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BRACKET MASTER

Model BM-1 & BM-2 • INSTALLATION & OPERATING MANUAL



IMPORTANT!

PLEASE READ THESE INSTRUCTIONS COMPLETELY TO FULLY UNDERSTAND THE WIRING, PROGRAMMING, OPERATION, AND FUNCTIONS OF THE DEDENBEAR BRACKET MASTER.

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INSTALLATION

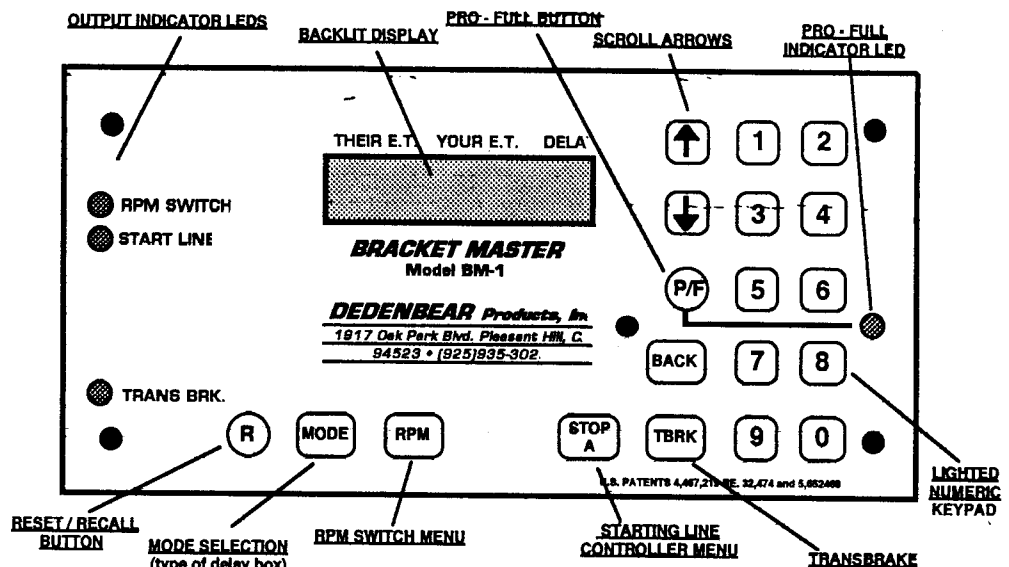
Using #8 screws through the rubber grommets in the base, mount the BM (Bracket Master) away from heat, vibration, and the ignition system.

Make sure that you can reach the buttons when strapped in and that you are reading the display straight on. If you mount the box so that you view the display at an angle, it will be hard to read.

Wire the Bracket Master as shown in the wiring diagram on page 7 in the instructions. Make sure that the ground wire goes to a good chassis ground, **NOT** sheetmetal panels (these are not reliable grounds).

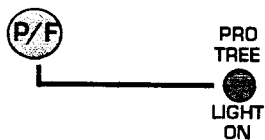
BUTTON USE AND SETTINGS

The BM has many selections that can be programmed with your particular settings. Each time you press the button for the particular settings you are adjusting, it will step to the next prompt screen. The BM will only ask you the settings for the particular mode you are in so that for example, when adjusting settings for RPM, you don't have to step through the entire list of screens you would need to use for the Transbrake / Delay, etc. At each screen you can enter a setting, by using the scroll arrows or the number keys to make quick changes. If no adjustment is required for that setting, press the button again to step to the next screen. When your adjustments are completed, the BM automatically returns to run mode after 8 seconds.



PRO-FULL BUTTON

PRO-FULL BUTTON: The BM's **PRO/FULL** feature allows you to switch between 2 complete setting groups for delay box, starting line control and RPM features. This enables you to program the box for one group of bracket class settings in **PRO**, and then program another group of bracket settings in **FULL**. Now you will no longer have to reprogram every setting between rounds when you change from one class or driver to another.



