

ADDRESSING

➤ **2 Digit Address** Use if the address is 127 or less. Record

2	Primary Loco Address	use when "E" = 0	CV 1	3	
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➤ **4 Digit Address** Use the systems procedure if available. Example Your Choice

3	Enter the desired engine number on your calculator.	2147			
	Divide by 256 and enter the whole number in CV 17.	8,3867			
	Multiply the whole number by 256 then subtract it from the engine number and enter the result in CV 18.	2147 - 2048 = 99			
		CV 17	0	CV 18	0

➤ **Consist Address** If this is greater than 0, you can't alter the regular address. Record

4	2 Digit Address when added to a consist (Multiple units).	CV 19	0	
	If you want to maintain some or all engine lighting when in consist, see table 21. Add 128 to reverse the engine when in consist. Some systems only!			

➤ **Decoder Lock** When CV 15 = 0 all decoders with the same address are unlocked - - when CV 15 equals CV 16 all decoders are locked except the decoder in CV 16 - - when CV 15 = 7 all are locked. If you have two of any type decoder, give the second one a sub address of 4, 5, or 6 in CV 16. Record

5	All Unlocked = 0	Decoder you want to unlock = ?	All locked = 7	CV 15	0	
	Mobil = 1	Sound = 2	Light Only = 3	___ = 4	___ = 5	___ = 6
				CV 16	1	

MOTOR CONTROL

➤ **Start Volts** It is superceded by Dither. For most conditions, leave this "0". Record

6	Start Volts	1 volt = roughly 18	use if "D" = 0	CV 2	0	
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➤ **Speed Graph** Using "0" (the default value) produces straight line acceleration. Record

7	Top Volts	1 volt = roughly 18	use if "D" = 0	CV 5	0	
	Mid Volts	1 volt = roughly 18	use if "D" = 0	CV 6	0	
	Adjust these to make engines run alike. This is useful in multiple unit operation.					

➤ **Momentum** creates the effect of engines pulling and stopping heavy loads. Record

8	Acceleration	Adds time to each speed step. Practical range is 0-25	CV 3	0	
	Deceleration	Adds time to each speed step. Practical range is 0-25	CV 4	0	

Loadable Speed Tables

Use if "D" = 16

9	CV 67	2		CV 74	30		CV 81	72		CV 88	135		
	CV 68	5		CV 75	35		CV 82	79		CV 89	147		
	CV 69	7		CV 76	40		CV 83	84		CV 90	161		
	CV 70	12		CV 77	47		CV 84	93		CV 91	177		
	CV 71	16		CV 78	51		CV 85	100		CV 92	196		
	CV 72	21		CV 79	58		CV 86	112		CV 93	219		
	CV 73	26		CV 80	65		CV 87	121		CV 94	255		
	Shaded CVs are the ones used for 14 speed steps (when "B" = 0).												

➤ **Dither provides the ultimate in slow speed control.** Engines will run slower than one half MPH. **NOTE: Both CV 56 and CV 57 must be greater than 0.** Record

10	Dither Frequency	The frequency range is 1 (high) to 10 (low)	CV 56	3	
	Dither Voltage	The practical range is 5 (low) to 50 (high)	CV 57	10	
If the flywheel isn't moving with the throttle at 1% or 2%, increase CV 57 by 5 until you have some very slow movement of the flywheel. Then if you want to fine tune the motor speed, increase or decrease CV 56 by 1 until it is running as desired.					

LIGHTING CONTROL

Lighting CVs

Timing + Effect = Total

11	White Wire	CV 49	0		+		=	
	Yellow Wire	CV 50	16		+		=	

Choose when light is On (timing).

Light is On running Forward only = 0

Light is On running in Reverse only = 16

Light is On running in Both directions = 32

Choice of lighting effects.

Constant Bright Light = 0

Random Flicker (fire box) = 1

Mars Light = 2

Gyra Light = 7

Rule 17 (dimmable light) = 8

Lighting Effects Add the value for the timing to the value for the effect to get the value you need for the CV you are programming.

Headlight Dimming

Record Your Total

	Not Used = 0	Headlight Dims when stopped = 16	Opposite Headlight is dimmed = 32	0	
13	Headlight Dimming	See Table 14 (below)		0	
	Headlight Dimming is not used unless you have an 8 in the effect column of table 11.				

Button Control of the Motor Circuit

This allows you to use the higher amp motor circuit (1.2 A) for a smoke unit or an additional Lighting circuit. Choose manual (button 2 for forward, and button 3 for reverse) or automatic control (button 2 for on/off, and reversing is automatic). Record Your Total

	Not Used = 0	Manual Control = 64	Automatic Reverse = 68	0	
14	Headlight Dimming and Button Control of the Motor Circuit	CV 61		0	
	Add The Value in Table 13 to the Value in Table 14 to enter in CV 61				

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