

**ALTRONIC DISN
MEDIUM ENGINES, 4-16 CYLINDERS**

**SERVICE INSTRUCTIONS
FORM DISN800CM SI 6-97**

**ALTRONIC, INC.
712 TRUMBULL AVE.
GIRARD, OHIO 44420**

**DISN IGNITION SYSTEM
800C SERIES
801C SERIES
801M SERIES**

IMPORTANT SAFETY NOTICE

PROPER INSTALLATION, MAINTENANCE, REPAIR AND OPERATION OF THIS EQUIPMENT IS ESSENTIAL. THE RECOMMENDED PRACTICES CONTAINED HEREIN SHOULD BE FOLLOWED WITHOUT DEVIATION. AN IMPROPERLY INSTALLED OR OPERATING IGNITION SYSTEM COULD CAUSE PERSONAL INJURY TO OPERATORS OR OTHER NEARBY PERSONNEL.

TABLE OF CONTENTS**DISN SERVICE INSTRUCTIONS**

SECTION	ITEM	PAGE
1.0	SYSTEM DESCRIPTION	3
2.0	PARTS IDENTIFICATION AND SPECIFICATION	5
2.1	DISN 800/801 Series Unit	5
2.2	DISN Unit Part No.	6
2.3	DISN Unit Specification Chart	6
2.41	Hall-Effect Pickup 791050 Series	7
2.42	Magnets and Discs	7
2.51	Magnetic Pickup 791016/791018 Series	7
2.52	Trigger Discs	7
3.0	TEST STAND REQUIREMENTS	8
3.1	Material Required	8
3.2	Wiring Diagram	9
4.0	OHMMETER CHECKS	10
4.1	DISN Unit	10
4.2	Hall-Effect Pickup 791050 Series	10
4.3	Magnetic Pickup 791116/791118 Series	10
5.0	OPERATIONAL TEST	11
5.1	Performance Test	11
5.2	Timing Test	11
5.3	Diagnostic LED and Alarm Output Test	11
6.0	OSCILLOSCOPE TEST	12
6.1	Test Set-up	12
6.2	Voltage Pattern at Ignition Coil	12
6.3	Voltage Pattern on Storage Capacitor	12-13
7.0	CIRCUIT BOARD REPLACEMENT PROCEDURE	14
7.1	Disassembly Procedure	14
7.2	Assembly Procedure	14

