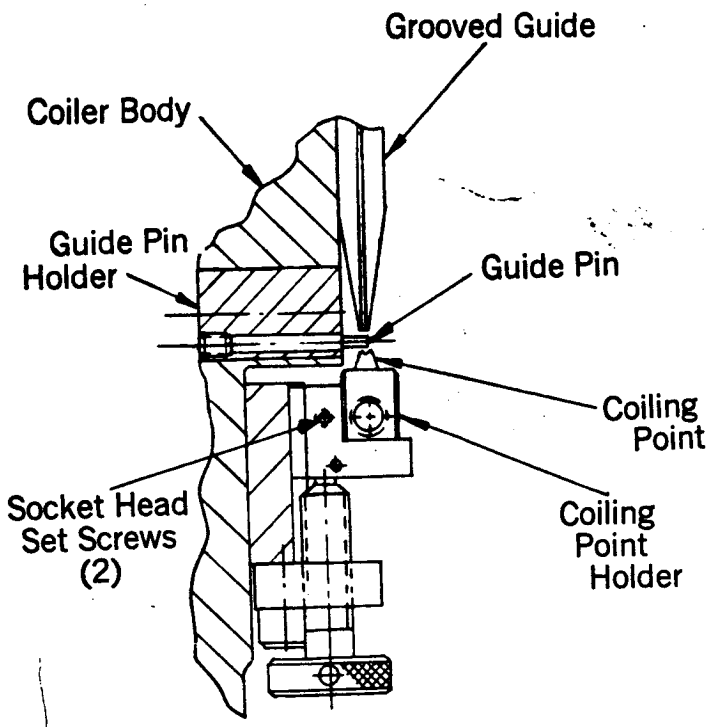


Figure 6

the factory. Larger diameter coils may contact the guides as they form, which can cause a pitch in the coils. When this occurs, an adjustment must be made in the position of the coiling point holder.

COILING POINT HOLDER ADJUSTMENT

Be sure the Pitch Adjustment Knob is set at zero (Figure 3) and the pitch tools are retracted snugly against the coiler body. As shown in Figure 6, the coiling point holder is secured to the elevating block by 2 socket head set screws, one on each side of the block. Loosen both set screws and pull coiling point and holder about 1/32" away from the elevating block. A small screw driver wedged between holder and block will facilitate this operation. Lock holder in the new position and run out a few coils. This new position will preload the coil and should cause the coils to wind close together. If coils are not close wound or the amount of pretension is not sufficient, move the coiling point holder a bit further away from the block. A little experience will indicate the correct position of the coiling point holder. If the holder is moved too far from the block, pretension will decrease to a point where coils will become open wound. Use side cutting pliers or nippers to cut coils at desired length.

To make a loop or hook on a close wound tension spring, use the Hook-Kon Spring Looping Tool, available as an accessory. In an emergency, use any tool with a 45 degree angle or less (such as a screw driver or chisel) to spread open the end of the tension spring, starting a loop or hook. Complete the loop with a pair of pliers.

PITCH ADJUSTMENT

Pitch is defined as the distance between the centers of two adjacent wire coils. This is illustrated in Figure 7. To make open coils, turn the Pitch Adjusting knob (Figure 3) counterclockwise. This operates a cam inside the coiler housing which causes the two pitch tools (Figure 4) to move away from the coiler body so one of the tools will contact the coil being formed. As the knob is turned to a larger number more force is exerted on the coil. This further deflects the wire and the pitch increases. The Pitch Adjustment Knob will stay in any position at which it is set—no need to hold it by hand.

VARISPEED MOTOR AND CONTROLS

The solid-state SCR motor has infinite speed control. Wire feed can be adjusted from a crawl speed of 6" per minute to 360" per minute at maximum speed.

To Operate: Set potentiometer knob on front panel of motor cabinet (Figure 1) at 0. Turn switch to "On". Rotate potentiometer knob slowly. Motor will not respond until scale reads 2 or above.

Use slow speed when setting up and for adjusting to desired diameter and/or pitch. Then speed up motor to obtain desired wire feed. When a suitable speed has been selected, the coiler may be started and stopped by using the line switch. When not in use, turn line switch "Off".

