WARNING: DEVIATION FROM THESE INSTALLATION INSTRUCTIONS MAY LEAD TO IMPROPER ENGINE OPERATION WHICH COULD CAUSE PERSONAL INJURY TO OPERATORS OR OTHER NEARBY PERSONNEL.

1.0 DESCRIPTION

1.1 The CPU-90 ignition system consists of these basic components (see drawing 709 901 for system layout):
1. CPU-90 Unit
2. Wiring Harness
3. Magnetic Pick-ups and Cable Assemblies (qty. 2 each)
4. Hall-effect Pick-up with Trigger Magnet and Cable Assembly (4-cycle engine only)
5. Ignition Coils - one per spark plug; use only the following types:
   501 061, 591 010, 591 040, 501 061-S, 591 010-S, 591 007, 591 011A, 591 011B, 591 012
   NOTE: Unit 791 916-150 only may be used with Altronic type 291 001, 291 001-S, 591 008 or Bendix ignition coils.

1.2 The Altronic CPU-90 is a DC-powered, microcircuit-based, capacitor discharge ignition system applicable to a wide range of industrial engines. The system features crankshaft-triggered timing accuracy and the capability to vary timing electronically by several means, including an external 1,000 ohm potentiometer or 4-20 ma control signal. In addition, two energy/spark duration levels are user selectable. The 791 91x-200 units have a double-strike spark option particularly recommended for 2-cycle applications. There are no wearing rotating parts added to the engine.

2.0 MOUNTING THE CPU-90 UNIT

2.1 Refer to drawing 799 013 for the CPU-90 unit mounting dimensions. Select a mounting location meeting the following requirements:
A. Located within 25 ft. (7,6 m.) of the furthest ignition coil and in a relatively cool location. The outside case temperature of the CPU-90 unit should not exceed 150°F. (65°C.) in operation.
B. The front panel door of the CPU-90 unit should be easily accessible and free to swing open.

2.2 The CPU-90 unit should be fastened securely to a rigid engine bracket using the shock mounts provided.

2.3 The internal CYCLE JUMPER (next to green LED) must be in the correct position (4-CYCLE or 2-CYCLE) for the application.

3.0 CRANKSHAFT REFERENCED GEAR OR HOLES

3.1 The Altronic CPU-90 system requires a source of angular pulses referenced to the engine crankshaft. Possible sources are:
A. The flywheel ring gear. If possible, locate the pick-up on a portion of the teeth that does not engage the starting motor. All teeth must be normally formed for the CPU-90 system to operate correctly.
B. A separately mounted gear meeting these requirements:
   - Must be ferrous material
   - Must be 18" (450 mm) diameter or greater
   - Preferably with 180 to 360 teeth (see NOTE below)
   - Maximum runout with respect to pick-up of .005" (.12 mm)
C. Specially drilled holes (180 to 360) in the flywheel. Refer to drawing 709 903 for details.
   NOTE: The maximum number of holes/teeth permitted (N) is determined by the formula:
   $N = 45{,}000 / A$ where A = the largest engine firing interval in degrees
   Refer to the CPU-90 Application List (form CPU90 AL) for a listing of engine firing angles.
   NOTE: For Ingersoll Rand model PSVG-10, the number of holes/teeth must be between 240 and 320.

4.0 MOUNTING THE MAGNETIC PICK-UPS

4.1 The system requires two magnetic pick-up signals: the angular position pulses from the gear or drilled holes and a reset pulse near the most advanced firing position desired for no. 1 cylinder. The pick-ups must be mounted to rigid brackets to maintain an air gap of .015" ±.005" (0.38 mm ±0.12 mm) with respect to the rotating gear or flywheel. It is also important for maximum signal efficiency that the centerline of the pick-up line up with the center of the rotating part - see drawing 709 902. Refer to drawing 691 118 for dimensions of the magnetic pick-up.

5.0 MOUNTING THE FLYWHEEL RESET PIN

5.1 Set the engine with no. 1 cylinder eight (8) degrees ahead of the most advanced firing point. Mark a point on the flywheel directly opposite the pole piece of the reset magnetic pick-up; then rotate the flywheel to a position convenient for drilling and tapping the flywheel at the point marked above. The reset pin should be made from a steel (magnetic) 1/4"-20 bolt or stud. See drawing 709 902 for details.
NOTE: Some applications require the reset pin be set ahead of the second cylinder in the firing order. Refer to the CPU-90 data sheet (page 6) for these applications.

5.2 Rotate the engine to the original set point and adjust the air gap between the end of the reset pin and the magnetic pick-up at .015" ±.005" (0.38 mm ±0.12 mm) using a feeler gauge.

6.0 MOUNTING THE CYCLE TRIGGER (4-CYCLE ENGINE ONLY)

6.1 The trigger magnet must be mounted on the engine camshaft or other accessory drive operating at camshaft speed. An 8 mm tapped hole 1/2" (12.7 mm) deep is required. There are two available trigger magnets; each has a clearance height requirement and must rotate on a diameter NOT EXCEEDING the amount specified below.
- Magnet 720 002: .33" (8.4 mm) height; 6" (150 mm) max. diameter circle.
- Magnet 260 604: 1.4" (35 mm) height; 15" (375 mm) max. diameter circle.

6.2 Set the engine on the COMPRESSION stroke of no. 1 cylinder with the reset pin DIRECTLY OPPOSITE the reset pick-up. The Hall-effect pick-up (591 014-x) must be mounted DIRECTLY OPPOSITE the trigger magnet coincident with the reset pin and pick-up being lined up - refer to drawing 709 901. The Hall-effect pick-up dimensions are shown on drawing 591 014.
NOTE: If the Hall-effect operation is correct, the 4-CYCLE LED INDICATOR will light in the CPU-90 unit.

6.3 The air gap between the Hall-effect pick-up and the trigger magnet must not exceed .040" (1.0 mm).

7.0 IGNITION COILS

7.1 Use only the ignition coils indicated in section 1.1.

7.2 Mount the ignition coils as close to the spark plugs as possible keeping the high-tension lead length to a minimum but also keeping temperature below 200°F. (95°C.) during operation.

8.0 CPU-90 UNIT WIRING (REFER TO DRAWING 709 904)

8.1 RIGHT-HAND ENTRY - The input power from a battery or source of DC power (12-28 VDC) should be run through the right-hand entry in the bottom access plate of the CPU-90 unit and connected to the "+" and "–" terminals of the right-hand, 6-position terminal strip as shown on drawing 709 904. The entry hole is sized for a 1/2"-14 NPT male conduit fitting.

8.2 CENTER ENTRY - The center entry should be used for all pick-up signal wires - the two magnetic pick-ups and (4-cycle engine only) the Hall-effect cable.

8.3 LEFT-HAND ENTRY - The left-hand entry is used for all connections to the left-hand, 12-position terminal strip in the CPU box. Use 24AWG, UL style 1015 wire for all these connections; this wire is available from Altronic under part no. 603 102 (black) or 603 103 (white).

A. Terminals 7-8 are used for the external 0-1,000 ohm potentiometer; see drawing 709 905.
B. Terminals 1-4 are used for the 4-20 ma timing control connections; see drawing 709 905.
   NOTE: Terminals 2 and 4 are electrically common with each other but isolated from the system ground.
C. Terminals 5-6 are used for the one-step timing adjustment; see drawing 709 906.
D. Terminals 10-11 are used for the analog timing signal fault indication; see drawing 709 907 and section 13 for details.
E. Terminal 12 can be used on the 791 91x-200 models to cancel the double-strike mode of operation; ground terminal 12 to revert unit to single-strike operation - refer to drawing 709 910.

9.0 PRIMARY WIRING (REFER TO WIRING DIAGRAMS 709 908 / 709 909)

9.1 The CPU-90 system requires a battery or other DC power source.
- The 791 91x-100 units operate over a voltage range of 12-28 VDC.
- The 791 916-150 units operate over a voltage range of 20-28 VDC.
- The 791 91x-200 units operate over a voltage range of 20-28 VDC.

Refer to drawing 709 900 for details of the required DC power source.

9.2 The main wiring harness connects to the 19-pin connector on the side of the CPU-90 unit. The harness connector should be inserted into the unit receptacle and tightened hand tight; then carefully tighten an additional one-sixth turn with a wrench.

9.3 The firing order of the CPU-90 units is shown on the data sheet (page 6). Starting with lead "A", the harness leads are connected in accordance with the engine's firing order to the positive (+) terminals of the coils - see wiring diagrams 709 908 and 709 909.
NOTE: Some engine models require special wiring instructions - refer to the data sheet (page 6).

9.4 A common ground lead connecting the negative (–) terminals of the coils must be run as shown in the wiring diagrams and be connected to the "J" harness lead. In addition, for the coils at the end cylinders of each bank (4 total on V-type engine) it is necessary to run a short wire from the negative (–) terminal of the coil to engine ground. For minimum emitted RFI, ground each coil's negative (–) terminal in this manner.

9.5 Primary wire should be no. 16 gauge stranded, tinned copper wire. The insulation should have a minimum thickness of .016" and be rated 105°C. or higher. Irradiated PVC or polyolefin insulations are recommended; Altronic primary wire no. 503 188 meets these specifications. All connections should be made using ring type terminals specified for 16 gauge wire and #10 stud size. Terminals should either be soldered to the wire or attached with an appropriate staking tool. All primary wiring should be protected from physical damage, vibration and temperatures in excess of 200°F. (95°C.).

9.6 If two ignition coils per cylinder are used, use parallel wiring as shown on wiring diagrams 709 908 and 709 909.

9.7 SHIELDED SYSTEM - For component layout and wiring for a shielded system, refer to drawing 709 909. See drawing 509 025 for instructions on altering the length of a shielded harness.

10.0 SHUTDOWN WIRING

10.1 The CPU-90 system can be shut-off in two ways:

A. OPTION 1 - Interrupt the DC power to the unit; use a switch or relay with contacts rated 24 VDC, 10 amps - refer to drawing 709 900.

