

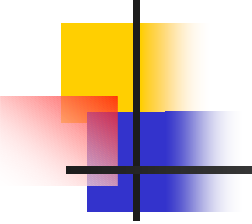
Altitude and LT5 Fueling



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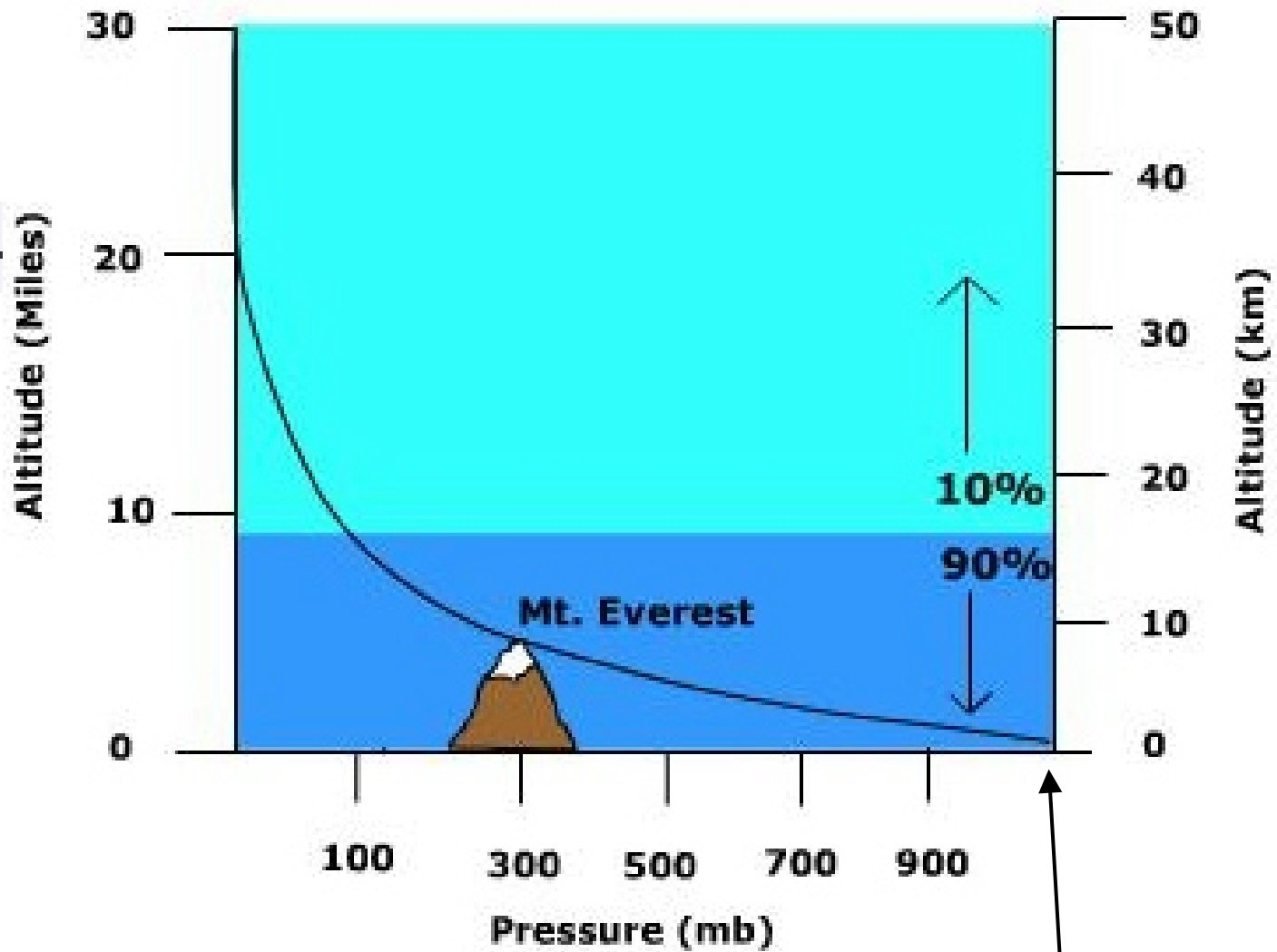
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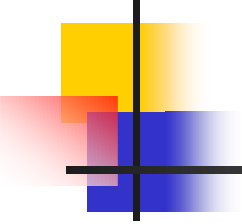
The LT5 determines fuel delivery from several factors. One of the factors is manifold pressure. Specifically ***manifold absolute pressure***. The acronym for this is MAP. MAP is referenced to air pressure at sea level.

