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MEGA 100/200

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Mega 100/200 Instructions

Digital Delay, the company that invented and patented the Crossover, designed and manufactured the *Mega 100 and 200* simply to be the best and most advanced multi-function box on the market without a 4 stage timer. The Mega 100 and 200 both have three separate outputs, four separate push-button inputs, and a tach input (200 only). This combination of inputs and outputs allows the Mega 100 and 200 to be tailored to fit a variety of roles.

Some of the special functions of the *Mega 100 and 200* are, the ability to Tap either up or down, programmable starting line enhancer, shift up to five times on either Time or RPM (100 has only a 1 time shift on time no RPM shifts), and to select one or two push-buttons to start the delay times. Some other special features include a Replay Tach (Mega 200 only) that samples the engine RPM 100 times a second, and a Driver's Reaction Tester that allows a driver using the buttons mounted in the vehicle to test his or her reaction time.

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Features and Specifications

Features:

- Microprocessor controlled timing
 - Discrete I/O (input - output) construction
 - Retains all numbers even with power disconnected from unit
 - Large illuminated display for easy reading of information day or night
 - Self-test mode on all display functions
 - Dust & splash-proof key pad with detent (positive feel)
 - Hit the tree twice with one or two separate buttons
 - Line Lock push-button input
 - Instant timing cycle reset
 - Programmable push-button interrupt time
 - Built-in digital tachometer (Mega 200 only)
 - Time or RPM Shift on Mega 200, Time Shift only on Mega 100
 - Works on 4,5,6,8,10 and 12 cylinder engines
 - Selectable Function Output (S.F.O.) with four separate functions
 - Secondary transbrake
 - Starting Line Enhancer (S.L.E.)
 - Line Lock Controller
 - Programmable Tap Up/Down feature for the delay
 - Programmable Starting Line Enhancer
 - Built-in drivers reaction tester
 - Built-in Replay Tach (Mega 200 only)
 - Digital data port for down loading (Mega 200 only)
-

Specifications:

- Input Voltage Range: 10 to 18 Volts DC (16 Volt compatible)
- Operating Temperature Range: 0 to 150 degrees F.
- Push-button Current: .1 AMPS at 12 VDC
- Tach and RPM Switch Range: 800 to 12750 in 50 increments
- Three Separate Output
 - Transbrake
 - Selectable Function Output (S.F.O.)
 - Shifter
- Five Separate Inputs
 - P.B. 1
 - P.B. 2
 - Tap P.B.
 - L.L. P.B.
 - Tach

The Terminal Strip

+12VDC Terminal: Connect the +12VDC terminal to a switched +12 Volt source with enough amperage capable of driving all outputs at the same time.

Transbrake Terminal: Connect the Transbrake terminal to the Transbrake solenoid. Connect the low side of the 2-Step here, if used.

S.F.O. Terminal: Connect the S.F.O. (Selectable Function Output) to a device that is to function in one of the four following ways.

- 1) A device to be used as the Starting Line Enhancer, usually a linkage style throttle stop.
- 2) Connect to the Line Lock, if the Line lock is to be engaged when the transbrake is engaged or the Line Lock pushbutton is pressed.
- 3) Connect to the Transbrake solenoid, this is to be used only as a temporary back-up output.

Make sur that the S.F.O. mode setting is correct for the device being used.
Incorrect settings will cause undesirable results.

Shift Terminal: Connect the shift terminal to the shifter.

Ground Terminal: Connect the Ground terminal to the Neg. terminal on the battery or to a good steel ground, not aluminum.

Button-1 Terminal: In single Push-button Mode the push-button connected to Button-1 terminal is used to control the primary delay and the secondary delay in sequence. In dual Push-button Mode the push-button connected to Button-1 terminal is used to control the primary delay only.

Button-2 Terminal: In single Push-button Mode this terminal is disabled and has no affect on the operation of the unit. In dual Push-button Mode the push-button connected to Button-2 terminal is used to control the secondary delay only.

Tap P.B. Terminal: To use the optional Tap P.B. terminal connect to an additional push-button. This button can control two different operations.

- 1) After a Transbrake push-button has been released, every time the Tap push-button is depressed a programmable amount of time is either added to, or subtracted from, the first delay time started until the transbrake is released.
- 2) If the Starting Line Enhancer is on and before the transbrake pushbutton is pressed, if the tap pushbutton is pressed the throttle will close.