B. OPTION 2 - Ground the "G" harness lead; this may be used if the panel (1) was powered from an Altronic I, III or V ignition system and (2) utilizes Altronic instruments if electronic instrumentation is used. Refer to wiring diagrams 709 908 and 709 909. When the "G" lead is grounded, the CPU-90 unit will draw about 0.1 amp from the power source.

NOTE: If desired, the "G" lead may be used to power Altronic display instruments in the panel and OPTION 1 used to shut-off the ignition.

11.0 SECONDARY WIRING

11.1 The spark plug leads should be fabricated from silicone insulated 7mm cable with suitable terminals and silicone spark plug boots. The use of suppression cable (Altronic part no. 503 285) is strongly recommended in order to minimize interference from emitted RFI on the operation of other nearby electronic equipment. Keep spark plug leads as short as possible and in all cases not longer than 20 inches (500 mm). Spark plug leads should be kept at least 2 inches (50 mm) away from any grounded engine part. In deep spark plug wells, use rigid, insulated extenders projecting out of the well.

11.2 The use of a clear, silicone grease (such as Dow Corning DC-4, G.E. G-623 or GC Electronics Z5) is recommended for all high-tension connections and boots. This material helps seal out moisture and prevent corrosion from atmospheric sources.

12.0 OPERATION

12.1 ENERGY LEVEL - The CPU-90 unit steps up the DC supply voltage to charge an energy storage capacitor. Two energy/spark duration levels are available as selected by switch SW4 within the unit. The higher output (EXTRA HIGH) setting should be selected for the following types of applications:
- engines with two coils per cylinder
- lean-burn engines with shielded spark plug leads
- engines with poor quality fuel

12.2 CYCLE JUMPER - The CYCLE JUMPER (next to green LED) must be in the correct position (4-CYCLE or 2-CYCLE) for the application.

12.3 TIMING INCREMENT - The CPU-90 unit consists of power conditioning circuitry for the logic circuit and memory, and an electronic distribution circuit. The system operates with two magnetic pick-up inputs. One counts the teeth on a crankshaft mounted gear or holes drilled in the flywheel; the other provides a reset pulse once per engine revolution. Two counts are provided for each gear tooth or flywheel hole. Thus the degree separation from one count to the next is 360/2N, where N = no. of teeth or holes. This value is called a TOOTH DEGREE.

Example: No. of teeth = 230 TOOTH DEGREE = 360 / 2x230 = 0.78 engine degree

The TOOTH DEGREE is the basic unit of timing adjustability or change in the system. As ignition timing is varied on an operating engine, it will vary one TOOTH DEGREE at a time.

12.4 TIMING ADJUSTMENTS - All timing adjustments are made by delaying (retarding) the spark output a given number of TOOTH DEGREES. There are three ways to vary the ignition timing with the CPU-90 system; all are through connections and/or switches in the CPU-90 unit (refer to drawing 709 904):

A. Manual Setting (SW1) - This subtracts TOOTH DEGREES (0-9) from the reset pin position to determine the maximum advance timing point in operation.

B. One-Step Setting (SW2) - This sets another retard amount in TOOTH DEGREES (0-15) that can be switched in through the use of external contacts (see drawing 709 906).

C. Analog Timing Adjustment (SW3) - The jumper next to the memory chip must be placed in the uppper position (LOOP/POT.). Then position switch SW3 for either 4-20 ma current loop (LOOP) or 1,000 ohm potentiometer (POT./RPM). The range of timing adjustment is programmed in the memory; see drawing 709 905 for the standard "E" code memory chip.

D. Programmed Timing Curve vs. RPM - When using a memory chip with a timing curve vs. RPM ("R" memory code), the jumper next to the memory chip must be in the lower position (RPM) and switch SW3 placed in the POT./RPM position.

NOTE: If neither analog nor programmed RPM timing adjustments are used, place switch SW3 in the middle OFF position.

NOTE: The total sum of all timing adjustments may not be available in some applications.

12.5 DOUBLE-STRIKE UNIT - The 791 91x-200 units have a double strike spark operation. Each output is fired twice giving better combustion performance on hard-to-ignite applications such as certain 2-cycle engines, ultra lean-burn engines or for operation on poor quality fuel. The second spark reduces misfiring in these applications by doubling the odds of igniting a good fuel mixture and by adding more spark energy to maintain the combustion flame front started by the first spark. Terminal 12 can be used on the 791 91x-200 models to cancel the double-strike mode of operation; ground terminal 12 to revert unit to single-strike operation - refer to drawing 709 910. This terminal may be used to allow double-strike operation on command, for example, when changing engine load or fuel content.

NOTE: 791 91x-200 series units are recommended only for engines operating at or below 1,000 RPM.

12.6 MEMORY CHIP (EPROM) - The system memory chip contains the specific information for any particular engine application. This includes no. of cylinders, 2 or 4-cycle, engine firing pattern in degrees, no. of teeth or holes being sensed, and timing range on the analog timing input. The memory code part no. is printed on the integrated circuit memory chip in the CPU-90 unit. See form CPU-90 AL for the memory code part no. to be sure the system program meets the application requirements. Special memory chips are available for custom timing curve requirements. To order a spare memory chip, order part no. 601 582 (memory code).

13.0 OPERATION INDICATORS

13.1 4-CYCLE LED - The CPU-90 has a 4-CYCLE LED INDICATOR to signify properly synchronized Hall-effect and reset signals (see section 6.2). When power is first applied, the LED will come on indicating that the unit is powered; this occurs regardless of the position of the CYCLE JUMPER. LED functioning under engine operating conditions is covered below:

A. 2-CYCLE OPERATION (jumper in 2-CYCLE position): After the engine is rotating, the LED will be off for normal 2-cycle operation.

B. 4-CYCLE OPERATION (jumper in 4-CYCLE position): After the engine is rotating, the LED will be on for normal 4-cycle operation. If the LED fails to stay on with the engine rotating in a 4-cycle installation, it indicates that either (1) the Hall-effect or reset pick-up signal is not being received, or (2) these signals are not properly synchronized - see section 6.2.

13.2 CURRENT LOOP AND POT. LED - The CPU-90 Unit has a CURRENT LOOP AND POT. LED INDICATOR to signify proper analog input operation. The LED will be on if the system is functioning with an analog timing input; if not, check the appropriate connections (see 709 905) and external circuits.

13.3 FAULT OUTPUT - The system has a normally-closed, solid state fault output switch available at terminals 10 and 11 in the CPU-90 unit; this automatically opens if the 4-20 ma signals are lost. The internal switch has a rating of 30 VDC, 250 ma. Terminals 10 and 11 in the CPU-90 unit may be connected to an external alarm or shutdown device; a typical hook-up using a relay is shown on drawing 709 907.

DATA SHEET - CPU-90 UNITS: 791 916-100, 791 916-200, 791 916-150, 791 918-100, 791 918-200

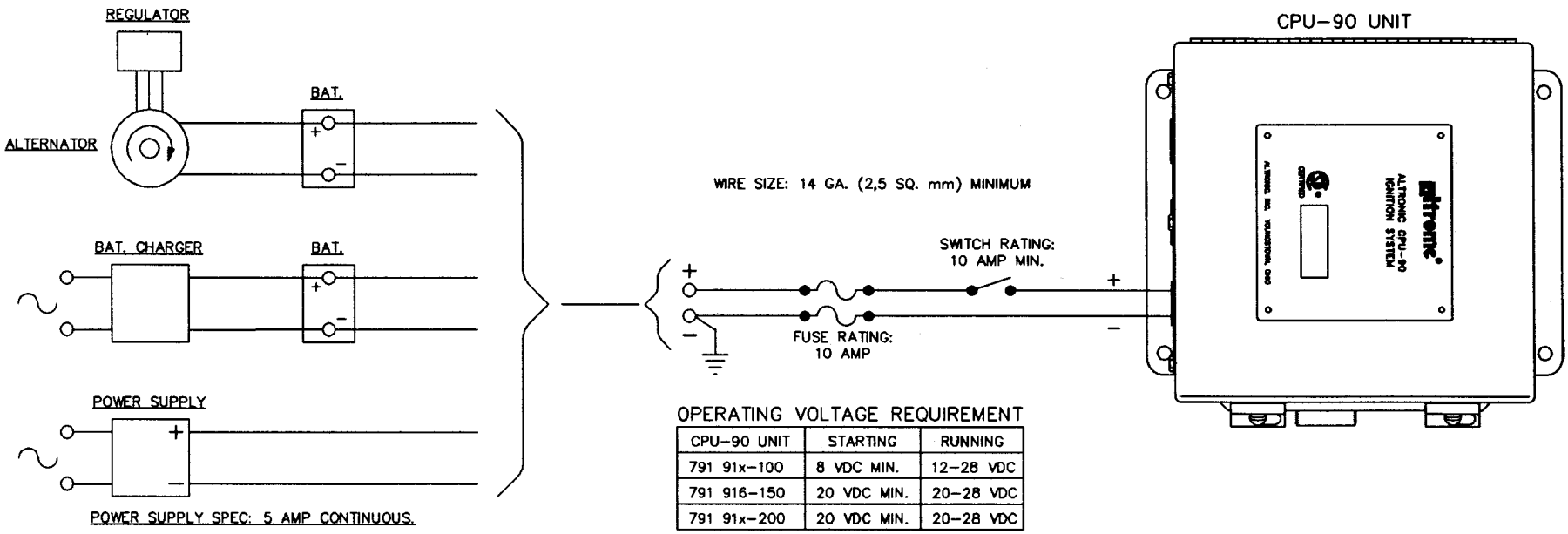
CPU-90 UNIT NO.	NO. OF OUTPUTS	FIRING ORDER
791 916-100	16	A - B - C - D - E - F - K - L - M - N - P - R - S - T - U - V
791 916-150	16	A - B - C - D - E - F - K - L - M - N - P - R - S - T - U - V
791 916-200	16	A - B - C - D - E - F - K - L - M - N - P - R - S - T - U - V
791 918-100	18	A - B - C - D - E - F - G - H - K - L - M - N - P - R - S - T - U - V
791 918-200	18	A - B - C - D - E - F - G - H - K - L - M - N - P - R - S - T - U - V

APPLICATIONS WITH SPECIAL WIRING INSTRUCTIONS - For the engine models listed below, the lead cylinder must be the SECOND cylinder in the firing order:

1. The reset pin location (section 5) must be eight (8) degrees ahead of the cylinder connected to lead "A" (see chart below).
2. Wire lead "A" to the cylinder indicated below; then follow with "B", etc. for the balance of the engine firing order ending with the first cylinder of the normal firing order.