Air Pressure at sea level is 14.7 psi, in metric it is 1 BAR.

Years ago vacuum was used to measure the pressure in the manifold. In the automotive world 29.92 in/HG means the same thing as 1 BAR.



1000 mb = 1 BAR = 14.7 psi at Sea Level

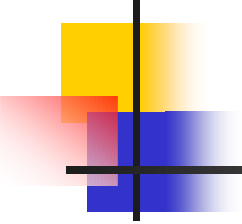


In the automotive world MAP is expressed in terms of KPA. KPA is also known as the kiloPascal.

$$1 \text{ BAR} = 100 \text{ KPA} = 14.7 \text{ PSI}$$

When a engine is running at wide open throttle the manifold pressure is at 100 KPA. This should be viewed as air pressure filling the manifold to 14.7 PSI at sea level.

As altitude is increased the pressure or weight of the air decreases.



The LT5 uses a sensor to measure the pressure in the intake manifold. The engine control system is programmed supply the correct proportion of fuel to match the pressure of the air. Air density is directly proportional to the air pressure.

For the LT5 and many other engines, at full load the control system is programmed to supply fuel at 1 part by weight to every 12 parts of air. 12:1 AFR

With light loads at less than about 50% throttle the system fuels the engine for best fuel economy and lowest emissions at 14.7:1 AFR

