

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 Altronic DISN 801M ignition system consists of these basic components:
1. DISN 801M Series Unit (7918xx-x5xM models)
 2. Magnetic Pickup Sensor (791016-2 or 791018-2)
 3. Trigger Disc
 4. Output Wiring Harness (793008 and 793012 series)
 5. Input Wiring Harness (793076 series)
 6. Control Cable Assembly (793075 series)
 7. Ignition Coils - one per spark plug; use only the following types: 501061, 591010
See drawing 709 861 for the general system layout.
- 1.2 The DISN 801M series unit has up to eight application programs which are selected by the application switch on the side of the unit - see drawing 799 046.
- 1.3 The DISN 801M system is designed to operate from a nominal 12 Vdc or 24 Vdc battery or power supply. Refer to drawing 709 860 for details of the power hook-up. The DISN unit steps up the DC supply voltage to charge an energy storage capacitor and contains microcircuit logic and SCR switching devices to release the stored energy to the ignition coils in programmed, timed sequence according to the application. The only attachment to a rotating part of the engine is the timing trigger disc. This signals the position of the engine crankshaft to the logic circuitry in the DISN unit. One additional trigger trails a few degrees after the last firing trigger; the DISN unit recognizes this as the index signal that another revolution is to begin.

2.0 DISN 801M UNIT

- 2.1 Refer to drawing 799 046 for DISN mounting dimensions. Install the DISN 801M unit within 15 ft. (5 m.) of the furthest ignition coil and in a relatively cool location. The outside case temperature of the DISN unit should not exceed 150°F. (65°C.) in operation.
- 2.2 Mount the DISN unit securely with four (4) 1/4" diameter screws. Use shock mounts if mounting the unit directly to the engine. The metal case should be grounded to the engine; a grounding screw is provided on the case of the unit for this purpose.

3.0 TRIGGER DISC / PICKUP SENSOR

- 3.1 See drawings 709 862, 791 016-2 and 791 018-2:
- A. For a single-firing system on 4-cycle engines, the trigger disc must mount to the camshaft or other shaft operating at one-half engine speed. If a dual-firing system is to be used (optional for in-line 2, 3, 4 and 6-cylinder engines), the disc mounts to the engine crankshaft.
 - B. Set the engine with no. 1 cylinder at the most advanced desired timing point on the compression stroke. This is the point where the magnetic pickup must line-up with the disc trigger bar next to the "x" on the O.D. of the disc (see drawing 709 862). When mounting the trigger disc, be sure to observe the rotation arrow marked on the disc. NOTE: On certain engines, a cylinder other than no. 1 must be used when lining up the disc and pickup; refer to the applicable data chart (page 7).
 - C. Mount the magnetic pickup sensor securely to a rigid bracket or surface to maintain an air gap not exceeding .020" (0,5 mm). The center of the pickup face must also line up with the center of the disc as it rotates - see drawing 709 862. Note there are two magnetic pickup types available: 3/4"-16 thread size and 5/8"-18 thread size - see drawings 791 016-2 and 791 018-2.
- 3.2 Plug the harness for the pickup into the 6-pin connector immediately adjacent to the 14-pin connector on the DISN 801M unit; the 2-pin connector end plugs into the magnetic pickup connector.

4.0 IGNITION COILS

- 4.1 Use only the Altronic coils indicated in section 1.1.
- 4.2 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.

5.0 POWER WIRING

- 5.1 The DISN 801M system requires a battery or other DC power source with a voltage between 12 and 28 VDC. The minimum voltage at cranking speed for proper operation is 8 volts. Refer to drawing 709 860 for details of the connection to the DC power source.

NOTE: DEVICE IS POLARITY SENSITIVE. In the 6-pin input wiring harness, lead "E" must be connected to the positive (+) power lead and lead "F" to the negative (-) power lead.

6.0 PRIMARY WIRING

- 6.1 The output wiring harness with the 10 or 19-pin connector plugs into the larger connector of the DISN unit. See the specific unit data chart for the firing order of the application being used. Starting with lead "A", the harness leads are connected in accordance with the engine's firing order to the positive (+) terminals of the coils - refer to wiring diagrams 709 863A, 709 863B and 709 864 and the applicable unit data chart.
- 6.2 A common ground lead connecting the negative (-) terminals of the coils must be run as shown in the wiring diagrams and be connected to output harness lead "J". 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.
- 6.3 All connections should be made using ring type terminals specified for no. 16 gauge (1.5 sq. mm) 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.).
- 6.4 For double-firing systems, two coils are connected in series as shown on wiring diagram 709 864.

7.0 SHUTDOWN WIRING

- 7.1 The DISN 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 wiring diagrams 709 863A, 709 863B and 709 864.
 - B. OPTION 2 - Ground harness lead "G"; 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 863A, 709 863B and 709 864. When lead "G" is grounded, the DISN unit will draw about 0.1 amp from the power source. If this option is used, see section 9.0 concerning the operation of the alarm output.

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

8.0 TIMING CONTROL WIRING

- 8.1 The control cable assembly (if used) plugs into the 7-pin control connector on the side of the unit next to the two switches. Refer to sections 11.4, 11.5 and drawing 709 865 for the specific wiring hook-up.

9.0 ALARM OUTPUT WIRING

- 9.1 The alarm output consists of a normally-closed, solid-state switch at lead "D" of the 6-pin input harness assembly. Upon detection of a pickup or primary output fault, this switch will open circuit. Pickup faults are non-latching and will follow the actual condition. Primary output faults will latch the alarm output in the faulted (open) position until the speed comes to zero and the next startup is attempted. Refer to wiring diagrams 709 863A, 709 863B and 709 864 for the wiring hook-up. NOTE: On applications with unused "live" output leads, the alarm function cannot be used as it will always be in the faulted condition; see page 7 for application specifics.

CAUTION: In order to prevent the ignition from stopping and restarting while the engine is still rotating in the event of a momentary pickup fault, the alarm output must be connected to a latching relay function to turn-off the ignition and stop the engine.