ENGINE MODEL	CPU-90 MEMORY CODE	CYLINDER FOR LEAD "A"
Caterpillar 3516SI	P4Pxxx.Ex	2
Caterpillar G399	P4Pxxx.Ex	2
Clark BA-8, HBA-8	H2Hxxx.Ex	6
Cooper GMV-8 series	H2Bxxx.Ex	1R or 2
Cooper GMV-8 series (short stroke)	H2Fxxx.Ex	2
Cooper GMV-10 series	J2Bxxx.Ex	1R or 2
Cooper GMV-10 series (short stroke)	J2Fxxx.Ex	2
Cooper GMW-12 series	L2Dxxx.Ex	1R
Cooper GMX-8 series	H2Fxxx.Ex	1R or 2
Cooper GMX-10 series	J2Fxxx.Ex	1R or 2
Ingersoll Rand 10SVG	J4Dxxx.Ex	10
Ingersoll Rand 103KVG	J4Exxx.Ex	10
Ingersoll Rand 104KVG	J4Exxx.Ex	9
Ingersoll Rand 410KVG	J4Exxx.Ex	10
Ingersoll Rand PKVG-10	J4Exxx.Ex	10
Ingersoll Rand PSVG-10	J4Pxxx.Ex	10
Ingersoll Rand PSVG-12	L4Pxxx.Ex	12
Waukesha P9390 (new firing order)	P4Pxxx.Ex	1L
Waukesha P9390 (old firing order)	P4Pxxx.Ex	8L

D.C. POWER SOURCE



OPERATING VOLTAGE REQUIREMENT

CPU–90 UNIT	STARTING	RUNNING
791 91x–100	8 VDC MIN.	12–28 VDC
791 916–150	20 VDC MIN.	20–28 VDC
791 91x–200	20 VDC MIN.	20–28 VDC

AVERAGE CURRENT DRAW

CPU–90 UNIT	GENERAL FORMULA 4–CYCLE ENGINE	GENERAL FORMULA 2–CYCLE ENGINE
791 91x–100	$\frac{N \times RPM}{16,000}$	$\frac{N \times RPM}{8,000}$
791 916–150	$\frac{N \times RPM}{10,000}$	$\frac{N \times RPM}{5,000}$
791 91x–200	$\frac{N \times RPM}{8,000}$	$\frac{N \times RPM}{4,000}$

N = NUMBER OF CYLINDERS

NOTE: FORMULA GIVEN IS FOR 24 VDC POWER. FOR 12 VDC POWER MULTIPLY BY 2.

NOTE:

INFORMATION IS PER ONE (1) CPU–90 SYSTEM. FOR MULTIPLE SYSTEMS, MULTIPLY REQUIREMENTS BY NUMBER OF SYSTEMS.

REVISIONS			
NO.	DATE	BY	DESCRIPTION
1	12–27–90	WTP	REMOVED GRAPH "CURRENT DRAW OF CPU–90 UNIT"
2	3–12–91	WTP	ADDED SECOND FUSE AND CSA LOGO
3	5–16–91	WTP	GROUND WAS LEFT OF FUSE
4	8–5–92	WTP	UPDATED CHARTS
5	4–30–93	WTP	ADDED 791 916–150 MODEL

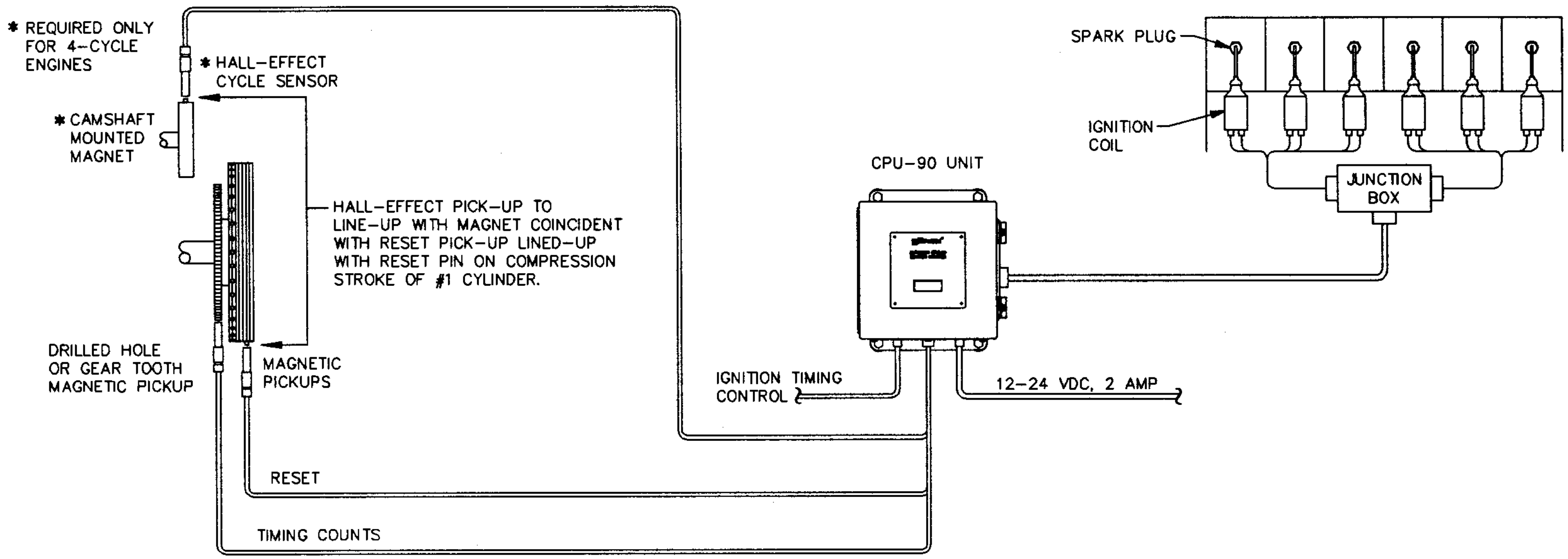
TOLERANCES (EXCEPT AS NOTED)
DECIMAL .XXX – ±.005 .XX – ±.010
FRACTIONAL
MATERIAL

ALTRONIC INC.

TITLE: DC POWER HOOKUP CPU–90 IGNITION SYSTEM

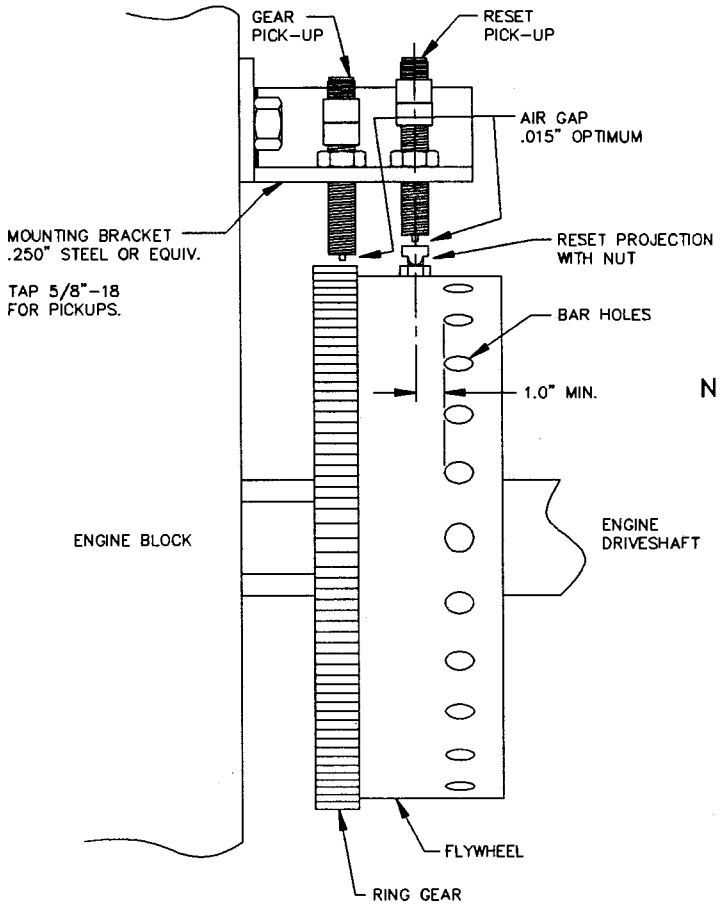
DRAWN BY WTP | SCALE NONE | PART NUMBER
CHECKED BY | DATE 9–29–90 | 709 900
APPROVED BY

709 900



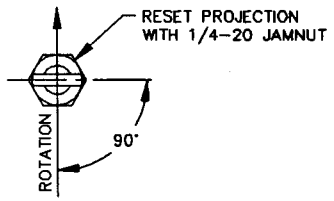
REVISIONS			
NO.	DATE	BY	DESCRIPTION
1	12-28-90	DEB	UPDATE LABEL
2			
3			
4			
5			

TOLERANCES (EXCEPT AS NOTED)	ALTRONIC INC.
DECIMAL .XXX - ±.005 .XX - ±.010	TITLE: SYSTEM DIAGRAM CPU-90 IGNITION SYSTEM
FRACTIONAL	DRAWN BY: WTP; SCALE: NONE; PART NUMBER: 709 901
MATERIAL	CHECKED BY; DATE: 7-17-90
	APPROVED BY



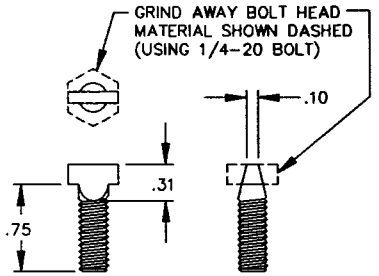
NOTE:

FLYWHEEL GUARD NOT SHOWN FOR CLARITY.