Volumetric Efficiency

MAP KPA	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100
Air Pres. PSI	2.9	3.7	4.4	5.1	5.9	6.6	7.4	8.1	8.8	9.6	10.3	11.0	11.8	12.5	13.2	14.0	14.7
Altitude Feet											10,000			5,000			0
400	43.0	45.7	50.0	52.3	54.7	57.4	60.5	60.9	61.3	62.1	62.9	64.1	64.8	66.0	66.8	69.1	71.1
500	43.0	45.7	50.0	52.3	54.7	57.4	60.5	60.9	61.3	62.1	62.9	64.1	64.8	66.0	66.8	69.1	71.1
600	44.1	46.9	50.4	52.7	55.1	58.2	60.9	61.7	62.1	62.9	63.7	64.8	65.6	66.8	67.6	69.9	71.5
700	44.9	48.0	50.8	53.5	55.9	58.6	61.7	62.5	63.3	64.1	64.8	65.6	66.8	68.0	68.8	71.1	72.7
800	45.7	48.8	51.6	54.3	56.6	59.8	62.5	63.3	64.1	64.8	65.6	66.4	67.6	68.8	69.9	71.9	73.0
900	46.1	49.2	52.3	55.1	57.4	60.5	62.9	64.1	64.8	65.6	66.4	67.2	68.4	69.1	70.3	72.3	73.4
1000	46.9	50.4	54.7	56.6	58.6	60.5	62.5	64.1	65.6	66.4	67.6	68.4	69.1	71.1	73.0	77.0	80.5
1100	48.0	51.2	55.1	57.0	59.0	60.9	62.9	64.5	66.4	67.6	68.4	69.1	69.5	71.5	73.4	77.3	80.9
1200	50.0	52.7	55.5	57.8	60.2	62.1	64.5	65.6	67.2	68.4	69.5	70.3	71.1	72.7	73.0	76.2	78.9
1300	50.8	53.9	55.9	58.2	60.5	62.5	64.8	66.0	67.6	68.8	70.3	70.7	71.5	73.0	73.4	76.6	79.3
R 1400	51.6	54.7	56.6	59.0	61.3	63.7	66.0	66.8	68.0	69.5	71.5	71.9	72.7	73.8	73.8	77.0	79.3
1500	53.1	55.5	57.4	60.2	62.5	64.5	66.8	68.0	69.1	70.7	72.3	72.7	73.4	74.6	74.6	77.3	79.7
P 1600	53.9	56.6	58.6	60.9	63.3	65.6	67.6	68.4	69.5	71.1	72.7	73.0	73.8	75.0	75.0	77.3	80.1
1700	54.3	57.4	60.5	62.5	64.5	66.0	68.0	69.1	70.7	71.9	73.0	73.4	74.2	75.4	75.0	77.3	80.1
M 1800	54.7	57.8	62.1	63.7	64.8	66.8	68.8	69.9	71.5	72.7	73.8	74.2	75.0	75.8	75.4	77.7	80.5
1900	55.5	58.6	64.5	65.6	66.8	68.0	69.5	70.7	72.3	73.0	74.2	74.6	75.4	76.2	75.4	78.1	80.9
2000	56.6	59.0	66.0	66.8	68.0	68.8	69.9	71.1	72.7	73.4	74.6	75.0	75.8	76.6	75.8	78.5	81.3
2200	57.0	59.8	66.0	66.8	67.2	68.4	69.9	71.5	73.0	74.2	75.4	75.8	75.8	76.6	76.2	78.5	81.6
2400	57.8	60.5	66.4	66.8	66.8	68.4	70.3	71.9	73.4	74.2	75.4	75.8	75.8	77.0	77.0	79.3	82.0
2800	58.2	61.3	68.4	68.8	69.1	69.5	74.2	75.0	75.8	77.0	78.1	78.5	78.5	79.7	79.3	80.9	82.8
3200	59.0	61.7	69.5	70.3	71.5	74.6	77.7	77.7	77.7	78.9	80.5	80.9	81.6	82.4	81.6	83.2	85.2
3600	59.4	62.5	70.3	71.9	73.0	76.2	79.7	80.1	80.1	81.6	83.2	84.0	85.2	85.9	84.8	87.5	90.6
4000	60.5	63.7	75.8	75.8	75.8	78.9	82.0	82.4	82.4	84.0	85.9	87.9	89.8	91.0	89.8	93.0	95.7
4500	62.5	66.4	76.2	77.0	77.7	81.3	84.8	85.2	85.5	87.5	89.8	92.6	95.3	96.1	94.5	96.5	98.8
5000	66.8	72.7	77.7	78.1	79.7	83.6	87.5	87.9	88.7	89.8	91.4	93.8	96.1	96.9	94.9	97.3	99.6
5500	70.3	76.2	77.7	78.5	79.3	81.6	84.0	85.9	87.9	89.5	91.4	93.8	96.1	96.5	94.5	96.9	99.2
6000	67.6	74.2	77.3	78.1	78.9	79.7	80.5	82.0	84.0	85.2	86.3	89.1	92.2	92.2	89.8	93.0	96.1
6500	67.6	74.2	75.0	76.2	77.0	77.3	77.3	78.5	80.1	80.5	80.9	83.2	85.5	86.7	85.9	90.2	94.9
7000	67.6	70.3	72.3	73.4	75.0	75.4	75.8	77.0	78.1	78.5	79.3	81.6	84.0	85.2	84.8	89.5	94.1

How Altitude Effects Power

The NHRA publishes correction factors to translate performance at an elevation to performance at sea level.

In Las Vegas at 2100 feet, the ET and MPH is be factored by about 2%.

13.2 ET = about 12.9 ET at sea level

108 MPH = about 110 MPH at sea level

In Denver at 5800 feet, the factor is about 6%.

13.7 ET = about 12.9 ET at sea level

106 MPH = about 110 MPH at sea level