10.0 SECONDARY WIRING

- 10.1 The spark plug leads should be fabricated from silicone insulated 7 mm cable with suitable terminals and silicone spark plug boots. The use of leads with resistor spark plug boots (Altronic series 5932xx-xx) is recommended to minimize interference from emitted RFI on the operation of other nearby electronic equipment. Another option is the use of suppression ignition cable (Altronic part no. 503285). It is also essential to keep spark plug leads as short as possible and in all cases not longer than 24 inches (600 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.
- 10.2 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.

11.0 OPERATION

- 11.1 BASIC OPERATION - The DISN unit steps up the DC supply voltage to charge an energy storage capacitor. SCR switching devices release this stored energy in response to signals from the unit's logic circuitry which processes signals from the rotating trigger disc. Applications have either one or two firings for each trigger event. Each firing occurs a programmed number of degrees after the trigger signal is received; this delay in degrees is adjustable - see sections 11.3 and 11.4. One additional index trigger trails a few degrees after the last firing trigger in the sequence to indicate that another revolution is to begin.

- 11.2 APPLICATION SWITCH - The DISN 801M unit has an 8-position application switch located next to the manual timing switch at one end of the box. If the trigger disc pattern does not correspond to the application switch setting, the DISN unit will have no output and the APPLICATION indicator will light (see section 12.0). This is the diagnostic and safety interlock to prevent out-of-time sparks from occurring if the application switch and trigger disc pattern do not correlate.
- A. Set the application switch to the appropriate setting based on the engine. Refer to the applicable data chart in these instructions (page 7).
 - B. Replace the white cap over the application switch once the appropriate setting has been selected.

- 11.3 MANUAL TIMING SWITCH - The DISN unit has a 16-position timing switch located at one end of the box.

NOTE: The manual timing switch is active only if no voltage is applied to lead "D" of the 7-pin control connector.

- A. The timing range is 15 degrees on 4-cycle engines. Switch position 15 gives the most advanced timing. The timing retards approximately 1.0 degree for each switch position as the switch is moved to position 14, 13, 12, . . . 2, 1, 0. Switch position 0 is full retard.

CAUTION: DO NOT switch from position 15 to 0, or 0 to 15 while the engine is running. The large timing change may cause the engine to shutdown or be damaged.

- B. Replace the white cap over the timing switch once the desired timing setting has been selected.
- C. Connecting together leads "D" and "F" of the 7-pin control connector gives the timing determined by the analog timing input (see section 11.4). Opening the above connection reverts the unit to the timing set by the manual switch - see drawing 709 865. This feature gives the ability to switch between two timing settings for differences in fuel, load, temperature, etc. The differential range is 1-15 degrees on 4-cycle engines.

- 11.4 ANALOG TIMING ADJUSTMENT - Connecting together leads "D" and "F" of the 7-pin control connector enables the analog timing capability of the DISN 801M unit and disables the manual timing switch. The basic analog timing input may be connected to a 0-1,000 ohm potentiometer or to a 4-20 ma current loop control. The analog timing range is 16 degrees, 4-cycle or 8 degrees, 2-cycle. Refer to drawing 709 865 for the wiring hook-up.

- 11.5 TIMING OFFSET FEATURE - Connecting together leads "B" and "F" of the 7-pin control connector causes a 2-degree timing retard. This can be used in conjunction with a temperature or pressure switch to automatically retard the timing at a selected high temperature or load.

- 11.6 ENERGY LEVEL CONTROL - Connecting together leads "A" and "F" of the 7-pin control connector increases the voltage level on the ignition storage capacitor from 160V. to 180V. It is recommended that this higher energy level be used only for very high voltage demand, lean-burn engines.

12.0 TROUBLESHOOTING

12.1 NORMAL OPERATION - Check the three LED indicators located on the main label of the unit. The green POWER indicator is ON when power is applied. The red PICKUP and APPLICATION indicators are ON when there is a fault.

INDICATOR	POWER APPLIED ENGINE STOPPED	POWER APPLIED ENGINE ROTATING
POWER	ON	ON
PICKUP	ON*	OFF
APPLICATION	OFF	OFF**

* No pickup signal generated due to lack of rotation.

** This indicator will flash ON briefly when rotation commences and then turn OFF.

12.2 TROUBLESHOOTING - Check the three indicators located on the main label of the unit. If the engine will not start or run correctly, crank engine with fuel turned off and check per the chart below:

INDICATION AND CHECKS	REMEDY
<p>POWER Indicator OFF:</p> <ol style="list-style-type: none"> 1. Check voltage to leads E(+) and F(-) of 6-pin pickup cable. 2. If above check is OK: 	<ol style="list-style-type: none"> 1. Must be in the range of 10-32 Vdc. 2. Replace DISN unit.
<p>PICKUP Indicator is ON with Engine Rotating:</p> <ol style="list-style-type: none"> 1. Check gap between pickup and disc O.D.: .020"±.005" (0.50±0.13 mm) 2. Check cable between pickup and DISN unit. 3. Pickup may be defective. 4. If above checks are OK: 	<ol style="list-style-type: none"> 1. Correct gap. 2. Connect or replace cable. 3. Replace pickup. 4. Replace DISN unit.
<p>APPLICATION Indicator is ON with Engine Rotating:</p> <ol style="list-style-type: none"> 1. Check that application switch setting matches engine application. 2. Check that trigger disc pattern matches engine application. 3. If above checks are OK: 	<ol style="list-style-type: none"> 1. Correct setting. 2. Replace with correct trigger disc. 3. Replace DISN unit.

13.0 DISN UNIT SPECIFICATIONS

DISN UNIT NO. 791 808-050M

APPLICATION SWITCH	NO. OF OUTPUTS	TRIGGER DISC	FIRING DISC DEGREES	UNIT FIRING ORDER
A	4	4+1	90° even	A-B-C-D
B	5	5+1	72° even	A-B-C-D-E
C	6	6+1	60° even	A-B-C-D-E-F
D	8	8+1	45° even	A-B-C-D-E-F-H-I
E*	2	2+1	180° even	A-B
F*	3	3+1	120° even	A-B-C

* Applications E and F are intended for crankshaft-mounted trigger disc providing a double-firing system.

