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ADJUST MODE...SETUP

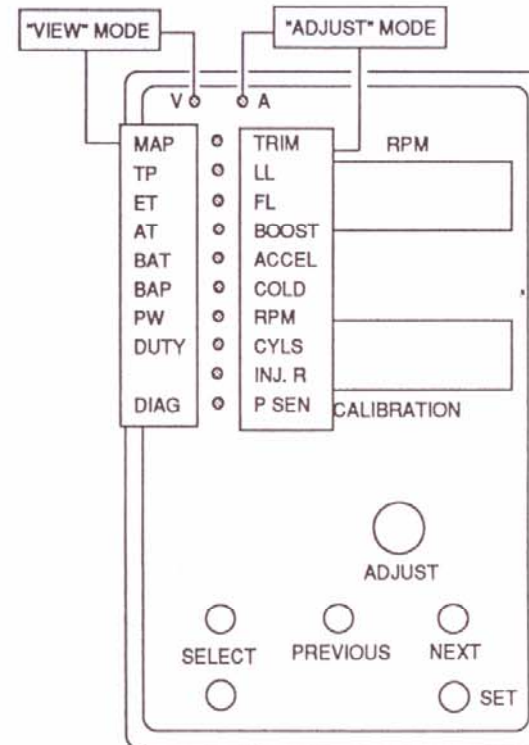
- 2.0 ENTER ADJUST MODE
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ADJUST MODE ...CALIBRATION

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NOTES
 DIAGNOSTICS QUICK REFERENCE
 WIRING DIAGRAM

NOMENCLATURE REFERENCE



PLEASE NOTE:

"VIEW" MODE REFERS TO THE LED "V" AND THE COLUMN UNDERNEATH.

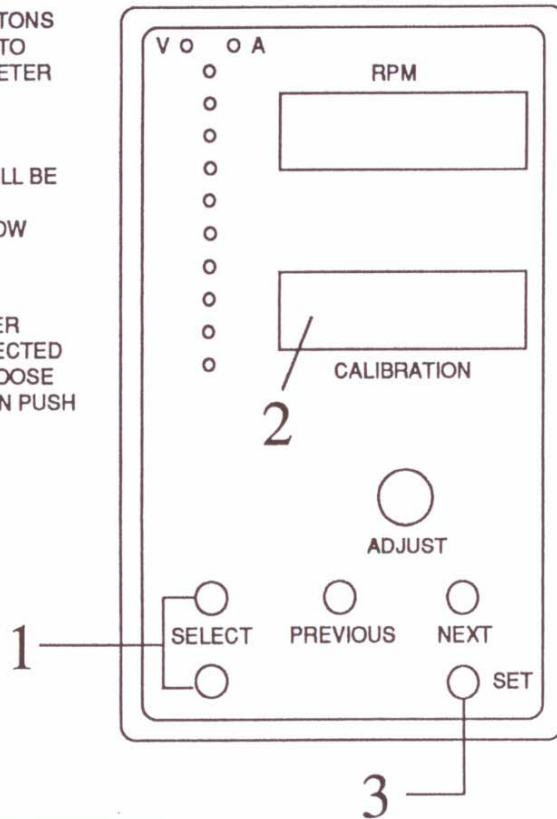
"ADJUST" MODE REFERS TO THE LED "A" AND THE COLUMN UNDERNEATH.

1.1

USING VIEW MODE

UPON POWER UP UNIT WILL BE IN THE VIEW MODE.
TO SELECT THE PARAMETER YOU WISH TO VIEW...

- 1 PRESS "SELECT" BUTTONS UNTIL THE LED NEXT TO THE DESIRED PARAMETER ILLUMINATES.
- 2 THE INFORMATION WILL BE DISPLAYED IN THE "CALIBRATION" WINDOW
- 3 TO HAVE A PARAMETER AUTOMATICALLY SELECTED UPON POWER UP, CHOOSE THE PARAMETER THEN PUSH "SET"



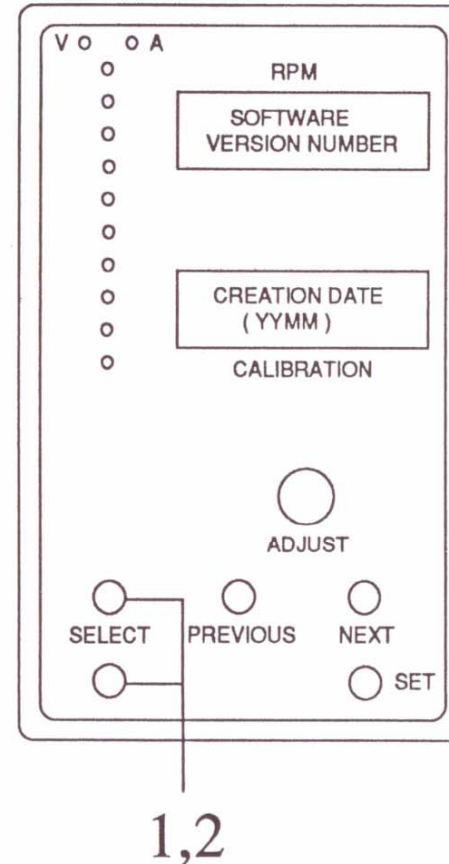
NOTE
THE LAST PARAMETER VIEWED WILL BE DISPLAYED WHEN MOVING BACK FROM THE ADJUST MODE TO THE VIEW MODE.

VIEW SOFTWARE VERSION

1.2

TO VIEW THE SOFTWARE VERSION CURRENTLY OPERATING...

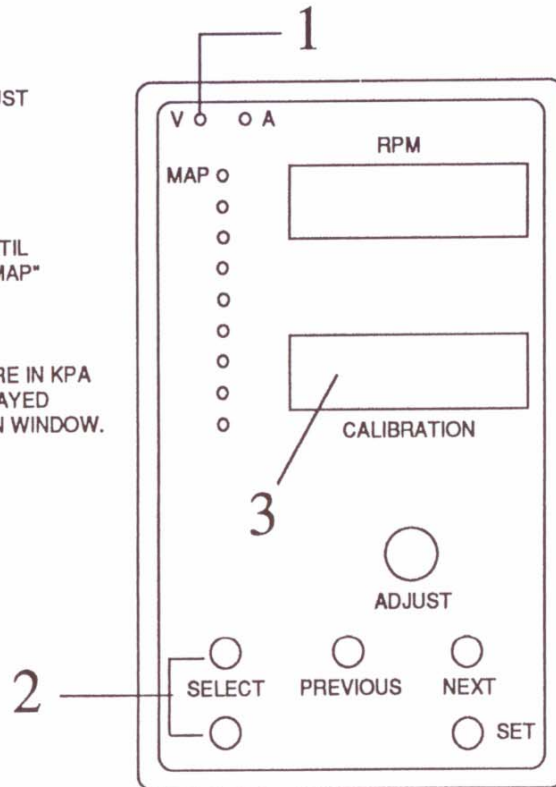
- 1 PRESS BOTH "SELECT" BUTTONS AT THE SAME TIME.
- 2 PRESS EITHER "SELECT" BUTTON TO EXIT.