By pressing and holding the P/F button, you can switch between **PRO** and **FULL** setting groups. The red LED indicator on the right side of the box will indicate which setting group you are in. When you are in the **PRO** group, the **PRO/FULL** LED will turn on solid and stay on. When you are in the **FULL** group, the LED will be off except for momentary flashing while making adjustments. This is normal.

REMEMBER: It is extremely important when you change a setting that you confirm you are in the setting group (PRO or FULL) in which you want the change to occur since each group has its own complete set of settings.

PROGRAMMING BUTTONS



TBRK button: This button accesses your Transbrake settings. Each time you press the TBRK button, different screens come up and allow you to change your Delay, Your ET, Their ET, Bottom Delay, CrossComp, Skip Up/Down, TB Pause, TB Lockout settings.



STOP A button: This button accesses the Starting Line Controller. When you press the STOP A button, a menu comes up and allows you to change the Starting Line Control setting.



RPM switch button: This button accesses the built in RPM activated switch. Each time you press this button you see your shift point, disable time, shifter type, and number of cylinders. By pressing and holding the R (Reset/Recall) button down while viewing the SETUP SHIFT POINT screen, you will turn on the BM-1 digital tachometer (when engine is running). This is just to verify you have a tach signal to the BM.



Arrow (scroll) buttons: When making minor changes to your delay setting or your/their dial -ins, you can use the scroll arrow buttons to add or subtract from the setting. This is especially handy when you only want to add just a little extra delay time if your reaction times are getting close to red lighting.



Number buttons: When you need to make large number changes such as dial-ins or shift point settings, you can simply type in the numbers using the number keypad. As an example, if you wanted to enter an E.T. of 12.73, you would simply type in 1273.



BACK button: If, when changing your settings, you accidentally advance past the screen where you would like to make an adjustment, you can go *backwards* by using the BACK button. Lets say for example you are setting your dial-in settings, and you wish to change THEIR ET. If you accidentally advance to YOUR ET and missed THEIR ET, you simply press the BACK button to go backwards through the menus.



Reset/Recall button: Used in the set-up screens where you need to set the type of equipment you are using, for example, "Type of Shifter", "Number of Cylinders", etc. you simply press and hold the RESET/RECALL button.

This button also resets the Transbrake Lockout. It also recalls information about a run after the run has been made.

TYPES OF DELAY BOXES



MODE button: The MODE button will allow you to select one of 4 delay box types available in the BM. **These are:**

1. **(DELAY)** A simple 4 digit delay box for leaving off your top amber for full tree racers and Pro-tree classes.
2. **(CROSSOVER)** A crossover box allows you to leave off your opponent's top amber when you are the faster car.
3. **(INTERFACE)** Interfacer is the same as a crossover box, except that you can take two hits at the tree. You leave off the opponent's top bulb, press the transbrake button again, and then release off your own top bulb. The delay box will launch the car on the *quicker* of the two releases. This is because a bad light is almost always a late light. This means if your release off the opponent's bulb gives you a .520 light and the release off your own top bulb gives you a .505 light, the box will launch the car on the .505 light.
4. **(TWICE YOUR TREE)** Twice your tree is the fourth option. It's essentially the same as interfacer, giving you 2 shots at the tree. You release off your top amber bulb, get back on the button, and release again off your bottom amber. The box will take the quicker of the two reaction times. This mode is great for bracket racers who can't see their opponent's side of the tree, or are the slower car leaving first.

TO CHANGE THE MODE, press and momentarily hold down the MODE button until the screen indicates a mode change. Continue until the mode you want appears.

SETTING YOUR TRANSBRAKE DELAY

The BM is very simple to program. When you are in any of the 4 delay box modes, it will ask you for the settings required for that mode only. Example: When you are in **RUN (DELAY)** it will not ask you for Their E.T. settings since you are not crossing over. All of the settings that are used in each of the modes will transfer over to the other modes if they are needed. Example: Your delay setting will transfer over to all four different delay box modes along with your **SKIP**, **TB PAUSE**, and **TB LOCK OUT** settings.