DISN UNIT NO. 791 812-050M

APPLICATION SWITCH	NO. OF OUTPUTS	TRIGGER DISC	FIRING DISC DEGREES	UNIT FIRING ORDER
A	6	6+1	60° even	A-B-C-D-E-F
B	12	6+1	30° even	A-B-C-D-E-F-K-L-M-N-P-R
C	8	8+1	45° even	A-B-C-D-E-F-K-L
D**	12	6+1	15°-45°	A-B-C-D-E-F-K-L-M-N-P-R

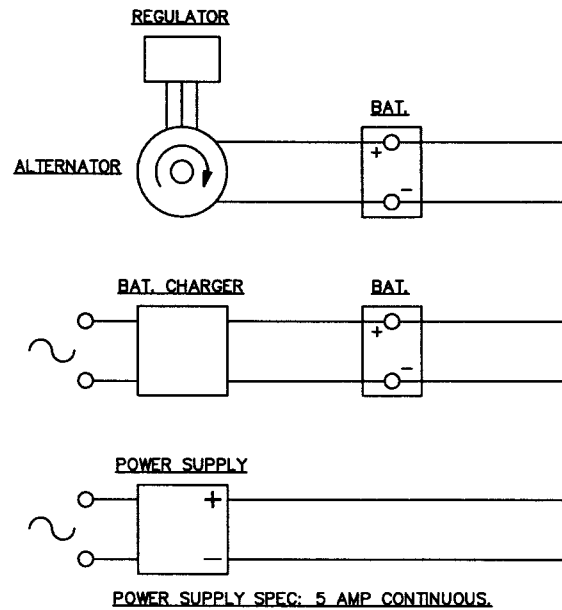
** On MAN and Iveco V12 engines, time trigger disc bar marked "x" to no. 12 cylinder, and wire as follows:

lead "A" to #12 cyl.	lead "K" to #7 cyl.
lead "B" to #5 cyl.	lead "L" to #2 cyl.
lead "C" to #8 cyl.	lead "M" to #11 cyl.
lead "D" to #3 cyl.	lead "N" to #4 cyl.
lead "E" to #10 cyl.	lead "P" to #9 cyl.
lead "F" to #6 cyl.	lead "R" to #1 cyl.

DRAWINGS SECTION:

709 860	DC POWER HOOK-UP
709 861	DISN 801M SYSTEM DIAGRAM
709 862	PICKUP / DISC INSTALLATION
709 863A	WIRING DIAGRAM, SINGLE-FIRING 8-CYL. SYSTEM
709 863B	WIRING DIAGRAM, SINGLE-FIRING 12-CYL. SYSTEM
709 864	WIRING DIAGRAM, DOUBLE-FIRING SYSTEM
709 865	TIMING CONTROL WIRING
791 016-2	MAGNETIC PICKUP, 3/4"-16
791 018-2	MAGNETIC PICKUP, 5/8"-18
799 046	DISN UNIT - 801M SERIES

D.C. POWER SOURCE



WIRE SIZE: 14 GA. (2.5 SQ. mm) MINIMUM

SWITCH RATING: 10 AMP MIN.

FUSE RATING: 10 AMP

OPERATING VOLTAGE REQUIREMENT

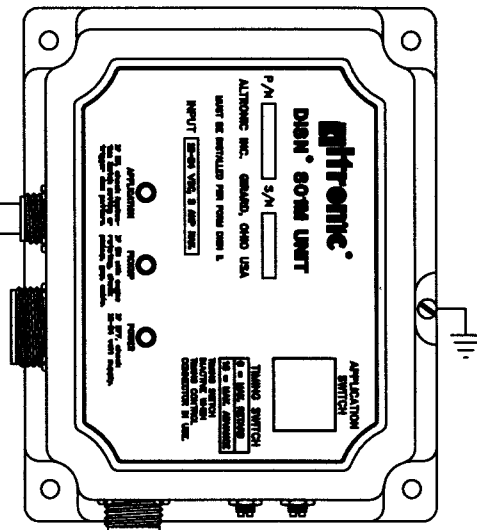
CONDITION	MIN.	MAX.
STARTING	8 VDC	28 VDC
RUNNING	12 VDC	28 VDC

AVERAGE CURRENT DRAW

DISN UNIT	GENERAL FORMULA	EXAMPLE: V12 ENGINE, 1800 RPM
12 VDC INPUT	$N \times \frac{\text{DISC RPM}}{5,000}$	$12 \times \frac{900}{5,000} = 2.16 \text{ AMPS}$
24 VDC INPUT	$N \times \frac{\text{DISC RPM}}{10,000}$	$12 \times \frac{900}{10,000} = 1.08 \text{ AMPS}$