1.3 VIEW INTAKE MANIFOLD PRESSURE

TO VIEW MANIFOLD PRESSURE...

- 1 VIEW MODE LED MUST BE ON.
- 2 PRESS "SELECT" UNTIL THE LED NEXT TO "MAP" ILLUMINATES.
- 3 MANIFOLD PRESSURE IN KPA ABSOLUTE IS DISPLAYED IN THE CALIBRATION WINDOW.

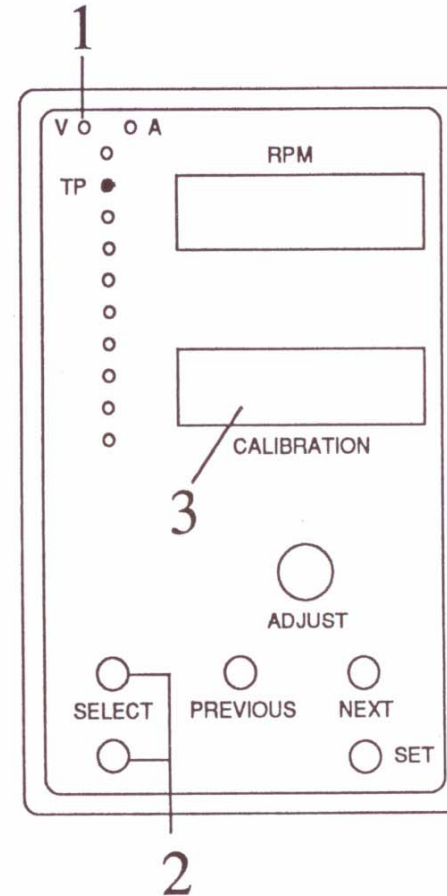


VIEW THROTTLE POSITION

1.4

IF A THROTTLE POSITION SENSOR IS FITTED, THE VOLTAGE VALUE PRODUCED BY THROTTLE OPENING IS DISPLAYED ...

- 1 VIEW MODE LED MUST BE ON.
- 2 PRESS "SELECT" UNTIL THE LED NEXT TO "TP" ILLUMINATES.
- 3 THROTTLE POSITION IS DISPLAYED AS MILLIVOLTS

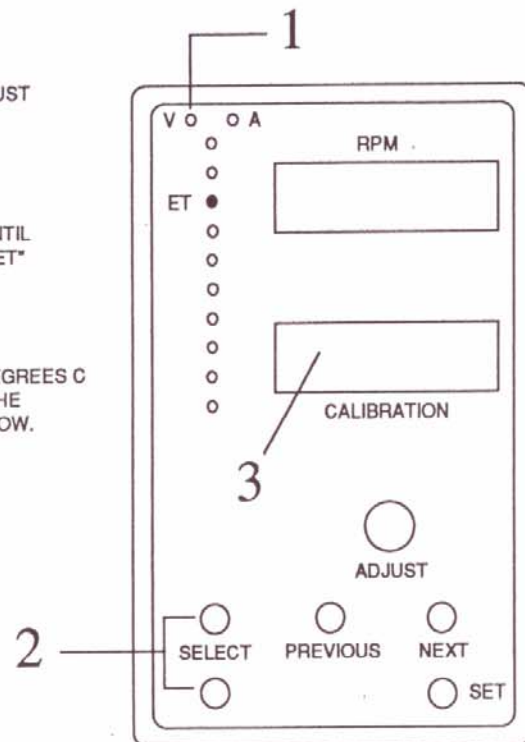


1.5

VIEW ENGINE TEMP

TO VIEW ENGINE TEMPERATURE...

- 1 VIEW MODE LED MUST BE ON.
- 2 PRESS "SELECT" UNTIL THE LED NEXT TO "ET" ILLUMINATES.
- 3 ENGINE TEMP IN DEGREES C IS DISPLAYED ON THE CALIBRATION WINDOW.

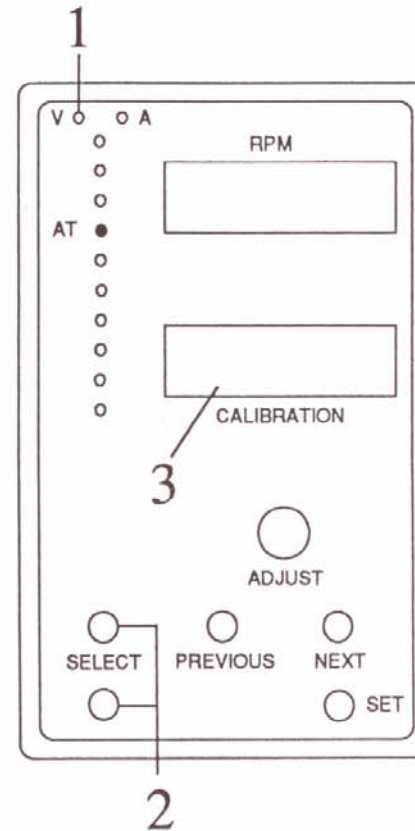


VIEW INTAKE AIR TEMP

1.6

TO VIEW THE INTAKE AIR TEMPERATURE IN DEGREES C

- 1 VIEW MODE LED MUST BE ON.
- 2 PRESS "SELECT" UNTIL THE LED NEXT TO "AT" ILLUMINATES.
- 3 AIR TEMP IS DISPLAYED IN DEGREES C