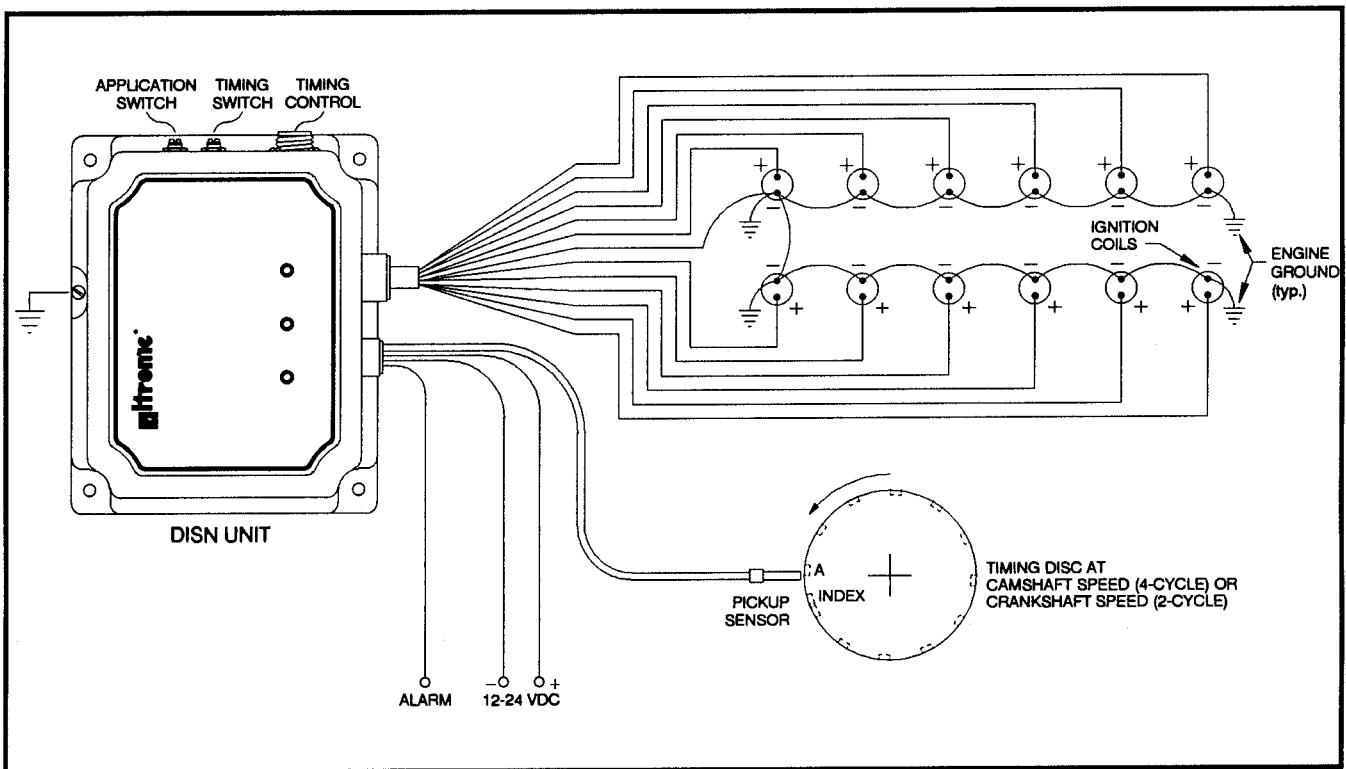
1.0 DESCRIPTION

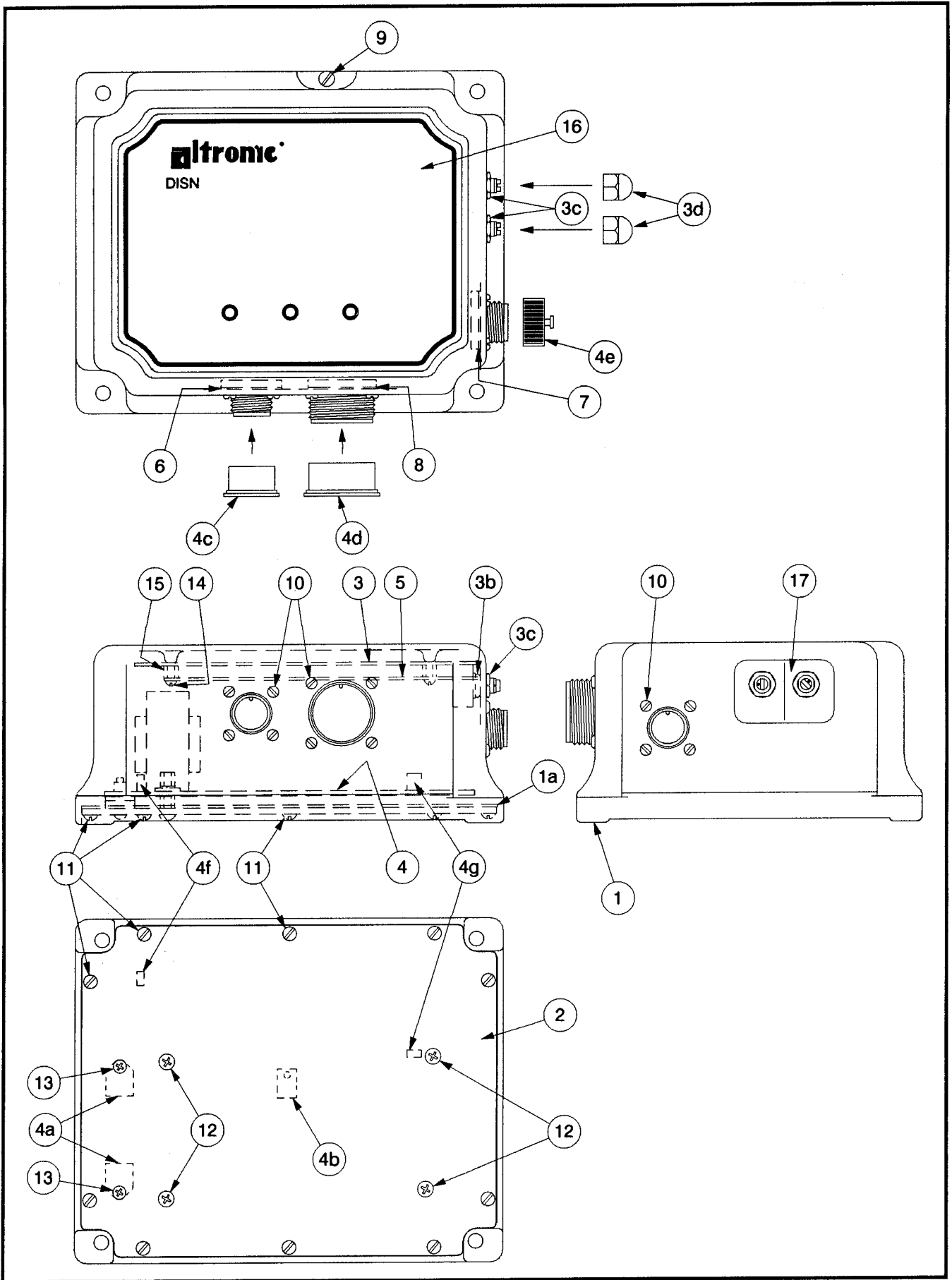
1.1 The Altronic DISN is a microcircuit based, digital ignition system for spark ignited engines fueled by natural gas, LPG or gasoline. The system has no wearing parts and uses the capacitor discharge principle providing high energy, precision timed sparks for maximum engine performance.

Crankshaft or camshaft referenced triggers with a magnetic pickup give extremely accurate timing reference signals. The DISN unit's microcircuits provide the proper timing and distribution functions. The DISN 800C/801C/801M series have multiple applications within one unit. For timing adjustment, there is a 16-position manual timing switch and an analog timing input. These allow a variety of timing control adjustments: two fixed settings, potentiometer control or 4-20 mA signal control.

1.2 In 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 triggers. Most even-firing DISN units have one trigger for every firing of the engine; each firing occurs a programmed number of degrees after the trigger signal is received. Some odd-firing units have one trigger for every two firings of the engine with the odd firing angle electronically synthesized by the DISN circuitry. One additional index trigger trails 10-15 degrees after the last trigger; the DISN unit recognizes this as the index signal that another revolution is to begin.

1.3 The DISN unit requires a DC supply capable of 12-24 Vdc, 5 amps continuous - see the Installation Instructions, form DISN80xx II, drawing 709 810 or 709 860.





