

glossary of terms

Engine
Products
Division





competitive

powerful diagnostics

economy electronics durability

enduring

high velocity

flexibility

innovative

leader

leadership

performance

programmability

reliable

responsive

robust

proven

serviceability

technology

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A

Abrasion – Wearing or rubbing away of a part.

Absolute Humidity – Amount of moisture in the air, indicated in grains per cubic foot.

Absolute Pressure – Gauge pressure plus atmospheric pressure (14.7 lb per in²).

Absolute Temperature – The temperature measured using absolute zero as a reference. Absolute zero is -469.69° F (-273.16° C) and is the lowest point of temperature known.

Absorber – A device containing liquid for absorbing refrigerant vapor or other vapors. In an absorption system, that part of the low side used for absorbing refrigerant vapor.

Acceleration – The rate of increase of velocity per time unit (example: feet per second).

Accumulator – A device used for storing liquid under pressure (sometimes used to smooth out pressure surges in a hydraulic system).

Active Power – The real power supplied by the generator set to the electrical load. Active power creates a load on the set's engine and is limited by the horsepower of the engine. Active power does the work of heating, turning motor shafts, etc., and is measured in watts, kilowatts, and megawatts.

Actuator – A device which uses fluid power to produce mechanical force and motion.

Additive – 1. A compound which is added to improve fuel. 2. A substance added to oil to give it certain properties. For example, a material added to engine oil to lessen its tendency to congeal or thicken at low temperatures.

Advance – To move the timing of the injection pump or injectors to an earlier injection point.

Advanced Diesel Engine Management (ADEM) – The name for current generation of the electronic engine control system.

A/F Dynamic Setting – The dynamic (engine running) setting of a device on the engine which limits the amount of fuel injected per stroke as a function of the boost.

Aftercooler – A heat exchanger inserted into the induction system of an engine after any device used to compress combustion air.

Air Bleeder – A device used to remove air from a hydraulic system. Types include a needle valve, capillary tubing to the reservoir, and a bleed plug.

Air Cleaner – A device (filter) for removing unwanted solid impurities from the air before the air enters the intake manifold.

Air Compressor – A device used to increase air pressure.

Air Conditioning – The simultaneous control of all or at least the first three of the following factors affecting the physical and chemical conditions of the atmosphere within a structure: temperature, humidity, motion, distribution, dust, bacteria, odors, toxic gases and ionization — most of which affect, in greater or lesser degree, human health or comfort.

Air Cooled Condenser – Heat of compression is transferred from condensing coils to surrounding air. This may be done either by convection or by a fan or blower.

Air Diffuser – Air distribution outlet designed to direct airflow into desired patterns.

Air-Fuel Ratio – The ratio (by weight or by volume) between fuel and air.

Air-Fuel Ratio Control (AFRC) – A feature on Cat engines which measures actual engine speed and boost pressure to reduce smoke and lower fuel consumption.

Air Gap – The distance between two components; clearance between internal rotating member and stationary outside member. Refers to gap per side.

Air Inlet Shutoff – An engine protection measure used to supplement the fuel shutoff, when blocking the air supply is the quickest way to stop the engine. Often this approach is used on larger engines when operating in combustible environments or to achieve fast shutdowns. Air shutoffs are not used for routine shutdowns.

Air Lock – The presence of air in a pump or pipes which prevents the delivery of liquid.

Air Pollution – Contamination of the earth's atmosphere by pollutants such as smoke, harmful gases, etc.

Air Return – Air returned from conditioned or refrigerated space.

Air (Saturated) – A mixture of dry air and saturated water vapor all at the same dry-bulb temperature.

Air (Specific Heat of) – The quantity of heat absorbed by a unit weight of air per unit temperature rise.

Air (Standard) – Air with a density of 0.075 lb per ft³ and an absolute viscosity of 0.0379×10^{-5} lb mass per (ft) (sec). This is substantially equivalent to dry air at 70° F and 29.92 in. Hg barometric pressure.

Air Starting Valve – A valve which admits compressed air to the air starter for starting purposes.

Air-to-Air Aftercooler (ATAAC) – A means of cooling intake air after the turbocharger, using ambient air for cooling. The intake air is passed through an aftercooler (heat exchanger) mounted in front of the radiator before going to the intake manifold.

Aldehydes – A chemical compound formed by incomplete combustion.

Align – To bring two or more components of a unit into the correct positions with respect to one another.

Allowance – The difference between the minimum and the maximum dimensions of proper functioning.

Alloy – A mixture of two or more different metals, usually to produce improved characteristics.

Alnico Magnet – A magnet composed of aluminum (Al), nickel (Ni), and cobalt (Co).

Alternating Current (AC) – An electric current that reverses its direction at regularly recurring intervals such as 50 or 60 times per second in 50 Hz and 60 Hz, respectively.

Alternating Current (AC) Metering Module – An apparatus which displays generator set volts, amps, and frequency.

Alternator – An electromechanical device which produces alternating current.

Altitude Adjustment – Adjusting refrigerator controls so unit will operate efficiently at altitude in which it is to be used.

Ambient – The surrounding atmosphere; encompassing on all sides; the environment surrounding a body but undisturbed or unaffected by it.

Ambient Temperature – Temperature of fluid (usually air) which surrounds object on all sides.

Ammeter – An instrument used to indicate, in amperes, the current flowing through the phases from a generator to the load.

Ammonia – Chemical combination of nitrogen and hydrogen (NH₃). Ammonia refrigerant is identified by R-117.

Amortisseur Windings – Apparatus formed by copper rotor end plates and damper bars to help stabilize a generator set during parallel operation.

Ampereage – A measure of the current or number of electrons passing a given point per unit of time.

Ampere (A) – A unit of measurement defined as the current that 1 V can send through 1Ω resistance.

Ampere-hour Capacity (Ah) – A measurement of the battery's capacity to deliver a specified current over a specified length of time.

Analog – A continuous performance signal representing the value of an engine performance characteristic.

Aneroid – A pressure-measuring device containing no liquid.

Angle – Inclination of two lines to each other.

Angularity – Having or being at an angle.

Anneal – To toughen metals by heating and then cooling.

Annular – In the form of an annulus; ring-shaped.

Annulus – A figure bounded by concentric circles or cylinders (e.g., a washer, ring, sleeve, etc.).

Annunciator – An alarm which produces audible and/or visual signals to give warnings of shutdown or fault conditions. Annunciators are typically used in applications where the equipment monitored is not located in a portion of the facility that is normally attended.

Anticipating Control – One which is artificially forced to cut in or cut out before it otherwise would, thus starting the cooling before needed or stopping the heating before control point is reached, to reduce the temperature fluctuation or override.

Antifreeze – A chemical such as alcohol, glycerin, etc., added to the coolant in order to lower its freezing point.

Antifriction Bearing – A bearing constructed with balls, rollers or the like between the journal and the bearing surface to provide rolling instead of sliding friction.

API Gravity – Gravity expressed in units of standard API (hydrometer).

Arc – Portion of a curved line or of the circumference of a circle.

Air Gap – The clearance between internal rotating member and stationary outside member. Refers to gap per side.

Air Welding – A method of utilizing the heat of an electric current jumping an air gap to provide heat for welding metal.

Armature – The movable part of a relay, regulator, or horn, or the rotating part of a generator or starter.

Asbestos – A heat-resistant and nonburning organic mineral.

Asphalt Epoxy – Additional protective coating on winding coil heads on the intake end of a generator.

Aspirate – To breathe (to draw out gas by suction).

Aspirating Psychrometer – A device which draws a sample of air through it for humidity measurement purposes.

Aspiration – The method used to move inlet air into the combustion chamber; e.g. Naturally Aspirated (NA), Turbocharged (T), and Turbocharged-Aftercooled (TA).

ATA Link – An analog terminal adaptor that allows a Northern Transcom Norstar digital phone system to use analog devices such as a fax, answering machine, or modem.

Atmosphere – The mass or blanket of gases surrounding the earth.

Atmospheric Pressure (Barometric Pressure) – The pressure exerted by the atmosphere, averaging 14.7 psi at sea level with a decrease of approximately 1/2 lb per 1,000 ft of altitude gained.

Atom – The smallest particle of an element.

Atomizer – A device which disperses liquid (e.g. fuel) into fine particles (pulverized spray).

Attrition – Wearing down by rubbing or by friction: abrasion.

Austempering – A method of hardening steel by quenching from the austenitizing temperature into a heat extracting medium (usually salt) which is maintained at some constant temperature level between 400° F and 800° F (usually near the higher temperature) and holding the steel in this medium until transformation is substantially complete and then cooling to room temperature.

Austenite – Solid solutions in which gamma iron is the solvent.

Automatic Defrost – System of removing ice and frost from evaporators automatically.

Automatic Expansion Valve (AEV) – Pressure controlled valve which reduces high pressure liquid refrigerant to low pressure liquid refrigerant.

Automatic Synchronizer – A magnetic-type control relay which will automatically close the generator switch/circuit breaker when the conditions for paralleling are satisfied.

Automatic Transfer Switch (ATS) – Automatically switches electrical load from the normal (or preferred) power source to an alternate supply, should normal voltage fail or be substantially reduced. It retransfers load to the normal source when voltage has been restored.

Automatic Valve – A valve assisted by a spring, which is opened by a difference of pressure acting in one direction and closed by a difference in pressure acting in the opposite direction.

Automatic Voltage Regulator – Controls the output voltage produced by a generator by controlling excitation.

Auxiliary – An aid to the main device which may only be used occasionally.

Avoided Costs – The decremental cost for the electric utility to generate or purchase electricity that is avoided through the purchase of power from a cogeneration facility.

Axial Fan – A shaft mounted fan on some designs between bearing and revolving field assembly to provide additional air movement within the unit for cooling; also used for balancing.

Avoided Cost (Regulatory) – The amount of money that an electric utility would need to spend for the next increment of electric generation production to produce or purchase elsewhere the power that it instead buys from a cogenerator or small power producer.

Azeotropic Mixture – Example of azeotropic mixture — refrigerant R-502 is mixture consisting of 48.8% refrigerant R-22, and 51.2% R-115. The refrigerants do not combine chemically, yet azeotropic mixture provides refrigerant characteristics desired.

B

Babbitt – An antifriction metal used to line bearings, thereby reducing the friction of the moving components.

Backfire – Ignition of the mixture in the intake manifold by flame from the cylinder such as might occur from a leaking inlet valve.

Backlash – The distance (play) between two movable components such as meshed gears.

Backpressure – A pressure exerted contrary to the pressure producing the main flow. Also called suction pressure or low side pressure.

Back-Up Power – Electric energy available from or to an electric utility during an unscheduled outage to replace energy ordinarily generated by the facility or the utility. Frequently referred to as standby power.

Baffle or Baffle Plate – A device which slows down or diverts the flow of gases, liquids, sound, etc.

Bainite – The structure that is obtained when steel is quenched at a constant subcritical temperature.

Balanced Valve – A valve in which the fluid pressure is equal on both sides (i.e., the opening and closing directions).

Ball Bearing – A bearing using steel balls as its rolling element between the inner and outer ring (race).

Ball Check Valve – A valve consisting of a ball held against a ground seat by a spring. It is used to check the flow or to limit the pressure.

Banded Structure – A segregated structure of nearly parallel bands which run in the direction of working.

Barometer – An instrument which measures atmospheric pressure.

Bars – The term “bars” includes rounds, squares, hexagons, etc.; small standard shapes (angles, channels, tees, etc.) under 3"; flats 6" or under in width and 13/64" or over in thickness.

Base Load – The lowest level of power production needs during a season or year.

Base Load Unit – A power generating facility that is intended to run constantly at near capacity levels, as much of the time as possible.

Base Loading – Use of on-site generating equipment to supply a set amount of power for a specific time period — usually on a daily basis.

Baseline Forecast – A prediction of future energy needs which does not take into account the likely effects of new conservation programs that have not yet been started.

Basic Size – The theoretical or nominal standard size from which all variations are made.

Battery – A connected group of cells storing an electrical charge and capable of furnishing a current from chemical reactions.

Bearing – The contacting surface on which a revolving part rests.

Bearing Clearance – The distance between the shaft and the bearing surface.

Bell Housing (Clutch Housing) – The metal covering around the clutch or torque converter assembly.

Bendix-Type Starter Drive (Inertia Starter Drive) – A type of starter drive that causes the gear to engage when the armature starts rotating and to automatically disengage when it stops.

Bernoulli's Principle – Given a fluid flowing through a tube, any constriction or narrowing of the tube will create an increase in that fluid's velocity and a decrease in pressure.

Bernoulli's Theorem – In a stream of liquid, the sum of elevation head, pressure head, and velocity remains constant along any line of flow provided no work is done by or upon the liquid in its course of flow, and decreases in proportion to energy lost in the flow.

Bessemer Process – A process for making steel by blowing air through molten pig iron contained in a suitable vessel. The process is one of rapid oxidation mainly of silicon and carbon.

Best Practice (BP) – A business idea, procedure or process which describes the method of improved efficiency and results.

Bimetal Strip – Temperature regulating or indication device which works on the principle that two dissimilar metals with unequal expansion rates, welded together, will bend as temperatures change.

Black Smoke – A soot-like substance emitted by engines resulting from incomplete combustion.

Black Start – Refers to the starting of a power system with its own power sources, without assistance from external power supplies.

Blended or Heavy Fuel – A mixture of residual fuel and a lighter fuel. This fuel type tends to create more combustion chamber deposit formations which can cause increased cylinder and ring wear, especially in smaller, higher- speed engines.

Blister – A defect in metal produced by gas bubbles either on the surface or formed beneath the surface.

Block Rate Schedules – Utility rate schedules that charge different rates for certain increments of energy consumed. For example: 3 cents for the first 1000 kW-hr, 4 cents for the next 1000 kW-hr, 5 cents for the next 1000 kW-hr, etc.

Block Wall – A concrete structure which is sometimes used to muffle the noise from an operating generator set.

Blowby – Combustion gas leakage into the engine crankcase. The leakage is normally from the combustion chamber past the piston rings or through the valve guides. Specific blowby is the volume of blowby at atmospheric pressure divided by the engine power.

Blower – A low-pressure air pump, usually of one rotary or centrifugal type.

Blowhole – A hole produced during the solidification of metal by evolved gas which, in failing to escape, is held in pockets.

Blue Brittleness – Brittleness occurring in steel when worked in the temperature range of 300-700° F or when cold after being worked within this temperature range.

Boiling Point – The temperature at which bubbles or vapors rise to the surface of a liquid and escape.

Boiling Temperature – Temperature at which a fluid changes from a liquid to a gas.

Bond – The holding together of different parts.

Boost – The gauge pressure as measured in the inlet manifold of a diesel engine. Adjusted boost is the calculated value of boost that would exist if an engine were running at nominal power. Boost is not synonymous with inlet manifold pressure.

Bore – The diameter of each cylinder in an engine.

Boring – Enlarging the cylinders by cutting or honing them to a specified size.

Boring Bar (Cylinder) – A tool used to machine the cylinders to a specific size.

Bosch Metering System – A metering system with a helical groove in the plunger which covers or uncovers ports in the pump barrel.

Bottom Dead Center (BDC) – The lowest point a piston reaches in its movement within a cylinder.

Bottoming Cycle – A means to increase the thermal efficiency of a steam electric generating system by converting some waste heat from the condenser into electricity rather than discharging all of it into the environment.

Bound Electrons – The inner-orbit electrons around the nucleus of the atom.

Boyle's Law of Physics – The absolute pressure which a given quantity of gas at constant temperature exerts against the walls of the containing vessel is inversely proportional to the volume occupied. Examples: If pressure is doubled on the quantity of gas, volume becomes one-half. If volume becomes doubled, gas has its pressure reduced by one-half.

Brake Horsepower (bhp) – A measurement of the power developed by an engine in actual operation. It subtracts the F.H.P. (friction losses) from the I.H.P. (pure horsepower).

Brake Mean Effective Pressure (BMEP) – Mean effective pressure acting on the piston which would result in the given brake horsepower output, if there were no losses due to friction, cooling, and exhaustion. Equal to mean indicated pressure times mechanical efficiency.

Brake Specific Fuel Consumption (BSFC) – The quantity of fuel burned to produce one horsepower for one hour.

Brake Thermal Efficiency – Ratio of power output in the form of brake horsepower to equivalent power input in the form of heat from fuel.

Braze – To join two pieces of metal using a comparatively high-melting-point material. An example is to join two pieces of steel by using brass or bronze as a solder.

Break-in – The process of wearing in to a desirable fit between the surfaces of two new or reconditioned parts.

Breather – A device that allows fumes to escape from the crankcase.

Breather Pipe – A pipe opening into the crankcase to assist ventilation.

Brine – Water saturated with chemical such as salt.

Brinell Hardness – The surface hardness of a metal, alloy, or similar material according to J.A. Brinell's method of measurement. A metal's surface is struck at a given force by a rigid steel ball of given diameter, and the indentation is measured.

British Gallon (Imperial Gallon, gal [Imp.]) – A gallon measurement of 277.4 in³.

British Thermal Unit (Btu) – Approximate definition: The amount of heat required to raise 1 lb of water 1° F. Exact definition: The amount of heat required to raise 1 lb. of water from freezing to boiling at standard atmospheric pressure.

Broad Voltage – A term used to denote 12-lead unit, which allows low and high voltage connections by customer.

Brownout – A controlled power reduction in which the utility decreases the voltage on the power lines, so customers receive weaker electric current.

Brush – The pieces of carbon or copper that make a sliding contact against the commutator or slip rings.

Brushless – A synchronous machine having a brushless exciter with its rotating armature and semiconductor devices on a common shaft with the field of the main machine.

Buoyancy – The upward or lifting force exerted on a body by a fluid.

Burning – The heating of a metal to temperatures sufficiently close to the melting point to cause permanent damage to the metal.

Burnish – To polish or shine a surface with a hard, smooth object.

Bursts – Ruptures made in forging or rolling.

Bus – Refers to the devices that connect the generators and loads in a paralleling system, or any point fed by multiple sources and/or supplying multiple loads.

Bus Bars – A set of common conductors on the load side of a circuit breaker used to conduct generator output to the distribution system.

Bus Capacity – The maximum load that can be carried on a system without causing degradation of the generator frequency. In other words, the full load capacity of the system.

Bushing – A metallic or synthetic lining for a hole which reduces or prevents abrasion between components.

Butane – A hydrocarbon gas formed synthetically by the action of zinc or ethyl iodide. This gas becomes a liquid when under pressure.

Butterfly Valve – A valve in the venturi to control the airflow.

Bypass Filter – An oil filter that only filters a portion of the oil flowing through the engine lubrication system.

Bypass Valve – A valve that opens when the set pressure is exceeded. This allows the fluid to pass through an alternative channel.

C

Cage – A housing in which a valve operates and seats.

Calcium Sulfate – Chemical compound (CaSO₄) which is used as a drying agent or desiccant in liquid line driers.

Calibrate – To make an adjustment to a meter or other instrument so that it will accurately indicate its input.

Bus – An electrical conductor that serves as a common connection for two or more electrical circuits.

Caliper – A tool for measuring diameter, usually having curved legs and resembling a pair of compasses.

Calorie – Heat required to raise temperature of one gram of water one degree centigrade.

Calorific Value – The amount of heat produced by burning one pound of fuel. (See *Heating Value*.)

Calorimeter – Device used to measure quantities of heat or determine specific heats.

Cam – A component of irregular shape. It is used to change the direction of the motion of another part moving against it, e.g., rotary into reciprocating or variable motion.

Cam Follower (Valve Lifter) – A part which is held in contact with the cam and to which the cam motion is imparted and transmitted to the pushrod.

Cam-Ground Piston – A piston ground to a slightly oval shape which under the heat of operation becomes round.

Cam Nose – That portion of the cam that holds the valve wide open. It is the high point of the cam.

Camshaft – The shaft containing lobes or cams to operate the engine valves.

Camshaft Gear – The gear that is fastened to the camshaft.

Capability – The maximum load which a generating unit, generating station, or other electrical apparatus can carry under specified conditions for a given period of time, without exceeding approved limits of temperature and stress.

Capacitor – An arrangement of insulated conductors and dielectrics for the accumulation of an electric charge with small voltage output.

Capacity (electric utility) – The maximum amount of electricity that a generating unit, power plant, or utility can produce under specified conditions. Capacity is measured in megawatts and is also referred to as the nameplate rating.

Capacity Credits – The value incorporated into the utility's rate for purchasing energy, based upon the savings due to the reduction or postponement of new generation capacity resulting from the purchase of power from cogenerators.

Capacity Factor – The ratio of the actual annual plant electricity output to the rated plant output.

Capacity-Net Cooling – The cooling capacity of an air-conditioning system or heat pump on the cooling cycle is the amount of Sensible and Latent heat (total heat) removed from the inside air.

Carbon – One of the nonmetallic elements constituting fuel and lubricating oil.

Carbon Dioxide (CO₂) – A “greenhouse” gas produced as a result of combustion of any hydrocarbon fueled engine, including a human. The highest efficiency engines produce the least CO₂.

Carbon Monoxide (CO) – A poisonous gas formed by combustion taking place with a shortage of oxygen. Measured in parts per million by volume.

CO Concentration (ppm) =

$$\frac{1034 \times \text{CO mass emissions (g/hr)}}{\text{Exhaust mass flow (kg/hr)}}$$

Carbon Pile – Carbon disks or plates capable of carrying high current.

Carbon Tetrachloride – A colorless liquid, the fumes of which are toxic. Used in fire extinguishers and for cleaning.

Carbonize – The process of carbon formation within an engine, such as on the spark plugs and within the combustion chamber.

Carburetor – A device for automatically mixing gasoline fuel in the proper proportion with air to produce a combustible vapor.

Carburetor “Icing” – A term used to describe the formation of ice on a carburetor throttle plate during certain atmospheric conditions.

Carburizing (cementation) – Adding carbon to the surface of iron-base alloys by heating the metal below its melting point in contact with carbonaceous solids, liquids, or gases.

Cat Data Link – A communication data link which displays status of various engine parameters on the Computerized Monitoring System.

Ceiling – The absolute maximum to which the high limit of an engine performance specification may rise.

Cementite – A compound of iron and carbon always containing 6.68% carbon and 93.32% iron.

Central Cooling – Same as central heating except that cooling (heat removal) is supplied instead of heating; usually a chilled water distribution system and return system for air conditioning.

Central Heating – Supply of thermal energy from a central plant to multiple points of end-use, usually by steam or hot water, for space and/or service water heating. Central heating may be large-scale as in plants serving central business districts, university campuses, medical centers, and military installations or in central building systems serving multiple zones; also district heating.

Cetane – Measure of ignition quality of diesel fuel — at what pressure and temperature the fuel will ignite and burn.

Chamfer – A bevel or taper at the edge of a hole.

Charge Air Cooler (CAC) – An air-to-air or water-to-air heat exchanger to cool turbocharged combustion air.

Chase – To straighten up or repair damaged threads.

Choke – A device such as a valve placed in a carburetor air inlet to restrict the volume of air admitted.