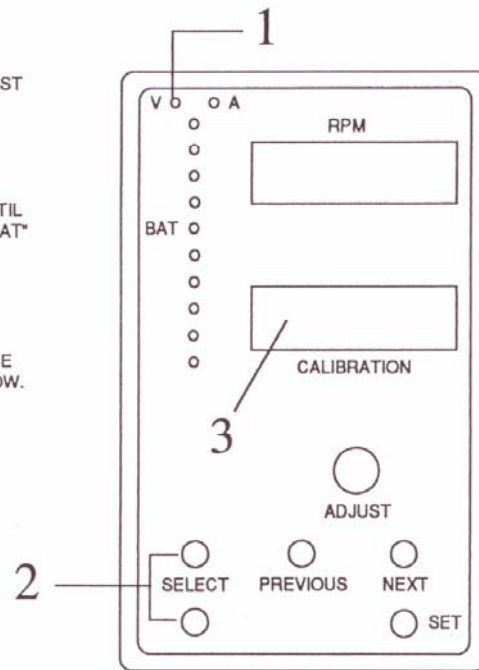


1.7

VIEW BATTERY VOLTAGE

TO VIEW BATTERY VOLTAGE AVAILABLE TO THE CONTROL UNIT:

- 1 VIEW MODE LED MUST BE ON.
- 2 PRESS "SELECT" UNTIL THE LED NEXT TO "BAT" ILLUMINATES.
- 3 BATTERY VOLTAGE IS DISPLAYED ON THE CALIBRATION WINDOW.

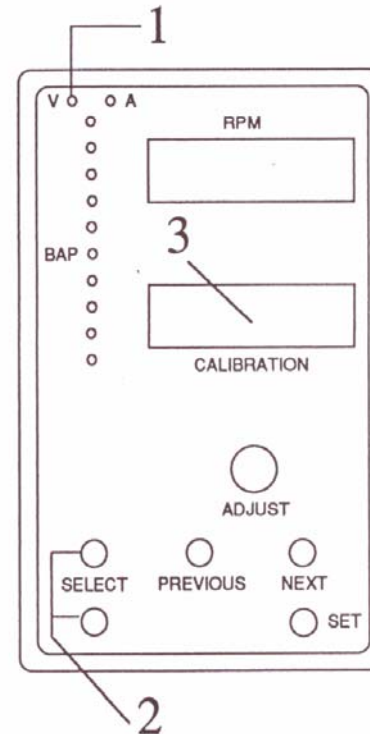


VIEW BAROMETRIC PRESSURE

1.8

TO VIEW BAROMETRIC PRESSURE...

- 1 VIEW MODE LED MUST BE ON.
- 2 PRESS "SELECT" UNTIL THE LED NEXT TO "BAP" ILLUMINATES.
- 3 THE BAROMETRIC PRESSURE READING IS RECORDED WHEN THE IGNITION KEY IS TURNED ON.



THIS VALUE IS DISPLAYED IN THE CALIBRATION WINDOW.

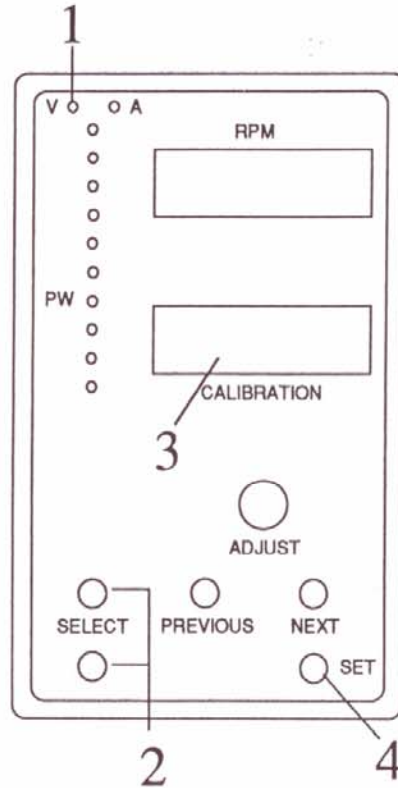
IF THE ECU CANNOT TAKE A BAROMETRIC READING BEFORE CRANKING STARTS IT WILL DEFAULT TO SEA LEVEL (100KPA)

1.9

VIEW INJECTOR PULSE WIDTH

TO VIEW THE ACTUAL PULSE WIDTH APPLIED TO THE INJECTORS...

- 1 VIEW MODE LED MUST BE ON.
- 2 PRESS "SELECT" UNTIL THE LED NEXT TO "PW" ILLUMINATES.
- 3 ON TIME IS DISPLAYED IN MILLISECONDS
- 4 IF THE "NEXT" BUTTON IS HELD DOWN DURING ACCELERATION, THE ACCELERATION ENRICHMENT CONTRIBUTION WILL BE DISPLAYED.

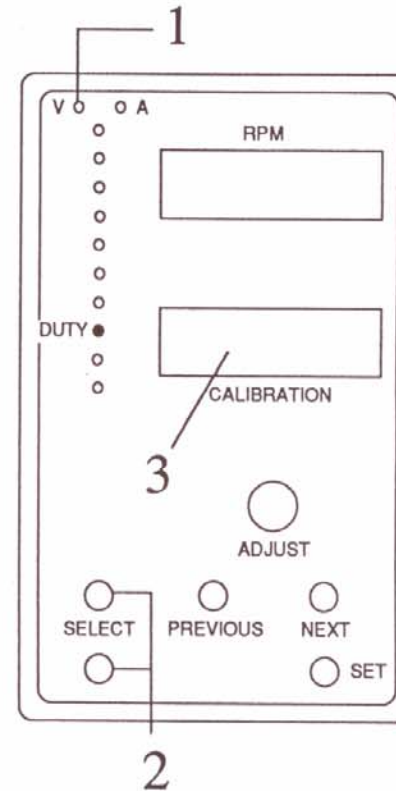


VIEW INJECTOR DUTY CYCLE %

1.10

TO VIEW INJECTION DUTY CYCLE...

- 1 VIEW MODE LED MUST BE ON.
- 2 PRESS "SELECT" UNTIL THE LED NEXT TO "DUTY" ILLUMINATES.
- 3 INJECTION OPEN TIME VRS. TOTAL CYCLE TIME IS EXPRESSED AS PERCENT DUTY CYCLE.



1.11

VIEW DIAGNOSTICS

TO VIEW THE STORED DIAGNOSTIC INFORMATION

- 1 VIEW MODE LED MUST BE ON.
- 2 PRESS "SELECT" UNTIL THE LED NEXT TO "DIAG" ILLUMINATES.