NOTE: DUE TO SHARING THE SAME SOFTWARE, BM-1 OWNERS WILL FIND WHEN IN RUN DELAY THE "YOUR E.T." SETTING WILL BE DISPLAYED ON THE SCREEN, THIS IS FOR BM-2 OWNERS USING THE REMOTE DISPLAY UNIT. FOR BM-1 OWNERS THIS SETTING DOES **NOT** NEED TO BE CHANGED, AND WILL **NOT** AFFECT YOUR DELAY TIME WHATSOEVER.

MODE

Press the **MODE** button until the screen shows the type of Delay Box you want to run. In this example, we'll use the Interface Mode.

THEIR E.T. YOUR E.T. DELAY

10.00 9.00 1.000
RUN (INTERFACE)

In this mode, the Bracket Master delay box functions as both a crossover delay box and a straight 4 digit delay box combined, giving you two chances at the tree. The screen shows your opponents E.T., your E.T., your Transbrake Delay and that the box is ready to run in Interface mode.

TBRK

Press the **TBRK** button to enter the **TRANSBRAKE** adjust settings menu. Each time you press this button it will advance to the next screen. (These screens have been listed in the order they will appear.) Once you have advanced through all the screens, the box returns back to **RUN** mode. If you happen to go too fast and pass the set-up menu screen you want, you can use the **BACK** button to back up. (The **STOP A** and **RPM** buttons function in this same manner.)

NOTE: When you are through making adjustments to the settings, and pause for 8 seconds, the box will automatically return back to **RUN** mode by itself.

SETUP MODE
DELAY 1.000

DELAY: When you first press the **TBRK** button, the delay setting will appear. Use the scroll arrows, or the number buttons to change this setting. For leaving off the top bulb on a full tree, this setting is typically around 1.000 second.

SETUP MODE
THEIR ET 10.00

THEIR ET: This is the next screen in **INTERFACE MODE**. This is where you enter your opponent's E.T. Use the scroll arrows or the number buttons to change this setting.

SETUP MODE
YOUR ET 09.00

YOUR ET: This is where you enter your own vehicle's E.T. Use the scroll arrows or the number buttons to change this setting. If you are running a Remote Display unit this is the setting that will be displayed on return to run mode.

SETUP MODE
BOT DELAY 100

BOTTOM BULB DELAY TIME (BOT DELAY): BOT DELAY is the amount of delay you need (if any) for a bottom bulb release on a full tree (bracket tree). This is also the "Last Chance" delay setting. Use the scroll arrows or the number buttons to change your bottom bulb delay.

SETUP MODE
CROSS COMP .015

CROSSOVER COMPENSATION TIME (CROSS COMP): When you cross over and leave off your opponent's tree, you get a glancing view of you opponents top bulb instead of a direct view like your side. This results in a reaction time that is usually .010 - .020 seconds slower. Crossover Compensation automatically subtracts this time from your delay setting whenever you crossover. Use the scroll arrows or the number buttons to change this setting.

SETTING YOUR TRANSBRAKE DELAY (continued)

SETUP MODE
SKIP DOWN - 015

SKIP DOWN or SKIP UP (depending on neg/pos number): This is the amount of time you want to add or remove from your pre-set delay if you feel you missed the tree. Each time you press your "skip" button, the box will add or remove this set amount of time from your delay. SKIP DOWN (-) subtracts time and shortens your delay. Use the scroll arrows to change your "skip" time.

SETUP MODE
TB PAUSE - 100

TB PAUSE: TB PAUSE is the amount of time the box waits or pauses when the driver presses the transbrake button **BEFORE** applying the transbrake solenoid. This prevents accidental applies while driving down the return road or in the staging lanes. Usually set for 0.100 seconds.

SETUP MODE
TB LOCK OUT 03

TB LOCK OUT: TB LOCKOUT is the amount of time the box will lock out the transbrake button so the driver cannot re-apply the transbrake during the pass. Usually set for 03 - 04 seconds. Use the scroll arrows, or the number buttons to change your lock out time in increments of whole seconds.

WHAT IS THE STARTING LINE CONTROLLER OUTPUT?