Line Lock Terminal: To use the optional Line Lock terminal connect to an additional push-button. This button functions as listed below.

- 1) If the Line Lock pushbutton is pressed and the S.F.O. is set to 2 (Line Lock Control), any Line Locks hooked toe S.F.O. Terminal will be engaged.
- 2) If the Line Lock pushbutton is pressed the Replay Tach Record function will be armed. (Mega 200 only)

Tach Terminal: Connect the Tach terminal to the tach output on the ignition. On the Mega 200 this terminal must be connected for proper operation of the Replay feature.

The Keypad

The keypad is made up of numerical and function keys that are used to control the information that is either entered into the unit or shown on the displays. The numerical keys 0-9 are used in conjunction with the function keys * and # to enter new information. While the numerical keys 1-9 are used to control what information is shown on the display.

Function Keys

The function keys * and # correspond to the * and # shown on the face of the unit and are used when changing either value. When either the * or # key is pressed the numbers to the left of the respective * or # on the face of the unit will go blank. This allows a new setting or value to be entered using the numerical keys.

Example:

1. Select the Dial-Ins by pressing the 1 key for Dial-Ins to be displayed, 2 key for Delay Times.
2. Press the * key, the numbers to the left side of the * on the screen will go blank, indicating it is ready to accept a new time.
3. Use the numerical keys to enter Your Dial-In, leading zeros have to be entered. As the numbers are entered they will appear on the display indicating that the number was accepted and stored into memory.

Note: If an error is made while entering, press the appropriate * or # key to erase the last digit. This can be repeated as many times as necessary until the display is blank.

Numerical Keys 1-9

The numerical Keys 1-9 are used to select what information is shown on the display. For example, if the Dial-Ins are wanted and the Delay times are being displayed, the 1 key would be pressed to display the Dial-Ins, the press of the 2 key would bring up Delay times. Then the corresponding * or # key would be used to change desired times.

<u>Displays using 1-9</u>	<u>Change with * key</u>	<u>Change with # key</u>
1	<u>Your Dial-in</u>	<u>Their Dial-in</u>
2	<u>Delay 1</u>	<u>Delay 2</u>
3	<u>Sub/Add</u>	<u>How late</u>
4	<u>Shift point.</u>	<u>! S.L.E.</u>
5	<u>S.F.O. Mode</u>	<u>P. B. mode</u>
<u>6 MEGA 200 only</u>	<u>Tach or & Peak Rpm</u>	<u>Shift Mode</u>
7	<u>Display Test Mode</u>	<u>Drivers Reaction Tester</u>
<u>8 Mega 200 only</u>	<u>! Replay Mode</u>	<u>Replay Mode</u>
<u>9 Mega 200 only</u>	<u># of Cylinders</u>	

! 0 Key must be pressed to get out of Replay Mode.

! Will only be displayed if S.F.O. is set to corresponding mode.

& Will only be displayed if engine is off

Test Mode * and # keys have no affect.

Setting Dial-In Times

To set a new Dial-In time into either Your Dial In or Their Dial in press the 1 key. To enter a new number press the corresponding key (&or#),for the Dial-In time to be changed. The selected display row will go blank indicating the unit is ready to accept the new time. Enter a new time using the numerical keys, leading zeros have to be entered. For example if 9.90 for a Dial-In time is desired 0990 would be entered on the keypad. As the numbers are entered they are shown on the display, indicating the numbers are accepted and entered into memory. If a mistake is made while entering the number, depressing the corresponding key (&or#) again will erase the last digit entered. This can be repeated as many times as necessary until the display is blank.

Setting Delay Times

To set a new Delay time into either Delay 1 or 2, press the 2 key. Then follow the same procedure for entering a new number as instructed in setting new Dial-In times.

Setting and Displaying the Delay Tap Up/Down (Sub-Add) Information

To display the Tap Up/Down information, press the 3 key. The Sub/Add information is shown to the left of the * sign. The left most digit shows the number of times the Tap Up/Down push-button was pressed. The two right hand digits show the programmable time (0 to 9 hundredths of a second) to be subtracted from or added to the delay time every time the Tap Up/Down push-button is pressed. If a minus sign is present in front of the two digits, a subtraction from the delay time is done, a blank indicates adding to delay times . To change the number, press the * key and enter the new number (0-9). To switch between the Sub and Add modes press the * key repeatedly, once the far right digit is blank the unit will toggle between the Sub and Add modes each time the * key is pressed. Once the mode is selected enter the new Sub/Add amount. The Tap Up/Down will only affect the first delay time started.