N = NUMBER OF CYLINDERS

DISN UNIT
801M SERIES

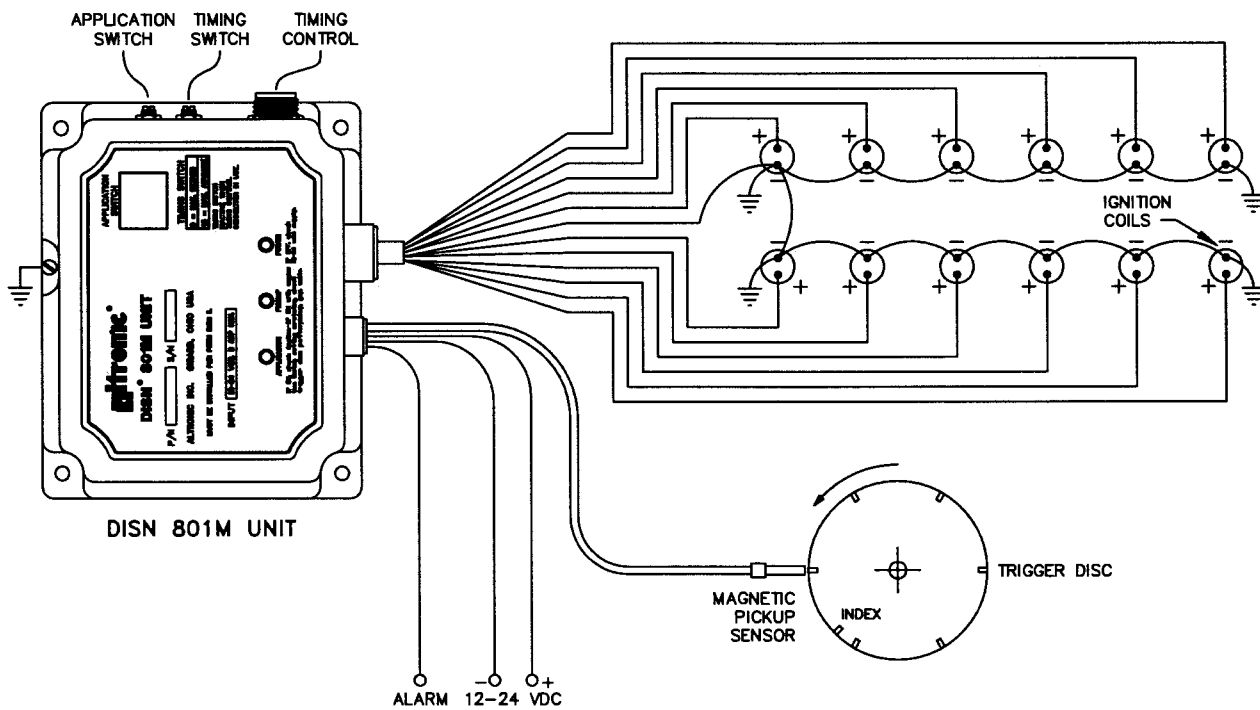


NOTE:

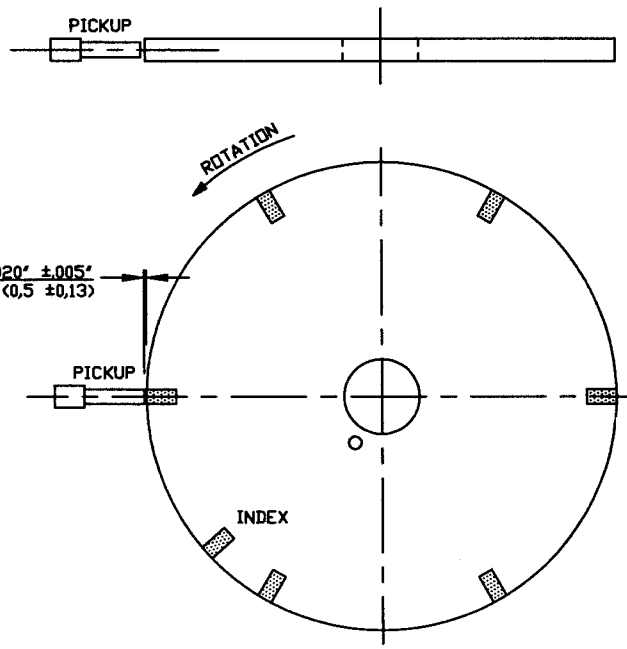
INFORMATION IS PER ONE (1) DISN SYSTEM.
FOR MULTIPLE SYSTEMS, MULTIPLY REQUIREMENTS
BY NUMBER OF SYSTEMS.

REVISIONS				TOLERANCES (EXCEPT AS NOTED)		ALTRONIC INC.			
NO.	DATE	BY	DESCRIPTION	DECIMAL	TITLE				
1				.XXX - ±.005	DC POWER HOOKUP DISN IGNITION SYSTEM				
2				.XX - ±.010					
3				FRACTIONAL	DRAWN BY	WTP	SCALE	NONE	DRAWING NUMBER
4				MATERIAL	CHECKED BY		DATE	5-22-97	709 860
5					APPROVED BY				

DISN 801M - IGNITION SYSTEM
(V12 ENGINE SHOWN)



REVISIONS				TOLERANCES (EXCEPT AS NOTED)		ALTRONIC INC.		
NO.	DATE	BY	DESCRIPTION	DECIMAL	TITLE	DRAWN BY		DRAWING NUMBER
1				.XXX - ±.005	DISN 801M SYSTEM DIAGRAM	WTP	SCALE	NONE
2				.XX - ±.010		CHECKED BY	DATE	5-28-97
3				FRACTIONAL	APPROVED BY	709 861		
4				MATERIAL				
5								



NO. 1 CYLINDER
SET AT MOST
ADVANCED
TIMING POINT

EXAMPLE:

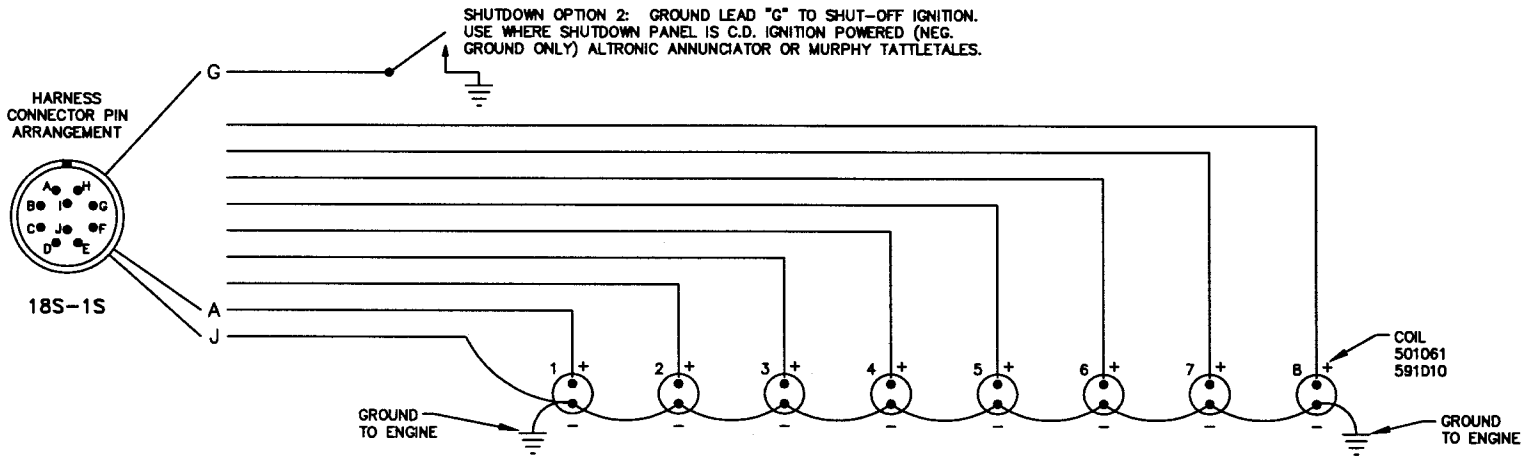
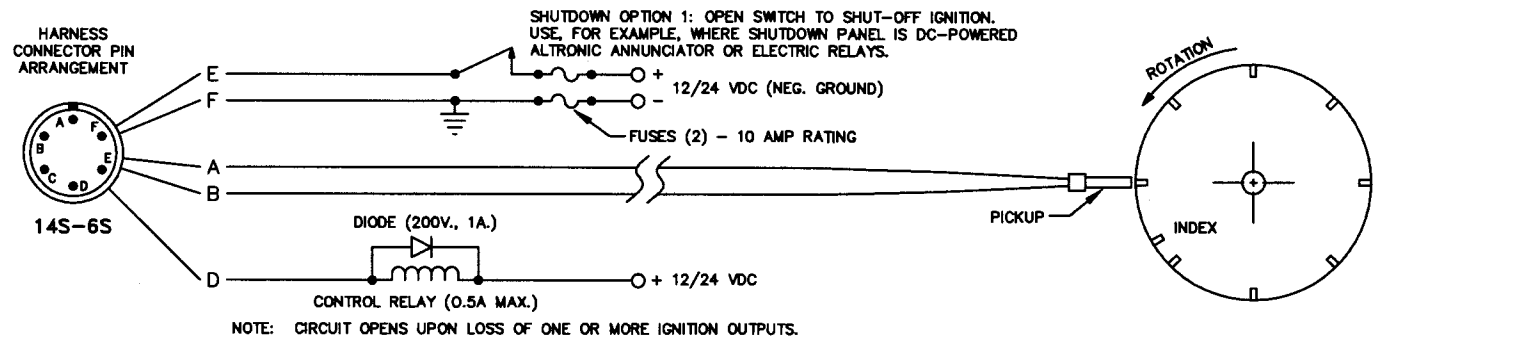
MOST ADVANCED TIMING SETTING = 20° BTDC
ENGINE SETTING FOR ABOVE LINE-UP = 20° BTDC

NOTE: (6+1) TRIGGER DISC SHOWN.

709 862

REVISIONS				TOLERANCES (EXCEPT AS NOTED)	ALTRONIC INC.			
NO.	DATE	BY	DESCRIPTION	DECIMAL JOKK - ±.005 JOK - ±.010	TITLE PICKUP/DISK INSTALLATION DISN 801M SYSTEM		DRAWING NUMBER	
1				FRACTIONAL	DRAWN BY	WTP	SCALE NONE	DRAWING NUMBER
2				MATERIAL	CHECKED BY	DATE	5-22-97	709 862
3					APPROVED BY			
4								
5								

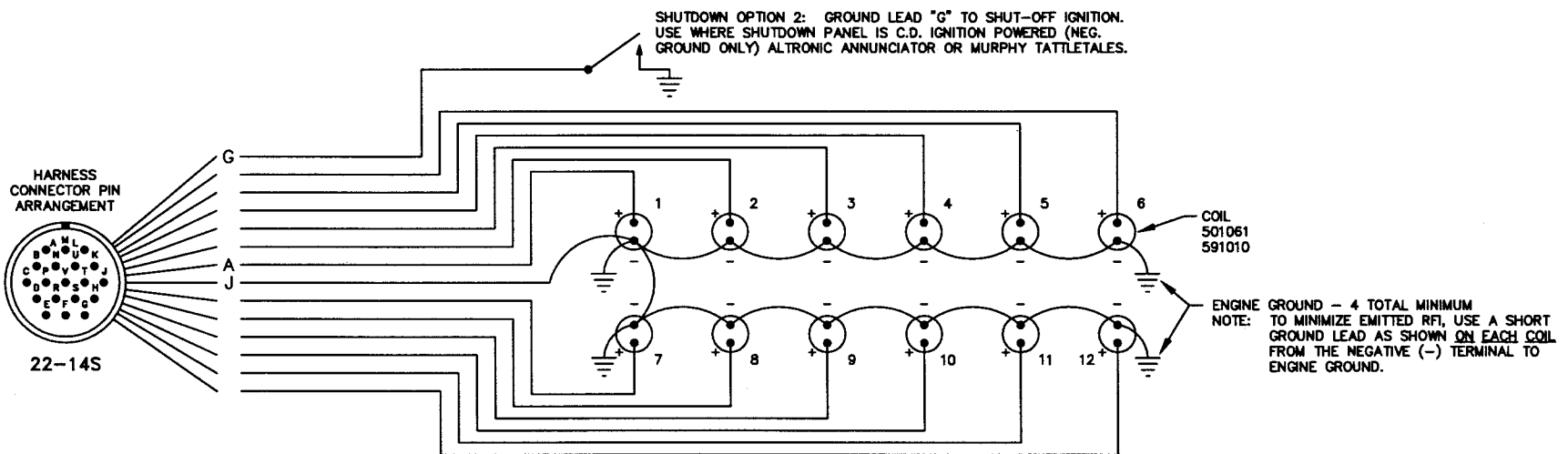
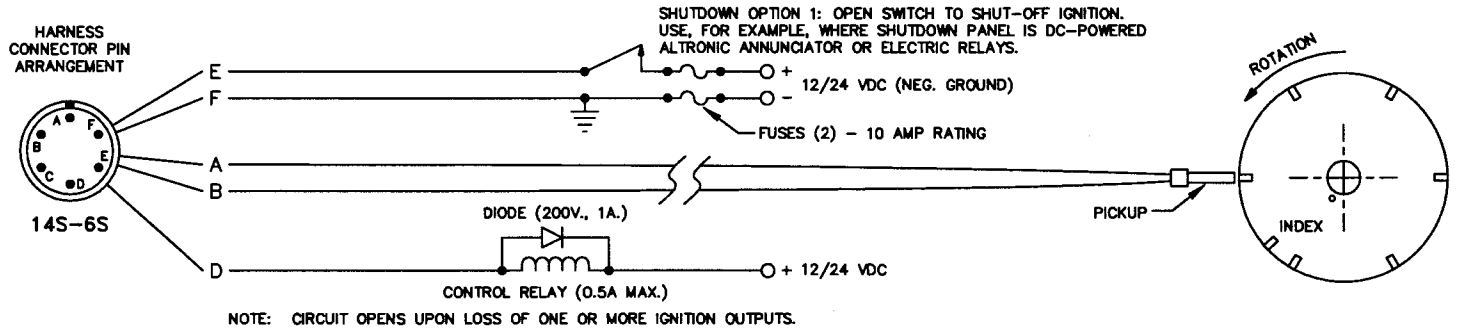
UNIT	WIRING										
791808-050M	IGNITION	A	B	C	D	E	F	H	I	J	
	ENGINE	1								GND	