The Starting Line Control is a feature that allows the use of a in-line "linkage" style throttle stop to control the engine rpm on the starting line while staging the car. When the transbrake button is pressed, the linkage throttle stop closes down to a preset throttle position, limiting engine rpm. The driver's foot is all the way down on the gas pedal, but the engine doesn't rev up. This prevents the motor from going up against the rev limiter for extended periods of time. At a preset moment, the engine will then rev up to the first rev limiter "chip" or up against the converter. The driver can choose to have the throttles open on the top bulb on their side of the tree (after the handicap in a bracket race), or on the release of the transbrake solenoid, or completely off and not used at all. This feature is a lot more consistant than having to press the gas pedal when your tree comes down.

SETTING THE STARTING LINE CONTROLLER



SLC - STARTING LINE CONTROL: To program your Starting Line Control, access it through the STOP A button. Press the STOP A button to see the SLC START LINE CONTROL screen.

This screen is where you can set your **SLC Starting Line Control** option.

Press and hold the R RESET/RECALL button for 1-1/2 seconds if you wish to change this setting.

THE THREE DIFFERENT SETTINGS ARE:

- **TOP BULB:** The linkage throttle stop will go wide open when your top amber bulb turns on. This is when you release the button when you are not crossing over and leaving off your own top bulb, or after the handicap when you are "crossing over".
- **TURNED OFF:** The linkage throttle stop will do nothing on the starting line.
- **2-STEP:** The linkage throttle stop will go wide open when your transbrake releases, like a 2-step ignition rev

limi

SETTING YOUR SHIFTER TYPE AND SHIFT POINT

The BM has a built in RPM activated switch that when tied into a electronic ignition system such as MSD or Mallory, will read the tach signal and activate an automated shifter system. This can be used to operate Dedenbear's Solenoid Shifter or any of the CO₂ "air" shifters. A single shift rpm is selected and each time the engine reaches this setting during a pass, the BM will activate the shifter.

A unique feature is the digital tachometer. The BM will display the engine rpm on screen when the driver wishes to double check the signal or double check the accuracy of the tachometer in the car (some racers don't have tachometers installed in the vehicles, and this can be used instead to see engine rpm at any time).

SETTING YOUR SHIFTER TYPE AND SHIFT POINT (CONTINUED)

RPM SWITCH: Press the RPM button on the face of the box to access the rpm activated switch settings. The screen will show **SETUP SHFT POINT** and will display the pre-set rpm shift point. Use the scroll arrows, or the number buttons to change your shift point.

Press the **RPM** button to advance to the next screen *or* . . .

While this screen is being displayed, you can press and hold the R RESET/RECALL button for 1-1/2 seconds and the BM's built-in **DIGITAL TACHOMETER** will display on the screen (**BM TACHOMETER**). If your engine is running, the screen will display the rpm of the engine. If the engine is not running, the display will show 000 rpm. As soon as you let go of the R RESET/RECALL button the screen returns back to the **SETUP SHIFT POINT** screen.

Press the **RPM** button to advance to the next screen.

RPM

The screen will show **SETUP DISABL TIM** (disable time).

This is the amount of time from the release of the transbrake solenoid that the rpm sensing circuitry is disabled. If the car experiences tire spin or converter flash right off the line, this setting will prevent accidental shifting from low to high for the amount of time programmed in. After the time expires, the rpm sensing circuitry will then "look" at the engine rpm, and when the rpm is reached, it will shift the shifter.

Use the scroll arrows, or the number buttons to change your shift disable time.

Press the **RPM** button to advance to the next screen.

The screen will show **SETUP SHFTER TYP** (shifter type) and **ELECTRIC** or **AIR**.

Press and hold the R RESET/RECALL button for 1-1/2 seconds to change from one to the other.

"ELECTRIC" = Power on until shift point rpm is reached, then **turned off**. This is used with "holding" type solenoid shifters. They are designed to hold back the spring loaded ram until power is removed, then the ram moves forward and makes the shift.