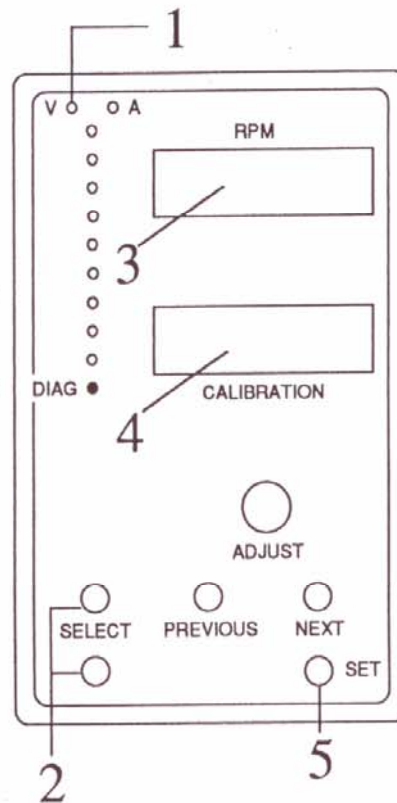
3 THE RPM WINDOW WILL DISPLAY UP TO FOUR OF THE FOLLOWING CODES:

- 0 NO ERRORS
- 1 CRANK SEN ERROR
- 2 RPM LIMIT EXCEEDED
- 3 ECU RESET WHILE ENG. RUNNING
- 4 INJECTOR MAX DUTY EXCEEDED
- 5 SYNCHRONIZATION PULSE ERROR
- 6 BATTERY BELOW 10V WHILE ENGINE ABOVE 2000 RPM
- 7 INTERNAL MEMORY ERROR
- 8 OVERBOOST

4 THE CALIBRATION WINDOW WILL DISPLAY UP TO FOUR OF THE FOLLOWING CODES:

- 0 NO ERRORS
- 1 SELF CHECK PERFORMED
- 2 MAP SEN. OUT OF RANGE
- 3 TP SEN. OUT OF RANGE
- 4 AT SEN. OUT OF RANGE
- 5 ET SEN. OUT OF RANGE
- 6 BATT VOLTS OUT OF RANGE
- 7 EX MAP OUT OF RANGE
- 8 A/F SEN OUT OF RANGE

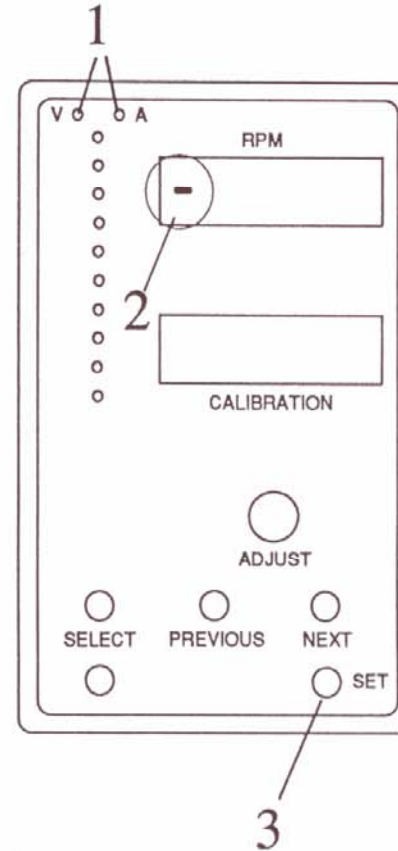
5 TO CLEAR BOTH WINDOWS PUSH "SET". ANY CODES REMAINING ARE CURRENT UNCORRECTED FAULTS. MOMENTARY FAULTS IN SENSORS OR WIRING ARE DETECTED. FAULT DATA IS LOST WHEN POWER IS TURNED OFF.



INJECTOR OVER DUTY WARNING

1.12

AS WELL AS SETTING A CODE IN DIAGNOSTICS, THE UNIT GIVES VISUAL INDICATION OF OVER DUTY...



1 HANDHELD UNIT MAY BE IN THE "VIEW OR "ADJUST" MODE.

2 IF THE REQUESTED INJECTOR ON TIME IS GREATER THAN THE TOTAL CYCLE TIME THIS CURSOR WILL TURN ON.

3 THE INDICATION CAN BE CLEARED BY PUSHING THE "SET" BUTTON WHILE VIEWING "DIAGNOSTICS"

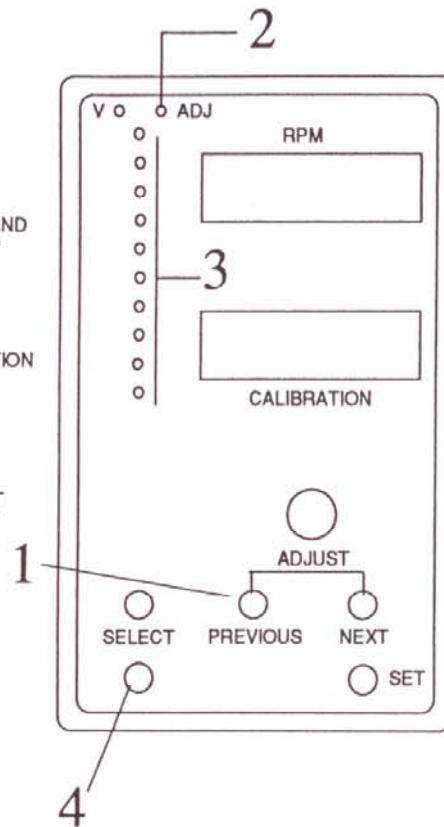
GEN. TWO WILL NOT ALLOW THE INJECTOR TO REACH 100% DUTY. MOST INJECTORS ENTER NON-LINEAR OPERATION AT HIGH SPEEDS AT 80-90% DUTY CYCLE. OPERATION OF THE INJECTORS IN THE NON-LINEAR RANGE SHOULD BE AVOIDED. IF FUEL REQUIREMENT CANNOT BE MET, RAISE PRESSURE, OR USE LARGER NOZZLE INJECTORS.

2.0

ENTER ADJUST MODE

UPON POWER UP, UNIT WILL BE IN THE VIEW MODE.
TO ENTER THE ADJUST MODE...

