

## 28-11 PRESSURE EQUIVALENTS

Fig. 28-3 shows how psia units are related to kPa units, and how psig units are related to kPa units.

|   |  |
|---|--|
| <p>1 psia = 0.068 atmosphere<br/>                     = 144 lb./sq. ft. = .703 meters water<br/>                     = 2.036 in. of mercury = 70.3 cm water<br/>                     = 2.307 ft. of water = 51.7 mm Hg<br/>                     = 27.7 in. of water = 6.9 kPa</p> | <p>1 atmosphere = 29.92 in. of mercury = 101.28 kPa<br/>                     = 33.94 ft. of water = 760 mm Hg<br/>                     = 14.696 psi = 10.33 m water<br/>                     = 2116.35 psf</p>                               |
| <p>1 psig = 15.7 psia = 108 kPa<br/>                     0 psig = 14.7 psia = 101.3 kPa</p>   | <p>1 psf = .007 psi = 0.048 kPa<br/>                     = <math>4.725 \times 10^{-4}</math> atmosphere<br/>                     = .01414 in. Hg = .0049 m water<br/>                     = .016 ft. water</p>                               |
| <p>1 oz./sq. in. = .128 in. of mercury<br/>                     = 1.73 in. of water</p>   | <p>1 kilogram/sq. cm = 14.22 psi = 10 meters of water<br/>                     = 2048.17 psf<br/>                     = .967 atmosphere = 97.98 kPa<br/>                     = 28.96 in. Hg<br/>                     = 32.8083 ft. water</p> |
| <p>1 in. of mercury = .0334 atmosphere = 3.386 kPa<br/>                     = .491 psi = 25.4 mm Hg<br/>                     = 1.13 ft. of water = .3453 m water<br/>                     = 13.6 in. of water<br/>                     = 70.73 psf</p>                            | <p>1 meter of water = 1.42 psi = 73.55 mm Hg<br/>                     = 204.8 psf = 9.78 kPa<br/>                     = .097 atmosphere<br/>                     = 2.896 in. Hg<br/>                     = 3.28 ft. water</p>                |
| <p>1 ft. of water = .0295 atmosphere = 2.985 kPa<br/>                     = .434 psi = 22.42 mm Hg<br/>                     = 62.43 lb./sq. ft. = .305 m water<br/>                     = .03 atmosphere<br/>                     = .883 in. of mercury (Hg)</p>                  | <p>1 mm Hg = .019 psi = 0.133 kPa<br/>                     = 2.78 psf = .0136 m water<br/>                     = .001316 atmosphere<br/>                     = .039 in. Hg<br/>                     = .0446 ft. water</p>                    |

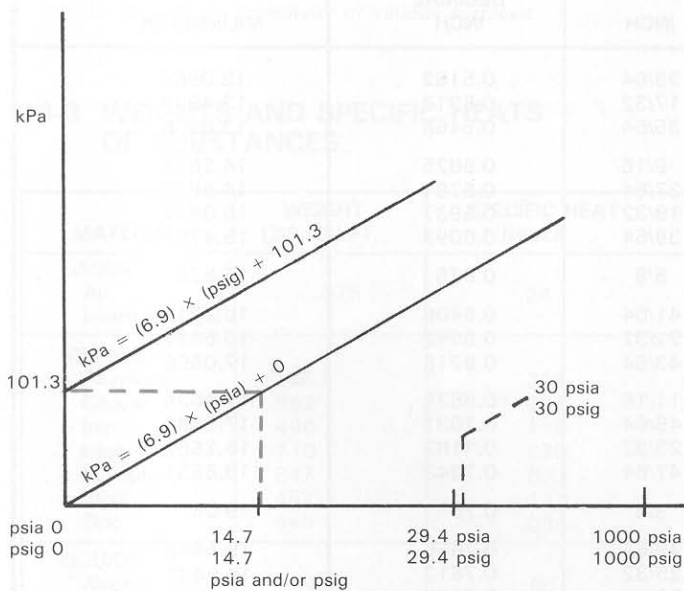


Fig. 28-3. The graph shows the following relationships: 1. Between psia and kPa (bottom graph line). 2. Between psig and kPa (top graph line). Most technicians prefer to use the lower graph line because it is simpler: it begins at zero. It is best to convert all psig readings to psia before trying to find the kPa reading.

## 28-12 VELOCITY EQUIVALENTS

|   |  |
|---|--|
| <p>1 mi./hr. = 1.47 ft./sec. = 1.61 km/hr.<br/>                     = .87 knots = .45 meters/sec.</p>                                       | <p>1 meter/sec. = 3.28 ft./sec. = 3.6 km/hr.<br/>                     = 2.24 mi./hr.<br/>                     = 1.94 knots</p> |
| <p>1 ft./sec. = .68 mi./hr. = 1.1 km/hr.<br/>                     = 60 ft./min. = .305 meters/sec.<br/>                     = .59 knots</p> | <p>1 km/hr. = .91 ft./sec. = .28 meters/sec.<br/>                     = .62 mi./hr.<br/>                     = .54 knots</p>   |

## 28-13 LIQUID MEASURE EQUIVALENTS

| Liquid Measure | U.S.                   | Metric         |
|----------------|------------------------|----------------|
| 1 pint         | = 16 ounces            | = .473 liters  |
| 1 quart        | = 2 pints              | = .946 liters  |
| 1 quart        | = 32 ounces            |                |
| 1 gallon       | = 4 quarts             | = 3.785 liters |
| 1 gallon       | = 8 pints              |                |
| 1 gallon       | = 231 cubic inches     |                |
| 1 cubic foot   | = 7.48 gallons         |                |
| 1 gallon       | = 8.34 pounds of water |                |
| 1.136 quart    |                        | = 1 liter      |

## 28-14 WEIGHT EQUIVALENTS

| AVOIRDUPOIS   |   |                                    |
|---------------|---|------------------------------------|
| 1 ounce       | = 437 grains  | = 28.35 grams<br>= .028 kilogram   |
| 1 pound (lb.) | = 7000 grains   | = .4536 kilograms<br>= 453.6 grams |
| 1 pound       | = 16 ounces   | = 453.6 grams                      |
| 1 grain       | = .000143 pounds                                      | = .064 80 grams                    |
| 1 ton         | = 2000 pounds   | = 907.2 kilograms                  |
| 1 gram        | = 15.43 grains<br>= .03527 ounces<br>= .002205 pounds | = .001 kilogram                    |
| 1 kilogram    | = 2.2 pounds  |                                    |