Understanding the How Late

To display the How Late information, press the 3 key. The How Late information is shown to the left of the # sign . If the Transbrake is released on Delay-2 (4-Digit) the left most digit will display an “2”, if not, it will be a “1”. The remaining digits display the How Late time. For example if the number displayed is “2.012” and your reaction time was .510 on the time slip, add the How Late time to the .510 for a total reaction time of .522 on the crossover delay.

NOTE: Both How Late and Tap Up/Down information are stored in memory until either a new How Late or Tap Up/Down number replaces the old one or the # key is pressed, followed by pressing the 1 key while the Tap Up/Down and How Late information is displayed, this will clear both to all zeros.

Setting Push-button Mode and the Push-button Interrupt Time

To set the Push-button Mode, press the 5 key. The Push-button Mode is shown to the far left the # sign. The left most digit shows “1” or “2” to indicate which Push-button Mode the unit is in, when in 1 Push-button Mode, the *First P.B.* starts both the primary and secondary delays. When in 2 Push-button Mode, one or both push-buttons can be used in any sequence, the *First P.B.* starts the primary and *Second P.B.* starts the secondary delay. The two right digits show the programmable amount of time (00 to 99 seconds) that after the Transbrake releases, Button 1 and Button 2 push-button inputs are disabled. To change either the Button Mode or the Interrupt Time first press the # key, then enter a “1” or “2” for the Push-button Mode followed by a two digit number representing the Push-button Interrupt Time. For example “1 10” would indicate 1 Push-button Mode with a 10 second Interrupt Time. If no Push-button Interrupt Time is wanted enter “00” after pressing a “1” or “2” for the Push-button Mode.

Setting Selectable Function Output Mode (S.F.O.)

To set the Selectable Function Output Mode, press the 5 key. The S.F.O. Mode is shown left of the * sign. There are four different modes (1-4) which are listed below, to change the S.F.O. mode repeatedly press the * key, each time the * key is pressed the S.F.O. mode will increase by one until it reaches four at which time it will revert back to one on the next press of the * key.

- 1) This sets the S.F.O. terminal to function as a Starting line Enhancer (S.L.E.).
- 2) This sets the S.F.O. terminal to function as a Line Lock Control.
- 3) This sets the S.F.O. terminal to function as a second Transbrake control.
- 4) This turns the S.F.O. terminal completely off (no voltage output)

Setting & Using the Starting Line Enhancer

Press the 4 key to bring up the Starting Line Enhancer. To turn on the Starting Line Enhancer, if the S.F.O. mode is set to any mode other than mode one, the Starting Line Enhancer will be turned off. To set the Starting Line Enhancer mode, press the 4 key. If there are two dashes shown at the bottom of the screen, the Starting Line Enhancer is turned off. If the Starting Line Enhancer is turned on, the number shown to the left of the # sign represents the mode the Starting Line Enhancer is in.

When the Starting Line Enhancer is turned on, to enter a new number do the following. Press the # key repeatedly, the digit to left of the # sign will change, the letters on the far left HI or LO represents whither the output on the terminal strip is putting out 12 volts or taking 12 volts away will also change. Most air throttles need 12 volts to close, most electric throttles need 12 volts to stay open.

Closing the throttle can be done by pressing the tap pushbutton before staging or after staging when the transbrake pushbutton is pressed.

Using mode 1 will release the SLE 8 tenths of a second before the transbrake releases.

Using mode 2 will release the SLE when the transbrake releases.

Using mode 3 will release the SLE when the Delay pushbutton is released.

Using mode 4 will release the SLE when the Delay pushbutton is engaged.