Circuit – The complete path of an electric current including, usually, the source of electrical energy.

Circuit Breaker – A device used to open and close a circuit by nonautomatic means, and to open the circuit automatically on a predetermined overload of current.

Closing Rating – The maximum fault current into which an automatic transfer switch of a generator set can close.

Coefficient of Expansion – The change in length per unit length or the change in volume per unit volume per degree change in temperature.

Coefficient of Performance (COP) – The ratio of the rate of heat removal to the rate of energy input in consistent units.

Cogeneration – Utilizing a prime power generator set, this process involves harnessing “free” heat energy from engine cooling and exhaust systems for heating or steam generation, or to power air conditioning, absorption chillers, or other equipment.

Cohesive Strength – The strength property of a metal that resists the tensile, disruptive stress across a plane at right angles to the load applied.

Coil Spring – A spring-steel wire wound in a spiral pattern.

Coil Wedge – A mechanical device which prevents coil bundle from coming out of rev. field slot passage during rotation of rev. field. Two types: expansion wedges — 360, 440, and 580, 680 frames; compression wedges — 800 frame.

Cold – Cold is the absence of heat; a temperature considerably below normal.

Cold Drawing – The process for finishing a hot rolled rod or bar at room temperature by pulling it through the hole of a die of the same shape but smaller in size.

Cold Finishing – The process of reducing the cross sectional area without heating by cold rolling, cold drawing, cold drawing and grinding, turning and polishing, or turning and grinding.

Cold Rolling – The cold working of hot rolled material by passing it between power-driven rolls. The process applies to flat bars of such a size that they cannot be pulled through a die.

Cold Working – Plastic deformation of a metal at a temperature low enough to ensure strain hardening.

Color Code – Colored markings or wires to identify the different circuits.

Combustion – The process of burning.

Combustion Chamber – The chamber in reciprocating engines between the cylinder head and piston, in which combustion occurs.

Combustion-Chamber Volume – The volume of the combustion chamber (when the piston is at TDC) measured in cubic centimeters.

Combustion Cycle – A series of thermodynamic processes through which the working gas passes to produce one power stroke. The cycle is: intake, compression, power, and exhaust.

Comfort Air-Conditioning – A simultaneous control of all, or at least the first three, of the following factors affecting the physical and chemical conditions of the atmosphere within a structure of the purpose of human comfort; temperature, humidity, motion, distribution, dust, bacteria, odors, toxic gases, and ionization, most of which affect in greater or lesser degree human health or comfort.

Commercial Engine Featurization (CEF) – A feature-based business process used by Caterpillar dealers that describes product in customer terms (feature codes), eliminating internal Caterpillar terms (part numbers). For the dealer, it impacts the configuring, quoting and ordering processes. Internally, at Caterpillar, it is incorporated into Marketing, Orders, Pricing, and Accounting. CEF includes: 1) part numbers changed to feature codes, 2) feature codes priced instead of part numbers, 3) PC software that mechanically checks product compatibility, 4) weekly updates to compatibility and pricing via the Internet, 5) electronic ordering via Internet or DBS.

Commutator – A number of copper bars connected to the armature windings but insulated from each other and from the armature. Rotation of the armature will, in conjunction with fixed brushes, result in unidirectional current output.

Compound – A combination of two or more elements that are mixed together.

Compressed Air – Air that at any pressure in excess of atmospheric pressure is considered to be compressed.

Compressibility – The property of a substance (e.g., air) by virtue of which its density increases with increase in pressure.

Compression – The process by which a confined gas is reduced in volume through the application of pressure.

Compression Check – A measurement of the compression of each cylinder at cranking speed or as recommended by the manufacturer.

Compression Gauge – A test instrument used to test the cylinder compression.

Compression Ignition – The ignition of fuel through the heat of compression.

Compression Pressure – Pressure in the combustion chamber at the end of the compression stroke, but without any of the fuel being burned.

Compression Ratio – Compares the minimum and maximum volumes between the piston crown and the cylinder head.

Compression Release – A device to prevent the intake or exhaust valves from closing completely, thereby permitting the engine to be turned over without compression.

Compression Ring – The piston rings used to reduce combustion leakage to a minimum.

Compression Stroke – That stroke of the operating cycle during which air is compressed into a smaller space, creating heat by molecular action.

Compressor – A mechanical device to pump air, and thereby increase the pressure. The pump of a refrigerating mechanism which draws a vacuum or low pressure on cooling side of refrigerant cycle and squeezes or compresses the gas into the high pressure or condensing side of the cycle.

Compressor-Brake Horsepower – A function of the power input to the ideal compressor and to the compression, mechanical, and volumetric efficiency of the compressor.

Compressor Efficiency – A measure of the deviation of the actual compression from the perfect compression cycle. Is defined as the work done within the cylinders.

Compressor, Hermetic – Compressor in which the driving motor is sealed in the same dome or housing that contains the compressor.

Compressor, Open-Type – Compressor in which the crankshaft extends through the crankcase and is driven by an outside motor.

Compressor Outlet Pressure – Gauge pressure of the combustion air at the turbocharger compressor outlet of a spark ignited engine.

Compressor, Reciprocation – Compressor which uses a piston and cylinder mechanism to provide pumping action.

Compressor, Rotary – Compressor which uses vanes, eccentric mechanisms, or other rotating devices to provide pumping action.

Computerized Monitoring System (CMS) – An electronic display for marine or industrial engines to display engine parameters and diagnostics.

Concentric – Having the same center.

Conceptual Design – The specification of the major components of a system and their operating characteristics, layout, space needs, and operating and maintenance requirements.

Condensate – Fluid which forms on an evaporator.

Condensate Pump – Device used to remove fluid condensate that collects beneath an evaporator.

Condensation – Liquid or droplets which form when a gas or vapor is cooled below its dew point.

Condense – Action of changing a gas or vapor to a liquid.

Condenser, Air-Cooled – A heat exchanger which transfers heat to surrounding air.

Condenser, Electrical – An arrangement of insulated conductors and dielectrics for the accumulation of an electric charge.

Condenser, Evaporative – A condenser in which heat is absorbed from the surface by the evaporation of water sprayed or flooded over the surface.

Condenser, Thermal – The part of a refrigeration mechanism which receives hot, high pressure refrigerant gas from the compressor and cools gaseous refrigerant until it returns to liquid state.

Condenser, Water-Cooled – Heat exchanger which is designed to transfer heat from hot gaseous refrigerant to water.

Condensing Unit – The part of the refrigerating mechanism which pumps vaporized refrigerant from the evaporator, compresses it, liquifies it in the condenser, and returns the liquid refrigerant to refrigerant control.

Conduction, Thermal – The process of heat transfer through a material medium in which kinetic energy is transmitted by the particles of the material from particle to particle without gross displacement of the particles.

Conductivity, Thermal – “k” factor — The time rate of heat flow through unit area of a homogeneous material under steady conditions when a unit temperature gradient is maintained in the direction perpendicular to the area. In English units its value is usually expressed in Btu per (hour) (square foot) (Fahrenheit degree per inch of thickness). Materials are considered homogeneous when the value of “k” is not affected by variation in thickness or in size of sample within the range normally used in construction.

Conductor – Any material whose properties allow electrons to move with relative ease. Typical examples are copper and aluminum.

Connecting Rod – A reciprocating rod connecting the crankshaft and piston in an engine.

Conservation – Steps taken to cause less energy to be used than would otherwise be the case.

Constant-pressure Combustion – Combustion which occurs without a change in pressure. In an engine, this is obtained by a slower rate of burning than with constant-volume combustion.

Contaminant – A substance (dirt, moisture, etc.) foreign to refrigerant or refrigerant oil in system.

Contamination – The presence of harmful foreign matter in a fluid or in air.

Continuous Cycle Absorption System – System which has a continuous flow of energy input.

Continuous Power – Output available without varying load for an unlimited time. Continuous power in accordance with ISO8528, ISO3046/1, AS2789, DIN6271, and BS5514.

Contour – Outline.

Contract – To reduce in mass or dimension; to make smaller.

Control – To regulate or govern the function of a unit.

Control Voltage Terminal Strip – Strips provided to allow easy customer connections of generator sets to regulators, space heaters, or other devices.

Controlled Port Scavenging – Scavenging method using ports which are controlled by valves in addition to the power piston.

Convection – Transfer of heat by means of movement or flow of a fluid or gas.

Convection, Forced – Transfer of heat resulting from forced movement of liquid or gas by means of fan or pump.

Convection, Natural – Circulation of a gas or liquid due to the difference in density resulting from temperature difference.

Conventional – According to the most common or usual mode.

Converge – To incline to or approach a certain point; to come together.

Converter – As used in connection with LP gas, a device which converts or changes LP gas from a liquid to a vapor for use by the engine.

Convolution – One full turn of a screw.

Coolant – A liquid used as a cooling medium.

Cooling Load – The rate of heat removed from the chilled water passing through the evaporator — measured in tons.

Cooling System – The complete system for circulating coolant.

Cooling Tower – Device which cools water by water evaporation in air. Water is cooled to wet bulb temperature of air.

Cooperative (electric utility) – A joint venture organized by consumers to make electric utility service available in their area.

Coproduction – The conversion of energy from a fuel (possibly including solid or other wastes) into shaft power (which may be used to generate electricity) and a second or additional useful form. The process may entail a series topping and bottoming arrangement for conversion to shaft power and either process or space heating. Cogeneration is a form of coproduction; however, the concept also includes a single heat producer serving several different mechanical and/or thermal requirements in parallel.

Core – The central or innermost part of an object.

Correction Factor – A number by which an engine performance characteristic is multiplied to show the value which would have been obtained if the engine were operating under some other set of conditions.

Corrosion – The slow destruction of material by chemical agents and electromechanical reactions.

Counterbalance – A weight, usually attached to a moving component, that balances another weight.

Counterbore – A cylindrical enlargement of the end of a cylinder bore or bore hole.

Counterelectromotive Force (cemf) – The electromotive force (voltage) that opposes the applied voltage.

Countersink – To cut or shape a depression in an object so that the head of a screw may set flush or below the surface.

Counterweight – Weights that are mounted on the crankshaft opposite each crank throw. These reduce the vibration caused by putting the crank in practical balance and also reduce bearing loads due to inertia of moving parts.

Coupling – A device used to connect two components.

Crankcase – The lower housing in which the crankshaft and many other parts of the engine operate.

Crankcase Dilution – When unburned fuel finds its way past the piston rings into the crankcase oil, where it dilutes or “thins” the engine lubricating oil.

Crankcase Scavenging – Scavenging method using the pumping action of the power piston in the crankcase to pump scavenging air.

Cranking – Rotating an engine with a source of power external to the engine.

Crankpin – The portion of the crank throw attached to the connecting rod.

Crankshaft – The main drive shaft of an engine which takes reciprocating motion and converts it to rotary motion.

Crankshaft Counter-Balance – A series of weights attached to or forged integrally with the crankshaft to offset the reciprocating weight of each piston and rod.

Crank Throw – One crankpin with its two webs (the amount of offset of the rod journal).

Crank Web – The portion of the crank throw between the crankpin and main journal. This makes up the offset.

Crest – The top surface joining the two sides of a thread.

Crest Clearance – Defined on a screw form as the space between the top of a thread and the root of its mating thread.

Critical Compression Ratio – Lowest compression ratio at which any particular fuel will ignite by compression under prescribed test procedure. The lower the critical compression ratio the better ignition qualities the fuel has. (Gasoline engine, 4:1; oil engine, 7:1; diesel engine, 12.5:1.)

Critical Pressure – Condition of refrigerant at which liquid and gas have the same properties.

Critical Speeds – Speeds at which the frequency of the power strokes synchronize with the crankshaft’s natural frequency or torsional damper. If the engine is operated at one of its critical speeds for any length of time, a broken crankshaft may result.

Critical Temperature – Temperature at which vapor and liquid have the same properties.

Crocus Cloth – A very fine abrasive polishing cloth.

Cross Current Compensating Transformer – A unit which senses circulating currents between generators in parallel operation.

Cross Current Compensation – Method of controlling the reactive power supplied by generators in a paralleling system so that they equally share the total reactive load on the bus, without significant voltage droop.

Crowned – A very slight curve in a surface (e.g. on a roller or raceway).

Crude Oil – Petroleum as it comes from the well (unrefined).

Crush – A deliberate distortion of an engine's bearing shell to hold it in place during operation.

Cryogenic Fluid – Substance which exists as a liquid or gas at ultra-low temperatures (-250° F or lower).

Cryogenics – Refrigeration which deals with producing temperatures at -250° F and lower.

Current – A flow of electric charge and the rate of such a flow measured in amperes.

Current Transformer – An auxiliary instrument used to reduce generator current to that of the instruments and apparatus. Current transformers are used to step down the higher line current to the lower currents that the control system is designed for. These signals are utilized by AC meters, protective relays, and control devices.

Custom Alarm Module (CAM) – A Cat unit which provides flexible annunciation capabilities for engines.

Customer Communication Module (CCM) – Apparatus which allows users of electronic engines to monitor up to eight Cat power systems remotely, perform system diagnostics, and receive parameter readouts in real time.

Customer Interface Module (CIM) – A device which decodes Cat electronic engine monitoring information and provides a link to remote alarms and annunciators.

Cut-In – Temperature or pressure valve which closes control circuit.

Cut-Out – Temperature or pressure valve which opens the control circuit.

Cyaniding – Surface hardening by carbon and nitrogen absorption of an iron-base alloy article or portion of it by heating at a suitable temperature in contact with a cyanide salt, followed by quenching.

Cycle – One complete rise and fall of the voltage of alternating current, from zero to maximum positive/back to zero and from zero to maximum negative and back to zero again.

Cyclic – Variation in the performance characteristics which vary as the engine runs; especially, but not exclusively, those characteristics which vary in a repetitive fashion.

Cyclic Irregularity – A nondimensional ratio describing the degree of crankshaft twist occurring between two successive firings of cylinders of an engine during steady-state operation.

$$\text{Cyclic Irregularity} = \frac{\text{rpm (maximum)} - \text{rpm (minimum)}}{\text{rpm (average)}}$$

Cylinder – The chamber in which a piston moves in a reciprocating engine.

Cylinder Block – The largest single part of an engine. The basic or main mass of metal in which the cylinders are bored or placed.

Cylinder Head – The replaceable portion of the engine fastened securely to the cylinder block that seals the cylinder at the top. It often contains the valves, and in some cases, it is part of the combustion chamber.

Cylinder Hone – A tool used to bring the diameter of a cylinder to specification and at the same time smooth its surface.

Cylinder Liner – A sleeve or tube interposed between the piston and the cylinder wall or cylinder block to provide a readily renewable wearing surface for the cylinder.

Cylinder, Refrigerant – Cylinder in which refrigerant is purchased and dispensed. The color code painted on cylinder indicates the kind of refrigerant the cylinder contains.

D

D – Diode; Distance from plane of reference to assembled unit center of gravity location

D1 – Distance from plane of reference aft to generator center of gravity

D2 – Distance from plane of reference forward to engine center

Dalton's Law – Vapor pressure exerted on container by a mixture of gasses is equal to sum of individual vapor pressures of gasses contained in mixture.

Dead Bus – The de-energized state of the power connections between outputs of paralleled generator sets.

Dead Center – Either of the two positions when the crank and connecting rod are in a straight line at the end of the stroke.

Dead Front – A term to used to describe the lack of accessibility of bare connections or apparatus on the panel face of controls or switchgear.

Dealer Process Improvement (DPI) – A three-part strategy that provides the format for dealers to identify, develop, and incorporate process improvements in their business operations.

Decarburization – The removal of carbon (usually refers to the surface of solid steel) by the (normally oxidizing) action of media which react with carbon.

Deceleration – Opposite of acceleration; that is, implying a slowing down instead of a speeding up. Also called *negative acceleration*.

Decibel – Unit used for measuring relative loudness of sounds. One decibel is equal to the approximate difference of loudness ordinarily detectable by the human ear, the range of which is about 103 decibels on a scale beginning with one for faintest audible sound.

Deferrable or Scheduled Loads – Loads which can be disconnected for extended periods of time and restarted later without a great effect on a facility's operation. Delaying energy use to a time of lower demand is effective in minimizing peak demand.

Deflection – Bending or movement away from the normal position, due to loading.

Deglazer – A tool used to remove the glaze from cylinder walls.

Degree, Circle – 1/360 of a circle.

Degree-Day – Unit that represents one degree of difference from given point in average outdoor temperature of one day and is often used in estimating fuel requirements for a building. Degree-days are based on average temperature over a 24-hour period. As an example, if an average temperature for a day is 50° F, the number of degree-day for that day would be equal to 65° F minus 50° F or 15 degree-days (65-15 = 50) Degree-days are useful when calculating requirements for heating purposes.

Degree Wheel – A wheel marked in degrees to set the lifter height.

Dehumidifier – Device used to remove moisture from air in enclosed space.

Dehumidifier, Surface – An air-conditioning unit, designed primarily for cooling and dehumidifying air through the action of passing the air over wet cooling coils.

Dehumidify – To remove water vapor from the atmosphere. To remove water or liquid from stored goods.

Dehumidifying Effect – The difference between the moisture contents, in pounds per hour, of the entering and leaving air, multiplied by 1.060.

Dehydrate – To remove water in all forms from matter. Liquid water, hygroscopic water, and water of crystallization or water of hydration are included.

Dehydrated Oil – Lubricant which has had most of water content removed (a dry oil).

Dehydration – The removal of water vapor from air by the use of absorbing or absorbing materials; the removal of water from stored goods.

Delta Connection – The connection of the three windings of a generator into a triangular or delta configuration. Most commonly used by utility companies. Has no neutral point.

Delta-T – The temperature rise of the engine coolant from the jacket water pump inlet to the engine coolant outlet.

Demand (Utility) – The level at which electricity or natural gas is delivered to users at a given point in time. Electric demand is expressed in kilowatts.

Demand, Annual – The greatest of all demands which occurred during a prescribed demand interval in a calendar year.

Demand, Billing – The demand upon which billing to a customer is based, as specified in a rate schedule or contract. It may be based on the contract year, a contract minimum, or a previous maximum and, therefore, does not necessarily equal the demand actually measured during the billing period.

Demand Charge – The sum to be paid by a large electricity consumer for its peak usage level.

Demand, Coincident – The sum of two or more demands which occur in the same demand interval.

Demand, Instantaneous Peak – The maximum demand at the instant of greatest load.

Dendrites – A crystal formed by solidification, or in any other way, having many branches and a tree-like pattern; also termed “pine tree” and “fir tree” crystals.

Density (Fuel) – The mass of fuel per unit volume. The units of density used in this specification are degrees API at 60 degrees Fahrenheit. (API = American Petroleum Institute)

Depth of Engagement – The depth of a thread in contact with two mating parts measured radially. It is the radial distance by which their thread forms overlap each other.

Desiccant – Substance used to collect and hold moisture in a refrigerating system. A drying agent. Common desiccants are activated alumina, silica gel.

Design Voltage – The nominal voltage for which a line or piece of equipment is designed. This is a reference level of voltage for identification and not necessarily the precise level at which it operates.

Detergent – A compound of a soap-like nature used in engine oil to remove engine deposits and hold them in suspension in the oil.

Detonation – Burning of a portion of the fuel in the combustion chamber at a rate faster than desired (knocking).

Dew Point – Temperature at which vapor (at 100 percent humidity) begins to condense and deposit as liquid.

Diagnosis – In engine service, the use of instruments to troubleshoot the engine parts to locate the cause of a failure.

Dial Indicator (dial gauge) – A precision measuring instrument.

Diaphragm – Any flexible dividing partition separating two compartments.

Dichlorodifluoromethane – Refrigerant commonly known as R-12. Chemical formula is CCl_2F_2 . Cylinder color code is white. Boiling point at atmospheric pressure is -21.62°F .

Die, Thread – A thread-cutting tool.

Dielectric – A nonconductor of direct electric current.

Diesel Engine – A type of internal combustion engine that burns fuel oil; the ignition is brought about by heat resulting from air compression, instead of by an electric spark, as in a gasoline engine.

Diesel Index – A rating of fuel according to its ignition qualities. The higher the diesel index number, the better the ignition quality of the fuel.

Differential – As applied to refrigeration and heating, the difference between cut-in and cut-out temperature or pressure of a control.

Differential Fuel Pressure – The gas pressure supplied to the carburetor of a spark ignited engine minus the carburetor inlet pressure.

Differential Pressure Fuel Valve – A closed fuel valve with a needle or spindle valve which seats onto the inner side of the orifices. The valve is lifted by fuel pressure.

Differential Protection (Line) – Leads pass through current transformers for the purpose of sensing current imbalance between line-leads.

Digital – A numeric value representing the value of an engine performance characteristic.

Digital Voltage Regulator (D.V.R.) – A microprocessor-based unit which regulates voltage output of a generator.

Dilution – Thinning, such as when fuel mixes with the lubricant.

Diode – A device which allows current to pass but only in one direction.

Dip and Bake – The process of treating a wound electrical element with varnish to provide protection/insulation, and to secure the winding insulation in place.

Dipstick – A device to measure the quantity of oil in the reservoir.

Direct Current (DC) – An electric current flowing in one direction only.

Direct Expansion Evaporator – An evaporator coil using a pressure-reducing device to supply liquid refrigerant at the correct boiling point for heat absorption into the refrigerant.

Direct-cooled Piston – A piston which is cooled by the internal circulation of a liquid.

Directional Control Valve – A valve which selectively directs or prevents flow to or from specific channels. Also referred to as *selector valve, control valve, or transfer valve*.

Discharge – A draw of current from the battery.

Displacement or Swept Volume – In a single-acting engine, the volume swept by all pistons in making one stroke each. The displacement on one cylinder in cubic inches is the circular area (in square inches) times the stroke (in inches) times the number of cylinders.

Distillation – Heating a liquid and then condensing the vapors given off by the heating process.

Distilling Apparatus – Fluid reclaiming device used to reclaim used refrigerants. Reclaiming is usually done by vaporizing and then recondensing refrigerant.

Distortion – A warpage or change in form from the original shape.

Distribution Circuit Breaker – A device used for overload and short circuit protection of loads connected to a main distribution device.

Distribution Switchgear – May include automatic transfer switches, circuit breakers, fusible switches, or molded case breakers. This equipment distributes utility or generator power to the site electrical loads.

Division Plate – A diaphragm surrounding the piston rod of a crosshead-type engine, usually having a wiper ring to remove excess oil from the piston rod as it slides through. It separates the crankcase from the lower end of the cylinder.

Dog-Leg – A colloquialism applied to the shape of a torque curve which has been modified to provide a steep torque rise at a speed just above the full load point to prevent excessive shifting of transmissions.

Double Acting – An actuator producing work in both directions.

Double Flare – A flared end of the tubing having two wall thicknesses.

Dowel – A pin, usually of circular shape like a cylinder, used to pin or fasten something in position temporarily or permanently.

Down-Draft – A type of carburetor in which the fuel-air mixture flows downward to the engine.