REVISIONS				TOLERANCES (EXCEPT AS NOTED)	ALTRONIC INC.		
NO.	DATE	BY	DESCRIPTION	DECIMAL .XXX - ±.005 .XX - ±.010	TITLE	SCALE	DRAWING NUMBER
1				FRACTIONAL	WIRING DIAGRAM - DISN 801M SINGLE-FIRING SYSTEM	.888	DRAWN BY WTP
2				MATERIAL			
3					CHECKED BY	DATE	5-28-97
4					APPROVED BY		
5							

709 863A

UNIT	WIRING													
791812-050M	IGNITION	A	B	C	D	E	F	K	L	M	N	P	R	J
	ENGINE	1												GND

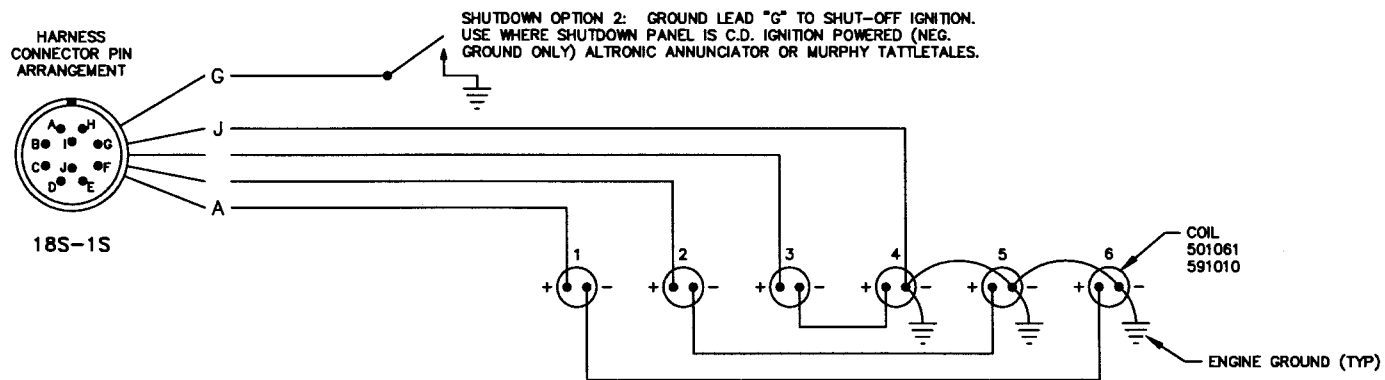
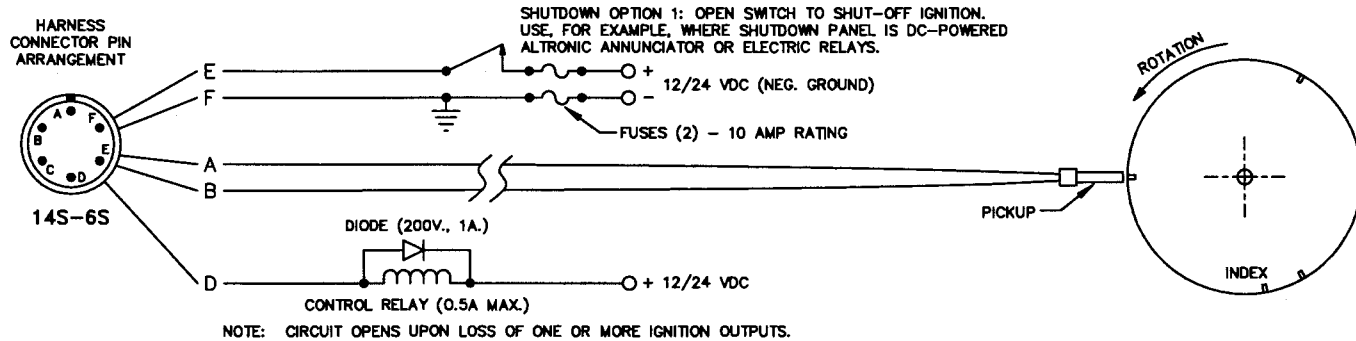


REVISIONS			
NO.	DATE	BY	DESCRIPTION
1			
2			
3			
4			
5			

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

ALTRONIC INC.			
TITLE WRING DIAGRAM - DISN 801M SINGLE-FIRING SYSTEM			
DRAWN BY	WTP	SCALE	.888
CHECKED BY		DATE	5-27-97
APPROVED BY		DRAWING NUMBER 709 863B	