PATH OF ROTATION IS PERPENDICULAR TO FLAT OF STUD

EDGE VIEW



RESET PROJECTION

NOTE:

VISUAL PROPORTION OF THIS ILLUSTRATION WILL CHANGE WITH VARIATIONS IN GEAR AND FLYWHEEL SIZE AND RELATIONSHIP.

REVISIONS			
NO.	DATE	BY	DESCRIPTION
1	12-27-90	WTP	1.0" MIN. WAS FROM ℄ OF RESET PICK-UP TO ℄ OF BAR HOLES
2			
3			
4			
5			

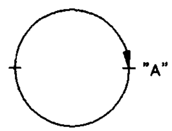
TOLERANCES (EXCEPT AS NOTED)
DECIMAL .XXX - ±.005 .XX - ±.010
FRACTIONAL
MATERIAL

ALTRONIC INC.

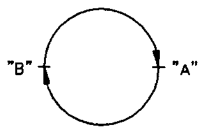
TITLE PICKUP MOUNTING DETAIL

DRAWN BY	WTP	SCALE	NONE	PART NUMBER
CHECKED BY		DATE	9-5-90	709 902
APPROVED BY				

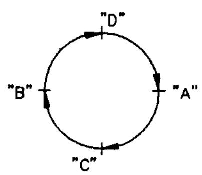
FLYWHEEL LAYOUT



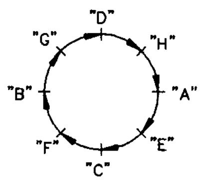
MARK "A" AND MEASURE CIRCUMFERENCE A→A



MEASURE 1/2A→A AND MARK "B"
NOTE: A→B = B→A

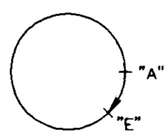


MEASURE 1/2A→B AND MARK "C"
MEASURE AND MARK "D" IN THE SAME MANNER



MEASURE 1/2A→C AND MARK "E"
MEASURE AND MARK "F", "G", AND "H" IN THE SAME MANNER

NOTE: CONFIRM INTERVALS BETWEEN MARKS ARE NOW EQUAL.

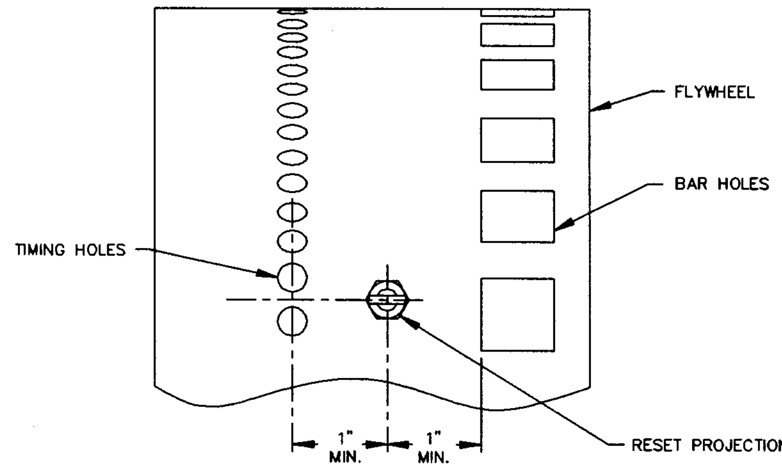


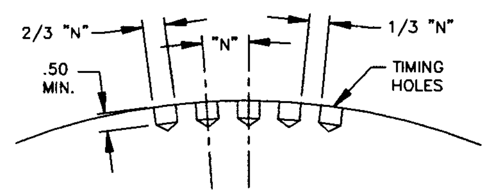
MEASURE THE LENGTH A→E, DIVIDE BY 45, AND BEGINNING WITH "A" MARK OFF INTERVALS OF THIS LENGTH TO "E". COUNTING "A" AND "E" THERE SHOULD BE 46 MARKS.

DO THE REMAINING 7 SECTIONS IN THE SAME MANNER.

PROCEDURE FOR DRILLING 360 HOLES IN ENGINE FLYWHEEL

DRILLING DETAIL





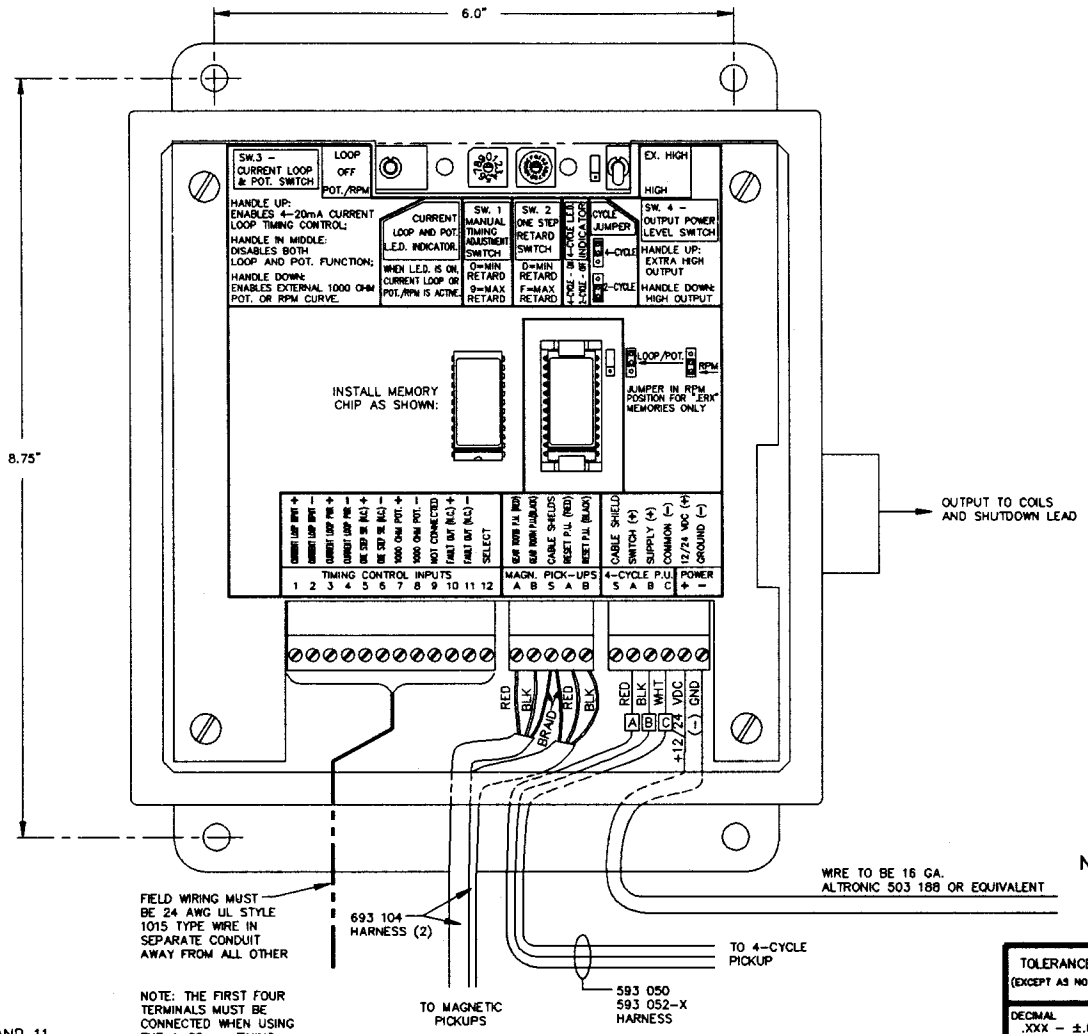
DISTANCE

$"N" = \frac{A \text{ TO } E}{45}$

NOTE: IF 2/3 "N" WORKS OUT TO BE BETWEEN STANDARD DRILL SIZES – USE NEXT SIZE LARGER.

REVISIONS			
NO.	DATE	BY	DESCRIPTION
1	3-12-91	WTP	UPDATE
2			
3			
4			
5			

TOLERANCES (EXCEPT AS NOTED)	ALTRONIC INC.
DECIMAL .XXX – ±.005, .XX – ±.010	TITLE: FLYWHEEL HOLE DRILLING
FRACTIONAL	DRAWN BY: WTP; SCALE: NONE; PART NUMBER: 709 903
MATERIAL	CHECKED BY: ; DATE: 10-19-90
	APPROVED BY:



TERM. NO.	DESCRIPTION
12–POSITION STRIP: TIMING CONTROL INPUTS	
1	CURRENT LOOP INPUT (+)
2	CURRENT LOOP INPUT (–)
3	CURRENT LOOP POWER (+)
4	CURRENT LOOP POWER (–)
5	ONE–STEP TIMING SWITCH N.C. (+)
6	ONE–STEP TIMING SWITCH N.C. (–)
7	1000 OHM POT (+)
8	1000 OHM POT (–)
9	NOT CONNECTED
10	FAULT OUTPUT (+)
11	FAULT OUTPUT (–)
12	SELECT
5–POSITION STRIP: MAGNETIC PICK–UPS	
A	GEAR TOOTH PICK–UP (RED)
B	GEAR TOOTH PICK–UP (BLACK)
S	CABLE SHIELDS
A	RESET PICK–UP (RED)
B	RESET PICK–UP (BLACK)
6–POSITION STRIP: 4–CYCLE P.U. / POWER	
S	CABLE SHIELD
A	SWITCH (+)
B	SUPPLY (+)
C	COMMON (–)
+	12/24 VDC INPUT (+)
–	GROUND (–)

NOTE:

TERMINALS 2, 4, 8, AND 11 ARE ELECTRICALLY COMMON.

NOTE: THE FIRST FOUR TERMINALS MUST BE CONNECTED WHEN USING THE 4–20 ma TIMING LOOP – SEE LABEL

NOTE:

THE NEGATIVE OF THE 12/24VDC SUPPLY MUST BE COMMON WITH ENGINE GROUND.