(this is mainly used in pro light racing)

Setting Shift Modes, Shift Output Mode, and Shift Points

The Mega 200 can handle up to 5 shifts on each pass. These 5 shifts can be either made on time, RPM, or a combination of both. The shifts occur when the Shift Point setting is reached for each of the five shifts in sequence. The 5 Shift Points can all be set to different values and shift modes. To the left of the * shows the value of the shift point. To change the shift point, press the * key and enter a new number. Numbers from 00.02 to 99.99 can be entered for time mode and from 1000 to 9950 in 50 RPM increments for RPM mode. To view a shift mode first press the 6 key, on the bottom half of the display will be the shift mode and the shift number. The shift mode can be changed by repeatedly pressing the # key, while the shift number is changed by repeatedly pressing the zero key. To view the shift point of any of the five shifts set the shift number to the desired shift, then press the 4 key. As the Shift Mode is changed, the decimal will either be added, (Time shift) or removed (RPM shift), from the Shift Point. Only when viewing Shift Number 1 can the shift output be seen or changed. The Shift output is displayed as either "LO" or "HI", along with the Shift Mode, "TIME" or "RPM" to the far left of the # sign and Shift Number just left of the # sign. When the Shift Output is set to "HI" (normally open) it means the every time a Shift Point is reached the Shift terminal will go from a low (0 Volts) to a high (12 Volts). When the Shift Output is set to "LO" (normally closed) it means the every time a Shift Point is reached the Shift terminal will go from a high (12 Volts) to a low (0 Volts). Setting the Shift Output is done at the same time the Shift Mode is set by repeatedly pressing the # key. Always check the shift point by pressing the number 4 key and looking for a decimal point (time shift) or not (RPM shift).

The MEGA 100 can only be set to shift once on time. To change a the time on the shift press the 4 key, then the * key once and enter a new time number for the shift. To change the shift output terminal from HI (12 volts) to LO (0 volts) press the * key repeatedly until a 1 digit appears on the far left of the * sign that makes the shift terminal HI (12volts). Press the * key again and the 1 digit will disappear leaving a blank, the shift terminal will now go to LO (0 volts) on the output.

The shifts will occur only for a 20 second time period and only after the transbrake has been released.

Understanding Time and RPM Mode

The Mega 200 can handle up to 5 shifts on each pass. These 5 shifts can be either made on time, RPM, or a combination of both. The shifts occur in sequence starting with Shift Number 1 and progressing to Shift Number 5. When a shift occurs the Mega 200 checks to see if the next Shift Point setting is valid. If the next Shift Point is an RPM, the only invalid setting is zero, the RPM must drop a least 200 Rpm's below the shift point to work. If the next Shift Point is a Time shift, the unit checks to make sure that the Shift Point time setting is greater than the amount of time that has gone by since the release of the Transbrake. If the amount of time is greater the unit waits for the next Shift Point to occur. If the amount of time is not greater, the next Shift Point is invalid. If an invalid Shift Point is reached, further shifting of the vehicle is terminated. This means that for vehicles that require only one shift, the driver should set the second Shift Point to zero. The Mega 100 will only shift 1 time and that is a timed shift only (no RPM).

Setting Number of Cylinders Mega 200 only

To set the Number of Cylinders, press the 9 key. To the left of the * sign will be a two digit number representing the number of cylinders. To change the number of cylinders press the * key. Each time the * key is pressed the unit will advance to the next cylinder setting. Cylinder settings of 4, 5, 6, 8, 10, and 12 are all available.

Understanding the Driver's Reaction Tester

This new feature in delay boxes allows a driver using the buttons mounted in the vehicle to test their reaction time. This can also be used to test different kind of buttons and locations that they are mounted in the vehicle for the quickest release possible.

To select the Driver's Reaction Tester, press the 7 key, everything on the screen will turn on, this can also be used to check for proper screen operation. Once in Reaction Test Mode, if a push button connected to either PB.-1 or PB.-2 is pressed and held down, the screen will go blank. After 2 seconds all eights will be shown on the screen, at which time the driver releases the push button being held. The display will now show the amount of time from when the eights were displayed to when the push button was released, this is the driver's reaction time. If the driver lets go of the button too soon, before the display turns on, dashes will be shown on the screen to indicate a red light. If the driver does not let go of the button within .75 seconds after the eights are displayed, the display will show reaction time of all nines to indicate a missed light. To exit the Driver's Reaction Test Mode press any key on the keypad. If neither PB.-1 or PB.-2 push-button is pressed, the unit will automatically exit the Driver's Reaction Test Mode after 30 seconds. Each time a push-button is pressed the 30 second time period resets.