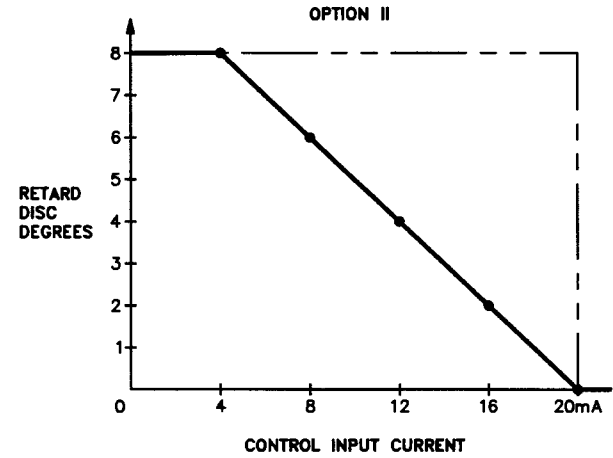
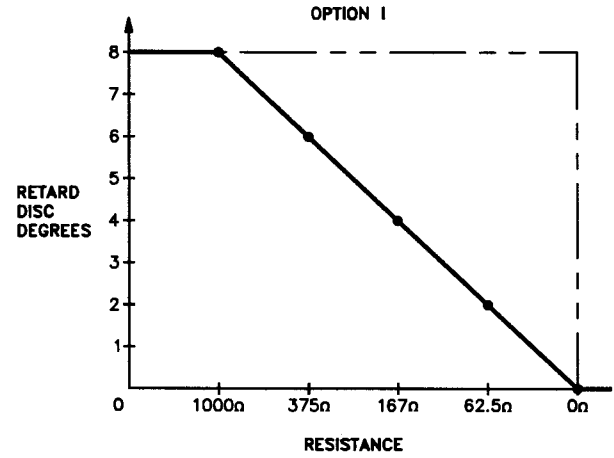
UNIT	WIRING					
791808-050M	IGNITION	A	B	C	J	G
	4-CYL.	A&D	B&C		GND	SHUTDOWN
	6-CYL. 1-5-3-6-2-4	A&F	B&E	C&D	GND	SHUTDOWN
	6-CYL. 1-4-2-6-3-5	A&F	C&D	B&E	GND	SHUTDOWN



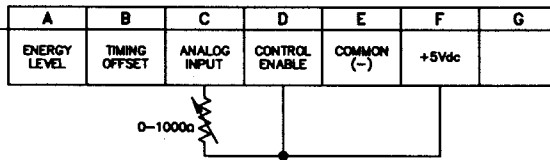
REVISIONS				TOLERANCES (EXCEPT AS NOTED)	ALTRONIC INC.	
NO.	DATE	BY	DESCRIPTION	DECIMAL .XXX - ±.005 .XX - ±.010	TITLE	DRAWING NUMBER
1				FRACTIONAL	WIRING DIAGRAM - DISN 801M DOUBLE-FIRING SYSTEM	
2				MATERIAL	DRAWN BY WTP	SCALE .888
3					CHECKED BY	DATE 5-27-97
4					APPROVED BY	709 864
5						

TIMING SWITCH	
SWITCH POSITION	RETARD DISC DEGREES
0	7.5
1	7.0
2	6.5
3	6.0
4	5.5
5	5.0
6	4.5
7	4.0
8	3.5
9	3.0
10	2.5
11	2.0
12	1.5
13	1.0
14	0.5
15	0

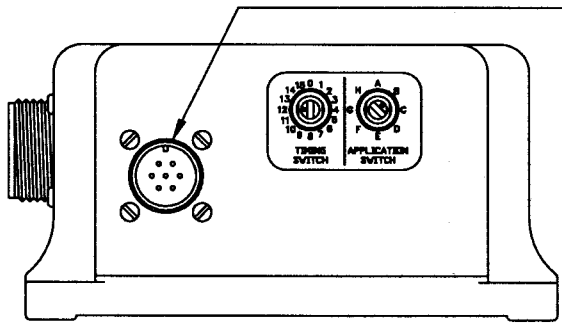
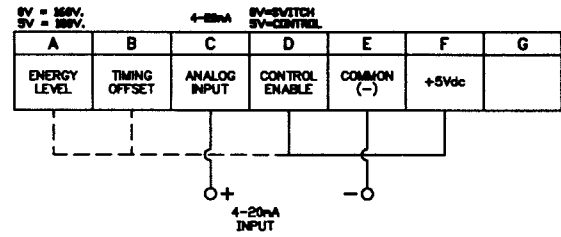
NOTE: SWITCH ACTIVE WHEN 0V. APPLIED TO PIN 'D' OF 7-PIN CONTROL CONNECTOR.