"AIR" = There is no power output until the shift point rpm is reached, then power is **turned on**. Most "air" shifters (including Dedenbear) and transking valve bodies use this setting.



If you are using a "push" style solenoid shifter that requires battery power to "push" forward, **DO NOT WIRE TO RPM OUTPUT TERMINAL. These types of solenoid shifters require over 45 amps to "push" the shifter forward!** Wire the RPM SWITCH OUTPUT to their supplied relay or starter solenoid, and let the relay/solenoid handle the high current. If you are using a shiftbrake valve body that requires +12V to "hold" the trans in low gear, please call for wiring details.

(Dedenbear SS-2 "Solenoid Shifter" is considered a holding style solenoid shifter and can be wired directly to the RPM Switch output.)

Press the **RPM** button to advance to the next screen.

The screen will show **SETUP # OF CYLINDERS: 8**.

Press and hold the R RESET/RECALL button for 1-1/2 seconds to change from 8 cylinders to 6 cylinders, again for 4 cylinders, and again to return back to 8 cylinders.

INDICATOR LIGHTS



RPM SWITCH



START LINE



TRANS BRK.

On the left hand side of the box, you will see 3 indicator LED's. These lights show you the output status of the BM. If the light is on, then there is power present at that terminal. Different types of automated shifters require power turned on to activate, or power turned off to activate. If your shifter was controlled by an RPM switch that controlled the ground side of the solenoid, we will convert it back to a battery positive switching system.

STARTING LINE CONTROL: The starting line rpm control is typically used on "linkage" type throttle stops, and only on the starting line. Therefore its output will be "off" until the transbrake is applied.

RPM SWITCH OUTPUT: Most "air" shifters require power to be applied to shift, while Dedenbear's SS-2 Solenoid Shifter (spring type) requires power to be removed to shift. This is also reversible in the RPM switch setup menus. You just tell the unit what type of shifter you're using.

TRANSBRAKE: The transbrake indicator light will show when power is present at the transbrake terminal.

TIPS

RESET / RECALL BUTTON - If pressed during a Transbrake lockout timeout, it will cancel the delay and go back to the "Ready to Run" condition.

- If pressed after a run, it will recall the "How Late" information from multiple hits at the tree and it will also tell you how many times you "Skipped", if held.

- It is used to change settings about the type of equipment on your car, for example - number of engine cylinders, the type of shifter, how you want the starting line controller set up, etc. To use it for these applications, go to the set-up display for the particular feature you are interested in adjusting. Press and hold the "RESET / RECALL" button until the box changes its set-up.

ARP (Accidental Release Protection) - Occasionally, you anticipate the lights and let go too quickly. ARP lets you recover from this situation. In DELAY or CROSSOVER mode, you simply press the transbrake button again and the BM will instantly reset itself. In TWICE YOUR TREE and INTERFACE mode, because the BM expects you to press the switch a second time, you can use the "Last Chance" feature.

LAST CHANCE - This feature is available in TWICE YOUR TREE and INTERFACE mode. If you think either or both your releases were too quick (and you may red light), press the transbrake button again (a third time) and the first two releases are cancelled. Release the button when your bottom bulb turns on, and after the BOTTOM BULB delay times out, the transbrake releases. (Bottom Bulb delay and Last Chance delay are the same thing).

HOW LATE - In modes where you take two "hits" at the tree (Interface and Twice Your Tree), the how late feature tells you which of the "hits" was first and how much it was quicker than the second "hit". In Interface mode, the display will say "THEIR TREE BY: .XXX, YOUR TREE BY: .XXX" or "LAST CHANCE WAS ACTIVATED". As an example, if you were in Twice Your Tree mode, the display might read "TOP BULB BY: .023". This means that you were quicker leaving off your top bulb than off your bottom bulb and that you were .023 seconds quicker. The BM released the Transbrake off the top bulb "hit" in this example (the quickest light always releases the brake). If you cancelled the "hits" by pressing the button a third time, the display "LAST CHANCE ACTIVATED" confirms that you left off your bottom bulb only as a last chance.