2.0 PARTS IDENTIFICATION AND SPECIFICATION

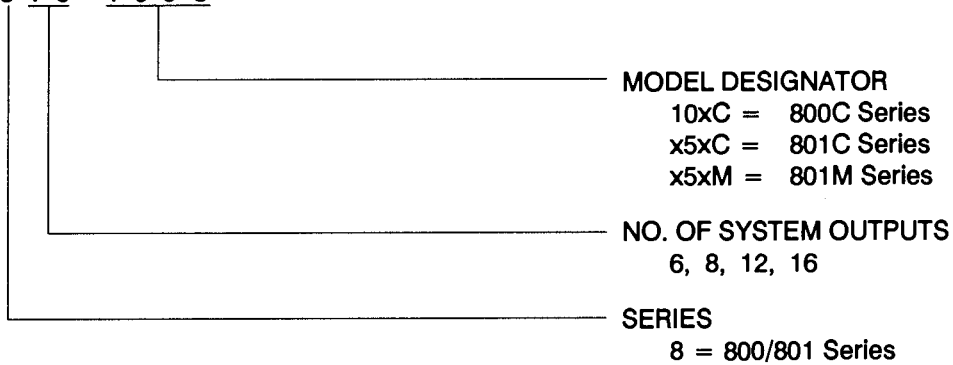
2.1 PARTS LIST - DISN UNIT

REF. NO.	QTY.	PART NO.	DESCRIPTION
1	1	710129	Enclosure, DISN 800C 8-output unit
		710122	Enclosure, DISN 800C 12-16 output unit
		710128	Enclosure, DISN 801C 12-16 output unit
		710146	Enclosure, DISN 801M 6-8 output unit
		710147	Enclosure, DISN 801M 12-output unit
1a	1	710119	Gasket, enclosure
2	1	710123	Bottom plate
3	1	See below	Logic board assembly
3b	2	610199	O-ring
3c	2	902621	Nut 3/8-32
3d	2	601431	Cap, switch
4	1	See below	Power board assembly
4a	2	610636	Insulator, large
4b	1	610530	Insulator, small
4c	1	510540	Cap, 6-pin connector
4d	1	604122	Cap, 10-pin connector
		510517	Cap, 19-pin connector
4e	1	504210	Cap, 5-pin connector
		504200	Cap, 7-pin connector
		504211	Cap, 10-pin connector
4f	1	601653	Fuse, 6.3 amp
4g	1	601653	Fuse, 6.3 amp
		601867	Fuse, 30 amp
5	1	702103	Shield board assembly
6	1	501335	Gasket, 6-pin connector
7	1	501335	Gasket, 5-pin connector
		501368	Gasket, 7-pin connector
		501372	Gasket, 10-pin connector
8	1	501372	Gasket, 10-pin connector
		501222	Gasket, 19-pin connector
9	1	902348	Screw 8-32 x 3/16
10	12	902648	Screw 6-32 x 5/16
11	10	902656	Screw 8-32 x 1/2
12	4	902647	Seal screw 8-32 x 5/16
13	2	902646	Seal screw 6-32 x 3/4
14	4	902061	Screw 6-32 x 5/16
15	4	610675	Standoff, logic board
16	1	See below	Label, DISN part no.
17	1	702115	Label, switches

DISN UNIT	LOGIC BOARD ASSEMBLY (3)	POWER BOARD ASSEMBLY (4)	PART NO. LABEL (16)
791806-150M	772063-1A (806-150M)	781063-6	702123A
791808-050M	772063-1B (808-050M)	781063-8	702126A
791808-100C	772060-2A (808-100C)	781066-8	702107A
791812-050M	772063-1B (812-050M)	781063-12	702131A
791812-100C	772060-2B (812-100C)	781066-12	702108A
791812-151C	772053-2A (812-151B)	781066-12	702128A
791812-250M	772063-1A (812-250M)	781063-12	702124A
791812-251C	772053-2A (812-251B)	781066-12	702114A
791816-056C	772053-2A (816-056B)	781066-16H	702113A
791816-100C	772060-2B (816-100A)	781066-16	702109A
791816-101C	772060-2B (816-101A)	781066-16	702110A
791816-102C	772060-2C (816-102A)	781066-16	702111A
791816-103C	772060-2A (816-103A)	781066-16H	702112A
791816-104C	772060-2C (816-104C)	781066-16	702141A
791816-451C	772053-2A (816-451B)	781066-16	702129A

2.2 DISN UNIT PART NO. - The DISN units are available with various numbers of outputs, even or odd firing patterns. The part no. identifies the various factors as follows:

7 9 1 8 1 6 - 1 0 0 C



2.3 DISN UNIT SPECIFICATION CHART

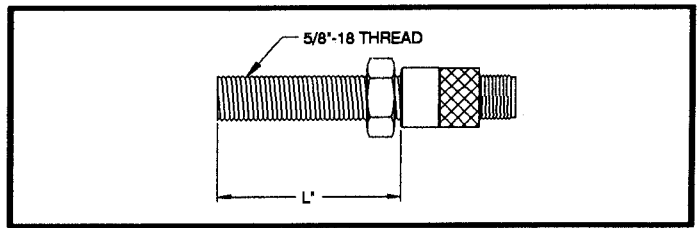
DISN PART NO.**	TRIGGER DISC	CAP. VOLT.	ANALOG TIMING	FIRING PATTERN - DISC DEGREES***
			A - B - C - D - E - F - H - I	
791806-150M (A)	6+1	160V.*	8-	0 - 60 - 120 - 180 - 240 - 300
791808-050M (D)	8+1	160V.*	8-	0 - 45 - 90 - 135 - 180 - 225 - 270 - 315
791808-100C (D)	8+1	160V.	8-	0 - 45 - 90 - 135 - 180 - 225 - 270 - 315

DISN PART NO.**	TRIGGER DISC	CAP. VOLT.	ANALOG TIMING	FIRING PATTERN - DISC DEGREES***
				A - B - C - D - E - F - K - L - M - N - P - R - S - T - U - V
791812-050M (B)	6+1	160V.*	8-	0 - 30 - 60 - 90 - 120 - 150 - 180 - 210 - 240 - 270 - 300 - 330
791812-100C (A)	12+1	160V.	8-	0 - 30 - 60 - 90 - 120 - 150 - 180 - 210 - 240 - 270 - 300 - 330
791812-151C (A)	12+1	160V.*	8-	0 - 30 - 60 - 90 - 120 - 150 - 180 - 210 - 240 - 270 - 300 - 330
791812-250M (A)	6+1	160V.*	8-	0 - 15 - 60 - 75 - 120 - 135 - 180 - 195 - 240 - 255 - 300 - 315
791812-251C (A)	6+1	160V.*	8-	0 - 15 - 60 - 75 - 120 - 135 - 180 - 195 - 240 - 255 - 300 - 315
791816-056C (D)	8+1	180V.*	8-	0 - 10 - 45 - 55 - 90 - 100 - 135 - 145 - 180 - 190 - 225 - 235 - 270 - 280 - 315 - 325
791816-100C (D)	8+1	160V.	8-	0 - 15 - 45 - 60 - 90 - 105 - 135 - 150 - 180 - 195 - 225 - 240 - 270 - 285 - 315 - 330
791816-101C (D)	8+1	160V.	8-	0 - 15 - 45 - 60 - 90 - 105 - 135 - 150 - 180 - 195 - 225 - 240 - 270 - 285 - 315 - 330
791816-102C (D)	8+1#	160V.	7.5-	0 - 15 - 45 - 60 - 90 - 105 - 135 - 150 - 180 - 195 - 225 - 240 - 270 - 285 - 315 - 330
791816-103C (D)	8+1	180V.	8-	0 - 10 - 45 - 55 - 90 - 100 - 135 - 145 - 180 - 190 - 225 - 235 - 270 - 280 - 315 - 325
791816-104C (D)	8+1#	160V.	7.5-	0 - 15 - 45 - 60 - 90 - 105 - 135 - 150 - 180 - 195 - 225 - 240 - 270 - 285 - 315 - 330
791816-451C (A)	8+1	160V.*	8-	0 - 15 - 45 - 60 - 90 - 105 - 135 - 150 - 180 - 195 - 225 - 240 - 270 - 285 - 315 - 330