NOTE: When in the Driver's Reaction Test Mode, the Transbrake solenoid will not be activated when a push button is pressed. This is to prevent any damage to the solenoid from over heating.

Understanding the Replay Tach (Mega 200 Only)

The Mega 200 has a built-in replay tach that records the engine RPM every hundredth of a second for fifteen seconds after the Transbrake releases. To start the unit recording, the unit must first be armed. This is done by pressing and releasing the push-button that is connected to the Line Lock terminal. After the unit is armed if either P.B. 1 or P.B. 2 is pressed and released, after either Delay 1 or Delay 2 timer times out and releases the Transbrake, the Mega 200 will start recording. While the Mega 200 is recording, the words "replay recording" will be shown on the display. This is for a 15 second time period.

Once the engine is shut off the Replay Tach information can be viewed on the screen. This is done by pressing the 8 key, the word "REPLAY" will be shown on the screen. The top row of digits is the engine RPM, with the next row down being the time. The time is relative to the release of the Transbrake solenoid. Use the * key to scroll the time up and the # key to scroll the time down. By repeatedly pressing the * or # keys the scrolling speed can be changed for desired viewing. Pressing the 8 key will stop the scrolling at that point. If any shifts, up to five, occurred during the time the unit was recording, the time and RPM of each shift will also have been recorded. To recall the Shift Points press the number key corresponding to the shift desired. An example would be to press the 2 key, if there were at least two shifts the Mega 200 will now display the time and RPM that the second shift occurred. If there was not a second shift the Mega 200 will display the RPM at the time the Transbrake released, which is at 00.00 on the time row of digits. To exit the REPLAY mode press the number zero key, this will take to Dial Ins.

The Mega 200 also has a Digital Data port located on the side of the unit opposite the terminal strip. This Digital Data port is used to download a recorded pass to a hand-held unit called a Digital Viewer (Part # 1025-DV). Once the recorded pass has been downloaded it can be viewed on the screens of the Digital Viewer or printed out on an IBM compatible DOT matrix printer. When a recorded pass is printed there will be several lines showing all of the Mega 200's settings at the time the pass was recorded. A sample print-out of a recorded pass is shown on the next page along with a drawing of the Digital Viewer.

The recording will occur for 15 seconds after the transbrake releases.

Explanation of the Peak RPM

The Peak RPM is shown on the display in place of the Tach any time the engine is off. The Peak RPM value will be the highest RPM the engine has reached since the last time the Peak RPM was cleared. To clear the Peak RPM, press the * key. This must be done before each pass if a new number is desired at the end of each pass. If the engine is on when the * key is pressed nothing will happen.

Understanding the Selectable Function output (S.F.O.)

The Selectable Function Output is a single output that can be programmed to function in three separate ways. Each of the separate functions is listed below with an explanation of the setting basic function. Once the basic understanding of the setting is understood, additional uses may be thought of by the driver.

- 1) When the S.F.O. is set to a one, the S.F.O. Functions as a Starting Line Enhancer (S.L.E.). This means a Throttle Stop connected to the S.F.O. will control the starting line RPM.
- 2) When the S.F.O. is set to a two, the S.F.O. Functions as a Line Lock Control. This means that the Line Lock solenoids will engage when either the line lock pushbutton is pressed (burn outs) or the transbrake pushbutton is pressed (starting line).
- 3) When the S.F.O. is set to a three, the S.F.O. functions as a second transbrake output if the first has been damaged. The S.F.O. can be used until the box can be shipped back for repairs.
- 4) When the S.F.O. is set to a four the output is turn off.

Understanding Line Lock push-button

The push-button connected to Line Lock terminal is mainly used to engage the Line Lock solenoids that are connected to the S.F.O. terminal. This is typically done for a burn out when the Transbrake solenoid should not be engaged. Only the Mega 200 has a second use for the Line Lock push-button, which is to arm the Replay Tach for recording a pass.

If the S.F.O. terminal is **not** to be used as Line Lock control, it is not necessary to connect either the Line Lock push-button or the Line Lock solenoids to the unit. However for the Mega 200 a Line Lock push-button is required to arm the Replay Tach for recording a pass. If the vehicle has Line Lock solenoids, the Line Lock push-button and the Line Lock solenoids can both be connected to the Line Lock terminal. This will automatically arm the Replay Tach recording feature, when a burn out is done using the Line Locks and eliminate the need for a separate record push-button.