REPEAT-A-COIL CONTROLS

1. When the diameter of a coil has been made for a particular purpose or to a specific drawing and duplicates may be required at some future date, record the horizontal and vertical scale positions of the slide assembly and coiling point holder block. When duplicates are required, reset the coiler to these positions—then only minor final adjustments will be required to make exact duplicates.
2. When producing coils requiring a Pitch Adjustment Knob setting, record the numerical setting of the pitch control pointer. Thus, future duplication of coil pitch is easily accomplished.
3. Frequently it becomes necessary to make a quantity of duplicate compression springs with closed ends. After setting the adjustments for obtaining the correct coil diameter, find the pitch pointer position which will give the desired number of coils per inch. Then, on the

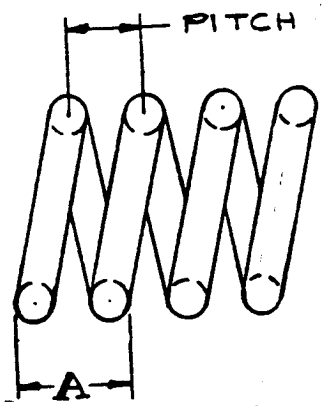


Figure 7

rear surface of the coiler body, turn the pitch setting knob counterclockwise until it brings up against an internal stop. Leave it in this position. Then run out a few closed coils, turn the pitch knob until it brings up against the internal stop, count the coils as they are being formed and when the spring has the correct number of coils, move the pitch pointer back to zero. Turn a few closed coils and repeat. This will produce a continuous quantity of duplicate springs. Stop coiler and cut off wire close to coiling point. Then cut between the closed coils to separate the springs. Use pliers, nippers or an abrasive wheel. Cut off excess coils on each spring end with nippers and the springs are ready for use.

STANDARD TOOLING AND EQUIPMENT SUPPLIED WITH PERKINS COILERS

VARISPEED—The following items are standard equipment:

1—Feed Roll, plain

3—Feed Rolls, grooved, marked .011-.030, .031-.070, .071-.125, respectively

1—Guide, plain

3—Guides, grooved, marked .011-.030, .031-.070, .071-.125, respectively

3—Coiling Points, small, medium and large

1—Set Allen Wrenches

MS-1—All tooling and equipment included with the Varispeed, plus a 1-pound Wire Reel and Bracket Assembly.

MS-2—All tooling and equipment included with the MS-1, plus a Grooved Feed Roll and Grooved Guide, each marked .005-.010. This extends the wire handling capability of the MS-2 Coiler to .005" through .125" wire size.

SPECIAL TOOLING

1. Materials such as resistance wire, copper and certain alloys which may nick, scratch or form irregular coils on a coiling point can usually be satisfactorily handled with a coiling roll, available at extra cost. The coiling roll has a groove around its outside diameter. It rotates on a spindle fitted in a special elevating block. This assembly is used in place of the standard block, coiling point and holder. Unlike a coiling point which can handle a wide range of wire sizes, a coiling roll will handle wires only over a limited diameter range. It can not be used with wires larger than for which it is designed but it may be used with wire somewhat smaller, down to .006" below the design size.

   The coiling roll can be adjusted to form closed coils, with or without tension, by a simple screw driver adjustment on the spindle. Coil diameters are determined in the same manner as with a coiling point.

2. WIRES OTHER THAN ROUND can usually be coiled satisfactorily with special tooling, available at extra cost. Usually a special feed roll, guide and coiling roll, designed to accept the shape of the wire are required. Its use is limited to the wire size and shape for which it is designed.

   For a quotation on special tooling cost, please submit the following data:

   a. Drawing or exact description of cross-section shape.
   b. Dimensions, including tolerances.
   c. Material specification.
   d. Diameter of coil desired.
   e. Open or closed coils; if open, specify pitch.

MAINTENANCE

Perkins coilers require only a minimum of maintenance. Clean all exposed surfaces frequently, including feed rolls, guides, coiling point or roll and all adjustment knobs.

Please refer to the following sections for specific maintenance and lubrication recommendations for Varispeed and hand-operated coilers.

VARISPEED—

Lubricate the Varispeed coiler frequently, depending upon usage, in the following manner:

1. Use lithium base grease in a pressure gun to lubricate the vertical drive shaft needle bearing. The grease fitting is located on the rear surface of the coiler body.
2. Remove the coiler body cover and apply lithium base grease on the worm gear, worm wheel and two spur gears. At the same time, apply grease to the pitch cam, shafts and springs.
3. Occasionally apply a few drops of SAE 10 non-detergent oil on the pitch tool shafts from the front of the machine.

NOTE: The feed roll shafts turn in needle bearings which are grease packed at the factory. They require no further lubrication.

Motor bearings are permanently packed and require no further attention.

Both sides of the electric supply are fused with quickly removable bayonet type fuses in holders mounted on the rear wall of the Varispeed motor cabinet. If a fuse fails from overload or fatigue after long usage, replace with dual element slow-blow MDL10 or 3AG-SB fuses.

MS-1 AND MS-2 HAND COILERS—

Lubricate hand coilers frequently, depending upon usage, in the following manner:

1. Lubricate the horizontal worm gear shaft with SAE 10 non-detergent oil through the fitting on the top of the cover.
2. Remove the large plug above and to the left of the pitch control knob and apply lithium base grease on the worm and all gears.
3. Occasionally apply a few drops of SAE 10 non-detergent oil on the pitch tool shafts from the front of the machine.

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