Draw-Out Relay – An AC protective relay that is door mounted, and can be removed from its case without disturbing the wiring to the case, or interrupting the connected circuits. This allows for easy testing and calibration of the relay.

Draw-Out Unit – A structure that holds a circuit breaker in an enclosure. It has a movable carriage and contact structures that permit the breaker to be removed from the enclosure without manually disconnecting power cables and control wires.

Drawbar Horsepower – Measure of the pulling power of a machine at the drawbar hitch point.

Dribbling – Unatomized fuel running from the fuel nozzle.

Drier – A substance or device used to remove moisture from a refrigeration system.

Drill – A tool used to bore holes.

Drill Press – A fixed machine to drive a tool in rotary motion.

Drive Flange – Presses on shaft of revolving field rabbit pilot and mounting bolt pattern for mounting to engine drive discs.

Drive-fit – A fit between two components, whose tolerance is so small that the two parts must be pressed or driven together.

Droop Load Sharing – A method of making two or more parallel generator sets share a system kW load. This is accomplished by having each governor control adjusted so that the sets have the same droop (reduction of speed).

Droop (or Speed Droop) – The decrease from no load speed to full load speed when full load is applied to a generator set, expressed as a percentage of the full load speed.

Droop Transfer – A small transformer provided for mounting current flow through output line leads. A loop of one or two turns of one of the line leads passes through the coil/ plane of the transformer to produce sensing.

Drop-forged – Formed by hammering or forced into shape by heat.

Dry Bulb – An instrument with a sensitive element which measures ambient (moving) air temperature.

Dry Bulb Temperature – Air temperature as indicated by an ordinary thermometer.

Dry Cell, Dry Battery – A battery that uses no liquid electrolyte.

Dry-Charged Battery – A battery in a precharged state but without electrolyte. The electrolyte is added when the battery is to be placed in service.

Dry Sleeve – A cylinder sleeve (liner) where the sleeve is supported over its entire length. The coolant does not touch the sleeve itself.

Dual Element (DE) – Number of elements in an assembly, especially filters.

Dual Fuel – A term used to describe an engine which starts on one type of fuel and runs on another type.

Dual Service – Utilizing a prime power generator set for a regular, but noncritical load. When a utility outage occurs, the unit automatically switches to provide emergency power immediately.

Dual Valves – Refers to cylinders having two valves performing one function, e.g. two intake valves, two exhaust valves.

Dual Voltage – The term used to denote 10-lead machine — 240/480, 300/600.

Ductility – The ability of a metal to withstand plastic deformation without rupture.

Dynamic Balance – Condition when the weight mass of a revolving object is in the same plane as the centerline of the object.

Dynamic Pressure – The pressure of a fluid resulting from its motion, equal to one-half the fluid density times the fluid velocity squared. In incompressible flow, dynamic pressure is the difference between total pressure and static pressure.

Dynamometer – A device for absorbing the power output of an engine and measuring torque or horsepower so that it can be computed into brake horsepower.

E

Ebullient Cooled Engine – An engine cooled by boiling water. The cooling is accomplished by turning water into steam. The latent heat of evaporation absorbed in this process cools the engine.

Ebullient System – A type of high temperature heat recovery system. Also known as solid water system.

Eccentric – One circle within another circle but with different center of rotation. An example of this is a driving cam on a camshaft.

Economizer – A device installed in a carburetor to control the amount of fuel used under certain conditions.

Edge Filter – A filter which passes liquid between narrowly separated disks or wires.

Efficiency – In general, the proportion of energy going into a machine which comes out in the desired form, or the proportion of the ideal which is realized.

Elapsed Time Meter – Totals the hours of generator set operation.

Elastic Limit – The greatest stress which a material is capable of developing without a permanent deformation remaining upon complete release of the stress.

Electric Power Generation (EPG) – Producing energy through the use of a generator set.

Electric Power Generation Designer (EPG Designer) – A Cat software program which guides Cat dealers and consulting engineers through “specing” and installing generator set packages.

Electrical Operator – The electric motor-driven closing and tripping (opening) devices that permit remote control of a circuit breaker.

Electrolyte – A solution of sulfuric acid and water.

Electromotive Force (emf) – Forces that move or tend to move electricity.

Electronic Control Analyzer Programmer (ECAP) – An electronic service tool developed by Caterpillar used for programming and diagnosing a variety of Caterpillar electronic controls using a data link.

Electronic Control Module (ECM) – The engine control computer that provides power to the truck engine electronics. It accepts inputs that monitor and outputs that control or change to act as a governor to control engine rpm.

Electronic Modular Control Panel (EMCP) – A microprocessor-based feature on all Cat generator sets which provides improved reliability through precise engine control.

Electronic Technician (ET) – A software program to run on a service tool like a personal computer (PC). This program will supplement and eventually replace ECAP.

Element, Battery – A group of plates — negative and positive.

Elongation – The amount of permanent extension in the vicinity of the fracture in the tension test, usually expressed as a percentage of the original gauge length, such as 25 percent in two inches.

Embedded Stator Temperature Detector – Thermocouple embedded in a generator’s stator winding.

Emergency System – Independent power generation equipment that is legally required to feed equipment or systems whose failure may present a hazard to persons or property.

Emission Standard – The maximum amount of a pollutant legally permitted to be discharged from a single source.

Emissions – The gaseous products emitted in engine exhaust.

Emulsify – To suspend oil in water in a mixture where the two do not easily separate.

Encapsulation – An impervious material to surround and protect an item from the environment.

End Mounted Terminal Box (EMTB) – The latest design on very large generators; 580, 680, and 800 frames; for covering customer line lead connections (bus bars or circuit breakers) and regulator assemblies.

End Play – The amount of axial movement in a shaft that is due to clearance in the bearings or bushings.

Endurance Limit – A limiting stress, below which metal will withstand without fracture an indefinitely large number of cycles of stress.

Energize – To make active.

Energized Systems – A system under load (supplying energy to load) or carrying rated voltage and frequency, but not supplying load.

Energy – Capacity for doing work.

Energy Charge – That portion of the billed charge for electric service based upon the electric energy (kilowatt-hours) supplied, as contrasted with the demand charge.

Energy Consumption – The amount of energy consumed in the form in which it is acquired by the user (excluding electrical generation and distribution losses).

Energy Efficiency Ratio (EER) – The heat transfer ability of the refrigeration system, expressed in Btu/h, compared to watts of electrical energy necessary to accomplish the heat transfer. This comparison is expressed in Btu/h/Watt of electrical energy.

Engine – The prime source of power generation used to propel the machine.

Engine Coolant Level – On the EMS II module, a flashing red light and horn annunciate when a customer-provided coolant level switch is activated. This information is provided to EMS II directly and then sent on the datalink. In the event that coolant level input is not provided, the input will be shorted on the terminal strip.

Engine Displacement – The volume each piston displaces when it moves from BDC to TDC times the number of cylinders. (*Also see Displacement.*)

Engine Investment Analysis – A Cat service to aid potential buyers in the decision making process, through qualifying fuel savings and calculating return on investment.

Engine Load – The engine power is determined as a function of manifold pressure and speed from dynamometer test data.

Engine Monitoring System (EMS) – An electronic display for marine or industrial engines to display engine parameters and diagnostics.

Engine Mounting Ring – A rabbet fit ring with mounting holes on end of the stator frame for engine mounting.

Enthalpy – Total amount of heat in one pound of a substance calculated from accepted temperature base. Temperature of 32° F is the accepted base for water vapor calculation. For refrigerator calculations, the accepted base is -40° F.

Environmental Protection Agency (EPA) – A Federal agency.

Erode – To wear away.

Etching – A process which determines the structure and defects in metals.

Ether – A volatile, colorless, and highly flammable chemical compound which is used as a starting aid.

Ethylene Glycol – A compound added to the cooling system to reduce the freezing point.

Eutectoid – Nearly all iron contains some carbon. In annealed steel, iron carbide mixes with iron (ferrite) in alternate thin layers and is called pearlite. As the carbon content increases, it causes an increase in pearlite and a decrease in ferrite. At the point of increase where all the ferrite is in combination with carbon, the structure will be entirely of pearlite. This is called the eutectoid, and the structure is the eutectoid composition.

Evaporation – The process of changing from a liquid to a vapor, such as boiling water to produce steam. Evaporation is the opposite of condensation.

Evaporative Cooling System – A cooling system in which the heat finally passes to the atmosphere by evaporation. This system may be either open or closed.

Evaporator – Part of a refrigerating mechanism in which the refrigerant vaporizes and absorbs heat.

Evaporator, Dry Type – An evaporator into which refrigerant is fed from a pressure reducing device. Little or no liquid refrigerant collects in the evaporator.

Evaporator, Flooded – An evaporator containing liquid refrigerant at all times.

Excess Air – Air present in the cylinder over and above that which is theoretically necessary to burn the fuel.

Excess Oxygen – The amount of free oxygen in the products of combustion. It may be expressed as a percentage of either volume or mass.

Excitation – The power required to energize the magnetic field of generators in an electric generating station.

Excitation Current – Amperage required by the exciter to produce a magnetic field.

Excite – To pass current through a coil or starter.

Exciter – A generator or static rectifier assembly that supplies the electric current used to produce the magnetic field in another generator.

Exhaust – Air removed deliberately from a space by fan or other means, usually to remove contaminants from a location near their source.

Exhaust Analyzer (Smoke Meter) – A test instrument used to measure the density of the exhaust smoke to determine the combustion efficiency.

Exhaust Fan – Normally shipped with MCE generators, designed to mount on engine drive disc to run inside of generator exhaust opening.

Exhaust Gas – The products of combustion in an internal-combustion engine.

Exhaust Gas Analyzer – An instrument for determining the efficiency with which an engine is burning fuel.

Exhaust Manifold – The passages from the engine cylinders to the muffler which conduct the exhaust gases away from the engine.

Exhaust Port – The opening through which exhaust gas passes from the cylinder to the manifold.

Exhaust Valve – The valve which, when opened, allows the exhaust gas to leave the cylinder.

Expansion – An increase in size. For example, when a metal rod is heated it increases in length and perhaps also in diameter. Expansion is the opposite of contraction.

Expansion Ratio – Ratio of the total volume when the piston is at BDC to the clearance volume when the piston is at TCD. (Nominally equal to compression ratio.)

Expansion Valve – A device in a refrigerating system which maintains a pressure difference between the high side and low side and is operating by pressure.

Extended Service Coverage (ESC) – A Cat service offering maintenance and or repair (up to five years) beyond that offered in a particular product's warranty.

Eye Bolt – A bolt threaded at one end and bent to a loop at the other end.

F

Fahrenheit (°F) – A designated temperature scale in which the freezing temperature of water is 32° F and boiling point 212° F (when under standard atmospheric pressure).

Fatigue – Deterioration of material caused by constant use.

Fault – (1) The failure of an operating piece of equipment, and the specific reason for the failure, or (2) an electrical distribution system failure, where there is a line-to-ground or line-to-line short circuit.

Federal Energy Regulatory Commission (FERC) – An independent regulatory commission within the U.S. Department of Energy that has jurisdiction over energy producers that sell or transport fuels for resale in interstate commerce; the authority to set oil and gas pipeline transportation rates and to set the value of oil and gas pipelines for ratemaking purposes; and regulates wholesale electric rates and hydroelectric plant licenses.

Feeder – An electric line for supplying electric energy within an electric service area or subarea.

Feeler Gauge – A strip of steel ground to a precise thickness used to check clearance.

Feature Based Ordering (FBO) – Use of feature codes instead of part numbers to describe/order product.

Feature Code – A functional characteristic of a product described in customer terms.

Ferrite – Solid solutions in which alpha iron (or delta iron) is the solvent.

Field – A space or region where magnetism exists.

Field Coil – An insulated wire wound around an (iron) pole piece.

Fillet – A curved joint between two straight surfaces.

Filter: Oil, Water, Gasoline, etc. – A unit containing an element, such as a screen of varying degrees of fineness. The screen or filtering element is made of various materials depending upon the size of the foreign particles to be eliminated from the fluid being filtered.

Fin (Flash) – A thin fin of metal formed at the sides of a forging or weld where a small portion of the metal is forced out between the edges of the forging or welding dies.

Finishing Stone (hone) – A honing stone with a fine grid.

Fire Point – Lowest temperature at which an oil heated in standard apparatus will ignite and continue to burn.

Firing Order – The order in which the cylinders deliver their power stroke.

Firing Pressure – The highest pressure reached in the cylinder during combustion.

Firm Energy – Power supplies that are guaranteed to be delivered under terms defined by contract.

Fit – The closeness of contact between machined components.

Fixed Displacement Pump – A type of pump in which the volume of fluid per cycle cannot be varied.

Flake – Internal fissures in large steel forgings or massive rolled shapes. In a fractured surface or test piece, they appear as sizeable areas of silvery brightness and coarser grain size than their surroundings. Sometimes known as “chrome checks” and (when revealed by machining) “hairline cracks.” Not to be confused with “woody fracture.”

Flame Hardening (Shorterizing) – A method for hardening the surface without affecting the remainder of the part, used mainly for gears or other parts where only a small portion of the surface is hardened and where the part might distort in a regular carburizing or heat-treating operation. The operation consists of heating the surface to be hardened by an acetylene torch to the proper quenching temperature followed immediately by a water-quench and proper tempering. A special tool is required, and either the torch or part may be rotated so that the flame passes over the surface at a speed that will produce the proper quenching temperature. Water quenching follows immediately, and the part is neither scaled nor pitted by the operation.

Flange – A metal part which is spread out like a rim; the action of working a piece or part spread out.

Flank, Side or Thread – The straight part of the thread which connects the crest with the root.

Flank Angles – The angle between a specified flank of a thread and the plane perpendicular to the axis (measured in an axial plane).

Flare – To open or spread outwardly.

Flaring Tool – A tool used to form a flare on a tubing.

Flash Point – The temperature at which a substance, usually a fluid, will give off a vapor that will flash or burn momentarily when ignited.

Flat Crank – A crankshaft in which one of the bearing journals is not round.

Floating Piston Pin – A piston pin which is not locked in the connecting rod or the piston, but is free to turn or oscillate in both the connecting rod and the piston.

Float Level – The height of the fuel in the carburetor bowl, usually regulated by means of a suitable valve or float.

Flooded System – Type of refrigerating system in which liquid refrigerant fills the evaporator.

Flooding – Act of filling a space with a liquid.

Floor – The absolute minimum to which the low limit of an engine performance specification may fall.

Flow Control Valve – A valve which is used to control the flow rate of fluid in a fluid power system.

Flowmeter – An instrument used to measure the quantity or flow rate of a fluid in motion.

Fluctuating – Wavering, unsteady, not constant.

Fluid – A liquid, gas, or mixture thereof.

Fluid Flow – The stream or movement of a fluid; the rate of a fluid's movement.

Fluid Power – Power transmitted and controlled through the use of fluids, either liquids or gases, under pressure.

Flush – An operation to remove any material or fluids from refrigeration system parts by purging them to the atmosphere using refrigerant or other fluids.

Flute – The grooves of a tap that provide the cutting rake and chip clearance.

Flutter or Bounce – In engine valves, refers to a condition where the valve is not held tightly on its seat during the time the cam is not lifting it.

Flux, Magnetic – Magnetic force.

Flyball Governor – Conventional type of centrifugal governor commonly called a *mechanical governor*.

Flywheel – A device for storing energy in order to minimize cyclical speed variations.

Flywheel Ring Gear – A circular steel ring having gear teeth on the outer circumference.

Foaming – Formation of a foam in an oil-refrigerant mixture due to rapid evaporation of refrigerant dissolved in the oil. This is most likely to occur when the compressor starts and the pressure is suddenly reduced.

Foot-pound (ft-lb) – The amount of work accomplished when a force of 1 lb produces a displacement of 1 ft.

Force – The action of one body on another tending to change the state of motion of the body acted upon. Force is usually expressed in pounds (kilograms).

Force Convection – Movement of fluid by mechanical force such as fans or pumps.

Force-Feed Lubrication – A lubricating system in which oil is pumped to the desired points at a controlled rate by means of positive displacement pumps.

Forged – Shaped with a hammer or machine.

Fossil Fuel – Oil, coal, natural gas, or their by-products. Fuel that was formed in the earth in prehistoric times from remains of living-cell organisms.

Foundation – The structure on which an engine is mounted. It performs one or more of the following functions: holds the engine in alignment with the driven machine, adds enough weight to the engine to minimize vibration, adds to rigidity of the bed plate.

Four-cycle Engine – Also known as Otto cycle, where an explosion occurs every other revolution of the crankshaft, a cycle being considered as 1/2 revolution of the crankshaft. These strokes are (1) intake stroke, (2) compression stroke, (3) power stroke, (4) exhaust stroke.

Four-Stroke Cycle – Cycle of events which is completed in four strokes of the piston, or two crankshaft revolutions.

Frame – The main structural member of an engine.

Free Electrons – Electrons which are in the outer orbit of the atom's nucleus.

Free Flow – Flow which encounters little resistance.

Freon – Trade name for a family of synthetic chemical refrigerants manufactured by DuPont, Inc.

Frequency – The number of cycles completed within a one-second period, expressed as hertz.

Frequency Meter – A unit which monitors a generator set's output frequency.

Frequency Relay – This relay can be configured to operate when the monitored frequency is above or below a given setpoint.

Friction – The resistance to motion due to the contact of two surfaces, moving relatively to each other.

Friction Horsepower (FHP) – A measure of the power lost to the engine through friction or rubbing of parts.

Fuel Cell – A device or an electrochemical engine with no moving parts that converts the chemical energy of a fuel, such as hydrogen, and an oxidant, such as oxygen, directly into electricity. The principal components of a fuel cell are catalytically activated electrodes for the fuel (anode) and the oxidant (cathode) and an electrolyte to conduct ions between the two electrodes, thus producing electricity.

Fuel-Flow Oil Filter – All engine oil passes through this oil filter before entering the lubrication channels.

Fuel Knock – See *Detonation*.

Fuel Level – On the EMS II module, a flashing red light and horn annunciate when a customer provided fuel level switch is activated. This information is provided to EMS II directly and then sent on the datalink. In the event that coolant level input is not provided, the input will be shorted on the terminal strip.

Fuel Mixture – A ratio of fuel and air.

Fuel Pressure – The fuel pressure supplied to the injection pumps of a diesel engine.

Fuel Rate (Diesel) – The mass of fuel burned by an engine in a specified time. Corrected fuel rate is the actual or observed fuel rate corrected for fuel density.

Fuel Rate (Spark Ignited) – The volume of fuel burned by an engine in a specified time at the pressure and temperature being supplied to the engine. Corrected fuel rate is the volume of fuel at standard conditions multiplied by the lower heating value of the fuel.

Fuel Transfer Pump – A mechanical device used to transfer fuel from the tank to the injection pump.

Fuel Valve – A valve admitting fuel to the combustion chamber. In a more general sense, this term may also apply to any manual or automatic valve controlling flow of fuel.

Fulcrum – The pivot point of a lever.

Full-Floating Piston Pin – A piston pin free to turn in the piston boss of the connecting-rod eye.

Full Load – The maximum power an engine can develop when running at rated speed with the fuel system opened to its maximum specified condition.

G

Gallery – Passageway inside a wall or casting.

Galvanic Action – When two dissimilar metals are immersed in certain solutions, particularly acid, electric current will flow from one to the other.

Gas – A substance which can be changed in volume and shape according to the temperature and pressure applied to it. For example, air is a gas which can be compressed into smaller volume and into any shape desired by pressure. It can also be expanded by the application of heat.

Gasket – A layer of material used between machined surfaces in order to seal against leakage.

Gassing – Hydrogen bubbles rising from the electrolyte when the battery is being charged.

Gate Valve – A common type of manually operated valve in which a sliding gate is used to obstruct the flow of fluid.

Gauge Construction – Shell is a cosmetic wrapper. Only advantage — no varnish clean-up of shell required.

Gauge, Low Pressure – Instrument for measuring pressures in range of 0 psig and 50 psig.

Gauge, High Pressure – Instrument for measuring pressures in range of 0 psig to 500 psig.

Gauge Pressure – Pressure above atmospheric pressure.

Gauge Snubber – A device installed in the fuel line to the pressure gauge used to dampen pressure surges and thus provide a steady reading. This helps protect the gauge.

Gear Ratio – The number of revolutions made by a driving gear as compared to the number of revolutions made by a driven gear of different size. For example, if one gear makes three revolutions while the other gear makes one revolution, the gear ratio would be 3 to 1.

Gear-type Pump – A pump which uses the spaces between the adjacent teeth of gears for moving the liquid.

Generator, Electrical – An electromagnetic device used to generate electricity.

Generator, Cooling – A device used in absorption-type refrigeration systems to heat the absorbing liquid to drive off the refrigerant vapor for condensing to a liquid before entering the evaporator.

Generator Power System (GPS) – EPG power system that uses energy off an electric generator.

Ghost (Ferrite Ghost) – A faint band of ferrite.

Gland – A device to prevent the leakage of gas or liquid past a joint.

Glaze – As used to describe the surface of the cylinder, an extremely smooth or glossy surface such as a cylinder wall highly polished over a long period of time by the friction of the piston rings.

Glaze Breaker – A tool for removing the glossy surface finish in an engine cylinder.

Glow Plug – A heater plug for the combustion chamber. It has a coil of resistance wire heated by a low voltage current.

Governor – A device that maintains a constant engine speed under various load conditions. The governor must have provision for adjustment of speed (which controls generator frequency) and of the amount of speed droop from no load to full load.

Grain – A unit of weight equal to one 7000th of a pound. It is used to indicate the amount of moisture in the air.

Grain Size – There are two types of grains in steel which affect the physical properties of steel; the austenite grain and the ferrite grain. The ferrite grain tends to remain stable in size at temperatures below the transformation range unless the steel is cold worked a critical amount, in which case the grains grow rapidly. When steel is heated above the transformation range, the newly formed austenite grain is small but tends to grow in size with increasing temperature and time at temperature. Grain size, as commonly used, is the size of the grain that is developed in the austenite at the final heat treating temperature and does not refer to the ferrite grain. Except for the austenitic steels, the austenite grain size does not exist at room temperature; but its pattern can be developed by special methods.

Gravity – The force which tends to draw all bodies toward the center of the earth. The weight of a body is the result of all gravitational forces on the body.

Gravity, Specific – The specific gravity of a solid or liquid is the ratio of the mass of the body to the mass of an equal volume of water at some standard temperature. At the present time a temperature of a 4° C (39° F) is commonly used by physicists, but the engineer uses 16° C (60° F). The specific gravity of a gas is usually expressed in terms of dry air at the same temperature and pressure as the gas.

Grid – The electric utility companies' transmission and distribution system that links power plants to customers through high power transmission line service (110 kilovolt [kV] to 765 kV); high voltage primary service for industrial applications and street rail and bus systems (23 kV to 138 kV); medium voltage primary service for commercial and industrial applications (4 kV to 35 kV); and secondary service for commercial and residential customers (120 V to 480 V). Grid can also refer to the layout of a gas distribution system of a city or town in which pipes are laid in both directions in the streets and connected at intersections.