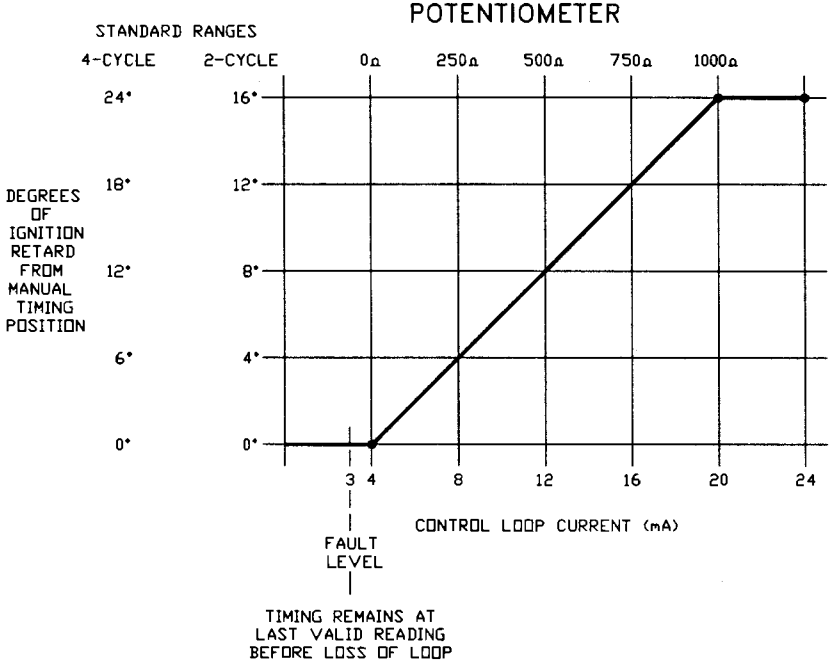
REVISIONS			
NO.	DATE	BY	DESCRIPTION
3	8–5–92	WTP	REVISED LABEL

TOLERANCES (EXCEPT AS NOTED)	ALTRONIC INC.
DECIMAL .XXX – ±.005 .XX – ±.010	TITLE CPU–90 UNIT HOOK–UP
FRACTIONAL	DRAWN BY WTP; SCALE .75; PART NUMBER
MATERIAL	CHECKED BY; DATE 7–16–90; 709 904
	APPROVED BY

709 904

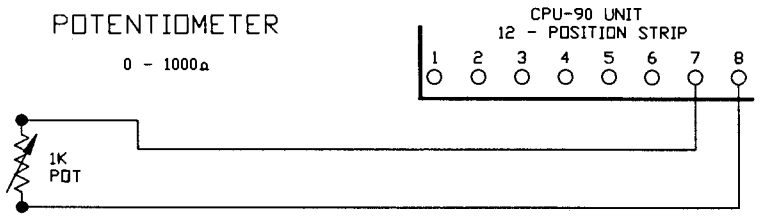
S06 60Z

POTENTIOMETER



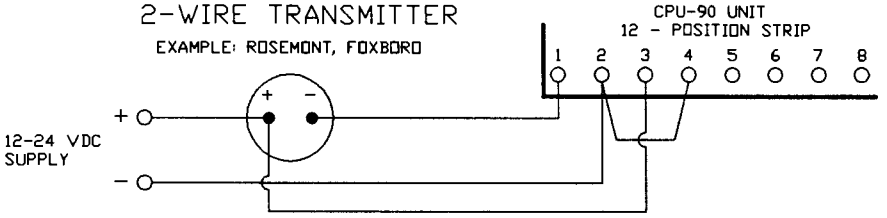
POTENTIOMETER

0 - 1000Ω



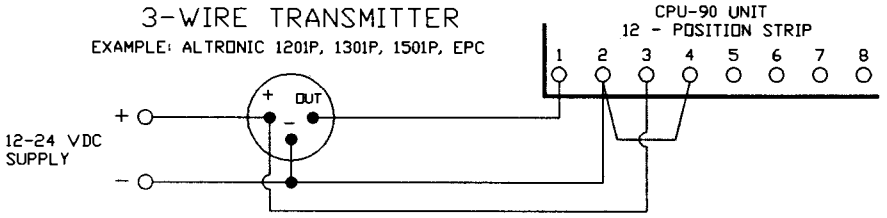
2-WIRE TRANSMITTER

EXAMPLE: ROSEMONT, FOXBORO



3-WIRE TRANSMITTER

EXAMPLE: ALTRONIC 1201P, 1301P, 1501P, EPC



NOTES:

1. LOOP INPUT IMPEDANCE: 250Ω ±1%
   POWER REQUIREMENT: 12-24 VDC, 50mA
2. TERMINALS 2 AND 4 ARE ELECTRICALLY COMMON NEGATIVE.
3. FIELD WIRING MUST BE 24 AWG UL STYLE 1015 TYPE WIRE IN SEPARATE CONDUIT AWAY FROM OTHER WIRING.

REVISIONS			
NO.	DATE	BY	DESCRIPTION
1			
2			
3			
4			
5			

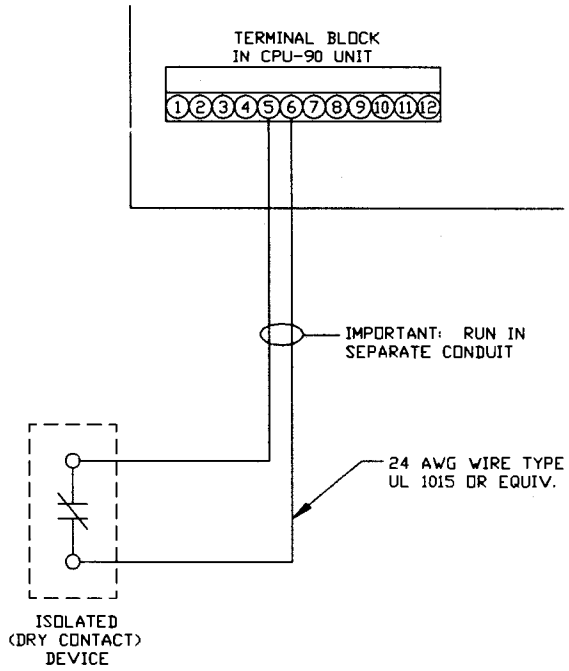
TOLERANCES (EXCEPT AS NOTED)
DECIMAL .XXX - ±.005 .XX - ±.010
FRACTIONAL
MATERIAL

ALTRONIC INC.

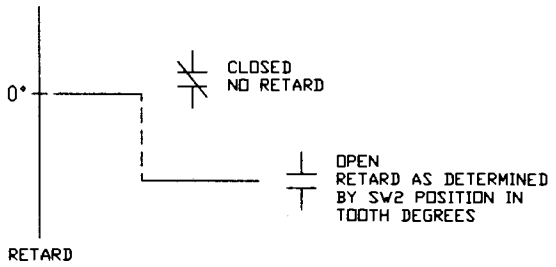
TITLE: ANALOG TIMING HOOK-UP CPU-90 IGNITION SYSTEM

DRAWN BY WTP	SCALE NONE	PART NUMBER	
CHECKED BY	DATE 7-16-90	709 905	
APPROVED BY			

906 607



I.E. PRESSURE SWITCH
TEMPERATURE SWITCH
RELAY ETC.



REVISIONS			
NO.	DATE	BY	DESCRIPTION
1			
2			
3			
4			
5			

TOLERANCES (EXCEPT AS NOTED)
DECIMAL
.XXX - ±.005
.XX - ±.010
FRACTIONAL
MATERIAL

ALTRONIC INC.

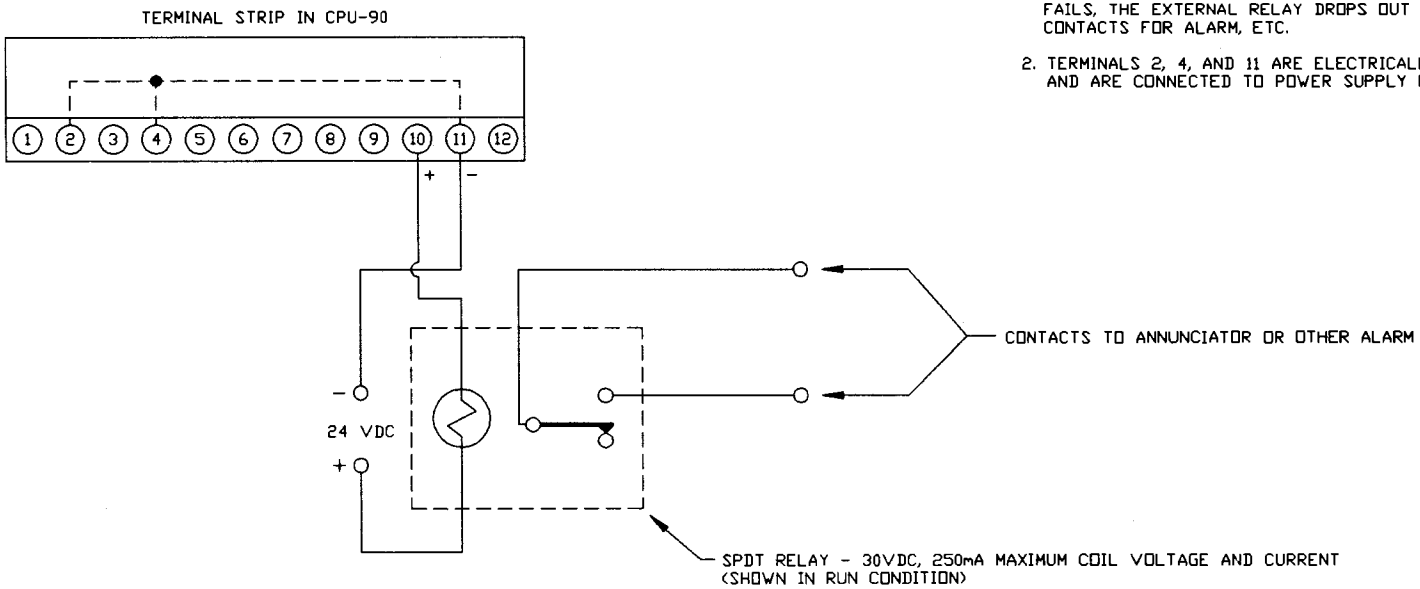
TITLE: TIMING CURVE
ONE-STEP

DRAWN BY	WTP	SCALE	NONE
CHECKED BY		DATE	7-9-90
APPROVED BY			

PART NUMBER
709 906

NOTES:

1. TERMINALS 10 AND 11 ARE CLOSED IN A RUN CONDITION WHICH ENERGIZES EXTERNAL RELAY. IF 4 TO 20mA SIGNAL FAILS, THE EXTERNAL RELAY DROPS OUT ACTIVATING CONTACTS FOR ALARM, ETC.
2. TERMINALS 2, 4, AND 11 ARE ELECTRICALLY COMMON AND ARE CONNECTED TO POWER SUPPLY NEGATIVE.