After a run is made, the "How Late" Information is recalled by pressing and holding the **RESET/RECALL** button. The display will show the "How Late" information along with the skip information.

SKIP RECALL - Skip Recall tells you the number of times that you pressed the "skip" button during the delay box time out. By checking **TBRK** set-up you can determine how much time each skip was and whether it added or subtracted time to the delay setting. By multiplying the skip time and the number of skips, you can calculate the amount of time that was added or subtracted to your delay setting. The number of skips during a run is displayed by pressing and holding the **RESET/RECALL** button at the end of a run. The display will alternate between the how late time and the number of skips. If the display reads "SKIPPED: 2X", this means you pressed the skip button twice.

LINE LOCK OUTPUT - The Line Lock Output is exactly the same as the Transbrake Output except that it is diode protected. This means that the delay box will operate the Line Lock on the starting line, but the Line Lock will not back feed the Transbrake when you are doing your burnout.

DIAL-INS WRONG - If their E.T. is set smaller than your E.T., the screen will display an error message. If you make a run anyway, the BM will assume the handicap is zero and will use only the delay setting. Pressing the **RESET/RECALL** button after the run will show that the run was made with incorrect settings.

LEAVING SET-UP MENUS - FIVE WAYS TO LEAVE

- 1) Do nothing and unit will return to RUN mode automatically after 8 seconds.
- 2) Press the Transbrake button and the box will instantly switch to RUN mode.
- 3) Clock through the menu by repeatedly pushing the setting button until you get back to the RUN mode.
- 4) Go backwards to RUN mode by repeatedly pushing the BACK button.
- 5) Change set-up modes (i.e. in Transbrake set-up, you can press the RPM set-up button & jump to the set-up menus for the RPM, etc.)

In all cases, the box always goes back to the RUN mode so you will always be able to make a pass.