Grid, Battery – The lead frame to which the active material is affixed.

Grid Interconnection – The intertie of a cogeneration plant to an electric utility's system to allow electricity flow in either direction.

Grinding – Removing metal from an object by means of a revolving abrasive wheel, disk, or belt.

Grinding Compound – Abrasive for resurfacing valves, etc.

Ground, Battery – The battery terminal that is connected to the engine of the framework.

Ground Fault Protection – This function trips (opens) a circuit breaker or sounds an alarm in the event that there is an electrical fault between one or more of the phase conductors and ground (earth). This ground fault protection function may be incorporated into a circuit breaker.

Grounding Bar – A copper or aluminum bar that electrically joins all the metal sections of the switchgear. This bar is connected to the earth or ground connection when the system is installed. The grounding or earthing protects personnel.

Growler – A test instrument used for testing the armature of a starter or generator for open, short, and grounded circuits.

GSC + Synchronizing – General Status Control plus Synchronizing

H

Half-moon Key – A fastening device in a shape somewhat similar to a semicircle. (See Key.)

Halide Refrigerants – Family of refrigerants containing halogen chemicals.

Hardenability – This relates to the ability of steel to harden deeply upon quenching and takes into consideration the size of the part and the method of quenching. In testing for hardenability, standards are established governing the method of quenching and the quenching medium which makes it possible to compare the hardenability of steels of various analysis and grain size.

Hardness – The ability of a metal to resist penetration. The principal methods of hardness determination are described under hardness testing and the correlation of these determinations with the other mechanical properties are described under physical properties.

Hardness Testing – The determination of the ability of a metal to resist penetration; the hardness of the metal may be determined by several methods (i.e. Brinell, Rockwell, Superficial).

Harmonics – Waveforms whose frequencies are multiples of the fundamental (60 Hz) wave. The combination of harmonics and fundamental waves causes a non-sinusoidal, periodic wave. Harmonics in power systems are the result of non-linear effects. Typically, harmonics are associated with rectifiers and inverters, arc furnaces, arc welders, and transformer magnetizing current. There are both voltage and current harmonics.

Head Pressure – Pressure which exists in the condensing side of a refrigerating system.

Head, Static – Pressure of fluid expressed in terms of height of column of the fluid, such as water or mercury.

Head, Velocity – In flowing fluid, head of fluid equivalent to its velocity pressure.

Head-Pressure Control – Pressure operating control which opens electrical circuit if high side pressure becomes excessive.

Heat – Form of energy the addition of which causes substances to rise in temperature; energy associated with random motion of molecules.

Heat Balance – Energy flow in a power generating system.

Heat Coil – A heat transfer device which releases heat.

Heat Exchanger – Device used to transfer heat from a warm or hot surface to a cold or cooler surface. Evaporators and condensers are heat exchangers.

Heat, Latent – Heat characterized by a change of state of the substance concerned, for a given pressure and always at a constant temperature for a pure substance, i.e., heat of vaporization or of fusion.

Heat Load – Amount of heat, measured in Btu, which is removed during a period of 24 hours.

Heat of Compression – Mechanical energy of pressure transformed into energy of heat.

Heat of Fusion – The heat released in changing a substance from a liquid state to a solid state. The heat of fusion of ice is 144 Btu per pound.

Heat Pump – A name given to an air-conditioning system that is reversible so as to be able to remove heat from or add heat to a given space or material upon demand.

Heat Pump — Air Source – A device that transfers heat between two different air quantities, in either direction, upon demand.

Heat Pump — Water Source – A device that uses a water supply as a source of heat or for disposal of heat depending upon the operational demand.

Heat Rate – A measure of generating station thermal efficiency, generally expressed in Btu (per net kilowatt-hour).

Heat Recovery – The capture and utilization of heat energy which is normally wasted as a by-product of a diesel or gas engine.

Heat, Sensible – A term used in heating and cooling to indicate any portion of heat which changes only the temperature of the substances involved.

Heat Sink – An aluminum plate or extrusion under the rectifier assembly which dissipates heat generated by the rectifier.

Heat Source – The material from which the refrigeration system extracts heat.

Heat, Specific – The heat absorbed (or given up) by a unit mass of a substance when its temperature is increased (or decreased) by 1-degree Common Units: Btu per (pound) (Fahrenheit degree), calories per (gram) (Centigrade degree). For gasses, both specific heat at constant pressure (c_p) and specific heat at constant volume (c_v) are frequently used. In air-conditioning, c_p is usually used.

Heat Transfer – Movement of heat from one body or substance to another. Heat may be transferred by radiation, conduction, convection, or a combination of these three methods.

Heat Treatment – A combination of heating and cooling operations timed and applied to a metal in a solid state in a way that will produce desired properties.

Heating Value – The amount of heat produced by burning 1 lb of fuel.

Helical Gear – A gear wheel of a spiraling shape. (The teeth are cut across the face at an angle with the axis.)

Hermetically Sealed Unit – A sealed hermetic-type condensing unit is a mechanical condensing unit in which the compressor and compressor motor are enclosed in the same housing with no external shaft or shaft seal, the compressor motor operating in the refrigerant atmosphere. The compressor and compressor motor housing may be of either the fully welded or brazed type, or of the service-sealed type. In the fully welded or brazed type, the housing is permanently sealed and is not provided with means of access of servicing internal parts in the field. In the service-sealed type, the housing is provided with some means of access of servicing internal parts in the field.

Hermetic Motor – Compressor drive motor sealed within same casing which contains compressor.

Hermetic System – Refrigeration system which has a compressor driven by a motor contained in compressor dome or housing.

Hertz (Hz) – A unit of frequency equal to one cycle per second.

Hg (Mercury) – Heavy silver-white metallic element; only metal that is liquid at ordinary room temperature.

High Coolant Temperature – On the EMS II module, a flashing red light and a horn will indicate the engine has started a high coolant temp. derate. If the ECM triggers an engine shutdown due to high coolant temperature, the light and horn will continue, and the system shutdown light will also begin flashing.

High Heat Value (HHV) – The total energy content of a fuel available by complete combustion and all products of combustion at 60° F and water in a vapor state. Equals to the High Heat Value less the latent heat of vaporization.

High Idle Setting – The maximum speed at which an engine will run with the governor wide open at no load condition.

High Side – Parts of a refrigerating system which are under condensing or high side pressure.

High Voltage – Any AC voltage above 15000V.

Hone – A tool with an abrasive stone used for removing metal, such as correcting small irregularities or differences in diameter in a cylinder.

Horsepower (hp) – A unit used to measure power of an engine. An electric motor develops one horsepower by lifting weight of 550 pounds through a distance of one foot in one second. It represents the product of force and rate of motion. (See *Brake Horsepower and Indicated Horsepower*.)

Horsepower-hour (hp-h) – A unit of energy equivalent to that expended in 1 hp applied for 1 hour. Equal to approximately 2,545 Btu.

Hot Gas Bypass – Piping system in refrigerating unit which moves hot refrigerant gas from condenser into low pressure side.

Hot Gas Line – The line that carries the hot discharge gas from the compressor to the condenser.

Hot Shortness – Brittleness in metal when hot.

Hot Spot – Refers to a comparatively thin section or area of the wall between the inlet and exhaust manifold of an engine, the purpose being to allow the hot exhaust gases to heat the comparatively cool incoming mixture. Also used to designate local areas of the cooling system which have attained above average temperatures.

Hot Well (expansion tank) – A system used when static head exceeds 17.4 m (57 ft), or a boost pump imposes excessive dynamic head.

Humidifier – Device used to add to and control the humidity in a confined space.

Humidistat – An electrical control which is operated by changing humidity.

Humidity – Moisture; dampness. Relative humidity is a ratio of quantity of vapor present in air to the greatest amount possible at given temperature.

Hunting – Alternate overspeeding and underspeeding of the engine caused by governor instability.

Hybrid – An engine which combines the features of reciprocating and rotating engines.

Hydraulic Governor – A governor which uses a control valve to allow oil pressure to work directly on the terminal shaft through a power piston.

Hydraulically Actuated Electronically Controlled Unit Injector (HEUI) – A Cat system which manages precise injection of fuel in an engine to achieve optimal efficiency and performance.

Hydraulics – That branch of mechanics or engineering which deals with the action or use of liquids forced through tubes and orifices under pressure to operate various mechanisms.

Hydrocarbons (HC) – Emissions consisting of unburned fuel or lubricating oil, which cause eye irritation and unpleasant odors. Measured in parts per million by volume.

HC concentration (ppm) = $\frac{2067 \times \text{HC mass emissions (g/hr)}}{\text{Exhaust mass flow (kg/hr)}}$

Hydrogen – One of the elements constituting fuel and lubricating oil.

Hydromechanical Governor – A governing system which uses engine lubricating oil pressure to support the action of a mechanical control — any mechanical governor assisted by a hydraulic servo valve.

Hydrometer – A test instrument for determining the specific gravities of liquids.



ID – Inside diameter.

Idle – To operate (an engine) without transmitting power.

Idling – Refers to the engine operating at its slowest speed with a machine not in motion. An engine running without load.

Ignition – The start of combustion.

Ignition Delay – The period between when fuel injection begins and when fuel actually starts to burn.

Ignition Lag – The time between start of injection and ignition.

Immersed – To be completely under the surface of a fluid.

Impact Testing – Method to determine the tendency of a metal toward brittleness. Samples are mounted and struck with a single pendulum-type blow of such force as to fracture the specimen. The energy required is measured in foot-pounds and is affected by the striking velocity, temperature, form, and size of sample. If the sample resists fracture in the test, it is described as tough; if it fractures easily, it is brittle or notch sensitive. See *Cohesive Strength*.

Import/Export Control – Requires varying generator set power output with site load to keep the amount of power “imported” from or “exported” to the utility near constant. The generator sets operate in parallel with the utility, and their output is raised and lowered to match changes in the site load. This scheme requires a monitoring device at the point in the system to be kept near constant and is typically accomplished with a programmable logic controller (PLC).

Inboard Exciter – Exciter components are physically inboard of ball bearing. This design is okay where shaft deflection between bearing center and engine drive flange mounting is not a problem.

Inclusions – Particles of impurities, usually oxides, sulphides, silicates, and such, which are mechanically held during solidification or which are formed by subsequent reaction of the solid metal. These impurities are called nonmetallic inclusions and may or may not be harmful depending on their type, size, distribution, and the end product to be manufactured.

Indicated Horsepower (ihp) – An elevated engine power measurement which includes the entire amount of horsepower developed in the combustion chamber, before any is lost through friction or operation of satellite systems.

Indicated Thermal Efficiency – The ratio of indicated horsepower to equivalent power input in the form of heat from fuel.

Indicator – An instrument for recording the variation of cylinder pressure during the cycle.

Indicator Card – A graphic record of the cylinder pressures made by an indicator.

Indirectly Cooled Piston – A piston cooled mainly by the conduction of heat through the cylinder walls.

Induction – Using the magnetic field to impart electricity into an object which is not otherwise connected to the first ones.

Induction Generator – A nonsynchronous AC generator similar in construction with an AC motor, and which is driven above synchronous speed by external sources of mechanical power.

Induction Hardening – A method of hardening the surface of a part electrically. A high frequency current, varying from a few thousand cycles to several million cycles per second, is passed through a coil that is held very close to the surface to be hardened. This induces eddy currents into the surface of the part which, together with hysteresis effect of the rapid reversals, heats the surface, and by conduction may through heat the part, if desired. Quenching may be done immediately in water, or in some cases the cold core of the steel itself may be the quenching medium. The surface finish is in no way affected by this method nor is the part distorted.

Induction Motor – An AC motor which operates on the principle of rotating magnetic field. The rotor has no electrical connection, but receives electrical energy by transformer action from field windings.

Induction System – Those components of an engine involved in providing combustion air to an engine.

Inductor – An apparatus formed by wrapping a number of turns of insulated wire around a form; used to introduce inductance into an electric circuit.

Industrial Air-Conditioning – Air-conditioning for uses other than comfort.

Industrial Grade Relay – An AC protective relay that is installed within the switchgear enclosure and cannot be easily removed for testing and calibration.

Inertia – That property of matter which causes it to tend to remain at rest if already motionless or to continue in the same straight line of motion if already moving.

Inhibitor – Any substance which retards or prevents such chemical reactions as corrosion or oxidation.

Injection Pump – A high-variable pressure pump delivering fuel into the combustion chamber.

Injection System – The components necessary for delivering fuel to the combustion chamber in the correct quantity, at the correct time, and in a condition satisfactory for efficient burning.

Injector – A device used to bring fuel into the combustion chamber.

Injector Actuation Pressure Control Valve (IAPCV) – A component of the Cat HEUI fuel system that controls the pressure of the oil which actuates the unit injector.

Inlet Air Pressure – The dry air pressure supplied to the inlet of an engine. This is normally barometric pressure minus water vapor pressure minus inlet air restriction.

Inlet Air Restriction – The pressure drop of the combustion air from atmospheric pressure to the compressor inlet of a supercharged engine or to the inlet manifold of a naturally aspirated engine.

Inlet Fuel Pressure – The fuel pressure supplied to the fuel inlet of a diesel engine.

Inlet Fuel Pressure (ABS) – The gas pressure supplied to the fuel inlet of a spark ignited engine.

Inlet Fuel Temperature – The temperature of the fuel supplied to the fuel inlet of either a diesel or spark ignited engine.

Inlet Manifold Pressure – Absolute pressure in the inlet manifold of a spark ignited engine.

Inline – A type of cylinder arrangement in an engine where the cylinders are aligned in a row.

Input Shaft – The shaft carrying the driving gear, such as in a transmission by which the power is applied.

Insert Bearing – A removable, precision-made bearing.

Insulated Case Circuit Breaker – A power circuit breaker that is provided in a preformed case, similar to a molded case breaker.

Insulator – Materials or substances that effectively block the movement of electrons. An example is glass.

Intake Manifold – A connecting casting between the air filter or turbocharger and the port openings to the intake valves.

Intake Valve – The valve which allows air to enter into the cylinder and seals against exit.

Integral – The whole, made up of parts.

Intercooler – Heat exchanger for cooling the air between stages of compression.

Internal Rate of Return – Discount rate at which the present value of an investment is equal to the investment.

Internal-Combustion Engine – An engine that burns fuel within itself as a means of developing power.

Interrupted Quenching – Refers to the use of two or more quenching media to obtain the final structure required. The part may be removed after a definite time in the original quenching medium and then finish cooled in another medium. Several methods have been developed. See *Austempering*, *Isothermal Quenching*, *Martempering*.

Interruptible – This refers to the practice of operating on-site power systems, at the request of a utility, to reduce electrical demand on the utility grid during periods of high consumption.

Interruptible Loads – Loads which can be temporarily disconnected without damage or any apparent reduction in facility performance. Such loads may include electric motors, driving pumps and fans, or lighting circuits.

Interruptible Power – Electric energy supplied by an electric utility subject to interruption by the electric utility under specified conditions.

Interrupting Capacity – The magnitude of electrical current that a device can safely interrupt (open against), without failure of the component.

Interrupting Rating – The maximum current allowed by the normal source protective device on a generator set, that the automatic transfer switch is capable of interrupting. It applies when line voltage falls below the preset value of the voltage sensing relay, and the standby source is present. The switch then could transfer before the normal service protective device clears the fault.

Inverter – An electromechanical or electronic device for converting direct current into alternating current.

Irregular Straighteners – Used to straighten hexagons, flats, and squares. Essentially consisting of two groups of rolls placed at right angles to each other. Each group of rolls consists of five or more rolls set in the same plane and adjusted to provide reciprocate bending of the steel in the same plane.

Isochronous – The condition of maintaining constant speed, regardless of load, at steady-state conditions, for constant electrical frequency output.

Isochronous Governor – A governor having zero speed droop.

Isochronous Load Sharing – A method of controlling the speed of paralleled generator sets so that all sets share the load equally, without any droop in frequency.

Isolators – Materials used between the foundation of a generator set and its mounting surface.

Isothermal Quenching – A method of hardening steel by quenching from the austenitizing temperature into an agitated salt bath which is maintained at a constant temperature level above the point at which martensite is formed (usually 450° F or higher), holding in this for sufficient time to permit transformation, transferring the steel immediately to some medium maintained at some higher temperature level for tempering and cooling in air. The advantages of this method of interrupted quenching are a minimum of distortion and residual strains with higher hardness which can be tempered to produce the needed physical properties. Larger sections can be hardened by this method than by austempering.

J

Jacket – A covering used to isolate or insulate, especially engine heat.

Jacket Water – Cooling water which circulates through the engine.

Jet – A small hole in a carburetor passage to measure the flow of gasoline.

Jet Cooling – A method of passing cooling oil below the piston by means of a jet or nozzle.

Joiminy Hardenability Test – A test used to determine the hardenability of any grade of steel. It is based on the premise that (1) irrespective of their chemistry, steel bars of the same size loose heat at a predetermined number of degrees per second under fixed conditions and (2) that the structure and physical properties vary with the rate of cooling. See *Hardenability* and *Quenching*.

Journal – The portion of a shaft, crank, etc., which turns in a bearing.

K

Kelvin Scale (K) – A temperature scale having the same size divisions as those between Celsius degrees, but having the zero point at absolute zero.

Key – A fastening device wherein two components each have a partially cut groove, and a single square is inserted in both to fasten them together such as between the shaft and hub to prevent circumferential movement.

Keyway or Keyseat – The groove cut in a component to hold the key.

Killed Steel – A steel sufficiently deoxidized to prevent gas evolution during solidification. The top surface of the ingot freezes immediately and subsequent shrinkage produces a central pipe. A semikilled steel, having been less completely deoxidized, develops sufficient gas evolution internally in freezing to replace the pipe by a substantially equivalent volume of rather deep-seated blow holes.

Kilometer (km) – A metric measurement of length equal to 0.6214 mi.

Kilovolt (kV) – 1000 volts.

Kilowatt (kW) – 1000 watts. A term for rating electrical devices. Generator sets in the United States are usually rated in kW. Sometimes called active power; kW loads the generator set engine.

Kilowatt-Hour (kW-h) – The most commonly used unit of measure telling the amount of electricity consumed over time. It means one kilowatt of electricity supplied for one hour.

Kinetic Energy – The energy which an object has while in motion.

Knock – A general term used to describe various noises occurring in an engine; may be used to describe noises made by loose or worn mechanical parts, preignition, detonation, etc.

Knurling – A method of placing ridges in a surface, thereby forcing the areas between these ridges to rise.

kV•A – The abbreviation for Kilo-Volt-Amperes, a common term for rating electrical devices. A device's kV•A rating is equal to its rated output in amps multiplied by its rated operating voltage.

kVAR – The abbreviation for Kilo-Volt-Amperes Reactive. It is associated with the reactive power that flows in a power system. Reactive power does not load the set's engine but does limit the generator thermally.

L

Lacquer – A solution of solids in solvents which evaporate with great rapidity.

Lag – To slow down or get behind; time interval, as in *ignition lag*.

Laminar – A layer of fluid.

Laminar Flow – A smooth flow in which no crossflow of fluid particles occurs.

Land – The projecting part of a grooved surface; for example, that part of a piston on which the rings rest.

Lap – A surface defect appearing as a seam caused from folding over hot metal, fins, or sharp corners and then rolling or forging, but not welding them into the surface.

Lap (lapping) – A method of refinishing (grinding and polishing) the surface of a component.

Latent Heat – Heat energy absorbed in process of changing form of substance (melting, vaporization, fusion) without change in temperature or pressure.

Letter Drills – Drills on which the size is designated by a letter.

L-Head Engine – An engine design in which both valves are located on one side of the engine cylinder.

Line – A tube, pipe, or hose which is used as a conductor of fluid.

Linear – Moving in one direction only.

Liner – The sleeve forming the cylinder bore in which the piston reciprocates.

Linkage – A movable connection between two units.

Liquid – Matter which has a definite volume but takes the shape of any container.

Liquid Absorbent – A chemical in liquid form which has the property to “take on” or absorb moisture.

Liquid Crystal Display (LCD) – A device for alphanumeric displays using a pattern of tiny sealed capsules which contain a transparent liquid crystal that becomes opaque when an electric field is applied to it; the contrast between the transparent and opaque areas forms letters or numbers.

Liquefied Natural Gas (LNG) – Natural gas that has been condensed to a liquid, typically by cryogenically cooling the gas to -327.2° F (below zero).

Liquefied Petroleum Gas (LPG) – A mixture of gaseous hydrocarbons, mainly propane and butane that change into liquid form under moderate pressure.

Liter (L) – A metric measurement of volume equal to 0.2642 gal (U.S.).

Live Wire – A conductor which carries current.

Load – The power that is being delivered by any power-producing device. The equipment that uses the power from the power-producing device. (Also see *Cooling Load and Engine Load*.)

Load Current – Amperage required by the load that is supplied by an electrical power source.

Load Curve – A curve on a chart showing power (kilowatts) supplied, plotted against time of occurrence, and illustrating the varying magnitude of the load during the period covered.

Load Factor – The mathematical ratio of the actual load divided by the connected load.

Load Following – Operation of equipment to match production to demand.

Load Line – A center line indicating the points of contact where the load passes within the bearing.

Load Management – The utilization of generator sets in order to control the amount of electrical power purchased from a utility. This can be accomplished by switching specific loads from utility power to generator power, or operating generator(s) in parallel with the utility.

Load Sense Demand – A paralleling system operating mode in which the system monitors the total kW output of the generator sets, and controls the number of operating sets as a function of the total load on the system. The purpose of load demand controls is to reduce fuel consumption and limit problems caused by light load operation of reciprocating diesel generator sets.

Load Shedding – The process by which the total load on a paralleling system is reduced, on overload of the system bus, so that the most critical loads continue to be provided with reliable electrical service. Overload is typically determined as a bus underfrequency condition.

Load-Line Angle – The angle of a load line with respect to the shaft center or bearing radial centerline.

Lobe – The projecting part, usually rounded, on a rotating shaft.

Low Coolant Temperature – On the EMS II module, a flashing red light and horn announce when the coolant temperature falls below a value programmed within EMS II.

Low Heat Value (LHV) – The total heat produced by burning a given mass of fuel minus the latent heat of evaporation of water produced by the combustion process.

Low Side – That portion of a refrigerating system which is under the lowest evaporating pressure.

Low Side Pressure – Pressure in cooling side of refrigerating cycle.

Low Voltage – Any AC voltage between 120V and 600V.

LP-Gas, Liquefied Petroleum Gas – Made usable as a fuel for internal combustion engines by compressing volatile petroleum gases to liquid form. When so used, must be kept under pressure or at low temperature in order to remain in liquid form, until used by the engine.

Lubricant – A substance to decrease the effects of friction, commonly a petroleum product (grease, oil, etc.).

Lubricator – A mechanical oiler which feeds oil at a controlled rate.

Lug – Condition when the engine is operating at or below its maximum torque speed, or slowing the speed of an engine by adding load.