- 1 DEPRESS "PREVIOUS" AND "NEXT" BUTTONS SIMULTANEOUSLY.
- 2 "ADJ" LED WILL TURN ON, AND UNIT WILL ENTER "ADJUST" MODE..
- 3 THE LED(S) FOR THE FUNCTION CURRENTLY SELECTED WILL ALSO TURN ON.
- 4 USE "SELECT" BUTTONS TO MOVE THRU THE ADJUST MODE ITEMS.



SET REV LIMITER

2.1

SET EITHER HARD OR SOFT REV LIMIT



- 1 HANDHELD MUST BE IN THE "ADJUST" MODE, AND "RPM" MUST BE SELECTED. REV VALUE IS PLACED INTO "CALIBRATION" SCREEN
- 2 ROTATE "ADJUST" KNOB TO TH DESIRED RPM, PUSH "SET"
- 3 MINUS (-) SIGN APPEARS WHEN HARD LIMIT IS SELECTED

NOTES;

LIMIT: 0-15,000 RPM IN 10 RPM INCREMENTS

HARD LIMIT:
BOTH INJECTOR GROUPS CUT AT THE SPECIFIED RPM.

SOFT LIMIT:
ONE GROUP OF INJECTORS CUTS. IF STILL OVER SPEED, THEN THE SECOND GROUP CUTS AT 200 RPM OVER LIMIT.

DO NOT SET A SOFT LIMIT IF MORE THAN ONE INJECTOR IS USED PER CYLINDER

2.2

SELECT NUMBER OF CYLINDERS

SELECT THE PROPER NUMBER OF CYLINDERS

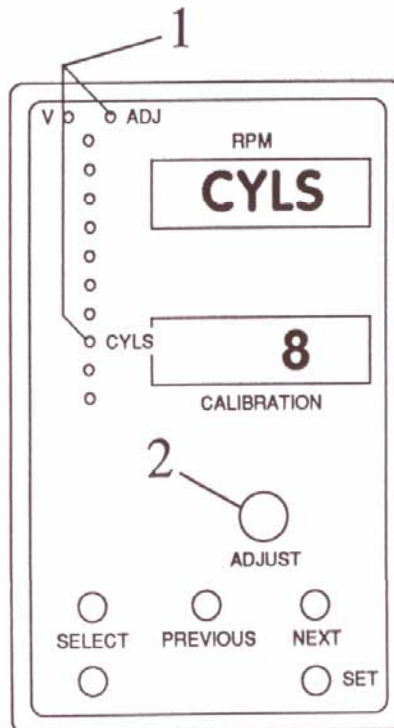
1

HANDHELD MUST BE IN THE "ADJUST" MODE, AND "CYLS" MUST BE SELECTED. SEE PAGE 2.0

2

ROTATE "ADJUST" KNOB UNTIL DESIRED NUMBER APPEARS ON CALIBRATION SCREEN, PUSH "SET". CYCLE IGNITION KEY.

NOTE:
FOR TWO STROKE SET
AT TWICE THE NUMBER OF
CYLINDERS.

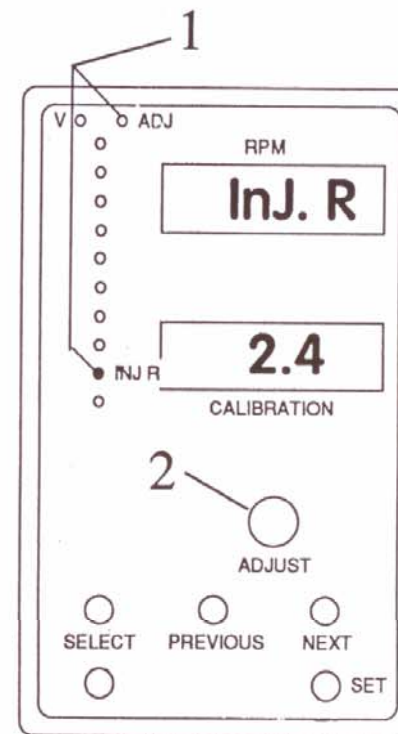


FOR SAFETY:
CHANGES MADE TO THIS SETTING
DO NOT TAKE EFFECT UNTIL ECU IS RE-INITIALIZED.

SET INJECTOR DRIVE FACTOR

2.3

TO PREPARE THE INJECTOR DRIVE STAGES...



1

HANDHELD MUST BE IN THE "ADJUST" MODE, AND "INJ R" MUST BE SELECTED. SEE PAGE 2.0

2

ROTATE "ADJUST" KNOB UNTIL DESIRED NUMBER APPEARS ON CALIBRATION SCREEN, PUSH "SET". CYCLE THE IGNITION KEY

NOTE: SET THE NUMBER
BASED ON THE OHMIC VALUE
OF THE INJECTOR.

EXAMPLE:
IF THE INJECTOR
USED IS 2.4 OHMS, DIAL IN
2.4 ON THE DISPLAY.

RANGE OF ADJUSTMENT
IS .5-16.0 .

FOR SAFETY:
CHANGES MADE TO THIS SETTING
DO NOT TAKE EFFECT UNTIL ECU IS RE-INITIALIZED.

2.4

SET PRESSURE SENSOR TYPE

SENSOR DEFAULT IS ALSO CONTROLLED BY THIS SELECTION...

1 HANDHELD MUST BE IN THE "ADJUST" MODE, AND "P SEN" MUST BE SELECTED. SEE PAGE 2.0

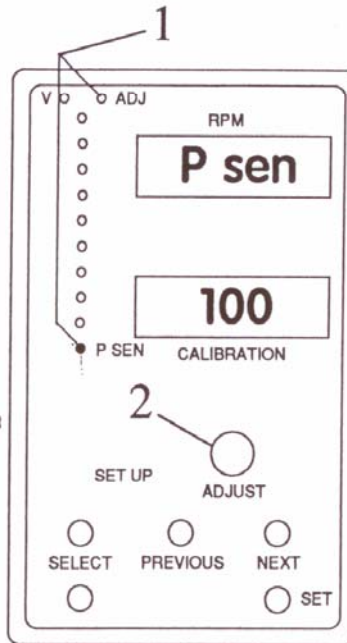
2 ROTATE "ADJUST" KNOB UNTIL CORRECT NUMBER APPEARS ON CALIBRATION SCREEN, PUSH "SET", CYCLE IGNITION KEY.

NOTE:

"100" GM 1 BAR SENSOR
"300" GM 3 BAR SENSOR

IN CASE OF ERROR DETECTION, DEFAULT VALUE IS MAX SENSOR VALUE.