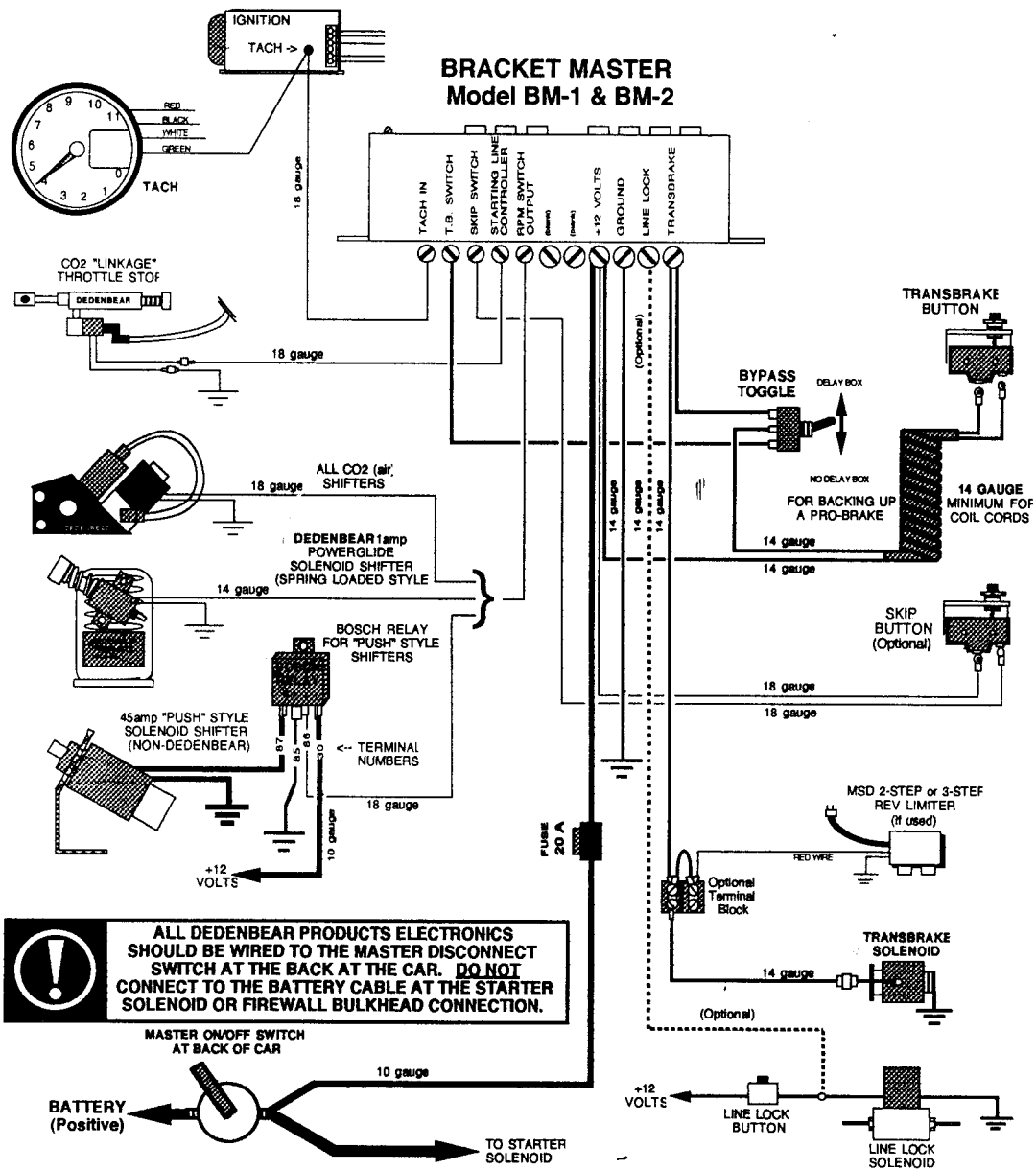
WIRING INSTRUCTIONS

Wire the BM **exactly as shown**. If you do not wish to use optional features of the box such as Line Lock, Starting Line Control, or RPM activated switch, simply hook nothing to the terminal screws on the terminal blocks.

Use the appropriate size (gauge) wire as indicated for each of the terminals.

The "by-pass" toggle switch that is supplied with the BM will literally by-pass the entire delay box and all of its features (except for the rpm switch). This is especially useful for **PRO BRAKE VALVE BODIES** that require the driver to press the transbrake button to put the transmission into **REVERSE**. The driver would flip the switch to "bypass" before backing up the car, to eliminate the transbrake delay and Starting Line Control from activating. This could be very distracting for the driver to have the Starting Line Control activated while trying to back up, and waiting for the delay to expire on a long handicap before proceeding forward to stage the car. After the driver is done backing up and doing his/her dry hop (optional), then switch the bypass toggle to "Delay" setting.

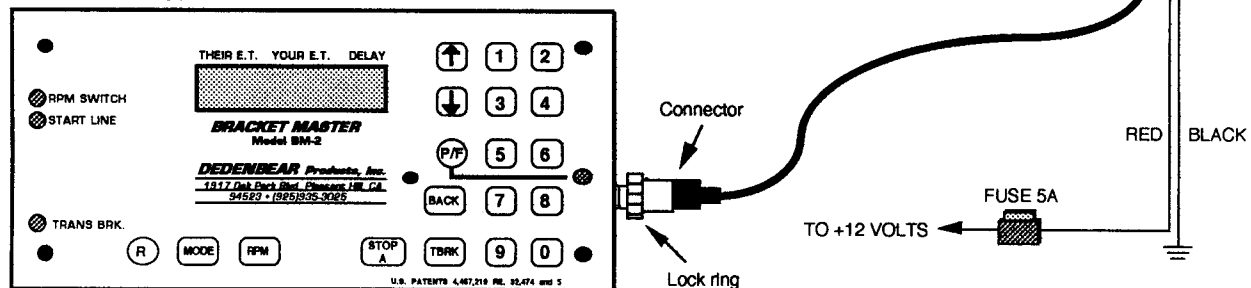
WIRING DIAGRAM



WIRING DIAGRAM FOR REMOTE DISPLAY (BM-2 ONLY)

Wire the Remote Display unit as shown, use at least 18 ga. wire connecting the black wire to a solid chassis ground and the red to +12 volts. Use a 5 amp fuse in the red wire to protect the Remote Display from damage. Connect the display to your BM-2 using the transmitting cable included with the display unit. Slip the connectors into the jacks and turn the lock ring clockwise to lock in place.