- # Units 791816-102C and 791816-104C must be operated with Test Unit 791022-1.
- * DISN 801C and 801M units have dual output voltage (160/180 V.). The voltage listed above is the level with pin "A" of the timing control connector NOT connected; connecting pin "A" to pin "F" will give the alternate value (180/160 V.).
- ** The letter in parenthesis following the DISN part no. is the setting for the application switch for the firing pattern listed.
- *** DISN 801C and 801M units have timing offsets programmed on one or more cylinders when pins "B" and "F" of the timing control connector are connected together. Contact the factory for specific information if it is desired to check this feature.

2.41 HALL-EFFECT PICKUPS - DISN 800C/801C

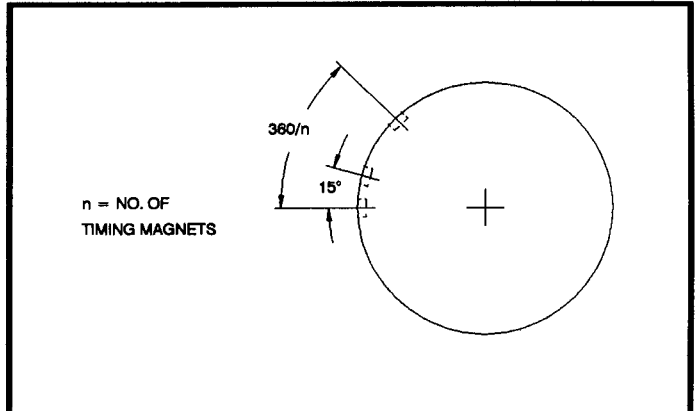
PART NO.	LENGTH "L"
791050-1	1.75"
791050-2	2.5"
791050-4	4.5"



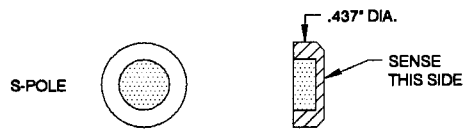
2.42 MAGNETS AND DISCS - DISN 800C/801C

7901xx-x MAGNET DISC

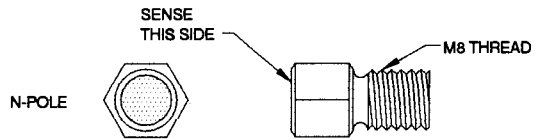
MAGNETS	7.45" DIA.	5.00" DIA.
3 + 1	790103-1	790113-1
4 + 1	790104-1	790114-1
5 + 1	790105-1	790115-1
6 + 1	790106-1	790116-1
8 + 1	790108-1	790118-1
10 + 1	790120-1	790130-1
12 + 1	790122-1	790132-1



720001 MAGNET BUTTON - .437 DIA.

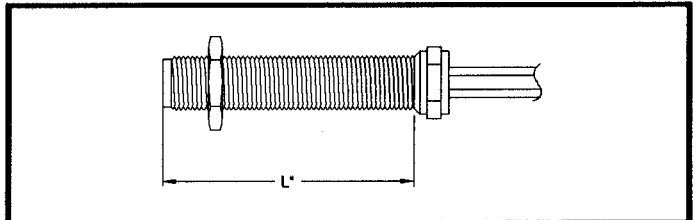


720002 MAGNET - 8mm THREAD



2.51 MAGNETIC PICKUPS - DISN 801M

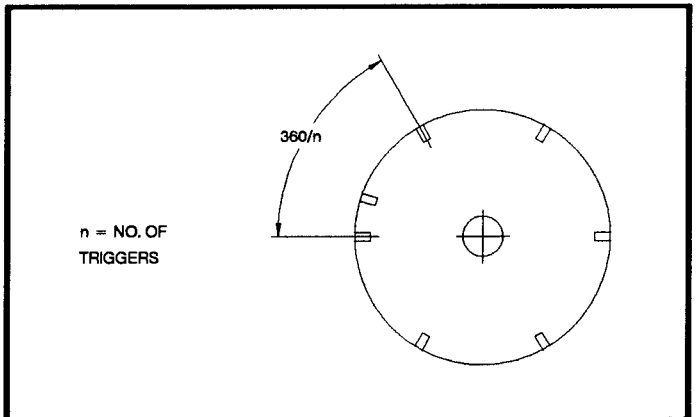
PART NO.	LENGTH "L"
791016-2	3.4"
791018-2	2.5"