A MINUS SIGN (-) IN FRONT OF THE SELECTION MEANS : ERROR CHECKING IS NOT PERFORMED. SENSOR OUTPUT IS CONSIDERED VALID REGARDLESS OF VALUE. ROTATE KNOB COUNTER-CLOCKWISE TO ACHIEVE A NEGATIVE NUMBER.



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FOR SAFETY:
CHANGES MADE TO THIS SETTING
DO NOT TAKE EFFECT UNTIL ECU IS RE-INITIALIZED.

3.0

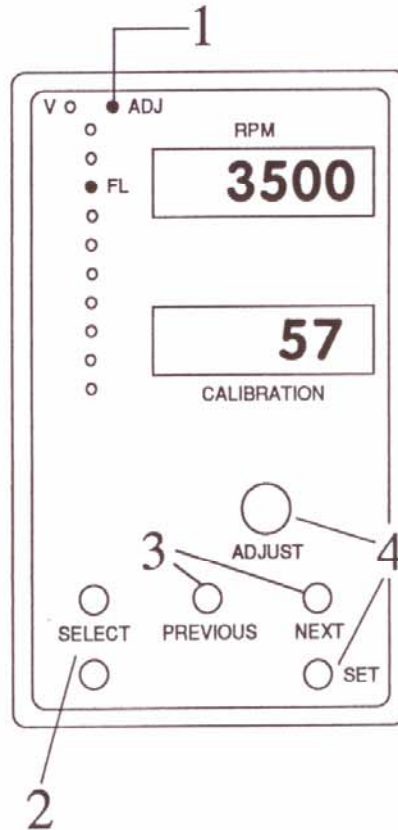
SCROLL THRU RPM SITES

ENGINE CALIBRATION CONSISTS OF SETTING FUEL, SPARK, ACCEL, ETC. VALUES INTO RPM SITES. THE "PREVIOUS" & "NEXT" BUTTONS STEP THE RPM NUMBER UP OR DOWN TO VIEW OR CHANGE THE CALIBRATION VALUES.

- 1 UNIT MUST BE IN "ADJUST" MODE. (PAGE 2.0).
- 2 CHOOSE DESIRED PARAMETER WITH "SELECT" BUTTONS. IF THE PARAMETER HAS AN RPM RELATED FUNCTION, THE "RPM" WINDOW WILL DISPLAY.
- 3 USE THE "PREVIOUS" AND "NEXT" BUTTONS TO SCROLL TO THE RPM SITE DESIRED.
- 4 MAKE ANY DESIRED CHANGES IN "CALIBRATION" WINDOW WITH THE "ADJUST" KNOB AND HIT "SET" TO LOCK THE VALUE INTO MEMORY.

REPEAT STEPS 3 & 4 AS OFTEN AS NECESSARY TO MAKE THE DESIRED CHANGES TO THE PARAMETER.

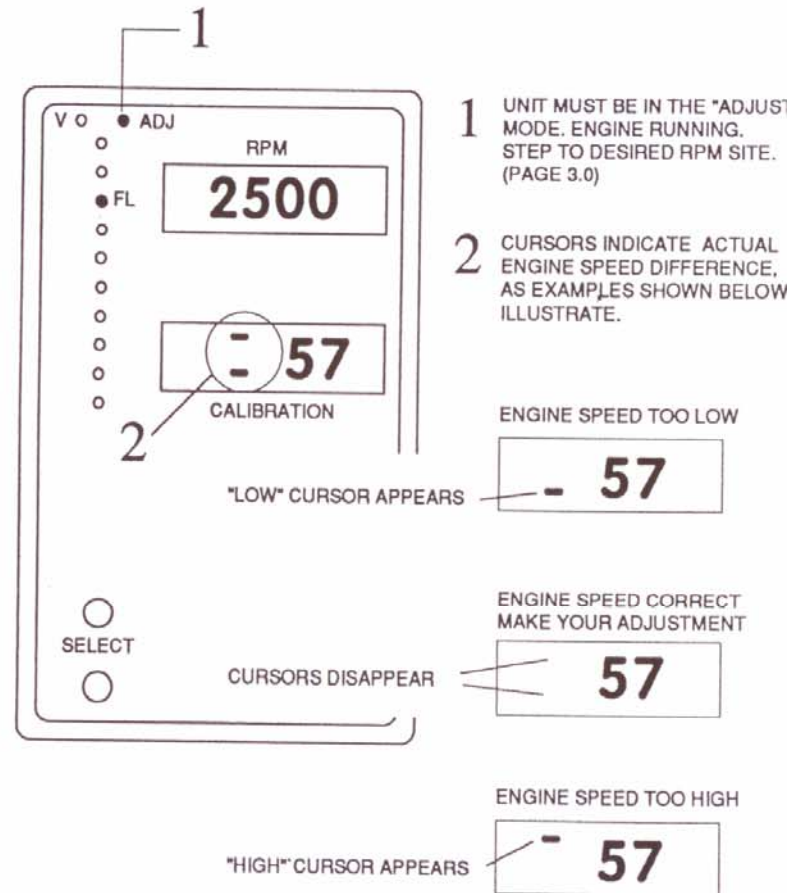
IMPORTANT!
WHEN YOU'VE MADE A CHANGE TO THE CALIBRATION AND YOU STEP THE RPM BEFORE YOU PUSH "SET" YOU WILL LOSE ANY CHANGES MADE.



USING RPM CURSORS

3.1

WHEN ADJUSTING A PARAMETER AT A SPECIFIC RPM, YOU NEED TO KNOW WHEN ENGINE SPEED MATCHES THE RPM SITE SELECTED...