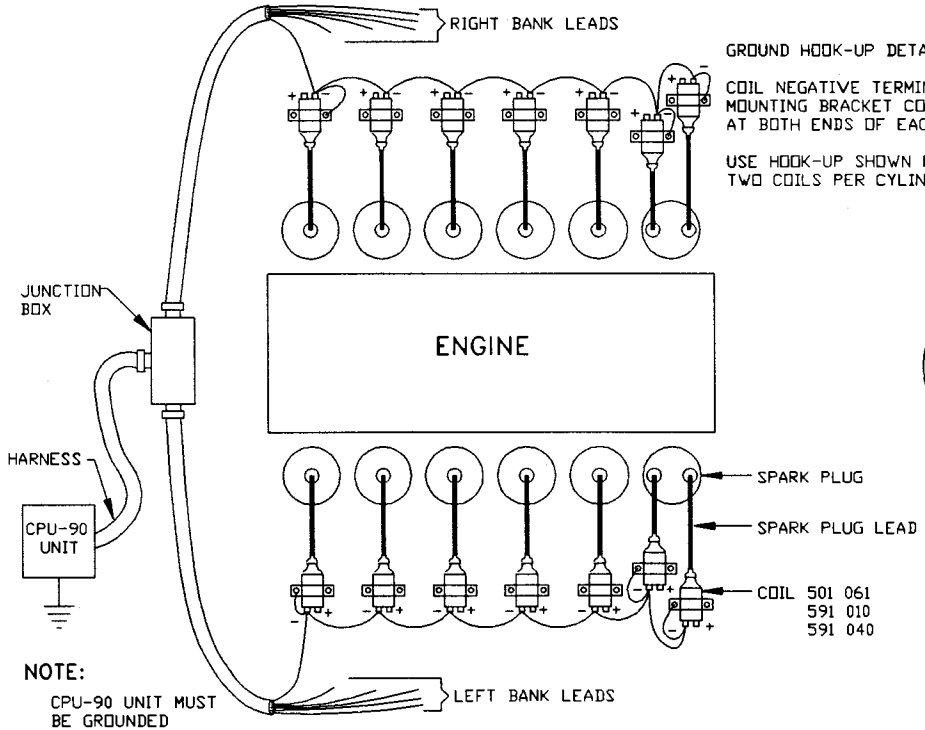
REVISIONS			
NO.	DATE	BY	DESCRIPTION
1			
2			
3			
4			
5			

TOLERANCES (EXCEPT AS NOTED)
DECIMAL .XXX - ±.005 .XX - ±.010
FRACTIONAL
MATERIAL

ALTRONIC INC.

TITLE: ALARM ON LOSS OF LOOP CPU-90 IGNITION SYSTEM

DRAWN BY	WTP	SCALE	NONE	PART NUMBER
CHECKED BY		DATE	7-9-90	709 907
APPROVED BY				

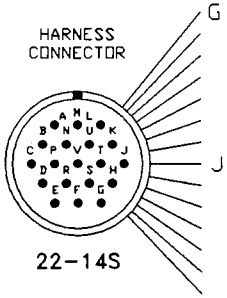


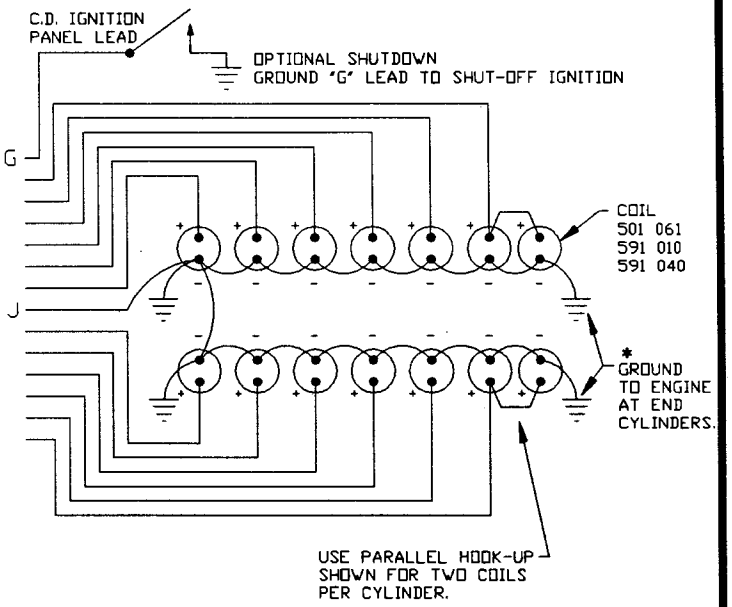
NOTE:
CPU-90 UNIT MUST BE GROUNDED

GROUND HOOK-UP DETAIL:

COIL NEGATIVE TERMINAL TO MOUNTING BRACKET CONNECTION AT BOTH ENDS OF EACH BANK.

USE HOOK-UP SHOWN FOR TWO COILS PER CYLINDER





* NOTE: TO MINIMIZE EMITTED RFI, USE A SHORT GROUND LEAD AS SHOWN ON EACH COIL FROM THE NEGATIVE (-) TERMINAL TO ENGINE GROUND.

709 908

REVISIONS			
NO.	DATE	BY	DESCRIPTION
1	1-17-91	WTP	REVISED NOTE, WAS 'USE SERIES HOOK-UP ...'
2	5-22-92	WTP	ADDED ENGINE GROUND NOTES
3			
4			
5			

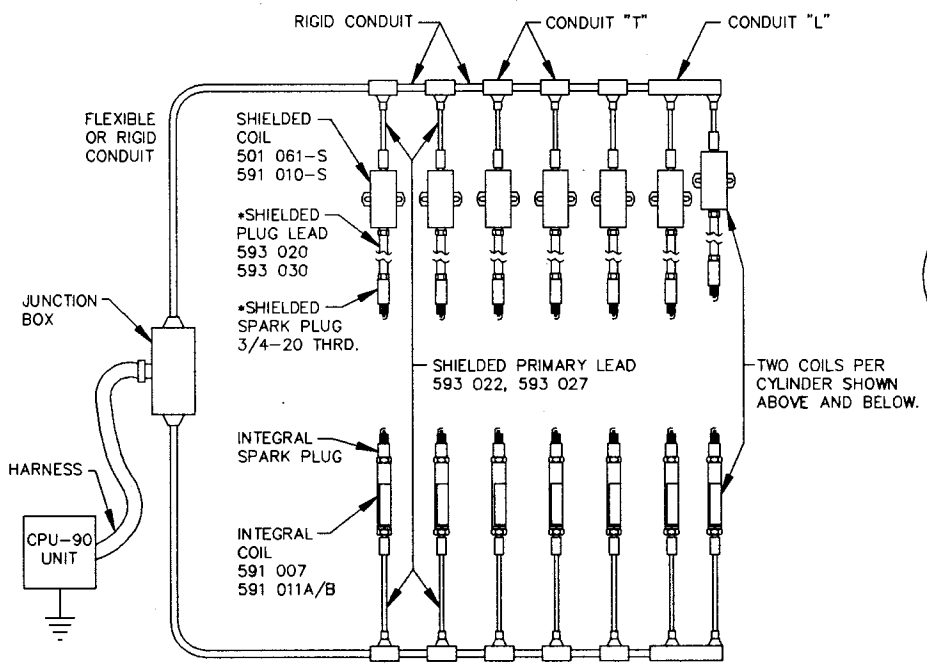
TOLERANCES (EXCEPT AS NOTED)
DECIMAL .XXX - ±.005 .XX - ±.010
FRACTIONAL
MATERIAL

ALTRONIC INC.

TITLE: WIRING DIAGRAM - UNSHIELDED CPU-90 IGNITION SYSTEM

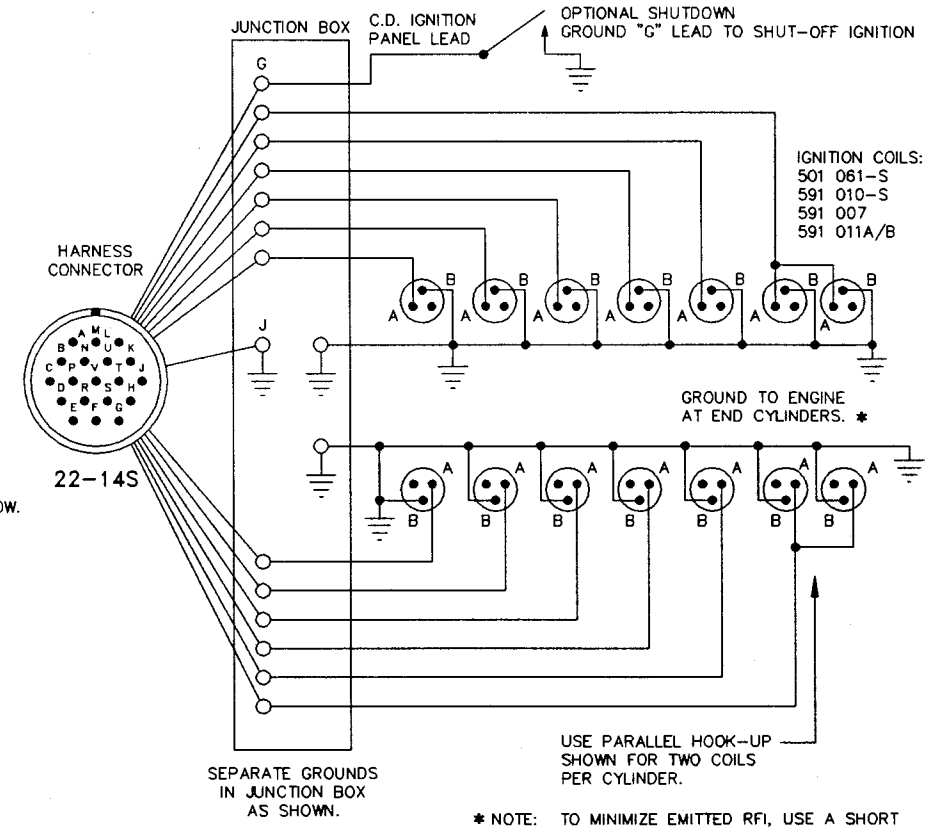
DRAWN BY	WTP	SCALE	NONE	PART NUMBER
CHECKED BY		DATE	7-10-90	709 908
APPROVED BY				

* CLASS I, GROUP D, DIV. 2 CERTIFIED SYSTEM. UNSHIELDED SPARK PLUG AND LEAD MAY BE USED WHERE SUCH RATING IS NOT REQUIRED.