2.52 TRIGGER DISCS - DISN 801M

7903xx-x TRIGGER DISC

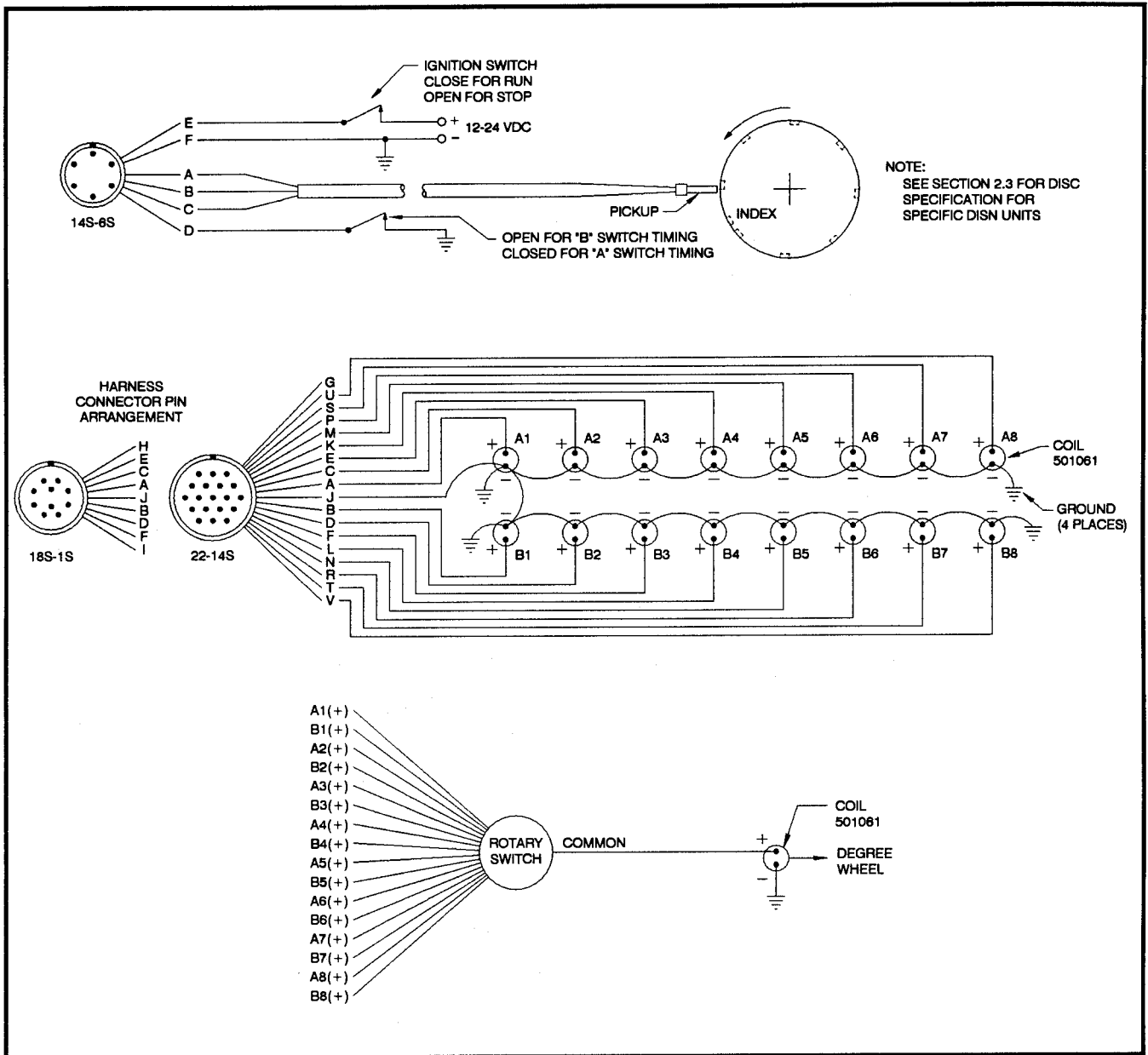
TRIGGERS	7.45" DIA.	5.00" DIA.
2 + 1	790302-1	-
3 + 1	790303-1	-
4 + 1	-	790314-1
6 + 1	-	790316-1
8 + 1	-	790318-1



3.0 TEST STAND REQUIREMENTS

- 3.1 MATERIAL REQUIRED - In order to test a DISN ignition system, a specialized test stand is required comprised of the following items:
- A. A variable speed motor of 0.25 HP or greater, capable of rotating 1,800 RPM.
 - B. A spark degree wheel graduated in 360 increments with the indicator attached to the driving shaft.
 - C. An attachment for either the 5.00" diameter or 7.45" diameter trigger discs for the DISN system to be mounted to the motor driving shaft.
 - D. For the DISN 800C/801C systems, a Hall-effect pickup 791050-2 mounted to sense a rotating magnet disc - see installation instructions form DISN800C II, drawing 709 812. For the DISN 801M systems, a magnetic pickup 791016-2 mounted to sense a rotating trigger disc - see installation instructions form DISN801M II, drawing 709 862.
 - E. Sixteen (16) ignition coils 501061 connected to suitable, adjustable spark gaps. Additionally, one 501061 coil connected to the indicating degree wheel and an arrangement to connect its positive terminal individually to the positive terminals of all other coils.
 - F. Wiring harnesses as follows:
 - 793008-8 for 6-8 output DISN units
 - 793012-16 for 12-16 output DISN units
 - G. Pickup cable assemblies as follows:
 - 793007-2 for the DISN 800C/801C systems
 - 793076-1 for the DISN 801M system
 - H. Control cable assemblies as follows:
 - 793020-1 for the DISN 800C systems
 - 793041-1 for the DISN 801C systems
 - 793075-1 for the DISN 801M systems
 - I. A DC power source capable of supplying 12-24 Vdc, 5 amps - see installation instructions form DISN800CII, drawing 709 810 or DISN801M II, drawing 709 860. NOTE: If a battery is used to provide the DC power, be sure to install two fuses as shown on the above drawings.
 - J. A 0-1,000 ohm potentiometer.
 - K. A means to elevate the DISN unit to a controlled temperature of 150° F. (65° C.).
- NOTE: Altronic Test Unit 791022-1 can provide simulated magnet disc signals to exercise DISN 800C/801C unit outputs at a fixed firing rate.