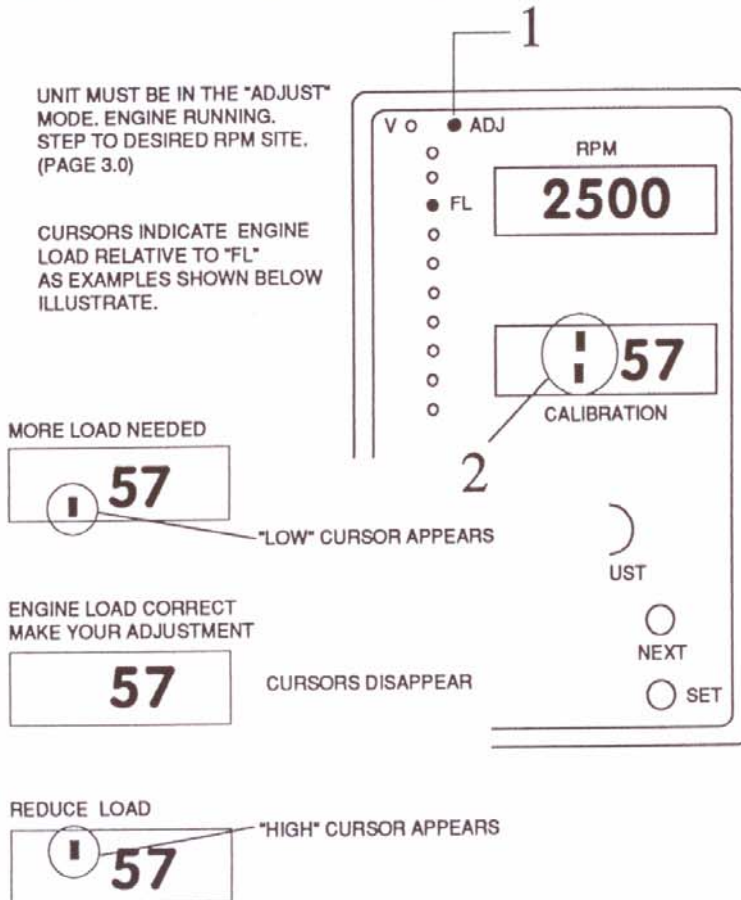


NOTE:
CALIBRATION ADJUSTMENT CAN BE PERFORMED REGARDLESS OF ENGINE SPEED, HOWEVER, YOU WON'T SEE THE EFFECT OF THE CHANGE ON THE ENGINE WHILE YOUR ADJUSTING UNLESS YOU MATCH SPEEDS.

3.2

USING LOAD CURSORS

TO ASSIST "FL" CALIBRATION, LOAD CURSORS INDICATE ENGINE LOAD DEVIATION. EFFECTIVE ON ECU'S VERSION 3.3 LATER

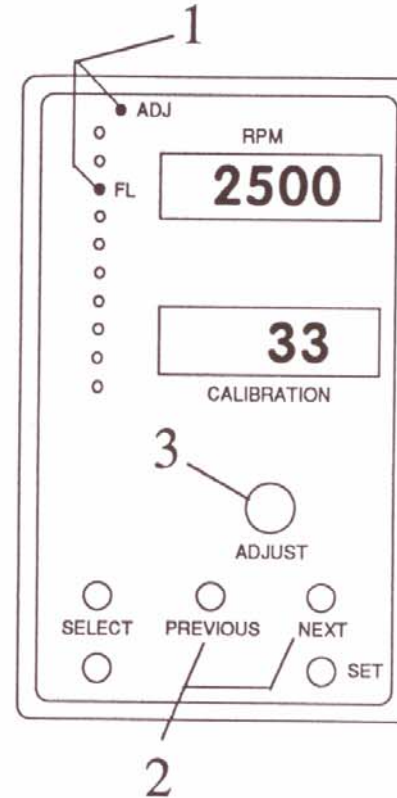


LOAD CURSORS AND SPEED CURSORS APPEAR ON SAME WINDOW.

SET FULL LOAD FUEL

3.3

THE FULL LOAD MAP ANCHORS THE LIGHT LOAD & BOOST MAPS AND THEREFORE IS COMPLETED FIRST...



- 1 HANDHELD MUST BE IN THE "ADJUST" MODE, AND "FL" MUST BE SELECTED.
 - 2 STEP TO DESIRED RPM SITE (PAGE 3.0) A GOOD STARTING PLACE IS ONE HALF RED LINE RPM.
 - 3 APPLY LOAD TO ENGINE UNTIL 100 KPA MANIFOLD PRESSURE IS REACHED. ADJUST THROTTLE OR LOAD UNTIL RPM CURSOR DISAPPEARS (PAGE 3.1) ROTATE "ADJUST" KNOB UNTIL DESIRED AIR FUEL RATIO IS ACHIEVED. HIT "SET" BUTTON.
- STEP TO NEXT RPM SITE. REPEAT UNTIL ALL APPLICABLE RPM SITES ARE CALIBRATED.

NOTE:
START RICH AND GO LEAN.

IF THE HALF RED LINE NUMBER IS ABOVE FIFTY THEN THE INJECTORS ARE TOO SMALL, OR RAISE FUEL PRESSURE.

3.4

SET LIGHT LOAD FUEL

LIGHT LOAD IS CORRECTION FOR THE PART THROTTLE EFFECIENCY DEVIATION

- 1 HANDHELD MUST BE IN THE "ADJUST" MODE, AND "LL" MUST BE SELECTED.
- 2 STEP TO DESIRED RPM SITE (PAGE 3.0)
A GOOD STARTING PLACE IS ONE HALF RED LINE RPM.
- 3 APPLY A LIGHT LOAD TO ENGINE, AROUND 20 BHP. ADJUST THROTTLE OR LOAD UNTIL RPM CURSOR DISAPPEARS (PAGE 3.1) ROTATE "ADJUST" KNOB UNTIL DESIRED AIR FUEL RATIO IS ACHIEVED.

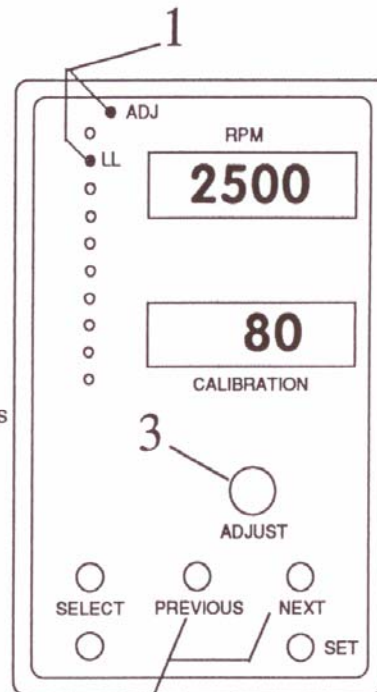
HIT "SET" BUTTON.

STEP TO NEXT RPM SITE. REPEAT UNTIL ALL APPLICABLE RPM SITES ARE CALIBRATED.

NOTE:
START RICH AND GO LEAN.