Understanding and Connecting a By-pass push-button

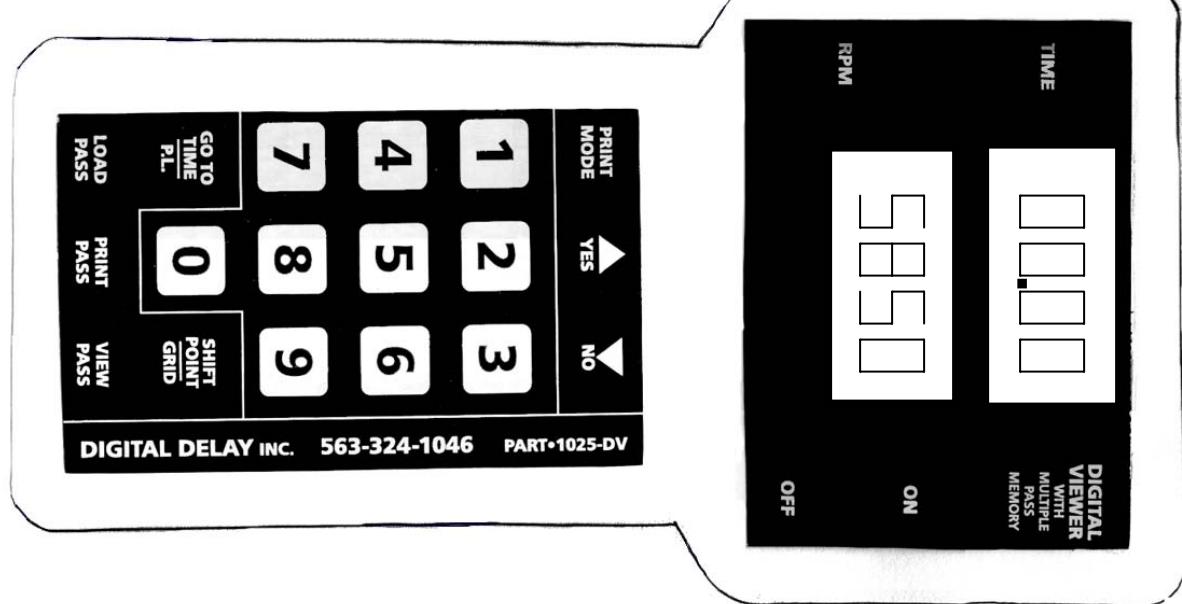
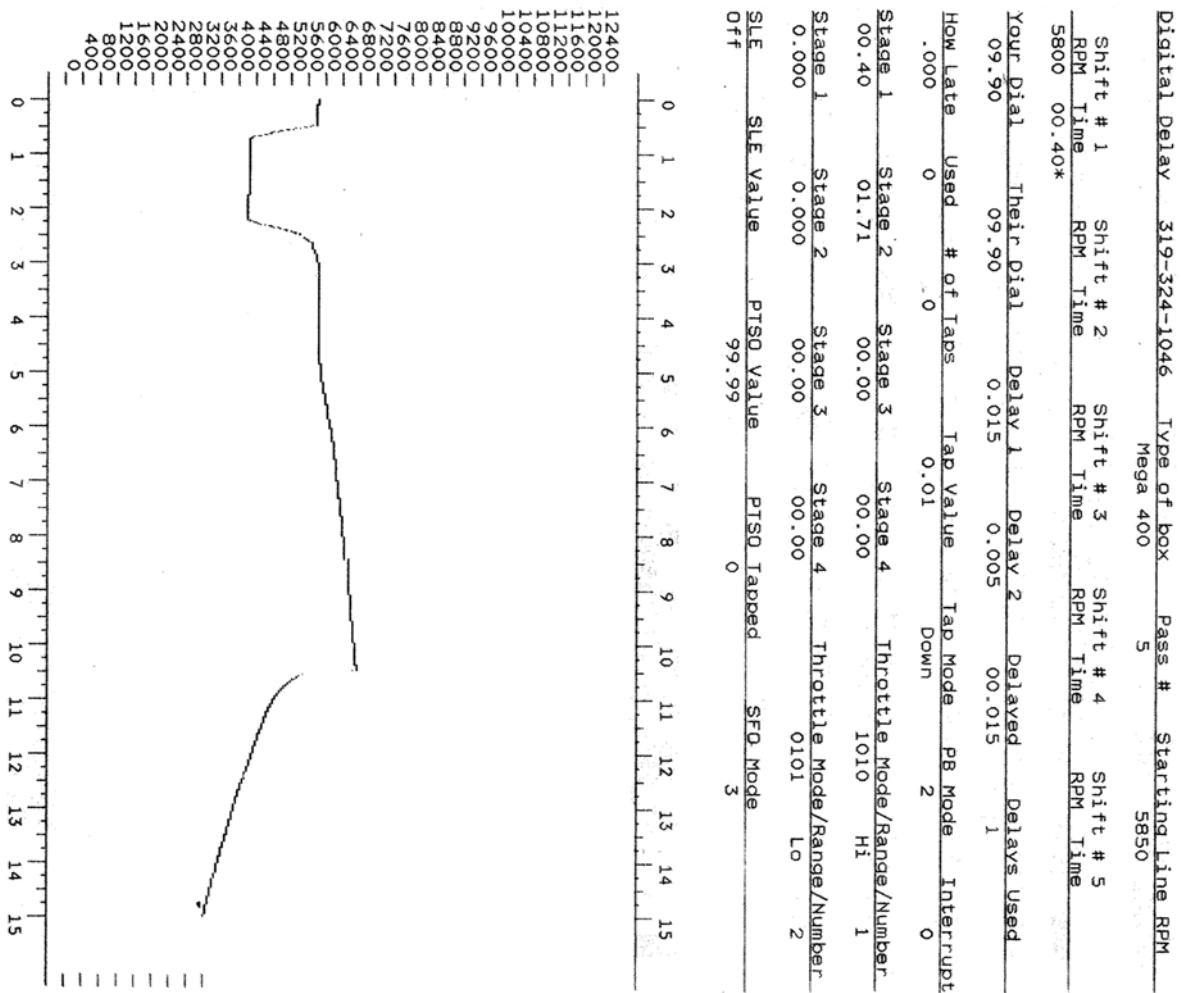
A by-pass push-button is used to engage the Transbrake solenoid without starting a timing cycle. This can be helpful if the vehicle needs the Transbrake engaged to back up. If a by-pass push-button is desired, connect one side of a push-button to the Transbrake terminal and the other side of the push-button to +12 Volts.