3.2 WIRING DIAGRAM - The test stand should be constructed and wired as shown below.



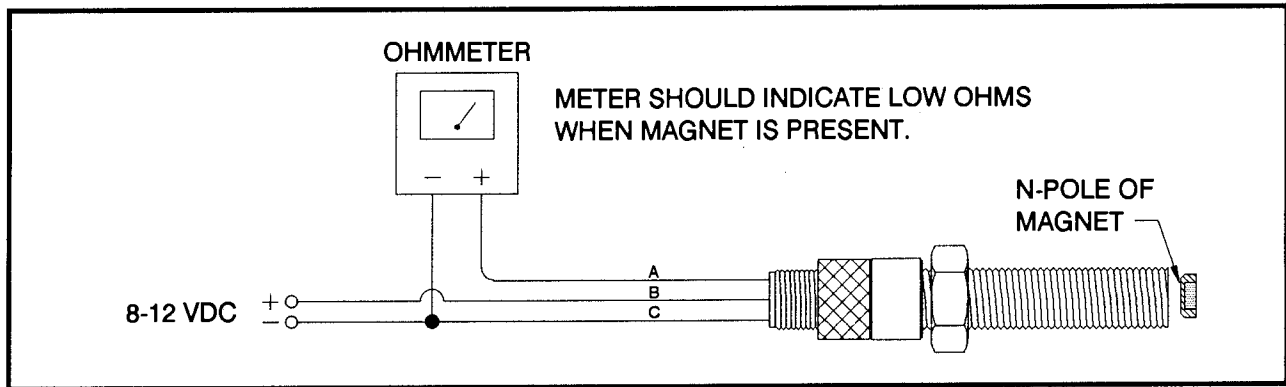
4.0 OHMMETER CHECKS

4.1 DISN UNIT - Use Simpson Model 260 or equivalent analog volt-ohmmeter. The checks below, if outside the range indicated, establish a bad unit. A unit with a normal reading may still be defective; only the full performance check using an oscilloscope (see sections 5.0 and 6.0) can confirm correct operation.

TEST	OHMMETER SCALE	POSITIVE LEAD	NEGATIVE LEAD	READING
DISN unit 10-pin (1) or 19-pin (2) connector	R x 10,000	Pin "G"	Pin "A"	*Infinite - replace power board (4) if reading is below 250,000 ohms.
		Pin "G"	Pin "B"	
		Pin "G"	Pin "C"	
		Pin "G"	Pin "D"	
		Pin "G"	Pin "E"	
		Pin "G"	Pin "F"	
		Pin "G"	Pin "H" (1)	
		Pin "G"	Pin "I" (1)	
		Pin "G"	Pin "K" (2)	
		Pin "G"	Pin "L" (2)	
		Pin "G"	Pin "M" (2)	
		Pin "G"	Pin "N" (2)	
		Pin "G"	Pin "P" (2)	
		Pin "G"	Pin "R" (2)	
		Pin "G"	Pin "S" (2)	
Pin "G"	Pin "T" (2)			
Pin "G"	Pin "U" (2)			
Pin "G"	Pin "V" (2)			
DISN unit 10-pin or 19-pin connector	R x 10,000	Pin "G"	Ground stud	*Infinite - replace power board (4) if reading is below 250,000 ohms.
DISN unit 6-pin connector	R x 100	Pin "E"	Pin "F"	Infinite - replace power board (4) if reading is below 1,000 ohms.

*NOTE: The ohmmeter needle will deflect and then move to a final infinite reading within 5 seconds.

4.2 HALL-EFFECT PICKUP 791050-x - A source of 8 to 12 volts DC is required in addition to an ohmmeter. The DC source may be a small battery or commercial power supply. Use one of the DISN system magnets - see section 2.42. NOTE: The Hall-effect pickup may also be tested using Altronic Test Unit 791022-1.



4.3 MAGNETIC PICKUP 791116-2/791118-2 - Check the resistance value between pins A and B as shown.
Pickup 791116-2: 2,700-3,300 ohms
Pickup 791118-2: 900-1,200 ohms

5.0 OPERATIONAL TEST

5.1 PERFORMANCE TEST - Apply 24 VDC and operate the magnet disc at the speed indicated for each test.

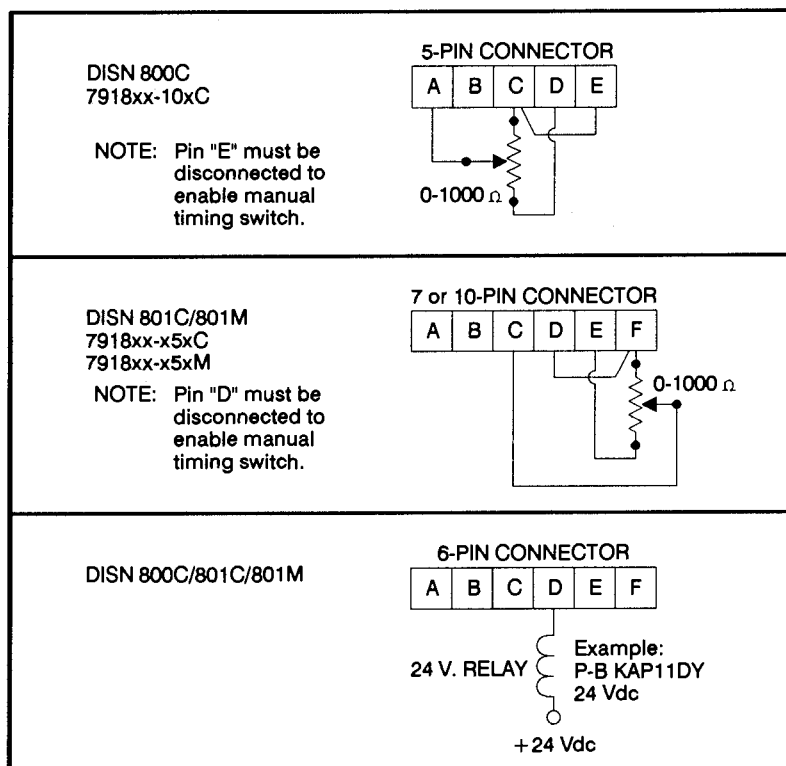
DISC RPM	INPUT VOLTAGE	TEST
25 RPM	10 VDC	All outputs fire a 15mm gap
400 RPM	24 VDC	All outputs fire a 15mm gap
900 RPM	24 VDC	All outputs fire a 15mm gap

5.2 TIMING TEST - Refer to section 2.3 for the information for the particular DISN unit being tested. If performance does not meet the indicated specification, change the logic board assembly (3).