M

Machinability – The factors involved in determining machinability are cutting speed and feed, resultant surface produced, and tool life. There are, however, many variables involved in each of these factors such as hardness, grain size, structure, inclusions, size and shape of tool, coolant, etc. The standard for machinability ratings is SAE 1112 (AISI B.1112) Bessemer screw stock rated as 100% although other materials may be used.

Magnaflux – A method used to check components for cracks.

Magnaflux Testing – A method of inspection used to locate cracks, cavities or seams in steel bars at or very close to the surface. Special equipment has been developed for this test and several methods are used. In principle the part is magnetized and magnetic powder is applied, wet or dry. Flaws that are not otherwise visible will be indicted by the powder clinging to them. Due to many variables that may be present in this test, considerable experience is needed for uniform interpretation or results.

Magnetic Field – The affected area of the magnetic lines of force.

Magnetizing Current – Transformers, motors and other electromagnetic devices containing iron in the magnetic circuit must be magnetized in order to operate. It is customary to speak of the lagging inductive current as a magnetizing current.

Main Bearing – A bearing supporting the crankshaft on its axis.

Main Breaker – A circuit breaker at the input or output of the bus, through which all of the bus power must flow. The generator main breaker is the device that interrupts the set's power output. Main breakers provide overcurrent protection and a single disconnect point for all power in a switchboard or device.

Maintenance Costs – The cost of servicing and repair of equipment, including parts and labor.

Maintenance Power – Electric energy supplied by an electric utility during scheduled outages of the cogenerator.

Makeup Water – The water required to replace the water lost from a cooling tower by evaporation, drift, and bleedoff.

Mandrel – A mounting device for a stone, cutter, saw, etc.

Manifold – A pipe with one inlet and several outlets, used to collect and direct fluids and gases.

Manometer – A device for measuring a vacuum. It is a U-shaped tube partially filled with fluid. One end of the tube is open to the air and the other is connected to the chamber in which the vacuum is to be measured. A column of Mercury 30 in. high equals 14.7 lbs. per square in., which is atmospheric pressure at sea level. Readings are given in terms of inches of Mercury.

Manual Control – A device which allows manual control of output voltage.

Manual Valve – A valve which is opened, closed, or adjusted by hand.

Marine Duty – A generator with features to meet marine duty certification. PM, thermocouples in winding for heat sensing, green paint, and space heaters.

Marine Power System (MPS) Software – A Cat computer program which automatically sizes marine engines, gears, and propellers, based on desired vessel performance. A complete report is compiled for buyers to reference comparisons between various system configurations.

Marmon Clamps – Circular clamps used for air pipe connection. They include metal rings to aid in sealing.

Martempering – A method of hardening steel by quenching from the austenitizing temperature into some heat extracting medium (usually salt) which is maintained at some constant temperature level above the point at which martensite starts to transform (usually about 450° F), holding the steel in this medium until the temperature is uniform throughout, cooling in air for the formation of martensite and tempering by the conventional method. The advantages of this method of interrupted quenching are a minimum of distortion and residual strains. The size of the part can be considerably larger than for austempering.

Martensite – A microconstituent or structure in quenched steel characterized by an acicular or needle-like pattern on the surface polished and etched. It has the maximum hardness of any of the decomposition products of austenite. It is a transition lattice formed by the partial transformation of austenite.

Mass Elastic System – Pistons, rods, crankshaft, flywheel, coupling, driven equipment, and associated shafting.

Matter – Any substance which occupies space and has weight. The three forms of matter are solids, liquids, and gases.

Mean Effective Pressure (mep) – The calculated combustion in pounds per square inch (average) during the power stroke, minus the pounds per square inch (average) of the remaining three strokes.

Mean Indicated Pressure (mip) – Net mean gas pressure acting on the piston to produce work.

Mechanical Advantage – The ratio of the resisting weight to the acting force. The distance through which the force is exerted divided by the distance the weight is raised.

Mechanical Efficiency – (1) The ratio of brake horsepower to indicated horsepower, or ratio of brake mean effective pressure to mean indicated pressure. (2) An engine's rating which indicates how much of the potential horsepower is wasted through friction within the moving parts of the engine.

Mechanical Governor – A simple type of governor using flyweights for speed sensing and throttle control.

Mechanical Injection – Mechanical force pressurizing the metered fuel and causing injection.

Mechanical Properties – Those properties that reveal the reaction, elastic and inelastic, of a material to an applied force or that involve the relationship between stress and strain; for example, Young's modulus, tensile strength, fatigue limit. These properties have often been designated as physical properties, but the term mechanical properties is much to be preferred. See *Physical Properties*.

Mechanically Operated Valve – A valve which is opened and closed at regular points in a cycle of events by mechanical means.

Medart – Equipment developed for straightening cold drawn bars measuring from about 1/2" to 2-7/8" in diameter. These straighteners have one concave and one straight roll which revolve the bar as it passes between them. Much of the sizing of the bar and the brightness of the finish is accomplished in this operation.

Medium Voltage – Any AC voltage between 1000 and 15,000 VAC.

Megawatt (MW) – One million watts

Megawatt Hour (MWh) – One thousand kilowatt-hours, or an amount of electricity that would supply the monthly power needs of a typical home having an electric hot water system.

Metal Fatigue – When metal crystallizes and is in jeopardy of breaking because of vibration, twisting, bending, etc.

Metering Fuel Pump – A fuel pump delivering a controlled amount of fuel per cycle.

Methyl Chloride (R-40) – A chemical once commonly used as a refrigerant. The chemical formula is CH_3Cl . Cylinder color code is orange. The boiling point at atmospheric pressure is -10.4°F .

Metric Size – Size of a component, part, etc., in metric units of measurement (e.g., meters, centimeters).

Micrometer (m) – One one-millionth of a meter or 0.000039 in.

Micrometer (mike) – A precision measuring tool that is accurate to within one one-thousandth of an inch or one one-hundredth of a millimeter.

Millimeter (mm) – One one-thousandth of a meter or 0.039370 in.

Milling Machine – A machine used to remove metal, cut splices, gears, etc., by the rotation of its cutter or abrasive wheel.

Minimum Generation – Generally, the required minimum generation level of a utility system's thermal units. Specifically, the lowest level of operation of oil-fired and gas-fired units at which they can be currently available to meet peak load needs.

Misfiring – When the pressure of combustion of one or more cylinders is lower than the remaining cylinders, one or more cylinders have an earlier or later ignition than the others.

Mixed Cycle – Where fuel burns partly at constant volume and partly at constant pressure. Sometimes applied to the actual combustion cycle in most high-speed internal combustion engines.

Mixture Control – A screw or adjustable valve to regulate the air/fuel provided by a carburetor.

Modem – Modulator/demodulator

Modulus of Elasticity – The ratio, within the limit of elasticity, of the stress to the corresponding strain. The stress in pounds per square inch is divided by the elongation in fractions of an inch for each inch of the original gage length of the specimen.

Molded Case Circuit Breaker – Automatically interrupts the current flowing through it when the current exceeds the trip rating of the breaker. Molded case refers to the use of molded plastic as the medium of electrical insulation for enclosing the mechanisms, and for separating conducting surfaces from one another and from grounded metal parts.

Molecule – The smallest portion to which a substance may be reduced by subdivision and still retain its chemical identity.

Molliers Diagram – Graph of refrigerant pressure, heat, and temperature properties.

Monochlorodifluoromethane – A refrigerant better known as Freon 12 or W-22. The chemical formula is CHClF_2 . Cylinder color code is green.

Monocoque Construction – Integral construction of stator assembly where outside shell provides a major portion of construction strength.

Motor – An actuator which converts fluid power or electric energy to rotary mechanical force and motion. This term should be used in connection with an electric motor and should not be used when referring to the *engine* of a machine.

Motor Inrush Current – The current required to start an electric motor at rest. This current is equal to the current that would be drawn by the motor if the rotor were not allowed to turn.

Muffler – A chamber attached to the end of the exhaust pipe which allows the exhaust gases to expand and cool. It is usually fitted with baffles or porous plates and serves to subdue much of the noise created by the exhaust.

Multifuel – A term used to describe an engine which can burn a variety of different fuels.

Multimegawatt – Many million watts.

Multiple Rating Engine – An engine which has a variable full load fuel setting to provide more than one full load power.

Multiviscosity Oil – An oil meeting SAE requirements.

N

National Electrical Manufacturers Association (NEMA) – A non-profit U.S. trade association of manufacturers of electrical apparatus and supplies. This organization facilitates understanding between manufacturers and users of electrical products.

Natural Convection – Movement of a fluid caused by temperature differences (density changes).

Natural Gas – Hydrocarbon gas found in the earth, composed of methane, ethane, butane, propane and other gases.

Naturally Aspirated – A term applied to an engine which has no method of compressing air supplied to the inlet manifold.

Needle Bearing – A roller-type bearing in which the rollers are smaller in diameter than in length proportional to the race.

Negative Terminal – A terminal from which the current flows back to its source.

NEMA 1 Enclosure – This enclosure designation is for indoor use only when dirt, dust, and water are not a consideration. Personnel protection is the primary purpose of this type of enclosure.

Neoprene – A synthetic rubber highly resistant to oil, light, heat, and oxidation.

Network – A system of transmission or distribution lines so cross-connected and operated as to permit multiple power supply to any principal point on it.

Neutron – A neutral charged particle of an atom.

New Material Release – Announces new or different items of interest that would be of value to dealers and sales representatives.

Newton's Third Law – For every action there is an equal, opposite reaction.

Nitrogen Oxide (NO) – The combination of nitrogen and oxygen that occurs during the combustion process.

Nominal – The specified or target value of an engine performance characteristic. The nominal value is usually accompanied by tolerances defining the acceptable range of the characteristic relative to the nominal.

Nonferrous Metals – Any metals not containing iron.

Non-Interruptible Loads – Loads which cannot tolerate even a momentary power outage without causing damage or severe functional loss to a facility. A computer is a noninterruptible load, as any power lapse could result in loss of vital data or computer-controlled action.

Nonlinear Loads – Any load for which the relationship between voltage and current is not a linear function. Some common nonlinear loads are fluorescent lighting, SCR motor starters, and UPS systems. Nonlinear loads cause abnormal conductor heating and voltage distortion.

North Pole (magnet) – The pole from which the lines of force emanate (thereafter entering the south pole).

Not In Auto (EPG only) – On the EMS II module, a flashing red light annunciates when the engine control switch is not in auto. The engine control switch information will be available on the datalink.

Notching – A method of producing stator laminations by indexing and punching stator slots one at a time.

NO_x [combination of nitric oxide (NO) and nitrogen dioxide (NO₂)] – A harmful chemical present in combustion air formed by decomposition and recombination of molecular oxygen and nitrogen. Measured in parts per million by volume.

$$\text{NO}_x \text{ Concentration (ppm)} = \frac{629 \times \text{NO}_x \text{ mass emissions (g/hr)}}{\text{Exhaust mass flow (kg/hr)}}$$

NO_x RACT – Reasonable Available Control Technology being applied to NO_x on existing stationary sources in nonattainment areas.

Nozzle – The component containing the fuel valve and having one or more orifices through which fuel is injected.

Number Drills – Drills on which the size is designated by a number.



Octane – Measurement which indicates the tendency of a fuel to detonate or knock.

Off-Peak – Time periods when power demand are below average. For electric utilities, generally nights and weekends; for gas utilities, summer months.

Ohm (Ω) – A unit used to measure the opposition or resistance to flow of electric current in a circuit.

Ohmmeter – An instrument for measuring the resistance in a circuit or unit in ohms.

Ohm's Law – The number of amperes flowing in a circuit is equal to the number of volts divided by the number of ohms.

Oil Cooler – A heat exchanger for lowering the temperature of oil.

Oil Filter – A device for removing impurities from oil.

Oil Gallery – A pipe-drilled or cast passage in the cylinder-head block and crankcase that is used to carry oil from the supply to an area requiring lubrication or cooling.

Oil Pressure – The engine oil pressure at full load at a specified location on the engine.

Oil Pump – A mechanical device to pump oil (under pressure) into the various oil galleries.

Oil Pumping – An engine condition wherein excessive oil passes by the piston rings and is burned during combustion.

Oil, Refrigeration – Specifically prepared oil used in refrigerator mechanism circulates to same extent with refrigerant. The oil must be dry (entirely free of moisture), otherwise, moisture will condense out and freeze in the refrigerant control and may cause refrigerant mechanism to fail. An oil classified as a refrigerant oil must be free of moisture and other contaminants.

Oil Seal – A mechanical device used to prevent oil leakage, usually past a shaft.

Oil Separator – Device used to remove oil from gaseous refrigerant.

Oil Slinger – A special frame disk fastened to a revolving shaft. When the shaft rotates and oil contacts the disk, it is thrown outward away from the seal, and thus reduces the force on the seal.

Oil-Bath Air Cleaner – An air filter that utilizes a reservoir of oil to remove the impurities from the air before it enters the intake manifold or the compressor of the turbine.

Open Circuit – A circuit in which a wire is broken or disconnected.

Open-Type System – A refrigerating system which uses a belt-driven compressor or a coupling-driven compressor.

Opposed – A type of cylinder arrangement in an engine where the cylinders are placed opposite one another.

Opposed Piston Engine – An engine having two pistons operating in opposite ends of the same cylinder, compressing air between them.

Orderly Turbulence – Air motion which is controlled as to direction or velocity.

Orifice – Accurate size openings for controlling fluid flow.

Oscillate – To swing back and forth like a pendulum; to vibrate.

Oscilloscope – A device for recording wave forms on a fluorescent screen, proportional to the input voltage.

Otto Cycle – Also called four-stroke cycle. Named after the man who adopted the principle of four cycles of operation for each explosion in an engine cylinder. They are (1) intake stroke, (2) compression stroke, (3) power stroke, (4) exhaust stroke.

Outboard Exciter – Exciter components are physically located outboard of the ball bearing. This design is used to keep shaft deflection between the bearing center and the engine drive flange mounting to a minimum.

Outage (electric utility) – An interruption of electric service that is temporary (minutes or hours) and affects a relatively small area (buildings or city blocks).

Output Shaft – The shaft which delivers the power.

Overcrank (EPG only) – On the EMS II module, a flashing red light and a horn annunciate when an overcrank has occurred. The ECM will determine when an overcrank has occurred and will provide the information on the datalink.

Overcurrent Relay – Operates when the monitored current exceeds the relay setpoint. Overcurrent protection usually consists of an instantaneous setting and a timed setting. Low voltage circuit breakers usually include a trip unit that incorporates these functions.

Overhaul Protection for Trucks (OPT) – A comprehensive Cat plan to protect against unexpected engine repair costs on overhauled engines; covers 100 percent of any repair cost for qualifying parts and labor.

Overhead Camshaft – A camshaft which is mounted above the cylinder head.

Overrunning Clutch – A clutch mechanism that transmits power in one direction only.

Overrunning-Clutch Starter Drive – A mechanical device that locks in one direction but turns freely in the opposite direction.

Overspeed – Engine running higher than the operational speed range. A dangerous engine condition where the combustion system is receiving more fuel than the engine load demands. On the EMS II module, a flashing red light and a horn annunciate when an engine overspeed has occurred. The ECM will determine when an engine overspeed has occurred and will shut down the engine by shutting off the fuel to the engine and tripping the air shutoffs (if provided).

Overspeed Governor – A governor that shuts off the fuel or stops the engine only when excessive speed is reached.

Oversquare Engine – An engine that has a larger bore diameter than the length of its stroke.

Overvoltage Relay – Operates when the monitored voltage exceeds the relay setpoint. If monitoring a generator set the generator set's circuit breaker is typically tripped open and the generator set is shut down.

Oxidation – That process by which oxygen unites with some other substance causing rust or corrosion.

P

Packing – A class of seal of flexible material used to seal two parts which move in relation to each other.

Paper Air Cleaner – An air filter with a special paper element through which the air is drawn.

Parallel Circuit – An electric circuit with two or more branch circuits. It is wired to allow current to flow through all branches at the same time.

Paralleling – Two or more AC generator sets (or one generator set and the utility) supplying power to a common load. Connection of the power sources is made so that the sources electrically function as a single source of power. Parallel operation requires that the two sources of electrical power match in voltage, frequency, and number of phases.

Particle Emissions – Emitted substances including soot (unburned carbon), soluble organic fraction (SOF), and sulfates.

Pascal's Law – Pressure applied anywhere to a body of confined fluid is transmitted undiminished to every portion of the surface of the containing vessel.

Payback Period – The time required to completely recover the original capital investment.

Peak Demand – The maximum electrical power (kilowatt) demand for a given facility for a given time.

Peak Load – The highest electrical demand within a particular period of time. Daily electric peaks on weekdays occur in late afternoon and early evening. Annual peaks occur on hot summer days.

Peak Load Power Plant – A power generating station that is normally used to produce extra electricity during peak load times.

Peak Sharing – Power customers directly assisting utilities by generating electricity during times of peak demand on the utility system.

Peak Shaving – The process by which loads in a facility are reduced for a short time to limit maximum electrical demand in a facility and to avoid a portion of the demand charges from the local utility. This is typically accomplished by turning off low priority loads, transferring specific loads to generator power, or generating electrical power in parallel with the utility.

Peak-to-Peak Voltage – Measurement of voltage from the maximum value of one polarity to the maximum of the opposite polarity.

Peak Voltage – Measurement of voltage at the maximum points of the waveform.

Peaking Unit – A power generator used by a utility to produce extra electricity during peak load times.

Pearlite – The lamellar aggregate of ferrite and carbide resulting from the direct transformation of austenite at Ar₁. It is recommended that this word be reserved for the microstructures consisting of thin plates of lamellae; that is, those that may have a pearly luster in white light.

Peen – The thin end of a hammer head (opposite to the face).

Peening – Flattening the end of a rivet, etc., using the force of a hammer.

Penetrating Oil – A special oil that aids the removal of rusted parts.

Perforate – To make full of holes.

Periphery – The external boundary or circumference.

Permanent Magnet (PM) – Excitation Type — A permanent magnet fixed on shaft which initiates current flow in PM stator when rotated.

Permanent Magnet Excitation (PME) – Use of a PM pilot exciter to supply power to the voltage regulator and main exciter.

Permissive Paralleling – A feature of manual and automatic paralleling switchboards that prevents out-of-phase manual paralleling. A synchronizing check relay prevents the electrical closing of the electrically operated circuit breaker if the incoming set is outside of the frequency or phase angle limits required for proper paralleling to a bus.

Personality Module (PM) – The apparatus which houses the software in a Cat electronic engine's ECM.

Petroleum – An oil-liquid mixture made up of numerous hydrocarbons chiefly of the paraffin series.

Phase – The relationship in time between two waveforms of the same frequency. For practical use, refer to single- and three-phase.

Phase Rotation – (Or phase sequence) describes the order (A-B-C, R-S-T, or U-V-W) of the phase voltages at the output terminals of a three-phase generator. The generator phase rotation must match the facility phase rotation.

Phase Selector Switch – Allows one meter to supply power to the voltage regulator and main exciter.

Phosphor-Bronze – A bearing material composed of tin, lead, and copper.

Physical Change – A change which does not alter the composition of the molecules of a substance.

Physical Properties – It has been established that fully hardened steels have the same mechanical properties when tempered to the same hardness, regardless of composition. Any one of several compositions having the desired hardenability would produce the same results. Since service stresses determine tensile strength requirements, a knowledge of this factor will permit the determination of the other properties of hardness, tempering temperature, elongation, reduction of area and yield. See *Mechanical Properties*.

Pickling – A treatment given hot rolled rods prior to cold drawing. Its purpose is to remove hot rolled scale and other foreign matter from the rod; and this is commonly done by immersing in a hot acid, generally a sulfuric acid solution. The rolls are then rinsed in cold water, followed most generally by lime coating by dipping in a vat of lime emulsion, and are then heated to dry the lime and remove acid embrittlement.

Pilot Shaft – A shaft position in or through a hole of a component as a means of aligning the components.

Pilot Valve – A valve used to control the operation of another valve.

Pinion – A small gear having the teeth formed in the hub.

Pintle-Type Nozzle – A closed-type nozzle having a projection on the end of the fuel valve which extends into the orifice when the valve is closed.

Pipe – In diesel applications, that type of fluid line, the dimensions of which are designated by nominal (approximate) inside diameter.

Pipe (steel defect) – A cavity formed in metal (especially ingots) during the solidification of the last portion of liquid metal. Contraction of the metal causes the cavity pipe.

Piston – A cylindrical part closed at one end which is connected to the crankshaft by the connecting rod. The force of the expansion in the cylinder is exerted against the closed end of the piston, causing the connecting rod to move the crankshaft.

Piston Boss – The reinforced area around the piston-pin bore.

Piston Collapse – A condition describing a collapse or a reduction in diameter of the piston skirt due to heat or stress.

Piston Displacement – The volume of air moved or displaced by a piston when moved from BDC to TDC.

Piston Head – The portion of the piston above the top ring.

Piston Lands – That space of the piston between the ring grooves.

Piston Pin (wrist pin) – A cylindrical alloy pin that passes through the piston bore and is used to connect the connecting rod to the piston.

Piston Ring – A split ring of the expansion type placed in a groove of the piston to seal the space between the piston and the wall.

Piston Ring End Cap – The clearance between the ends of the ring (when installed in the cylinder).

Piston Ring Expander – A spring placed behind the piston ring in the groove to increase the pressure of the ring against the cylinder wall.

Piston Ring Gap – The clearance between the ends of the piston ring.

Piston Ring Groove – The grooves cut in the piston into which the piston rings are fitted.

Piston Ring Side Clearance – The clearance between the sides of the ring and the ring lands.

Piston Skirt – The portion of the piston which is below the piston bore.

Piston Speed – The total distance traveled by each piston in 1 minute. The formula is piston speed = stroke (ft) x rpm x 2 or stroke (in) x rpm/6.

Pivot – The pin or shaft on which a component moves.

Plate (battery) – A flat, square, rigid body of lead peroxide or porous lead.

Play – The movement or slack between two components.

Plenum Chamber – Chamber or container for moving air or other gas under a slight positive pressure.

Plunger Pump – A pump which displaces fluid by means of a plunger.

PM (Excitation Type) – A permanent magnet fixed on shaft which initiates current flow in PM Stator when rotated.

Pneumatics – That branch of physics pertaining to the pressure and flow of gases.

Polar (magnet) – Either end of a magnet.

Polar Timing Diagram – A graphic method of illustrating the events of an engine cycle with respect to crankshaft rotation.

Polarity – Refers to the grounded battery terminal or to an electric circuit or to the north and south pole of a magnet.

Polarizing – To develop polarization of the pole shoes in respect to battery polarity.

Pole Shoe – A soft iron piece over which the field coil is placed.

Port Bridge – The portion of a cylinder or liner between two exhaust or scavenging ports.

Port Scavenging – Introducing scavenging air through ports in the cylinder wall when they are uncovered by the power piston near the end of the power stroke.

Ports – Openings in the cylinder block and cylinder head for the passage of oil and coolant. (Also exhaust-intake connection and valve openings.)

Positive Terminal – The terminal which has a deficiency of electrons.

Potential Energy – The energy possessed by a substance because of its position, its condition, or its chemical composition.