Applying 12 Volts to any of the outputs will not damage the unit.

Connecting or shorting any output terminal directly to ground will cause damage to the unit. This damage will not be covered by the warranty. It is strongly recommended that a 15 Amp fuse is put in each of the wires coming from the output terminals.

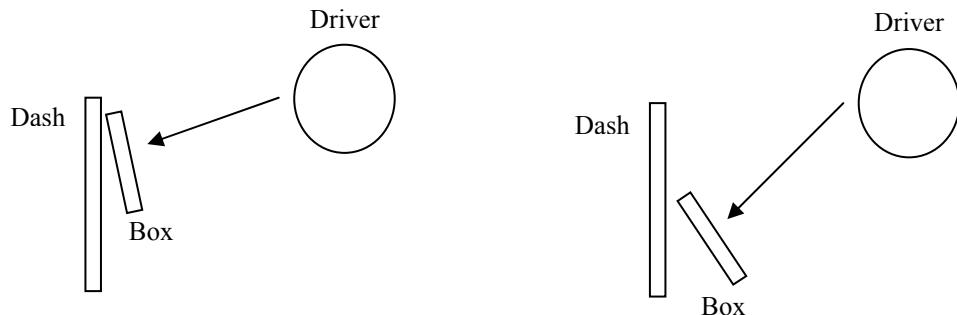
Accessories (Mega 200 Only)

Shown smaller than at actual size



Mounting the Mega 100/200

For complete viewing of the large LCD, care should be taken when mounting the unit to make sure that the display is angled towards the driver's eyes. Before mounting the Mega 100/200, place the box in the desired location and check the legibility of the display in both day and night conditions. As shown below, the lower the box is placed below eye level, the more the angle amount needs to increase for viewing.



Wiring the Unit