- Setting the degree wheel at 0 degrees for output "A", the timing pattern for the remaining outputs should match that shown in the chart of section 2.3.
- Check that the timing changes by 0.5 degree increments as the timing switch is adjusted from one position to the next. Position 15 should be the most advanced timing, position 0 most retarded.
- Check the analog timing capability of the unit using a 0-1,000 ohm potentiometer connected to the control connector per the hook-up shown below. See section 3.1H. for the timing control cable assembly for this test. The timing from 0-1,000 ohms should vary by the amount shown in the chart of section 2.3.
 - A "+" sign in the chart indicates that 0 ohms gives the most advanced timing; the timing retards as the resistance is increased towards 1,000 ohms.
 - A "-" sign in the chart indicates that 0 ohms gives the most retarded timing; the timing advances as the resistance is increased towards 1,000 ohms.

5.3 DIAGNOSTIC LED AND ALARM OUTPUT TEST - see hookup below.

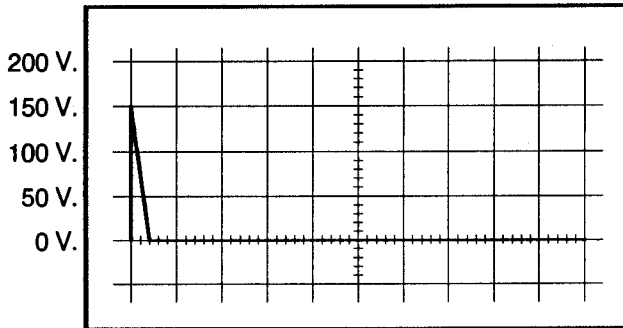
- The POWER LED should light when 24 Vdc is applied to the unit. If not, check both fuses (4f, 4g) on the power board assembly (4) for continuity; replace if open. If a fuse blows after replacement, replace the board assembly (3) or (4) causing the short. NOTE: Field wiring mistakes can blow either fuse (4f, 4g).
- The APPLICATION LED should light if the application switch is set on an application not compatible with the trigger disc being used. Replace the logic board assembly (3) if this function is faulty.
- With the system operating at the 900 RPM test above (section 5.1), disconnect the pickup connector at the pickup; the PICKUP LED should turn ON and the alarm output switch should open circuit. Replace the logic board assembly (3) if this function is faulty.
- With the system operating at the 900 RPM test above (section 5.1), disconnect the primary lead at the positive terminal of one coil; the alarm output switch should open circuit. Replace the power board assembly (4) if this function is faulty. NOTE: This fault will latch the alarm output open circuit until either the RPM is brought to zero or the power is turned off.



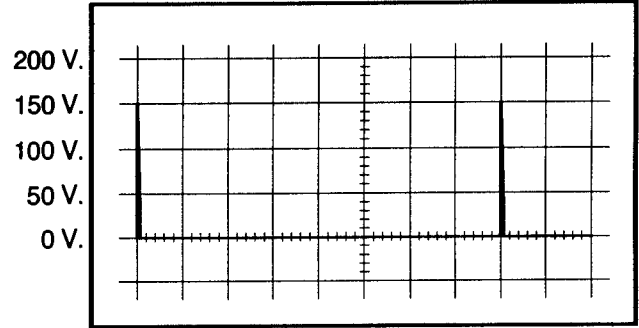
6.0 OSCILLOSCOPE TEST

- 6.1 TEST SET-UP - Two 100:1 oscilloscope probes are required. NOTE: The signals being monitored are 150-200 volts, positive polarity. It is recommended that these tests be performed with the DISN unit heated to a temperature of 150° F. (65° C.).
- 6.2 VOLTAGE PATTERN AT THE IGNITION COIL - Connect the oscilloscope trigger input and reading probe to the positive (+) coil terminal and ground. The patterns shown are common to all 160 volt DISN units. The maximum voltage output for each type unit is given in the chart of section 2.3.

Coil (-) Connection
Time Base - 100 usec/div.
750 RPM - Disc

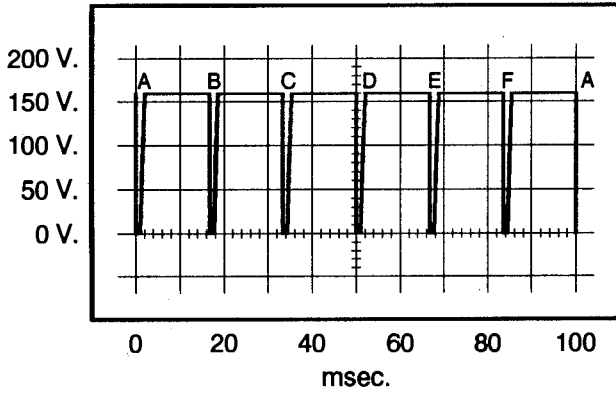


Coil (-) Connection
Time Base - 10 msec/div.
750 RPM - Disc

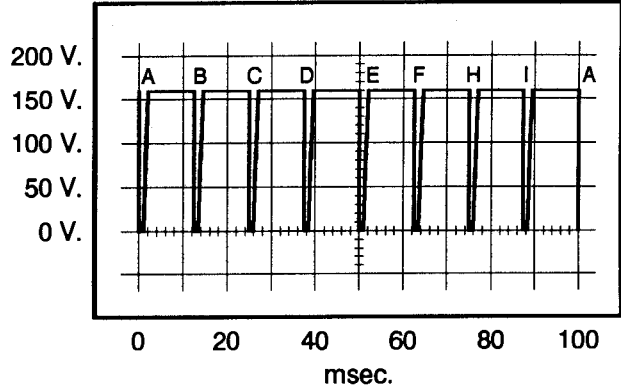


- 6.3 VOLTAGE PATTERN ON THE STORAGE CAPACITOR (see next page)
- A. The trigger input of the oscilloscope should be connected to primary coil lead "A". NOTE: This is a 150-200V. positive polarity signal.
- B. Connect the oscilloscope reading probe to the "G" lead of the 10-pin or 19-pin connector harness. The "G" lead pattern displays all firings of the unit. Refer to section 2.3 for reference to the maximum voltage of the waveform for the DISN unit being tested. The normal capacitor patterns are shown on the following page.
- C. If the pattern is missing one or more discharges, replace the power board assembly (4).