WHEN THE ENGINE IS ON THE CAM NUMBERS SHOULD BE IN THE 80-90 RANGE. SPEEDS WHERE THE CAM IS INEFFICIENT THE NUMBERS WILL BE BETWEEN 55-75

IF FULL LOAD NUMBER IS TOO LEAN, THIS NUMBER CANNOT COMPENSATE PROPERLY.



SET BOOST FUEL

3.5

THE BOOST MAP CORRECTS FOR ENGINE EFFECIENCY CHANGES DURING BOOSTED OPERATION

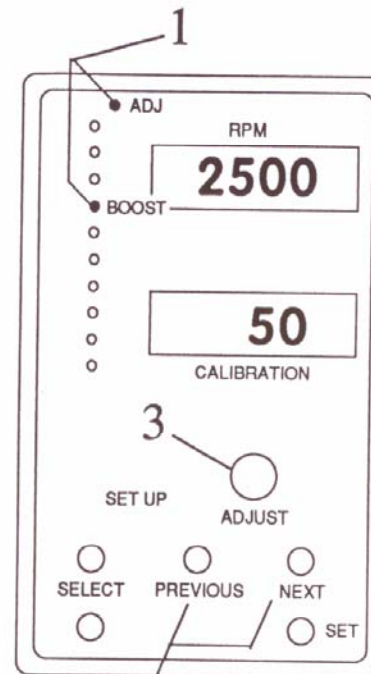
- 1 HANDHELD MUST BE IN THE "ADJUST" MODE, AND "BOOST" MUST BE SELECTED.
- 2 STEP TO DESIRED RPM SITE (PAGE 3.0)
- 3 APPLY LOAD TO ENGINE UNTIL MAX BOOST IS REACHED ADJUST THROTTLE OR LOAD UNTIL RPM CURSOR DISAPPEARS (PAGE 3.1) ROTATE "ADJUST" KNOB UNTIL DESIRED AIR FUEL RATIO IS ACHIEVED.

HIT "SET" BUTTON.

STEP TO NEXT RPM SITE. REPEAT UNTIL ALL APPLICABLE RPM SITES ARE CALIBRATED.

NOTE:
START RICH AND GO LEAN.

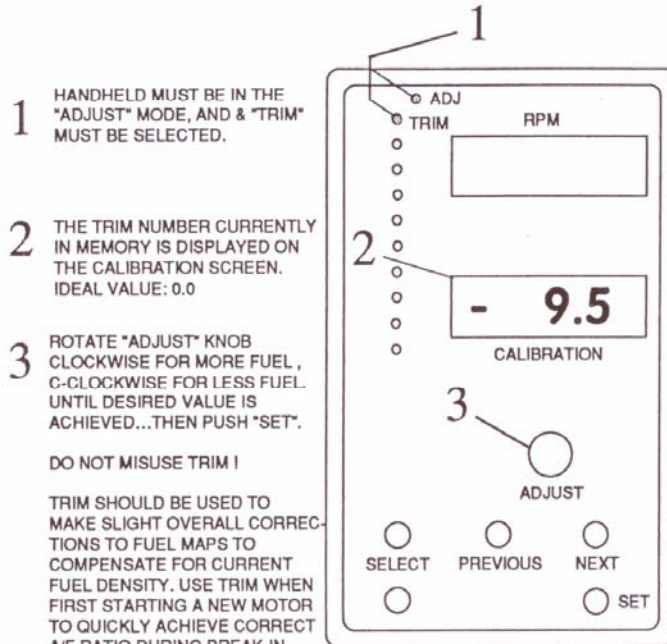
WHEN THE BOOST NUMBERS ARE SET AT 20 (v.3.3), OR 50 (v3.1), THERE IS LINEAR FUEL DELIVERY BASED ON THE FULL LOAD MAP. IF ENGINE REQUIRE MORE THAN TWICE THE FUEL FOR TWICE THE PRESSURE THEN RAISE THE NUMBER AND VICE-VERSA.



3.6

USING FUEL TRIM

USE THE FUEL TRIM TO TEMPORARILY RAISE OR LOWER THE ABSOLUTE VALUE OF THE FUEL CURVES WITHOUT CHANGING THE SHAPE OF THE CURVES.



DO NOT MISUSE TRIM I

TRIM SHOULD BE USED TO MAKE SLIGHT OVERALL CORRECTIONS TO FUEL MAPS TO COMPENSATE FOR CURRENT FUEL DENSITY. USE TRIM WHEN FIRST STARTING A NEW MOTOR TO QUICKLY ACHIEVE CORRECT A/F RATIO DURING BREAK-IN. USE TRIM DURING TROUBLESHOOTING TO QUICKLY DETERMINE IF AN ENGINE WILL RUN BETTER WITH MORE OR LESS FUEL.

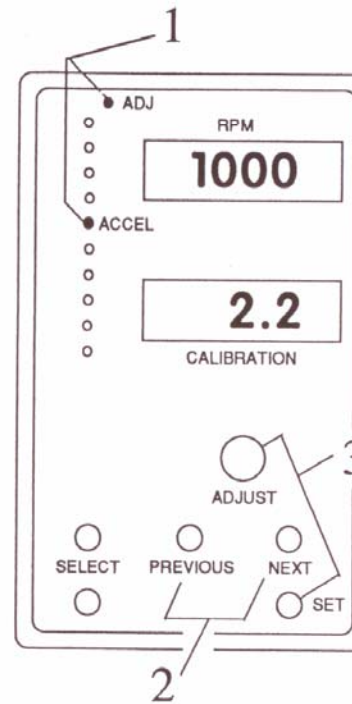
ALL RANGES AND LOADS ARE AFFECTED. RANGE OF TRIM IS MINUS 50% TO PLUS 50%.

A "MINUS" SIGN TO THE LEFT OF THE VALUE IS DISPLAYED WHEN MINUS TRIM IS ENTERED.

SET ACCEL ENRICH

3.7

SET ACCELERATION ENRICHMENT EVERY 1000 RPM



NOTES:

NUMBER IN "CALIBRATION" SCREEN IS SCALED IN MILLISECONDS.

ACCEL ENRICH IS DEPENDENT UPON A PROPERLY SET FUEL CURVE, SO DO ACCEL LAST.

MOST ENGINES REQUIRE NO ACCEL ABOVE 3000 RPM.

ACCEL NUMBER IS PROCESSED ALONG WITH ACCEL RATE AND DECAY FOR EACH REV RANGE.