Potential Transformer (PT) – An instrument used to reduce the voltage to be measured by a known ratio to a level suitable for the meter movement.

Pounds per Square Inch (psi) – A unit of measurement for pressure.

Pour Point – The lowest temperature at which an oil will flow.

Power – The rate of doing work. Power is the actual or observed power corrected to standard conditions of atmospheric pressure, inlet air temperature, and fuel density.

Power, Apparent – A quantity of power proportional to the mathematical product of the volts and amperes of a circuit. This product is generally designated in kilovoltamperes (kV•A), and is comprised of both real and reactive power.

Power Conditioner – A device which removes undesirable transients and distortion from a power source.

Power Factor – A correction factor used to figure the actual power being consumed. It is defined as the ratio of the actual power to the apparent power (current/voltage):

$$\text{Power Factor} = \frac{\text{Actual Power (watts)}}{\text{Apparent Power (kV}\cdot\text{A)}}$$

Power Factor Meter – Indicates the ratio between true power (kW) and apparent power (kV•A).

Power Factor/VAR Controller – A device to maintain constant generator set reactive power output while operating in parallel with a utility or other large source. The controller interfaces with the generator automatic voltage regulator and can usually be set to maintain a constant power factor or constant kVAR output.

Power Pool – Two or more interconnected electric systems planned and operated to supply power in the most reliable and economical manner for their combined load requirements and maintenance program.

Power, Real – The energy or work-producing part of “apparent power.” It is the rate of supply of energy, measured commercially in kilowatts.

Power Take-Off (PTO) – Accessory engine drive which is used to power auxiliary equipment.

PowerGram – A publication designed to feature an OEM (Original Equipment Manufacturer) product that incorporates a Caterpillar product into their system. The OEM feature includes a photograph, product description, and product features and benefits. Also included within the PowerGram is a portion similar to a specification sheet, which features the Caterpillar product.

Precision Insert Bearing – A precision type of bearing consisting of an upper and lower shell and a replaceable wear surface.

Precombustion Chamber – A portion of the combustion chamber connected to the cylinder through a narrow port. Fuel is injected into and is partly burned in the precombustion chamber. Heat released by the burning causes the CO in the precombustion chamber to be ejected into the cylinder with considerable turbulence.

Preignition – Ignition occurring earlier than intended. For example, the explosive mixture being fired in a cylinder as by a flake of incandescent carbon before the electric spark occurs.

Preloading – Adjusting taper roller bearings so that the rollers are under mild pressure.

Prerotation Vanes (PRVs) – Vanes which are located at the compressor inlet. These vanes can be rotated through the use of an actuator to vary the load.

Press-Fit – Also known as a force-fit or drive-fit. This term is used when the shaft is slightly larger than the hole and must be forced into place.

Press-Fit Pressure – Force exerted per unit of area. (See *Drive-fit*.)

Pressure – An energy impact on a unit area; force or thrust exerted on a surface.

Pressure Cap – A special radiator cap with a pressure-relief and vacuum valve.

Pressure Differential – The difference in pressure between any two points of a system or a component.

Pressure Drop – The pressure difference at two ends of a circuit, part of a circuit, or the two sides of a filter, or the pressure difference between the high side and low side in a refrigerator mechanism.

Pressure Lubrication – A lubricating system in which oil at a controlled pressure is brought to the desired point.

Pressure Regulator, Evaporator – An automatic pressure regulating valve. Mounted in suction line between evaporator outlet and compressor inlet. Its purpose is to maintain a pre-determined pressure and temperature in the evaporator.

Pressure Suction – Pressure in the low pressure side of a refrigerating system.

Pressure Time (PT) Curve – A visual representation of the pressure within the combustion chamber during an engine's working cycle.

Pressure-Relief Valve – A valve that limits the maximum system pressure.

Primary Distribution Feeder – An electric line supplying power to a distribution circuit, usually considered to be that portion of the primary conductors between the substation or point of supply and the center of distribution.

Prime Mover – The engine, turbine, water wheel, or similar machine which drives an electric generator.

Prime Power – An application where the generator set(s) must supply power on a continuous basis and for long periods of time between shutdowns. No utility service is present in typical prime power applications.

Printed Circuit – An electric circuit where the conductor is pressed or printed in or on an insulating material (panel) and at the same time is connected to the resistor, diodes, condenser, etc.

Probability of On-Site Power Economic Test (PROSPECT) – A Cat menu-driven personal computer software package which quickly analyzes peak shaving economic feasibility and return on investment.

Product Information – A book designed to educate dealers on a product or product line, and serve as a resource guide to aid in the sales process. It is comprehensive, yet quickly read, with a bulleted text format. Product features, benefits, and diagrams; servicing information; maintenance schedules; performance and competitive data; schematics; and other material may be included.

Product News – A publication used to update dealers on the development and availability of a new product, product update, product change, or feature. In addition to a basic description of the new item, among the contents may be specifications, detailed feature breakdown, performance data, schematics, pricing and shipping information, product contacts, and any other pertinent statistics.

Prognostics – Predict failure or potential problems before occurrence.

Progressive – Normally refers to a compound die where all slots are gang punched at one time.

Prony Brake – A friction brake used for engine testing.

Proof Stress – The load per unit area which a material is capable of withstanding without resulting in a permanent deformation of more than a specified amount per unit of cage length after complete release of load; i.e., the stress that will produce a very small permanent deformation, generally specified as 0.01% of the original gauge length. Because this is difficult to determine by the alternate loading and releasing which is generally prescribed, the offset method is frequently employed.

Proton – The positively charged particle in the nucleus of an atom.

Prussian Blue – A blue pigment, obtainable in tubes, which is used to find high spots in a bearing.

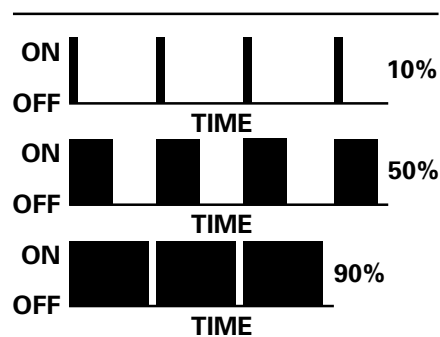
PS — Pferdestärke (horsepower) – German designation for metric horsepower.

Psychrometric Chart – A chart that shows the relationship between the temperature, pressure, and moisture content of the air.

Pull Down – An expression indicating action of removing refrigerant from all or a part of a refrigerating system.

Pulsate – To move with rhythmical impulse.

Pulse Width Modulation (PWM) – A signal consisting of variable width pulses at fixed intervals, whose ratio of “TIME ON” versus total “TIME OFF” can be varied. (Also referred to as “duty cycle.”)



Example of Pulse Width

Pulverize – To reduce or become reduced to powder or dust.

Pump – A device for moving fluids.

Pump Down – The act of using a compressor or a pump to reduce the pressure in a container or a system.

Pump Scavenging – Using a piston-type pump to pump scavenging air.

Pumping Loss – The power consumed by replacing exhaust gas in the cylinder with fresh air.

Punch Press – A method of straightening which employs a punch press, “V” block supports, a dial gauge, and a straightedge. The bar to be straightened is placed on “V” blocks under the punch and rotated against a dial gauge or straightedge. The punch is then used to straighten the bar by deflecting the bar in the direction indicated by the gauge or straightedge. Neither the size nor finish is affected by this operation.

Purging – Releasing compressed gas to the atmosphere through some part of parts for the purpose of removing contaminants from the part or parts.

Push Fit – The part of the bearing that can be slid into place by hand if it is square with its mounting.

Push Rod – A connecting link in an operating mechanism, such as the rod interposed between the valve lifter and rocker arm on an overhead valve engine.

Pyrometer – A temperature indicator used for indicating exhaust temperature.

Q

Qualified Facility – A cogeneration facility which has been granted a “qualified” status by the FERC. To obtain the qualified status a facility must meet the ownership requirements (i.e., less than 50% electric utility ownership) and operating efficiency standards as outlined in the Public Utility Regulatory Policies Act of 1978 (PURPA).

Qualifying Facility – A cogenerator or small power producer which, under federal law, has the right to sell its excess power output to the public utility.

Quenching – The rapid cooling by immersion in liquids or gases or by contact with metal. The operation of hardening steel consists of slowly and uniformly heating to the proper austenitizing temperature above the upper critical (AC3), holding for sufficient time for through heating, and then quickly cooling by plunging the part into the quenching medium.

Quicksilver – Metallic mercury.

R

R-11, Trichloromonofluoromethane – Low pressure, synthetic chemical refrigerant which is also used as a cleaning fluid.

R-113, Trichlorotrifluoroethane – Synthetic chemical refrigerant.

R-12, Dichlorodifluoromethane – A popular refrigerant known as Freon 12.

R-134a – A commercially available, environmentally friendly hydrofluorocarbon (HFC) refrigerant for use as a long-term replacement for R-12 in new equipment and for retrofitting medium temperature CFC-12 systems.

R-160, Ethyl Chloride – Refrigerant which is seldom used at the present time.

R-170, Ethane – Low temperature application refrigerant.

R-22, Monochlorodifluoromethane – Synthetic chemical refrigerant.

R-290, Propane – Low temperature application refrigerant.

R-40, Methyl Chloride – Refrigerant which was used extensively in the 1920s and 1930s.

R-500 – Refrigerant which is azeotropic mixture of R-12 and R-152A

R-502 – Refrigerant which is azeotropic mixture of R-22 and R-115.

R-503 – Refrigerant which is azeotropic mixture of R-23 and R-13.

R-504 – Refrigerant which is azeotropic mixture of R-32 and R-115.

R-600, Butane – Low temperature application refrigerant, also used as a fuel.

R-611, Methyl Formate – Low pressure refrigerant.

R-717, Ammonia – Popular refrigerant for industrial refrigerating systems; also a popular absorption system refrigerant.

R-764, Sulphur Dioxide – Low pressure refrigerant used extensively in the 1920s and 1930s. Not in use at present; chemical is often used as an industrial bleaching agent.

Race (bearing) – A finished inner and outer surface in which or on which balls or rollers operate.

Raceway – The surface of the groove or path which supports the balls or rollers of a bearing roll.

Rack Shutoff – An engine protection measure involving a hydraulic fuel rack actuator installed on an engine's injection pump housing. When activated, the piston of the actuator moves the rack to the fuel "off" position.

Radial – A type of cylinder arrangement in an engine where the cylinders are placed radially like wheel spokes.

Radial Clearance (radial displacement) – The clearance within the bearing and between the balls and races, perpendicular to the shaft.

Radial Load – A "round-the-shaft" load; that is, one that is perpendicular to the shaft through the bearing.

Radiator – A heat exchanger in which cooling water gives up heat to the air without coming into direct contact with it.

Radiator Cooling – A type of cooling system used on generator sets which involves a fan forcing air through an engine's radiator, lowering the temperature of the coolant.

Radius – The distance from the center of a circle to its outer edge or the straight line extending from the center to the edge of a circle.

Random Wound – The type of winding style which refers to flexible bundles of main stator winding with round wire.

Rate Schedule – Price list showing how the utility will bill a class of customers.

Rated – The advertised value of an engine when full load is removed, expressed as a percentage of full load speed.

Rated Horsepower – Value used by the engine manufacturer to rate the power of his engine, allowing for safe loads, etc.

Ratio – The relation or proportion of one number or quantity to another.

Reactive Droop Compensation – One method used in paralleled generator sets to enable them to share reactive power supplied to a load. This system causes a drop in the internal voltage of a set when reactive currents flow from that generator. Typically, at full load, 0.8 PF, the output voltage of a set is reduced by 4% from that at no load when reactive droop compensation is used.

Reactive Power – Power that flows back and forth between the inductive windings of the generator and the inductive windings of motors, transformers, etc., which are part of the electrical load. This power does no useful work in the electrical load nor does it present load to the engine. It does apply load to the generator and limits the capacity of the generator.

Ream – To finish a hole accurately with a rotating fluted tool.

Rebore – To bore a cylinder to a size slightly larger than the original.

Receiver-Drier – A cylinder in a refrigerating system for storing liquid refrigerant and which also holds a quantity of desiccant.

Reciprocating Action (motion) – A back-and-forth (alternating) movement.

Reciprocating Engine – A type of engine where pistons with pressurized gas move back and fourth (reciprocate) within the cylinders).

RECLAIM – REgional CLean Air Incentive Market is a newly adopted method of controlling emissions for stationary sites in the SCAQMD around Los Angeles. Essentially, a site is pictured with a bubble around it and is allowed a certain emission level. Each year, beginning in 1994 and ending at the end of 2010, the emission level is required to be lowered by 8.3%.

Rectifier – A device which exhibits a very high resistance to the flow of current in one direction and a very low resistance to flow in the opposite direction. Rectifiers are used to change AC voltages to DC before applying it to the generator field.

Reduction of Area – The difference between the original cross sectional area and that of the smallest area at the point of rupture. It is usually stated as a percentage of the original area, also called “contraction of area.”

Rectifier Assembly – An electronic device which rectifies AC current (produced by exciter rotor winding) to DC current and applies it to the revolving field winding.

Refrigerant – Substance used in refrigerating mechanism to absorb heat in evaporator coil by change of state from a liquid to a gas, and to release its heat in a condenser as the substance returns from the gaseous state back to a liquid state.

Refrigerant Charge – Quantity of refrigerant in a system.

Refrigerating Effect – The amount of heat in Btu/h or Cal/hr the system is capable of transferring.

Refrigeration – The process of transferring heat from one place to another by the change in state of a liquid.

Refrigeration System – A system composed of parts necessary to accomplish heat transfer by the change in state of the refrigerant.

Refrigeration-Absorption – Refrigerating effect produced by the change in pressure in the system produced by the changes in the ability of a substance to retain a liquid dependent upon the temperature of the substance.

Refrigeration-Mechanical – Refrigerating effect produced by the changes in pressure in the system produced by mechanical action of a compressor.

Regulator – An electronic device which senses AC current, compares current to a set value, rectifies AC to DC and applies it to the exciter stator winding in order to maintain constant output voltage in the main stator winding. (See VR1, 2, 3, 4)

Regulator, Electrical – An electromagnetic or electronic device used to control generator voltage.

Relative Humidity – Ratio of the amount of water vapor present in air to the greatest amount possible at the same temperature.

Relay – An electromagnetic switch which utilizes variation in the strength of an electric circuit to affect the operation of another circuit.

Relief Valve – An automatic valve which is held shut by a spring of correct strength. Excess pressure opens the valve and releases some of the gas or liquid. This valve is for protecting filters, air tanks, etc. from dangerous pressures.

Remanufactured Extended Coverage – A Caterpillar program which protects buyers from repair expenditures beyond the standard warranty period on remanufactured truck engines.

Residual Fuel – A fuel resembling tar and containing abrasive and corrosive substances. It is composed of the remaining elements from crude oil after the crude has been refined into diesel fuel, gasoline, or lubricating oil.

Resistance, Electrical – The opposition offered by a body when current passes through it.

Resistor – A device placed in a circuit to lower the voltage, to reduce the current, or to stabilize the voltage.

Response Check – A measure of the engine’s ability to develop increasing torque at constant speed.

Response Check Idle Speed – The engine speed specified for the cool-down portion of the response check.

Response Check Speed – The constant engine speed at which the engine is loaded to determine the time to develop a specified torque.

Response Time – A measure of the time required for an engine to develop a specified torque or power.

Retard (injection timing) – To set the timing so that injection occurs later than TDC or fewer degrees before TDC.

Reverse Flush – To pump water or a cleaning agent through the cooling system in the opposite direction to normal flow.

Reverse Power Relay – A device which is sensitive to the current flow direction. Reverse currents trip the relay, activating auxiliary switches that control the circuit breaker and/or alarm devices.

Reverse Rotation – An engine condition caused by a transmission shift from forward to reverse, or vice versa, when sufficient engine torque is not available at idle speed to overcome propeller and driveline inertia. It causes the engine to stall or reverse itself.

Reverse VAR Relay – Detects VAR flow into generator set (leading power factor). This condition occurs in a paralleled generator set if the system is not adjusted properly or a failure has occurred in the excitation system.

Revolutions per Minute (rpm) – The number of revolutions an engine's crankshaft makes in one minute.

Rheostat – A device to regulate current flow by varying the resistance in the circuit.

Rimmed Steel – An incompletely deoxidized steel normally containing less than 0.25% carbon and having the following characteristics: (a) During solidification an evolution of gas occurs sufficient to maintain a liquid ingot top ("open" steel) until a side and bottom rim of substantial thickness has formed. If the rimming action is intentionally stopped shortly after the mold is filled, the product is termed capped steel. (b) After complete solidification, the ingot consists of two distinct zones: a rim somewhat purer than when poured and a core containing scattered blowholes with a minimum amount of pipe and having an average metalloid content somewhat higher than when poured and markedly higher in the upper portion of the ingot.

Ring Groove – A groove machined in the piston to receive the piston ring.

Ring Job – The service work on the piston and cylinder including the installation of new piston rings.

Risers – Bus bars that connect circuit breakers to the system bus.

Rivet – A soft-metal pin having a head at one end.

Rocker Arm – A first-class lever used to transmit the motion of the pushrod to the valve stem.

Rocker Arm Shaft – The shaft on which the rocker arms pivot.

Rockwell Hardness – A measurement of the degree of surface hardness of a given object by pressing a steel ball or diamond cone into a sample and using scales which indicate differences between depths penetrated by major and minor loads.

Rod – Refers to a connecting rod.

Roller Bearing – An antifriction bearing using straight (cupped or tapered) rollers spaced in an inner and outer ring.

Roller Tappets (Roller Lifters) – Refers to valve lifters having a roller at one end which is in contact with the camshaft and is used to reduce friction.

Roots Blower – An air pump or blower similar in principle to a gear-type pump.

Rope Brake – A friction brake used for engine testing.

Rotary Blower – Any blower in which the pumping element follows rotary motion, centrifugal blowers being the exception.

Rotary Compressor – Mechanism which pumps fluid by using rotating motion.

Rotary Motion – A circular movement, such as the rotation of a crankshaft.

Rotating Engine or Turbine – An engine which sends pressurized gas through a wheel, forcing it to turn.

Rotation of Engine – The direction of rotation of the engine flywheel as viewed from the rear of an engine, usually expressed as clockwise or counterclockwise. The rotation of an engine is normally counterclockwise.

Rotor – Rotating valve or conductor for carrying fluid or electrical current from a central source to the individual outlets as required.

Roughing Stone (hone) – A coarse honing stone.

Runbacks – Bus extensions from the circuit breaker that provided a location for connection of the cables coming from a generator set.

Running-fit – A machine fit with sufficient clearance to provide for expansion and lubrication.

S

SAE Horsepower (Rated Horsepower) – Formula to determine power: bore diameter² x number of cylinders/2.5 = hp

SAE Viscosity Numbers – Simplified viscosity ratings of oil based on Saybolt viscosity.

Safety Factor – Providing strength beyond that needed as an extra margin of insurance against parts failure.

Safety Valve – See *Relief Valve*.

Sand Blast (Glass Blast) – A cleaning method using an air gun to force the sand at low pressure (about 150 psi) against the surface to be cleaned.

Saturation – A condition existing when a substance contains the maximum of another substance for that temperature and pressure.

Saybolt Viscosimeter – A container with a calibrated outlet tube for determining the viscosity of liquids. (This method is now obsolete.)

Saybolt Viscosity – The number of seconds necessary for 60 mL of liquid to pass through the outlet tube of a Saybolt viscosimeter under standardized test conditions.

Scab – A rough projection on a casting caused by the mold breaking or being washed by the molten metal or occurring where the skin from a blowhole has partly burned away and is not welded.

Scale – A flaky deposit occurring on steel or iron. Ordinarily used to describe the accumulation of minerals and metals accumulating in an engine cooling system.

Scavenging – The displacement of exhaust gas from the cylinder by fresh air.

Scavenging Air – The air which is pumped into a cylinder to displace exhaust gas.

Scavenging Blower – A device for pumping scavenging air.

Scavenging Pump – A piston-type pump delivering scavenging air to an engine.

Scheduled Oil Sampling (S-O-S) – A Cat service which offers insight into engine wear through periodic analysis of oil samples.

Score – A scratch, ridge or groove marring a finished surface.

Scraper Ring – An oil control ring.

Screw Extractor – A device used to remove broken bolts, screws, etc. from holes.

S-Curve – The curve that results from plotting the time for austenite transformation against the temperature at which the transformation takes place. These curves were originally developed by Davenport & Bain and reported in their paper entitled “Transformation of Austenite and Constant Subcritical Temperatures.”

SE (Excitation Type) – A self-excited generator where residual magnetism found in the revolving field lamination initiates current flow in the main stator winding.

Sealed Bearing – A bearing which is lubricated and sealed at the factory and which cannot be lubricated during service.

Sealed Unit – (See *Hermetic System*) A motor-compressor assembly in which motor and compressor operate inside a sealed dome or housing.

Seam – A crack on the surface of metal which has been closed but not welded, usually produced by blowholes which have become oxidized. If very fine, a seam may be called a hair crack or hair seam.

Seat – A surface, usually machined, upon which another part rests or seats. For example, the surface upon which a valve face rests.

Seat (Rings) – Rings fitted or seated properly against the cylinder wall.

Second Law of Thermodynamics – Heat will flow only from material at certain temperature to material at lower temperature.

Secondary Distribution System – A low-voltage, alternating-current system which connects the secondaries of distribution transformers to the customer’s services.

Sediment – Solid impurities in a liquid.

Segregation – Steel is a mixture of compounds and elements which, when cooled from the molten state, solidify at different temperatures. Segregation is the resulting concentration of the various ingredients in different parts of the ingot with the maximum concentration generally found at the base of the pipe.

Selective Energy System – The name previously used to describe a form of cogeneration in which part, but not all of the site’s electrical needs were met with on-site generation with additional electricity purchased from a utility as needed.

Self Excited (SE) – Excitation Type — Generator where residual magnetism found in the revolving field lamination initiates current flow in the main stator winding.

Semiconductor – An element which is neither a good conductor nor a good insulator.

Semifloating Piston Pin – A piston pin which is clamped either in the connecting rod or piston bosses.

Sensible Heat – Heat which causes a change in temperature of a substance.

Separate Circuit AfterCooled (SCAC) – Removal of the aftercooler from the jacket water circuit, and provision of cooling from an independent source. It is necessary on all turbocharged engines and high temperature jacket water systems used in heat recovery applications.

Separate Circuit Aftercooler – A heat exchanger for cooling combustion air cooled by a source of water external to the engine.

Separator, Battery – A porous insulation material placed between the positive and negative plates.

Separator, Oil – A device used to separate refrigerant oil from refrigerant gas and return the oil to the crankcase of the compressor.

Series Boost – An additional electronic device added into the generator power system which provides a power source for approximately 10 seconds after a short occurs to allow protective trip devices to function correctly.

Series Circuit – An electric circuit wired so that the current must pass through one unit before it can pass through the other.

Series-Parallel Circuit – A circuit with three or more resistance units in a combination of a series and a parallel circuit.