NOTE:

CPU-90 UNIT MUST BE GROUNDED



* NOTE: TO MINIMIZE EMITTED RFI, USE A SHORT GROUND LEAD AS SHOWN ON EACH COIL FROM THE NEGATIVE (B) TERMINAL TO ENGINE GROUND.

709 909

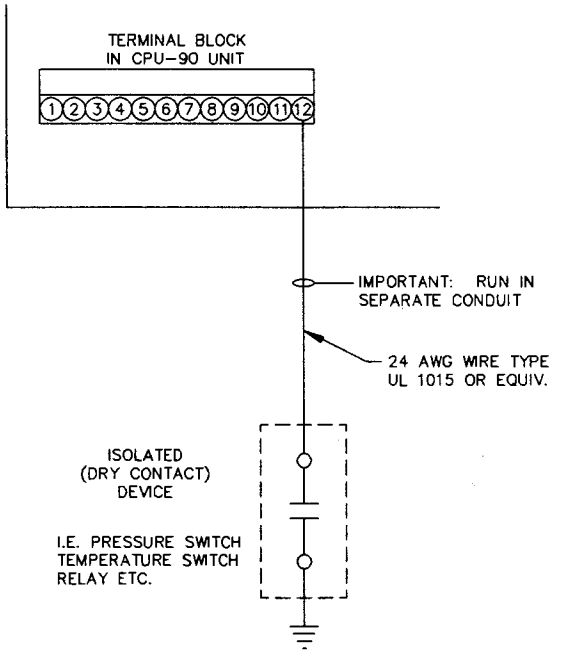
REVISIONS			
NO.	DATE	BY	DESCRIPTION
1	1-2-91	WTP	ADDED 591 010-S IGNITION COIL
2	1-17-91	WTP	REVISED NOTE, WAS "USE SERIES HOOK-UP ..."
3	5-22-92	WTP	ADDED ENGINE GROUND NOTES
4			
5			

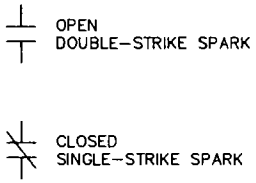
TOLERANCES (EXCEPT AS NOTED)
DECIMAL .XXX - ±.005 .XX - ±.010
FRACTIONAL
MATERIAL

ALTRONIC INC.

TITLE: WIRING DIAGRAM - SHIELDED CPU-90 IGNITION SYSTEM

DRAWN BY	WTP	SCALE	NONE	PART NUMBER
CHECKED BY		DATE	7-16-90	709 909
APPROVED BY				





709 910

REVISIONS			
NO.	DATE	BY	DESCRIPTION
1			
2			
3			
4			
5			

TOLERANCES (EXCEPT AS NOTED)
DECIMAL
.XXX - ±.005
.XX - ±.010
FRACTIONAL
MATERIAL

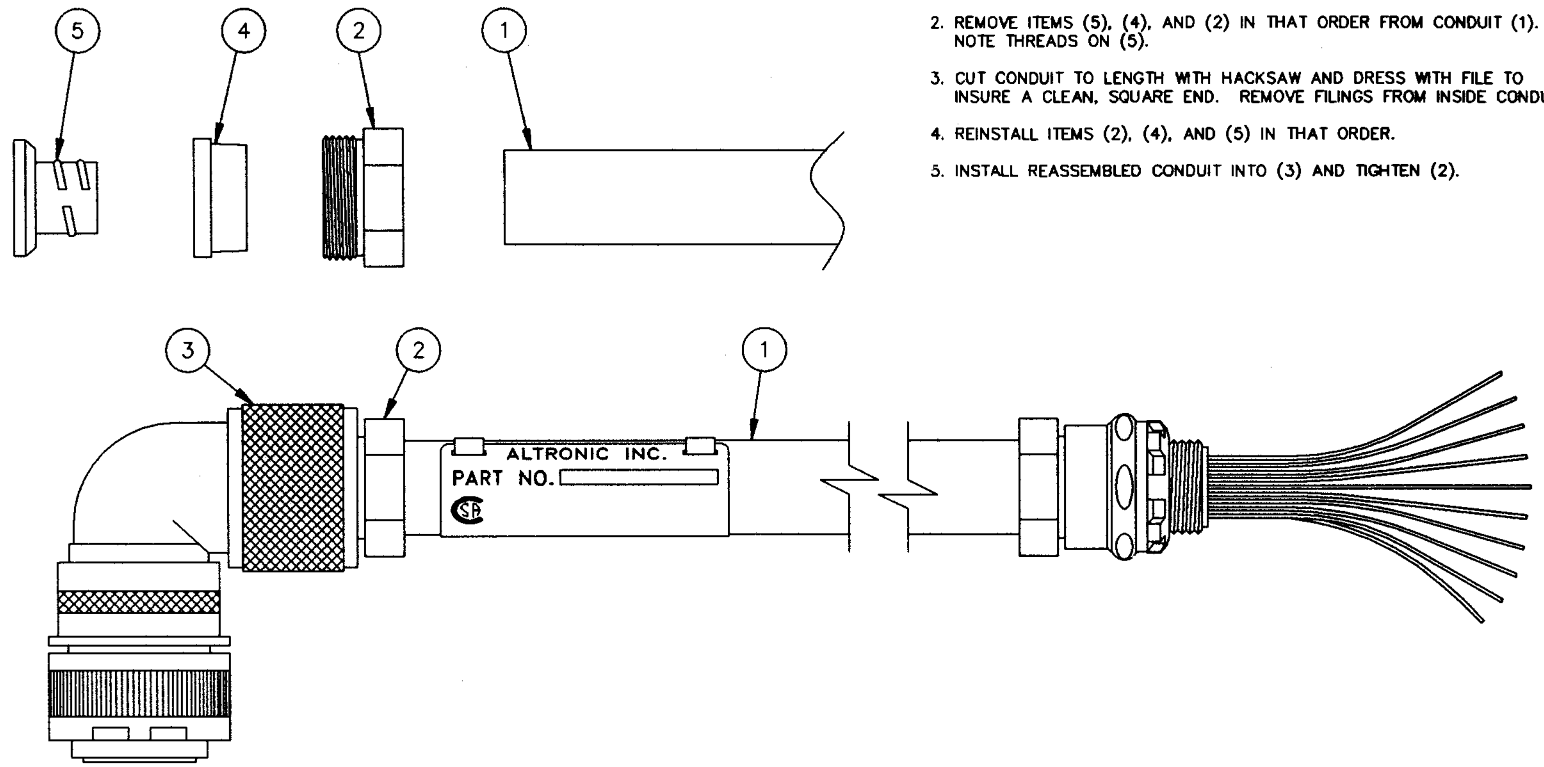
ALTRONIC INC.

TITLE DOUBLE-STRIKE CONTROL
791 91x-200 UNITS

DRAWN BY	WTP	SCALE	NONE
CHECKED BY		DATE	4-10-92
APPROVED BY			

PART NUMBER 709 910

509 025



TO SHORTEN HARNESS

1. LOOSEN AND DISENGAGE NUT (2) AND REMOVE CONDUIT (1) COMPLETELY FROM CONNECTOR AND HARNESS ASSEMBLY (3).
2. REMOVE ITEMS (5), (4), AND (2) IN THAT ORDER FROM CONDUIT (1). NOTE THREADS ON (5).
3. CUT CONDUIT TO LENGTH WITH HACKSAW AND DRESS WITH FILE TO INSURE A CLEAN, SQUARE END. REMOVE FILINGS FROM INSIDE CONDUIT.
4. REINSTALL ITEMS (2), (4), AND (5) IN THAT ORDER.
5. INSTALL REASSEMBLED CONDUIT INTO (3) AND TIGHTEN (2).