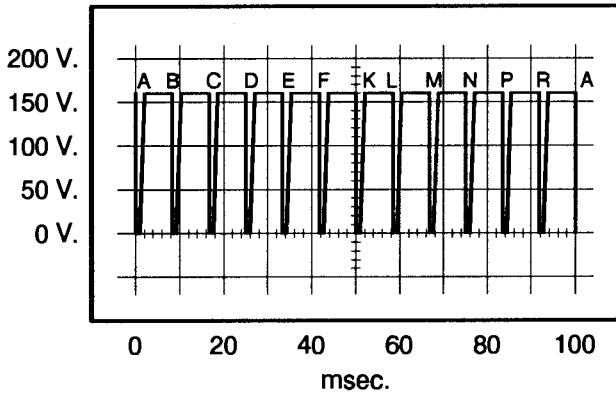
791806-150M (SW. A)
600 RPM - Disc (6 + 1)



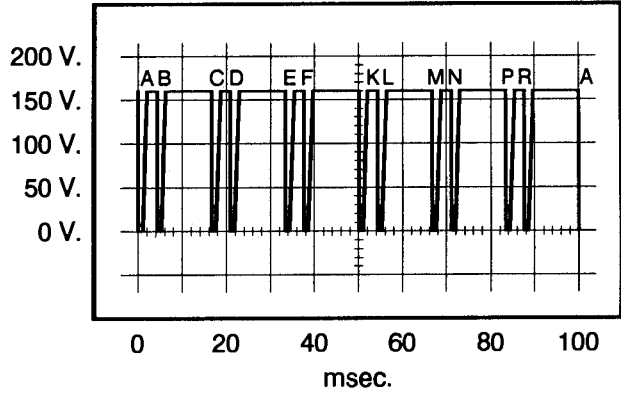
791808-050M (SW. D)
791808-100C (SW. D)
600 RPM - Disc (8 + 1)



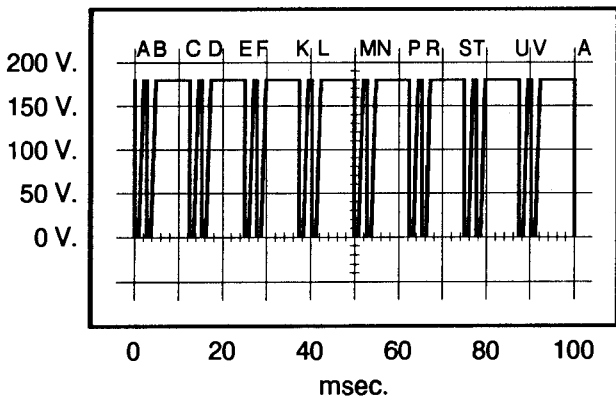
791812-050M (SW. B) - (6 + 1)
791812-100C (SW. A) - (12 + 1)
791812-151C (SW. A) - (12 + 1)
600 RPM - Disc



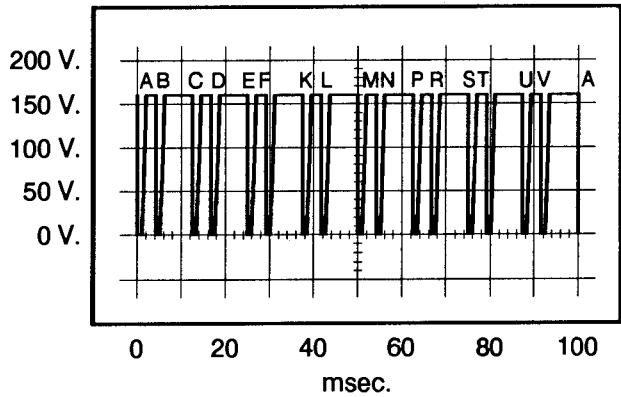
791812-100C (SW. B)
791812-251C (SW. A)
600 RPM - Disc (6 + 1)



791816-056C (SW. D)
791816-103C (SW. D)
600 RPM - Disc (8 + 1)



791816-100C (SW. D)
791816-101C (SW. D)
791816-102C (SW. D)
791816-104C (SW. D)
791816-451C (SW. A)
600 RPM - Disc (8 + 1)



7.0 CIRCUIT BOARD REPLACEMENT PROCEDURE

7.1 DISASSEMBLY PROCEDURE

- A. Loosen and remove the eight connector screws (10) on the two adjacent connectors on one long side of the enclosure; also remove ten screws (11) from the bottom plate. Carefully push the two connectors into the enclosure (1). While holding the bottom plate, loosen the enclosure and tilt upwards along the side with two connectors. Reach between the two assemblies and unplug the ribbon cable to separate the main enclosure from the bottom plate assembly.
- B. To remove the logic board assembly (3) from the main enclosure (1), loosen and remove the following hardware: two hex nuts (3c) holding the switches in the end of the enclosure, four connector screws (10) and four internal screws (14). The logic board can then be removed from the enclosure.
- C. To remove the power board assembly (4), loosen and remove four screws (12) and two screws (13). The power board can now be removed.

7.2 ASSEMBLY PROCEDURE

- A. Check the condition of gaskets (1a), (6), (7) and (8); replace if necessary.
- B. Examine the insulators (4a) on the bottom of the two power transistors and insulator (4b) on the bottom of the smaller device; replace if damaged.
- C. Install the power board assembly (4) to the bottom plate (2). Install and tighten four NEW screws (12) and two NEW screws (13) to 14 in-lbs. (0.14 kgm).
- D. Install the logic board assembly (3) into the main enclosure. Insert the connector and two switches through the holes in one end of the enclosure. Install and tighten (1st) four screws (14) and (2nd) the two switch nuts (3c), and (3rd) four connector screws (10). Tighten these screws to 14 in-lbs. (0.14 kgm).
- E. Position the two assemblies from 7.2C. and 7.2D. in the correct orientation to each other so that the two power board connectors can be inserted through their respective enclosure holes. Then plug the ribbon cable from the logic board assembly (3) into the power board assembly (4). Install eight each NEW connector screws (10) and tighten to 12 in-lbs. (0.14 kgm). Then install ten NEW screws (11) through the bottom plate and tighten to 18 in-lbs. (0.21 kgm).
- F. Test the completely assembled unit per sections 5.0 and 6.0 to insure correct operation.
- G. Reinstall switch caps (3d) and connector caps (4c), (4d) and (4e).