The display unit needs no set up. Just power both units up and the Remote Display will show whatever is dialed in to the "Your E.T." section of the BM-2. When you make a change to the "Your E.T." setting in the BM-2 and the box returns to the run mode, the Remote Display will change accordingly.



MEMORY

The microprocessor chip will remember all your settings, even after turning off the power supply. There are no internal batteries to ever go dead. Anytime you make a change to a setting, it will remember that new setting until you change it.

FACTORY DEFAULT SETTINGS

PRO-FULL SETTING PARAMETERS:			FACTORY SETTINGS	
Switch set for "PRO" P/F LIGHT ON				
Switch set for "FULL" P/F LIGHT OFF				
	RANGE	PRO	FULL	
DELAY:	0.000 to 1.999 sec.	.010	1.000	
THEIR ET:	00.00 - 19.99 sec. E.T.	10.90	10.00	
YOUR ET:	00.00 - 19.99 sec. E.T.	9.90	9.00	
BOTTOM DELAY:	0.00 TO .299	.010	.100	
CROSS COMP:	.000 to .099 sec.	.015	.015	
SKIP UP / SKIP DOWN:	+.050 to -.050 sec.	.010	.010	
TB PAUSE:	0.000 to 1.999 sec.	.010	.010	
TB LOCK OUT:	00 to 19 seconds	01	03	
SLC START LINE CONTROL:	Top Bulb, Off, 2-step	2 STEP	TOP	
SHIFT POINT:	2000 to 9999 rpm	7500	7500	
SHIFT DISABLE TIME:	0.000 to 3.999 sec.	.500	.500	
SHIFTER TYPE:	Electric or Air	ELEC	ELEC	
NUMBER OF CYLINDERS:	4, 6, 8 cylinders	8	8	

SERVICE

SERVICE:

DO NOT RETURN UNIT TO DISTRIBUTOR, CALL DEDENBEAR DIRECTLY.

Dedenbear Products, Inc. prides itself on its knowledgeable technical service staff and the industry's best customer service. If you feel you have a problem, have a question or two, need help wiring, or if you have special wiring needs, just call us. We are here to help you use your Dedenbear equipment to its full potential.

If you think the box needs to be serviced, call us first before removing it from the car (we might be able to troubleshoot it while it's still in the car). If it is necessary to return the box to our facility, **call first**; then package it carefully in a box, and enclose a note describing the problem.

Provide your name, address, work and home phone numbers so we can contact you regarding return shipment or other questions. Repair turn-around is 24 to 48 hours.

**CALL DEDENBEAR • Mon. - Fri. 8am - 5pm Pacific Time
(925)935-3025 • Fax (925)935-2287**

Ship to: DEDENBEAR PRODUCTS, INC. • REPAIR DEPT. • 1917 Oak Park Blvd. • Pleasant Hill, CA 94523

WARRANTY

LIMITED 1 YEAR WARRANTY

Dedenbear Products components are warranted **directly by Dedenbear Products** against defective material or workmanship under normal use and service for a period of **one (1) year after purchase**. Dedenbear Products will repair or replace the defective unit, at Dedenbear Products option, free of charge. This warranty does not cover any damage to the component caused by abuse, mishandling, alteration, accident, electrical current fluctuations, failure to follow installation/operating instructions, maintenance, storage and environmental conditions, or repair attempts made by anyone other than Dedenbear Products Authorized Service facility.

DEDENBEAR PRODUCTS SHALL NOT BE LIABLE FOR INJURY, CONSEQUENTIAL, OR OTHER TYPE DAMAGES RESULTING FROM THE USE OF ITS PRODUCTS, OTHER THAN THE LIABILITY STATED ABOVE. This warranty is in lieu of all other warranties of merchantability or fitness of use. This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.