Service Area – Territory in which a utility system is required or has the right to supply electric service to ultimate customers.

Serviceable Hermetic – Hermetic unit housing containing motor and compressor assembled by use of bolts or threads.

Shaft Horsepower – Power delivered at the engine crankshaft. This term is commonly used instead of *brake horsepower* to express output of large marine engines.

Shell-Type Condenser – Cylinder or receiver which contains condensing water coils or tubes.

Shell-and-Tube Flooded Evaporator – Device which flows water through tubes built into cylindrical evaporator or vice-versa.

Shim – A thin, flat piece of brass or steel used to increase the distance between two components.

Short Circuit – A circuit whose resistance is reduced in power owing to one or more coil layers contacting one another.

Shrink-Fit – A fit between two components made by heating the outer component so that it will expand and fit over the inner component. As the outer component cools, it shrinks and thereby fits tight to the inner component.

Shroud – The enclosure around the fan, engine, etc., which guides the airflow.

Shunt – A parallel circuit where one resistance unit has its own ground.

Shunt Trip – Feature modification allows for tripping the breakers with an electrical signal from a remote location.

Shunt Winding – A resistance coil with its own ground.

Shutoff Valve – A valve which opens and thereby stops the flow of a liquid, air, or gas.

Significant Figures – The number of digits in a number defining the precision of the number.

Silencer – A device for reducing the noise of intake or exhaust.

Silica Gel – Chemical compound used as a drier, which has the ability to absorb moisture when heated. Moisture is released and the compound may be reused.

Silicon-Controlled Rectifier (SCR) – A device that passes current in one direction only, like an ordinary rectifier, but includes a switch to control the current flow.

Single Element (SE) – Number of elements in an assembly, especially filters.

Single Phase – An AC system having one voltage of given frequency.

Single Voltage – Term used to denote 4-lead unit — 480V or 600V.

Single-Acting Cylinder – An actuating cylinder in which one stroke is produced by pressurized fluid, and the other stroke is produced by some other force, such as gravity or spring tension.

Sliding-Fit – Where sufficient clearance has been allowed between the shaft and journal to allow free running without overheating.

Slip-In Bearing – A liner made to precise measurements which can be used for replacement without additional fitting.

Slit Coil – A particular width of coil steel slit for a die run.

Slobber – Unburned lubricating oil or fuel discharged into the exhaust system along with exhaust gasses.

Slot Cell – Passage into which magwire is inserted. Either in stator lamination or revolving field lamination.

Slot Fill – Calculated and actual percentage area of the wire. Compared to the available slot area in the lamination minus the slot and coil insulation.

Slot Liners – Insulation between top and bottom magwire coil in slot passage.

Slot Separator – The insulation between top and bottom magwire coil in the slot passage.

Sludge – A composition of oxidized petroleum products along with an emulsion formed by the mixture of oil and water. This forms a pasty substance and clogs oil lines and passages and interferes with engine lubrication.

Small Brushless – The existing line of small generators; 360, 440, and 580 frames; where customer line lead connection and regulator assembly is covered with a top-mounted, front-covered terminal box.

Small Power-Production Facility – As defined in the Public Utility Regulatory Policies Act (PURPA), a facility that produces energy solely by using as a primary energy source, biomass, waste, renewable resources, or any combination thereof, and has a power production capacity that, together with any other facilities located at the same site (as determined by the Commission), is not greater than 80 megawatts.

S-N Curves – Curves that are obtained by plotting the number of cycles (N) as abscissa against the load per square inch(s) applied to the test specimen as ordinate. They graphically illustrate the effect of rapid reversals of stress of definite value on the life of the specimen.

Snap Ring – A fastening device in the form of a split ring that is snapped into a groove in a shaft or in a groove in a bore.

Snubbers – Material used to absorb energy produced by a sudden change in motion.

Sodium Valve – A valve designed to allow the stem and head to be partially filled with metallic sodium.

SoftCruise – Provides a small “soft” window centered around the cruise set speed. SoftCruise modulates fuel delivery above and below the cruise set speed to eliminate abrupt cutoffs in fuel delivery while in cruise, and allows the truck to increase speed slightly above the cruise set speed while going downhill (no load) to “warm-up” the turbocharger. This provides quick boost and improved engine response.

Solar Cell – A photovoltaic cell that can convert light directly into electricity. A typical solar cell uses semiconductors made from silicon.

Solenoid – An electrically magnetic device used to do work.

Solid Absorbent Refrigeration – Refrigerating system which uses a solid substance as an absorber of the refrigerant during the cooling part of the cycle and releases refrigerant when heated during the generating part of the cycle.

Solid Injection – The system used in diesel engines where fuel as a fluid is injected into the cylinder rather than a mixture of fuel and air.

Solid Water System – A type of high temperature heat recovery system. Also known as ebullient system.

Soluble Organic Fraction (SOF) – A particle emission.

Solvent – A solution which dissolves some other material. For example, water is a solvent for sugar.

Sorbite – A late stage in the tempering of martensite when the carbide particles have grown so that the structure has a distinctly granular appearance. Further and higher tempering causes globular carbides to appear clearly.

Sound Attenuated (SA) – A term used to describe a generator set enclosure which has been specially designed to reduce the amount and severity of escaping noise.

Sound Power Level – The total sound power being radiated from a source, such as a generator set. The magnitude of the sound is independent of the distance from the source.

Space Heaters – Heating elements mounted in the unit to keep windings warm during shutdown periods which eliminate condensation on the electric components.

Spark Ignited Engine – For purposes of this specification, Spark Ignited Engine is synonymous with Gaseous Fueled Engine.

Spark Testing – An inspection method for quickly determining the approximate analysis of steel. It is intended primarily for the separation of mixed steel and, when properly conducted, is a fast, accurate, and economical method of separation. It consists in holding the sample against a high speed grinding wheel and noting the character and color of spark, which is compared with samples of known analysis.

Specific Fuel Consumption – The fuel rate divided by the power. Corrected specific fuel consumption is the value obtained when the corrected fuel rate is divided by corrected power.

Specific Gravity – The ratio of the weight of a given volume of any substance to that of the same volume of water.

Specific Heat – Ratio of quantity of heat required to raise the temperature of a body one degree to that required to raise the temperature of an equal mass of water one degree.

Specification Sheet – A technical overview of a particular engine or engine-related product. Sales features, engine specifications, performance data and curves, dimensions and weight, standard and accessory equipment, and rating definitions and conditions are among the standard contents.

Spline – A long keyway. The land between two grooves.

Split System – Refrigeration or air-conditioning installation which places condensing unit outside or remote from evaporator. Also applicable to heat pump installations.

Spool Valve – A hydraulic directional control valve in which the direction of the fluid is controlled by means of a grooved cylindrical shaft (spool).

Spot Weld – To attach in spots by localized fusion of the metal parts with the aid of an electric current.

Spur Gear – A toothed wheel having external radial teeth.

Squish Area – The area confined by the cylinder head and flat surface of the piston when on compression stroke.

Stability – The resistance of a fluid to permanent change such as that caused by chemical reaction, temperature changes, etc.

Stabilized – The steady or cyclic condition of an engine performance characteristic which remains unchanged with time while the engine is running under a given steady state condition.

Standard Atmosphere – Condition when air is at 14.7 psia pressure, at 68° F temperature.

Standard Conditions – Used as a basis for air-conditioning calculations. Temperature of 68° F, pressure of 29.92 in Hg and relative humidity of 30 percent.

Standby Capacity – The capacity that is designed to be used when part or all of the prime source of power is interrupted.

Standby Power – Output available with varying load for the duration of the interruption of the normal source power. Fuel stop power in accordance with ISO3046/1, AS2789, DIN6271, and BS5541.

Standby Rate – The utility charge for standby electricity.

Starting Air – Compressed air used for starting an engine.

Starting-Air Valve – A valve which admits compressed starting air to the cylinder.

Static Electricity – Electricity at rest; pertaining to stationary charges.

Static Fuel System Setting – A setting of a fuel system, either mechanical or electronic, made in an attempt to obtain the desired fuel rate at a particular engine operating point. Settings are normally made to provide either full load fuel rate or the fuel rate at torque check rpm. They are identified respectively as Full Load Static Fuel Setting (FLSFS) or Full Torque Static Fuel Setting (FTSFS).

Static Head – The maximum height the coolant water is raised.

Static Pressure – The pressure exerted against the inside of a duct in all directions. Roughly defined as *bursting pressure*.

Stator – The fixed or stationary portion of a generator.

Staybolt – A stress bolt running diagonally upward from the bedplate to the opposite side of the frame.

Steady Flow – A flow in which the velocity components at any point in the fluid do not vary with time.

Stethoscope – A device for conveying the sound of a body (engine noise) to the technician.

Straightening – Cold finished bars may require straightening following cold drawing, turning, or furnace treatment in order to meet the standard established for the particular type or grade being produced. These bars may be straightened by several different types of equipment designed to deflect the bar so that equalizing stresses are set up in the bar which keep it straight. See *Irregular Straighteners*, and *Medart, Punch Press*.

Streamline Flow – A nonturbulent flow, essentially fixed in pattern.

Stress – The force or strain to which a material is subjected.

Stress Relief – A method of relieving the internal stress set up in metal by forming or cooling operations. It consists in heating to a temperature of approximately 1050° F for a sufficient length of time to through heat the part, and cooling in air.

Stroboscope (timing light) – An instrument used to observe the periodic motion of injection visible only at certain points of its path.

Stroke – A single movement (usually repeated continuously) of a piston within a cylinder from one end of its range to the other; constitutes a half revolution of an engine.

Stroke-to-Bore Ratio – The length of the stroke divided by the diameter of the bore.

Structural Shapes – The general term applied to the rolled, flanged sections having at least one dimension of their cross section 3 inches or greater.

Stud – A rod with threads cut on both ends, such as a cylinder stud which screws into the cylinder block on one end and has a nut placed on the other end to hold the cylinder head in place.

Stud Puller – A device used to remove or to install stud bolts.

Stuffing Box – A chamber having a manual adjustment device for sealing.

Subcooling – Cooling of liquid refrigerant below its condensing temperature.

Suction – Suction exists in a vessel when the pressure is lower than the atmospheric pressure, also see *Vacuum*.

Suction Line – Tube or pipe used to carry refrigerant gas from evaporator to compressor.

Suction Valve – Often used interchangeably with *intake valve*.

Sulfur – An undesirable element found in petroleum in amounts varying from a slight trace to 4 or 5 percent.

Sulfur Dioxide (SO₂) – An engine emission made up of the oxidized portion of sulfur in fuel.

$$\text{SO}_2 \text{ (g/kW-hr)} = 0.01998 \times \text{BSFC (g/kW-hr)} \times \% \text{ sulfur in fuel (by weight)}$$

Sump – A receptacle into which liquid drains.

Sump Pump – A pump which removes liquid from the sump tank.

Supercharger – A blower or pump which forces air into the cylinders at higher-than-atmospheric pressure. The increased pressure forces more air into the cylinder, thus enabling more fuel to be burned and more power produced.

Superficial Hardness – Measure of the degree of surface hardness with a more sensitive depth measuring system than is used with regular Rockwell machines. It is recommended for use on thin strip or sheet material, nitrided or lightly carburized pieces.

Supplemental Thermal – The heat required when recovered engine heat is insufficient to meet thermal demands.

Supplementary Firing – The injection of fuel into the recovered heat stream (such as turbine exhaust) to raise the energy content (heat of the stream).

Supplementary Power – Electric energy supplied by an electric utility in addition to that which the facility generates itself.

Supply Line – A line that conveys fluid from the reservoir to the pump.

Surge – A momentary rise and fall of pressure or speed in a system or engine.

Switchgear – The equipment between a generator and the lines of distribution that switches the electrical load to and from a generator, protects the generator from short circuits, monitors generator output, provides the means to parallel two or more units onto the system, and controls the operation of the engine.

Synchronization – The act of matching a generator set's frequency and phase with that of the system bus, before paralleling the set.

Synchronize – To make two or more events or operations occur at the proper time with respect to each other.

Synchronizer – An electronic device that monitors the phase relationship between two voltage sources and provides a correction signal to an engine governor, to force the generator set to synchronize with a system bus.

Synchronizing Check Relay – A device used in conjunction with both types of circuit breakers to assure that the incoming unit is within specified voltage and frequency limits before paralleling is accomplished.

Synchronizing Lights – Lamps connected across a circuit breaker of a generator set. The lights indicate when the voltage wave forms of the incoming and operating power sources coincide and paralleling can be completed. When the lights fade from light to dark, and they are at their darkest, the two sources are synchronized and paralleling can be accomplished.

Synchronous – Recurring operation at exactly the same time. The speed at which a rotating AC electrical machine would rotate if there were no slip. Example: Four-pole, 60 Hz generator has a synchronous speed of 1800 rpm.

Synchroscope – A meter that indicates the relative phase angle between an incoming set voltage and the bus voltage. The synchroscope pointer indicates whether the set is faster or slower than the bus and allows the operator to adjust the frequency (speed) accordingly before manually paralleling to the bus.

Synthetic Material – A complex chemical compound which is artificially formed by the combining of two or more compounds or elements.

System Shutdown – On the EMS II module, a flashing red light and a horn annunciate if the ECM initiates a system controlled emergency shutdown or if there is an active system fault. This may be an overspeed, low oil pressure, or high coolant temperature shutdown.

System Voltage – On the EMS II module, a flashing red light and a horn annunciate when the DC system falls below 20 volts.

T

Tachometer – An instrument indicating rotating speeds. Tachometers are sometimes used to indicate crankshaft rpm.

Tap – A cutting tool used to cut threads in a bore. (See *Chamfer*.)

Tap and Die Set – A set of cutting tools used to cut internal and external threads.

Tapered Roller Bearing – See *Roller Bearing*.

Tappet – The adjusting device for varying the clearance between the valve stem and the cam. May be built into the valve lifter in an engine or may be installed in the rocker arm on an overhead valve engine.

Tappet Noise – The noise caused by the excessive clearance between the valve stem and the rocker arm.

Telephone Influence Factor (TIF) – The possible effect of generated harmonics on adjacent telephone circuits. European standards refer to it as Telephone Harmonic Factor or THF. The factor relates to interference by magnetic induction. This is rarely a problem today as telephone lines are in conduit, shielded cable, or buried. However, some engineers use this factor to predict the amount of electrical noise induced or conducted into control circuits that may trigger SCR devices.

Temper – The condition of a metal with regard to harness achieved through heating and then suddenly cooling.

Temper Brittleness – The term applied to the brittleness or low impact resistance that may occur in medium carbon and many alloy steels that are slowly cooled from the tempering temperature. It may be corrected by water quenching after tempering. Molybdenum in amounts of 25% to 50% tend to retard the formation of temper brittleness.

Temperature of Compression – The temperature of the compressed air charge in a power cylinder at the end of the compression stroke before combustion begins.

Temporary Hardness – Dissolved substances which precipitate out when water is heated.

Tensile Strength – The maximum load in pounds per square inch that the sample will carry before breaking under a slowly applied gradually increasing load. In the stress/strain diagram, this is the highest point on the curve and is probably the most used steel specification.

Tension – Stress applied on material or body.

Terminal – The connecting point (post) of a conductor.

T-head Engine – An engine design wherein the inlet valves are placed on one side of the cylinder and the exhaust valves are placed on the other.

Theory – A scientific explanation tested by observations and experiments.

Thermal Capacity – The maximum amount of heat that a system can produce.

Thermal Efficiency – A gallon of fuel contains a certain amount of potential energy in the form of heat when burned in the combustion chamber. Some of this heat is lost and some is converted into power. The thermal efficiency is the ratio of work accomplished to the total quantity of heat in the fuel. (See also *Brake Thermal Efficiency* and *Indicated Thermal Efficiency*.)

Thermal Expansion – The increase of volume of a substance caused by temperature change.

Thermal Growth – The tendency for materials to expand when exposed to heat. Exhaust piping of a generator set undergoes this phenomenon.

Thermocouple – The part of a pyrometer which consists of two dissimilar metal wires welded together at the inner end and held in a protective housing.

Thermodynamics –

1st law of: Energy can neither be created nor destroyed — it can only be changed from one form to another.

2nd law of: To cause heat energy to travel, a temperature (heat intensity) difference must be created and maintained.

Thermometer – An instrument for measuring temperature.

Thermostat – A temperature-responsive mechanism used for controlling heating systems, cooling systems, etc. (such as between the cylinder block and the radiator) usually with the object of maintaining certain temperatures without further personal attention.

Thimbles – Separate the exhaust pipe from walls or ceiling to provide mechanical and thermal isolation.

Three Phase – An AC system having three voltages of the same frequency but displaced in phase by 120 degrees relative to another.

Throttling – Reducing the engine speed (flow of fuel).

Throw – The distance from the center of the crankshaft main bearing to the center of the connecting rod journal.

Thru-Bolt – Term usually applied to the stress rod passing through the engine frame to carry combustion stresses.

Thrust Bearing (Washer) – A bearing or washer of bronze or steel which restrains endwise motion of a turning shaft, or withstands axial loads instead of radial loads as in common bearings.

Thrust Load – A load which pushes or reacts through the bearing in a direction parallel to the shaft.

Thyristor Control – A method of powering a DC motor by an AC generator.

Time Lag of Ignition – See *Ignition Lag*.

Time-Of-Use Rates – Electricity prices that vary depending on the time periods in which the energy is consumed. In a time-of-use structure, higher prices are charged during utility peak-load times.

Timing (Diesel) – The angular position of the crankshaft relative to top dead center at the start of injection.

Timing Gears – Gears attached to the crankshaft, camshaft, idler shaft, or injection pump to provide a means to drive the camshaft and injection pump and to regulate the speed and performance.

Timing Marks – The marks located on the vibration damper, flywheel, and throughout an engine to check injection and valve opening timing.

Timing (Spark Ignited) – The angular position of the crankshaft relative to top dead center at the time the spark plugs are energized.

Tolerance – A permissible variation between the two extremes of a specification of dimensions. Used in the precision fitting of mechanical parts.

Ton – 12,000 Btu/Hour.

Ton of Refrigeration – Refrigerating effect equal to the melting of one ton of ice in 24 hours. This may be expressed as follows:

288,000 Btu/24 hr

12,000 Btu/1 hr

200 Btu/min

3.52 kW

Top Center (TC) – The position of the crankshaft at the time the piston is at its highest position.

Top-Down – Must meet the most stringent law, but, based on environmental, energy, and economic considerations could step down to a less stringent law.

Topping-Cycle – A cogeneration facility in which the energy input to the facility is first used to produce useful power, with the heat recovered from power production then used for other purposes.

Topsticks – Insulation wedge to prevent magwire coils from coming out of slot passage.

Torque – A measure of the tendency of a force to cause rotation, often used in engine specifications. Equal to the force multiplied by the perpendicular distance between the line of action of the force and the center of rotation.

Torque at TC rpm – The steady state torque developed by an engine at the torque check speed.

Torque Check Speed – The speed at which an engine is run to check the low speed performance characteristics.

Torque Curve or Lug Curve – A performance map created for a diesel engine, using high idle setting and rack setting values.

Torque Shaping – A way to optimize engine response through control of horsepower at a given engine speed.

Torque Wrench – A special wrench with a built-in indicator to measure the applied turning force.

Torsional Study – An analysis used to predict operating characteristics of the vibrating system of an engine, which includes pistons, rods, the crankshaft, the flywheel, coupling, the driven equipment, and associated shafting.

Torsional Vibration – The vibration caused by twisting and untwisting a shaft.

Total Energy Systems – The name previously used to refer to a form of cogeneration in which all electrical and thermal energy needs were met by on-site systems. A total energy system was usually completely isolated from or completely served by the electrical utility system for back-up. Generally a user was not served simultaneously by the electric utility grid and the cogenerator.

Transducer – A device for converting a variable physical parameter to a proportional electrical signal. The inputs can be temperature, pressure, position, voltage, current, or any other physical parameter. Outputs are typically 4-20 ma, 0-10 volts or some other signal easily accommodated by instruments and controlling devices.

Transfer Pump – A mechanical device for moving fuel from one tank to another or bringing fuel from the tank to the injection pump.

Transfer Switch – An electrical device for switching loads between alternate power sources. An automatic transfer switch monitors the condition at the sources and signals for starting of the emergency system if the preferred source fails. When the emergency source is available the load is switched. Upon return of the normal source the load is retransferred to normal power and the start signal is removed.

Transformer – A device used to convert from one voltage level to another with very little loss of power.

Transmission – The act or process of transporting electric energy in bulk from a source or sources of supply to other principal parts of the system or to other utility systems.

Trap – A receptacle often installed at the lowest point in generator set exhaust piping to drain moisture that could reach and damage the system's silencer.

Trichlorotrifluoroethane – Complete name of refrigerant R-113. Group 1 refrigerant in rather common use. Chemical compounds which make up this refrigerant are chlorine, fluorine, and ethane.

Trip Unit – A device within a low voltage circuit breaker that provides overcurrent protection.

Troostite – A microconstituent of hardened and tempered steel which etches rapidly and therefore usually appears dark. It consists of a very fine aggregate of ferrite and cementite and is normally not resolved under the microscope.

Tropicalization – Thoroughly insulating rotor and stator with epoxy to provide high insulating and mechanical properties under severe moisture and temperature conditions.

Troubleshooting – A process of diagnosing or locating the source of the trouble or troubles from observation and testing. Also see *Diagnosis*.

Truck Engine Pro (TEP) – A Cat computer program to assist customers in selecting truck engine models and options. Various drivetrain and component performance analyses can be reviewed.

Truck Owner Protection Plan (TOPP) – A Cat plan offering a guaranteed cost per mile for all truck engine maintenance and repairs.

Tube Cutter – A tube-cutting tool having a sharp disk which is rotated around the tube.

Tubing – That type of fluid line whose dimensions are designated by actual measured outside diameter.

Tune-Up – The act of checking, testing, measuring, repairing, and adjusting the engine components in order to bring the engine to peak efficiency.

Turbine – An engine or motor having a drive shaft driven either by steam, water, air, gas, etc., against curved vanes of a wheel or set of wheels, or by the reaction of fluid passing out through nozzles located around the wheel(s).

Turbine Generator – A device that uses steam, heated gases, water flow, or wind to cause spinning motion that activates electromagnetic forces and generates electricity.

Turbocharger – A type of charger driven by a turbine powered by exhaust gases.

Turbocharging – Increasing the intake air charge to a reciprocating engine by using a turbine driven by the energy of the engine's exhaust.

Turbulence – A disturbed, irregular motion of fluids or gases.

Turbulence Chamber – A combustion chamber connected to the cylinder through a throat. Fuel is injected across the chamber and turbulence is produced in the chamber by the air entering during compression.

Turning and Polishing – Whereas cold drawing reduces the cross sectional area by subjecting the bar to compressive and elongating forces, turning and polishing accomplishes the same by turning 1/16 to 3/16 inches from the diameter, depending on the bar size, usually following by polishing and straightening in a combination straightening and polishing machine.

Twist Drill – See *Drill*.