OPTION I (POTENTIOMETER)
7-PIN CONTROL CONNECTOR WIRING

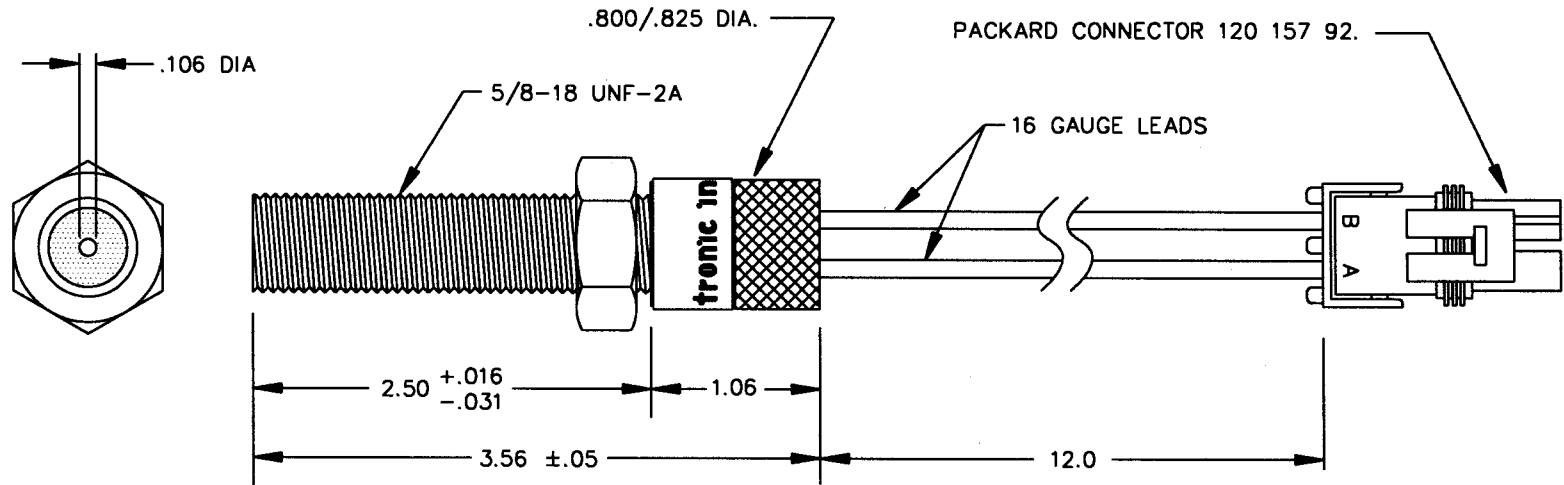


OPTION II (4-20mA CONTROL)
7-PIN CONTROL CONNECTOR WIRING



REVISIONS			
NO.	DATE	BY	DESCRIPTION
1			
2			
3			
4			
5			

TOLERANCES (EXCEPT AS NOTED)		ALTRONIC INC.	
DECIMAL .XXX - ±.005 .XX - ±.010	FRACTIONAL	TITLE TIMING CONTROL WIRING DISN 801M IGNITION SYSTEM	
MATERIAL	APPROVED BY	DRAWN BY WTP	SCALE NONE
		CHECKED BY	DATE 5-28-97
			DRAWING NUMBER 709 865

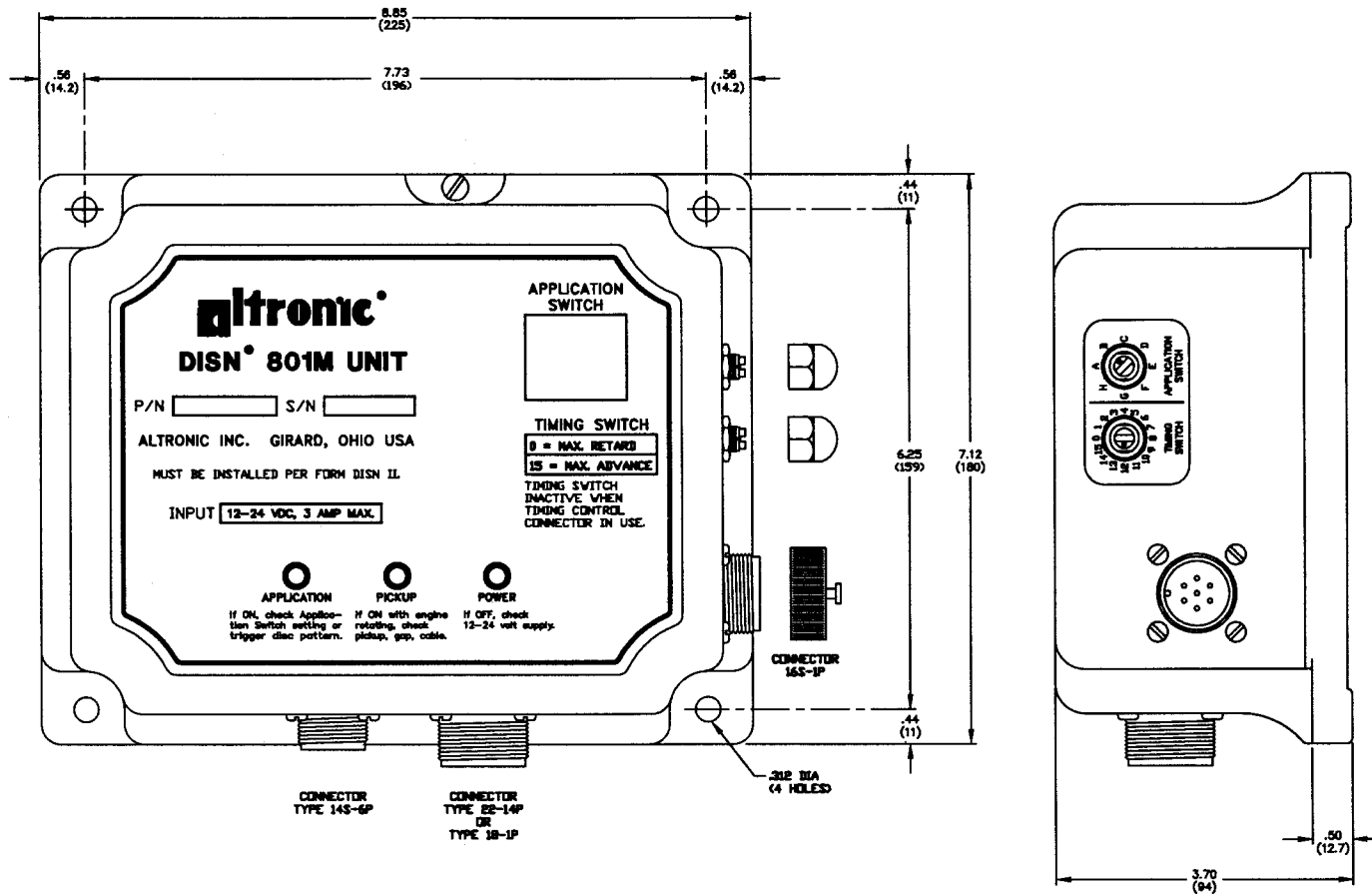


***NOTE:**

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

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

REVISIONS				TOLERANCES (EXCEPT AS NOTED)		ALTRONIC INC.			
NO.	DATE	BY	DESCRIPTION	DECIMAL		TITLE		PART NUMBER	
1				.XXX	±.005	PICKUP SENSOR		791 018-2	
2				.XX	±.010				
3				FRACTIONAL		DRAWN BY	WTP	SCALE	FULL
4				MATERIAL		CHECKED BY		DATE	12-1-95
5						APPROVED BY			



DIMENSIONS IN INCHES AND MILLIMETERS

REVISIONS				TOLERANCES UNLESS AS NOTED		ALTRONIC INC.		
NO.	DATE	BY	DESCRIPTION	DECIMAL DIM - .005 DIM - .002	FRACTIONAL	DRAWN BY	SCALE	FULL PART NUMBER
1	5-28-97	WTP	ECN 970064			VTP		
2								
3								
4							11-29-95	
5								799 046

799 046