REVISIONS

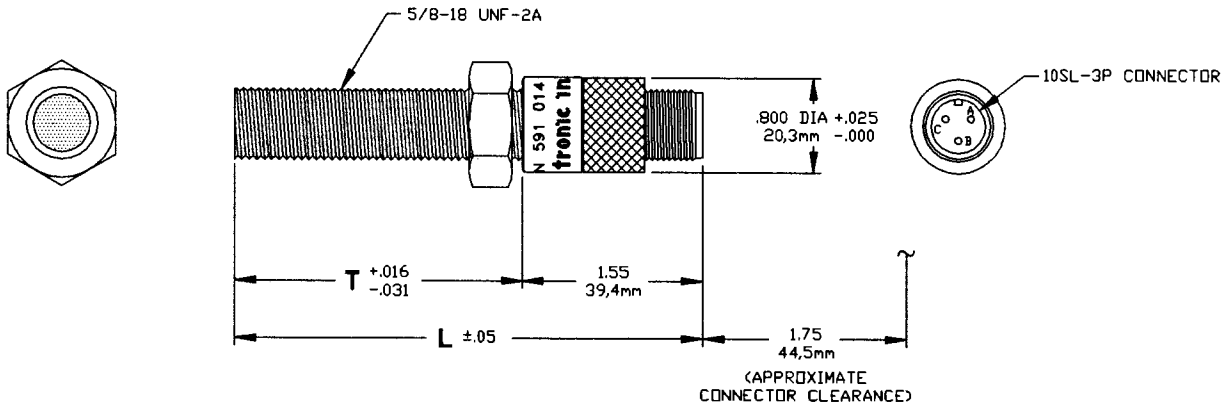
NO.	DATE	BY	DESCRIPTION
1	3-14-92	WTP	REDRAWN ON CAD
2			
3			
4			
5			

TOLERANCES (EXCEPT AS NOTED)
DECIMAL .XXX – ±.005 .XX – ±.010
FRACTIONAL
MATERIAL

ALTRONIC INC.

TITLE: SHIELDED HARNESS CONDUIT LENGTH ADJUSTMENT

DRAWN BY	DWA	SCALE	NONE	PART NUMBER
CHECKED BY		DATE	5-28-85	509 025
APPROVED BY				



591 014

NOTE:

1. NORTH POLE OF MAGNET MUST FACE SENSING END WITH AIR GAP OF .030/.040 (,76/1,0).
2. CENTERLINE OF MAGNET'S ROTATION MUST RUN THROUGH CENTERLINE OF PICKUP.

ALTRONIC P/N	T	L
591 014-2	2.50"/63,5mm	4.05"/102,8mm
591 014-4	4.50"/114,3mm	6.05"/153,7mm

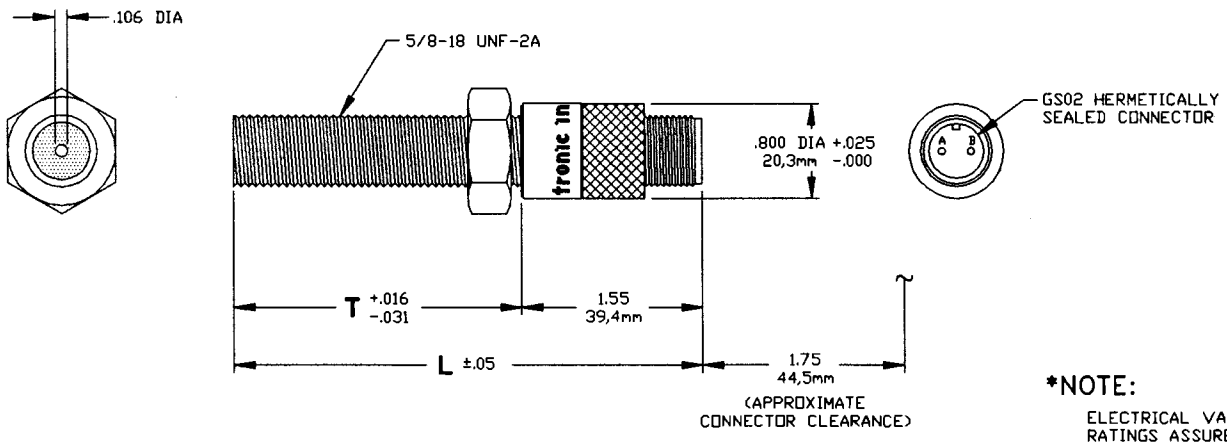
REVISIONS			
NO.	DATE	BY	DESCRIPTION
1	10-8-90	WTP	REDRAWN ON CAD
2	8-6-92	WTP	UPDATED TITLE
3			
4			
5			

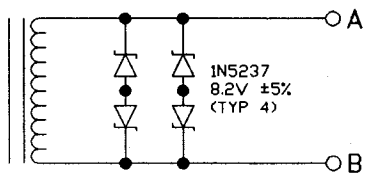
TOLERANCES (EXCEPT AS NOTED)
DECIMAL .XXX - ±.005 .XX - ±.010
FRACTIONAL
MATERIAL

ALTRONIC INC.

TITLE: HALL EFFECT PICKUP SALES DRAWING

DRAWN BY: DWA
CHECKED BY:
APPROVED BY:
SCALE: FULL
DATE: 1-26-88
PART NUMBER: 591 014





*NOTE:

ELECTRICAL VALUES GIVEN ARE ABSOLUTE RATINGS ASSURED 100% BY TEST.

ELECTRICAL DATA *	
MAX. COIL INDUCTANCE	420 mH
MIN. COIL RESISTANCE	900Ω

ALTRONIC P/N	T	L
691 118-1	1.75"/44,5mm	3.30"/83.3mm
691 118-2	2.50"/63,5mm	4.05"/102.8mm
691 118-3	3.0"/76.2mm	4.55"/115.6mm
691 118-4	4.5"/114.3mm	6.05"/153.7mm
691 118-6	6.0"/152.4mm	7.55"/191.8mm

REVISIONS			
NO.	DATE	BY	DESCRIPTION
6	8-7-92	WTP	UPDATED
7			
8			
9			
10			

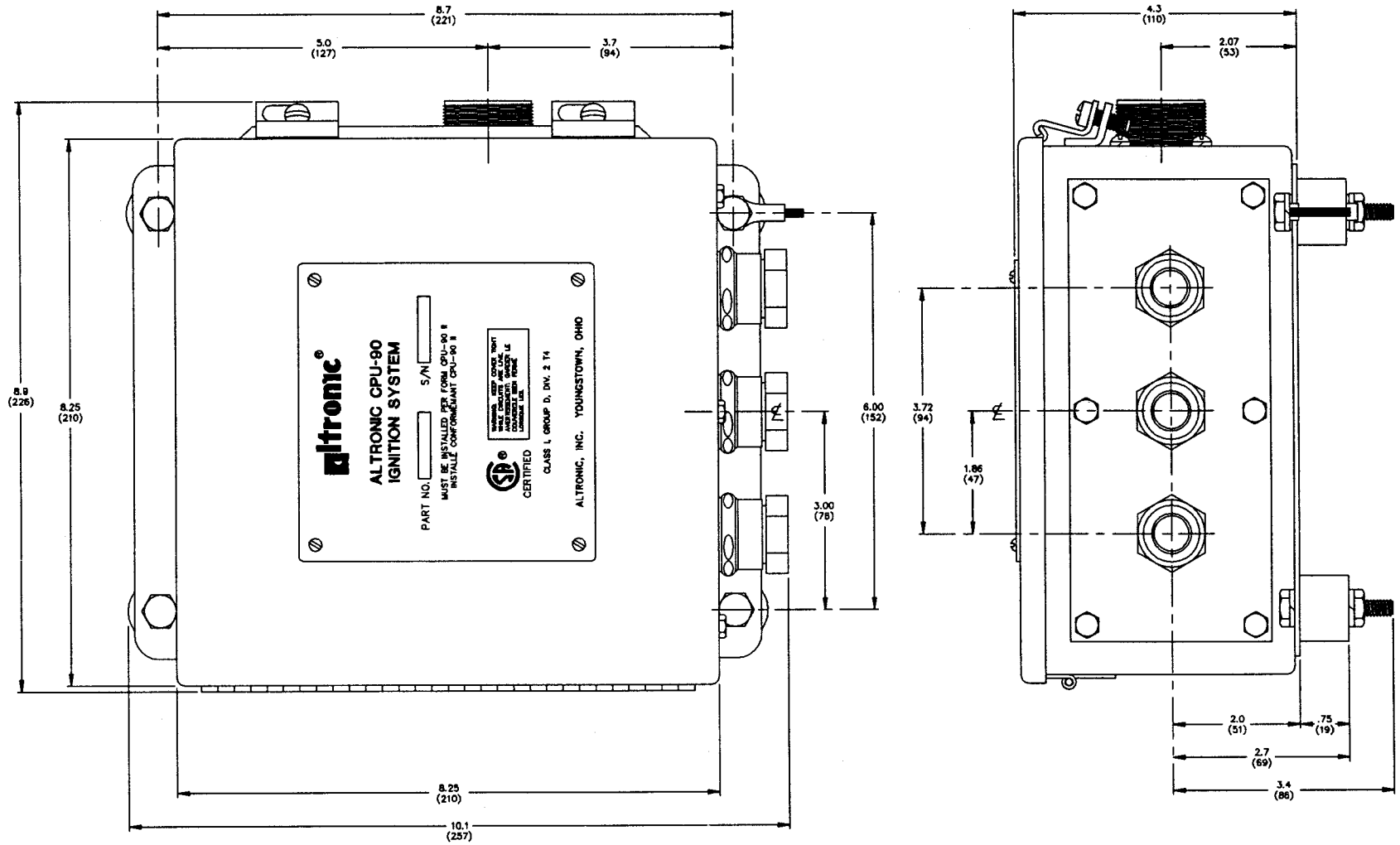
TOLERANCES (EXCEPT AS NOTED)
DECIMAL .XXX - ±.005 .XX - ±.010
FRACTIONAL
MATERIAL

ALTRONIC INC.

TITLE: MAGNETIC PICKUP SALES DRAWING

DRAWN BY: DWA
CHECKED BY:
APPROVED BY:
SCALE: FULL
DATE: 3-16-81
PART NUMBER: 691 118

691 118



DIMENSIONS IN INCHES AND (MILLIMETERS)

REVISIONS			
NO.	DATE	BY	DESCRIPTION
1	8-6-92	WTP	UPDATED LABEL
2	2-2-93	WTP	ADDED HUBS TO VIEWS
3			
4			
5			

TOLERANCES (EXCEPT AS NOTED)
DECIMAL .XXX - ±.005 .XX - ±.010
FRACTIONAL
MATERIAL

ALTRONIC INC.

TITLE: CPU-90 UNIT

DRAWN BY: WTP | SCALE: FULL | PART NUMBER: 799 013
CHECKED BY | DATE: 10-1-90
APPROVED BY

799 013