Two-Cycle Engine – An engine design permitting a power stroke once for each revolution of the crankshaft.

Two-Stage Combustion – Combustion occurring in two distinct steps such as in a precombustion chamber engine.

Two-Stroke Cycle – The cycle of events which is complete in two strokes of the piston or one crankshaft revolution.

U

“U” Factor – The amount of heat energy in Btu/h that will be absorbed by one square foot of surface for each degree of mean temperature difference through the surface material.

Undervoltage Relay – Operates when the monitored voltage is below the relay setpoint. It can be used to detect a failure in a power system or to indicate that a generator set is ready to be connected to a load on initial start-up.

Uniflow Scavenging – Scavenging method in which air enters one end of the cylinder and exhaust leaves the opposite end.

Uninterrupted Power Supply (UPS) – A power supply which maintains regulated power during a shortage to under- or overvoltage or no voltage.

Unit Injector – A combined fuel injection pump and fuel nozzle.

Updraft – A carburetor type in which the mixture flows upward to the engine.

U.S. gallon [gal (U.S.)] – United States gallon (231 in³).

Utility – A commercial power source that supplies electrical power to specific facilities from a large power grid.

Utility Grade Relay – Refers to a draw-out relay.

Utilization Factor – The ratio of the maximum demand of a system (or part of a system) to its rated capacity.

V

Vacuum – A perfect vacuum has not been created as this would involve an absolute lack of pressure. The term is ordinarily used to describe a partial vacuum; that is, a pressure less than atmospheric pressure — in other words a suction.

Vacuum Fluorescent (VF) – A type of visual display, often used on system control/monitoring panels, which provides excellent visibility in a variety of lighting conditions.

Vacuum Gauge – A gauge used to measure the amount of vacuum existing in a chamber or line.

Vacuum Pump – Special high efficiency compressor used for creating high vacuums for testing or drying purposes.

Valve – Any device or arrangement used to open or close an opening to permit or restrict the flow of a liquid, gas, or vapor.

Valve Clearance – The air gap allowed between the end of the valve stem and the valve lifter or rocker arm to compensate for expansion due to heat.

Valve Duration – The time (measured in degrees of engine crankshaft rotation) that a valve remains open.

Valve Expansion – Type of refrigerant control which maintains pressure difference between high side and low side pressure in a refrigerating mechanism. Valve is caused to operate by pressure in low or suction side. Often referred to as an Automatic Expansion Valve or AEV.

Valve Face – That part of a valve which mates with and rests upon a seating surface.

Valve Float – A condition where the valves are forced open because of valve-spring vibration or vibration speed.

Valve Grinding – Also called valve lapping. A process of lapping or mating the valve seat and valve face usually performed with the aid of an abrasive.

Valve Guide – A hollow-sized shaft pressed into the cylinder head to keep the valve in proper alignment.

Valve Head – The portion of the valve upon which the valve face is machined.

Valve Keeper (valve retainer) – A device designed to lock the valve spring retainer to the valve stem.

Valve Lash – Clearance set into the valve mechanism to assure that when hot, the valve will not be held open.

Valve Lift – The distance a valve moves from the fully closed to the fully open position.

Valve Lifter – A push rod or plunger placed between the cam and the valve on an engine. It is often adjustable to vary the length of the unit. (Also see *Cam Follower*.)

Valve Margin – The distance between the edge of the valve and the edge of the face.

Valve Oil Seal – A sealing device to prevent excess oil from entering the area between the stem and the valve guide.

Valve Overlap – The period of crankshaft rotation during which both the intake and exhaust valves are open. It is measured in degrees.

Valve Rotator – A mechanical device locked to the end of the valve stem which forces the valve to rotate about 5° with each rocker-arm action.

Valve Seat – The surface on which the valve face rests when closed.

Valve Seat Insert – A hardened steel ring inserted in the cylinder head to increase the wear resistance of the valve seat.

Valve Spring – A spring attached to a valve to return it to the seat after it has been released from the lifting or opening means.

Valve Stem – That portion of a valve which rests within a guide.

Valve Stem Guide – A bushing or hole in which the valve stem is placed which allows lateral motion only.

Valve, Suction – Valve in refrigeration compressor which allows vaporized refrigerant to enter cylinder from suction line and prevents its return.

Valve Timing – The positioning of the camshaft (gear) to the crankshaft (gear) to ensure proper valve opening and closing.

Valve-in-head Engine – Same as Overhead Valve Engine.

Valve-seat Insert – A hardened steel ring inserted in the cylinder head to increase the wear resistance of the valve seat.

Vanes – Any plate, blade, or the like attached to an axis and moved by or in air or a liquid.

Vapor – Word usually used to denote vaporized refrigerant rather than the word gas.

Vapor Charged – Lines and component parts of a system which are charged at the factory.

Vapor Line – The large line from the inside coil to the outside portion of the heat pump is dual purpose — suction line on cooling and hot gas line on heating. Only a high pressure gauge must be used to measure pressure in this line.

Vapor Lock – A condition wherein the fuel boils in the fuel system, forming bubbles which retard or stop the flow of fuel to the carburetor.

Vaporization – The process of converting a liquid into vapor.

Vaporizer – A device for transforming or helping to transform a liquid into a vapor; often includes the application of heat.

Vee – A type of cylinder arrangement in an engine where the cylinders form the shape of the letter “V.”

Venturi – A specially shaped tube with a small or constricted area used to increase velocity and reduce pressure.

Vibration Damper – A device to reduce the torsional or twisting vibration which occurs along the length of the crankshaft used in multi-cylinder engines; also known as a *harmonic balancer*.

VIP Cycle – The Vacuum Impregnation treatment of windings to provide improved environment protection/insulation of windings.

Viscosity – The property of an oil by virtue of which it offers resistance to flow.

Viscosity Index (VI) – Oil decreases in viscosity as temperature changes. The measure of this rate of change of viscosity with temperature is called the *viscosity index* of the oil.

Volatile – Evaporating readily at average temperature on exposure with air.

Volatility – The tendency for a fluid to evaporate rapidly or pass off in the form of vapor. For example, gasoline is more volatile than kerosene as it evaporates at a lower temperature.

Volt (V) – A unit of electromotive force that will move a current of one ampere through a resistance of 1 ft.

Voltage – Electric potential or potential difference expressed in volts.

Voltage Adjust Potentiometer – Controls generator voltage output through the generator voltage regulator.

Voltage Dip – The momentary drop of generator output voltage that occurs whenever a load is added to the system. There is a momentary increase in output voltage whenever a load is removed from the system. This is called “Voltage Rise.” “Voltage Rise” is seldom of concern with an adequate voltage regulator.

Voltage Droop – Gradual fall of voltage with increase in electrical load.

Voltage Drop – Voltage loss due to added resistance caused by undersized wire, poor connection, etc.

Voltage Flicker – Term commonly used to describe a significant fluctuation of voltage.

Voltage Regulator – A circuit which senses the generator output voltage and automatically adjusts the field coil current to maintain the desired output.

Voltmeter – A test instrument for measuring the voltage or voltage drop in an electric circuit.

Volts-per-Hertz Regulation – Providing fast recovery under block loading conditions, maintaining close voltage control over the normal load range, and producing rapid response of an engine/generator set by matching generator output to engine performance.

Volume – The amount of space within a given confined area.

Volumetric Efficiency – The difference between the volume of air drawn in on the intake stroke and the air mechanically entering the cylinder.

Vortex – A whirling movement of a mass of liquid or air.

VR3 – This new regulator replaces both VR1 and VR2 conversion of existing product line complete through 580 frame. VR3 meets all Cat premium custom specs.

VR4 – This new generator is used for alternate energy applications. Premium custom specs do not apply.

W

Water Brake – A device for engine testing in which the power is dissipated by churning water.

Water Jacket – The enclosure directing the flow of cooling water around the parts to be cooled.

Water Loop – The test cell water piping is plumbed to allow flow and temperature control to the evaporator, measured in tons.

Water-Cooled Condenser – Condensing unit which is cooled through use of water.

Water-Steam Circuit – Piping to direct the flow of steam.

Water Vapor Pressure – The partial pressure of the water vapor in the combustion air being supplied to an engine.

Watt – The unit of measure for electrical power.

Watt-Hour Demand Meter – Similar to a watt-hour meter except that it also provides an indication of the highest kW load level achieved during operation.

Watt-Hour Meter – A recording device that totals the average power (kW) passing through it in a period of time. The reading is kilowatt hours — a measure of the total energy consumed by the load.

Wattmeter – Simultaneously measures voltage current and power factor, and automatically multiplies the results to measure true power.

Waveform – The graphic representation of a voltage plotted against time.

Wear Testing – Wear is due to several unrelated actions such as cutting, abrasion, corrosion, galling, and fatigue. In wear testing, first the type of wear developed in service is determined, then suitable laboratory equipment is developed for the test, duplicating service conditions.

Weather Protective (WP) – A type of enclosure often used for generator sets to prevent damage from natural elements.

Wet Bulb – Device used in the measurement of relative humidity. Evaporation of moisture lowers temperature of wet bulb compared to dry bulb temperature in the same area.

Wet Sleeve – A cylinder sleeve which is about 70 percent exposed to the coolant.

Wheeling – The use of the transmission facilities of one system to transmit power for another system.

White Smoke – The emission caused by vaporized but unburned fuel passing through an engine; usually occurs during startup of a cold engine.

Withstand Rating – The maximum current of an automatic transfer switch on a generator set in a fault condition when the switch is closed and on normal service. The ATS is required to withstand the energy let through the normal service protective device while that device interrupts the fault.

Wrist Pin – The journal for the bearing in the small end of an engine connecting rod which also passes through piston walls. Also known as a *piston pin*.

Wye Connection – A means of connecting generator windings with the option of using the neutral connection.

Y

Yield Point – The load per unit of original cross section at which, in soft steel, a marked increase in deformation occurs without increase in load. In other steels and in nonferrous metals, yield point is the stress corresponding to some definite and arbitrary total deformation, permanent deformation or slope of the stress deformation; this is more properly termed the yield strength. See *Yield Strength*.

Yield Strength – Stress corresponding to some fixed permanent deformation such as 1% or 2% offset from the modulus slope. Not to be confused with yield point which, for steel, may occur over a wide range of elongation. It is the result of an effort to obtain the equivalent of the yield point by a standard means that provide reliable, easily reproducible determination. In general, the determination may be made by the offset method or by the use of the extensometer or other appropriate measuring device.

Yoke – A link which connects two points.

Z

Zener Diode – A diode that allows current to flow in reverse bias at the designed voltage.

CATERPILLAR ACRONYMS AND ABBREVIATIONS

A	Ampere	asp	Engine aspiration
ABDC	After Bottom Dead Center	ASTM	American Society of Testing Materials
ABS	American Bureau of Shipping Absolute	ATAAC	Air-To-Air AfterCooling
AC	Alternating Current	ATDC	After Top Dead Center
A/C	Aftercooler	ATS	Advanced Technical Services, After Test Assembly, Automatic Transfer Switch
ACCU	Air Conditioning Condensing Unit	AUX GEN	Auxiliary Generator
ADEM	Advanced Diesel Engine Management	AVR	Automatic Voltage Regulator
AEIS	Automatic Ether Injection System	BACT	Best Available Control Technology
AEV	Automatic Expansion Valve	BANANA	Build Anything Not Anywhere Not Anytime
AFA	Applied Failure Analysis	BART	Best Available Retrofit Technology
AFRC	Air-Fuel Ratio Control	BAT	Battery
AFTS	Automatic Fuel Transfer System	BBDC	Before Bottom Dead Center
AGS	Automated Graphics System	BDC	Bottom Dead Center
Ah	Ampere-hour	BES	Brushless Excitation System
AI	Accommodation Invoice	bgs	below ground surface
AIMS	A (cluster) – Information Management System	bhp	Engine brake horsepower without fan
AIS	Advanced Information Services, Assembly Information System	bkW	Engine brake kilowatts without fan
Amb	Ambient capability	B/L	Bill of Lading
AMD	Authorized Marine Dealers	B/M	Bill of Material
ANSI	American National Standards Institute	BMEP	Brake Mean Effective Pressure
APG	Arizona Proving Ground	BP	Best Practice
API	American Petroleum Institute	BPT	Best Practical Treatment, Business Plan Tracking
APU	Auxiliary Power Unit	BSFC	Brake Specific Fuel Consumption
ARC	Automatic Retarder Control	BSOC	Brake Specific Oil Consumption
AS	Air Shut-off (Solenoid)	BTDC	Before Top Dead Center
ASAP	As Soon As Possible	Btu	British thermal unit
ASME	American Society of Mechanical Engineers		
ASN	Advance Shipping Notices		

CAA	Clean Air Act
CAC	Charge Air Cooler
CACo	Caterpillar Americas Company
CAD	Computer Aided Design
CAECAM	Computer Aided Engineering Computer Aided Manufacturing
CAM	Computer Aided Manufacturing, Custom Alarm Module
CAMPAR	Computer Aided Marine PAR
CAPL	Caterpillar Asia PTE. Ltd.
CAPP	Corporate Accounts Parts Purchases
CAPS	Corporate Accounts Payable System
CARB	California Air Resources Board
CAT PC	Caterpillar Engine Power Connection
CB	Circuit Breaker
CBT	Computer Based Training
CCL	Caterpillar China Limited
CCM	Customer Communication Module
CDIS	Caterpillar Dealer Information System
CDIS/DBS	Caterpillar Dealer Information System/Dealer Business System
CDL	Cat Data Link
CDM	Clean Development Mechanism
CE	CE is a symbol for EEC compliance
CEF	Commercial Engine Featurization
CEM	Continuous Emissions Monitoring
CES	Caterpillar Export Services
cemf	counterelectromotive force
CHP	Combined Heat and Power (also referred to as cogeneration)
CID	Component Identifier

CIM	Customer Interface Module
CIPS	Caterpillar International Power Systems
CIS	Corporate Information Services
CLS	Caterpillar Logistics Services
CMLS	Corporate Mail List System
CMS	Computerized Monitoring System
COB	California and Oregon Border
COFA	Caterpillar of Australia Ltd.
COP	Coefficient of Performance
COSA	Caterpillar Overseas S.A.
CP	Coastal protected
CPO	Commercial Power Organization
CPR	Competitive Parts Reports
CPS	Cycles Per Second
C/R	Compression Ratio
CS	Common Service (PC-CS)
CSA	Canadian Standards Association, Customer Support Agreement
CSFC	Corrected Specific Fuel Consumption
CSTG	Caterpillar Service Technology Group
CT	Current Transformer, Crank Terminate (ESS)
CTI	Cat Training Institute
cu in	cubic inch
CV	Conventional Core
CVD	Dual inlet/Dual outlet single core
D	Diode, Distance from plane of reference to assembled unit center of gravity location, Dual turbochargers
D1	Distance from plane of reference aft to generator center of gravity
D2	Distance from plane of reference forward to engine center

GLOSSARY OF TERMS



DAP	Dealer Advisory Panels	DOLRS	Dealer On-Line Registration System
DBS	Dealer Business System	DOS	Disc Operating System
DB/WB	Dry Bulb/Wet Bulb	DPI	Dealer Process Improvement
DC	Direct Current	DPO	Dealer Parts Orders
DCAL	Dealer Customer Acceptance Level	DPORS	Dealer Parts Orders Reporting System
DCD	Data Carrier Detect	DPSR	Data Processing Service Request
DCS	Dealer Channel Systems, Distributed Control System	DSM	Demand Side Management
DCSG	Dealer Channel System Group	DSSD	Dealer System Support Division
DD	Dealer-Customer Acceptance Level – “DCAL”	DST	Detonation Sensitive Timing
DDS	Dealer Data System	DSU	Data Sending Unit
DDT	Digital Diagnostic Tool	DSUO	Dealer Solicited User Order
DE	Destruction Efficiency, Dual Element	DTR	Data Terminal Ready, Dealer Transaction Reporting
DEO	Diesel Engine Oil	DTS	Dealer Terminal System
DFD	Diode Fault Detector	DTSO	D-Time Sharing Option
DFT	Dealer Forecast Tracking	D.V.R.	Digital Voltage Regulator
DI	Direct Injection	ECAP	Electronic Control Analyzer Programmer
DISCO	Distribution Company	ECM	Electronic Control Module
DINA	Direct Injection Naturally Aspirated	ECS	Electronic Control System
DISTA	Direct Injection Series Turbocharged-Aftercooled	ECU	Electronic Control Unit
DIT	Direct Injection Turbocharged	ED	Engine Division
DITA	Direct Injection Turbocharged-Aftercooled	EDI	Electronic Data Interchange
DITA-JW	Direct Injection Turbocharged-Aftercooled — Jacket Water	EDS	Engine Data System
DITT	Direct Injection Turbocharged (Dual Turbo)	EEC	European Economic Community
DITTA	Direct Injection Turbocharged-Aftercooled (Dual Turbo)	EER	Energy Efficiency Ratio
DLRTSO	Dealer Time Share Option	EFH	Engine Front Horizontal
DMT	During Machine Time	EFV	Engine Front Vertical
D/N	Dealer/Net	EG	Emission Guidelines
DOE	Department of Energy	EIA	Engine Investment Analysis
DOEM	Dealer Original Equipment Manufacturer	EIS	Electronic Ignition System, Engine Information System, Environmental Impact Statement
		EkW	Electrical kilowatts with fan
		EMC	Electronic Media Center

EMCP	Electronic Modular Control Panel
emf	electromotive force
EMP	Engine/Machine/Lift Truck Population
EMS	Engine Monitoring System, Equipment Management System
EMT	Engine Mounted Tachometer
EMTB	End-Mounted Terminal Box
EOCS	Engine Order Communication System
EOD	Engine Order Division
EPA	Environmental Protection Agency
EPG	Electric Power Generation
EPTC	Electronic Programmable Transmission Control
ERH	Engine Rear Horizontal
ERR	Engine Rear Roll
ERV	Engine Rear Vertical
ESC	Extended Service Coverage, Energy Service Company
ESCO	Energy Service Company
ESO	Engine Ship Order
ESP	Engine Stop (GE designation)
ESS	Electronic Speed Switch, Engine Supervisory System
ESRS	Engine Specification Reporting System
ET	Engine Test, Electronic Technician
ETA	Estimated Time of Arrival
ETDS	Engine Technical Data System (TMI)
ETR	Energize To Run
EUI	Electronic Unit Injector
EVIM	Engine Vision Interface Module
EVS	Environmental Visualization System

FBC	Feature Based Configuration
FBO	Feature Based Ordering
FCOLS	Fuel Cut-Off Left Side (GE designation)
FCORS	Fuel Cut-Off Right Side (GE designation)
FERC	Federal Energy Regulatory Commission
FGR	Flue Gas Recirculation
fhp	friction horsepower
FID	Flame Ionization Detector
FIND	For Information, News & Documents
FIS	Fleet Information Software
FLI	Field Link Interface
FLSFS	Full Load Static Fuel Setting
FMI	Failure Mode Identifier
FMS	Factory Mutual System
FOEM	Factory Original Equipment Manufacturer
frame	Generator frame size
FRC	Fuel Ratio Control
FS	Fuel Solenoid
FSS	Floor Standing Switchgear
ft-lb	foot-pound
FTSFS	Full Torque Static Fuel Setting
GACT	Generally Achievable Control Technology
GCCS	landfill Gas Collection and Control Systems
GCM	Generator Control Module
GDD	General Dimension Drawing
GEF	Global Environmental Facility
GENCO	Generating Company
gov	governor
GPD	Gallons Per Day
gpm	gallons per minute
GPR	Ground Penetrating Radar

GLOSSARY OF TERMS



GPS	Generator Power System
GRA	Generator Rear Axial
GRH	Generator Rear Horizontal
GRV	Generator Rear Vertical
GSC	Genset Status Control
GSC + S	General Status Control Plus Synchronizing
GSE	Generator Set Engine
HAP	Hazardous Air Pollutants
HC	Hydrocarbons
HCR	High Compression Rating
HD	Heavy Duty
HDPE	High Density Polyethylene
HE	Harsh Environment (CIP) Protection
HEUI	Hydraulically actuated Electronically controlled Unit Injector
HHV	High Heat Value
HOC	Hazardous Organic Compounds
HOPS	High (rev/min) Oil Pressure Switch
HOTS	High Oil Temperature Switch
HP	High Performance
hp	Horsepower
HV	High Voltage
HWTS	High Water Temperature Switch
Hz	Hertz
IAPCV	Injector Actuation Pressure Control Valve
IAQ	Indoor Air Quality
IAS	Integrated Accounting System
ID	Inside Diameter
IEC	International Electromechanical Commission
ihp	indicated horsepower
IMS	Inf. Management System
in	inch

IP	Ingress Protection
IPM	Integrated Planning Model
IPS	Integrated Purchasing System
IR	Infrared
IS	Information Systems
ISN	Integrated System Network
ISO	Independent System Operator, International Standards Organization
ITA	Industrial Truck Association
JIT	Just-in-Time (Juran lingo)
JITD	Just-in-Time Delivery (Juran lingo)
JW	Jacket Water
JWAC	Jacket Water After-Cooling
JWH	Jacket Water Heater
KAIC	k Amps Interrupting Capacity
kV•A, kVA	Kilovolt Amp
kVAR	Kilovolt Amperes Reactive
kW	Kilowatt
L	Liter
LAEEM	Landfill Air Emissions Estimation Model
LAER	Lowest Achievable Emission Rate
LCD	Liquid Crystal Display
LCR	Low Compression Rating
LCS	Leachate Collection System
LDC	Local Digital Control
LDPO	Lift Truck Dealer Parts Orders
LE	Low Emission
LEC	Large Engine Center
LED	Light Emitting Diodes
LEL	Lower Explosive Limit
LFG	Landfill Gas
LFGTE	Landfill Gas-To-Energy
LH	Left Hand

LHV	Low Heat Value
L-L	Line-to-Line
LLDPE	Liner Low Density Polyethylene
LMOP	Landfill Methane Outreach Program
L-N	Line-to-Neutral
LNG	Liquefied Natural Gas
LOPS	Low (rev/min) Oil Pressure Switch
LP	Liquefied Petroleum
LPG	Liquefied Petroleum Gas
LR	Lloyd's Register
LS	Load Sharing
LWLS	Low Water Level Switch
m	micrometer
MACT	Maximum Achievable Control Technology
MASH	Machine Sales History
MBH	1000 Btu/hour
MCG	Machine Classification Guide
MCS	Material Control System
MD	Medium Duty
MEP	Mean Effective Pressure
MEPS	Marine Engine Power Systems
Mg	Million megagrams
MHA	Material Handling Arrangement
mike	micrometer
MIP	Mean Indicated Pressure, Membrane Interface Probe
MIS	Management Information System, Marketing Information System
MISO	Misc. Interplant Shipping Order
MIT	Misc. Interplant Transfer
mm	millimeter
MMCFD	1000 x 1000 cubic feet per day
MMIS	Machine Marketing Information System

mmscfd	million metric standard cubic feet per day
mmtce	million metric tons of carbon equivalents
MOP	Motor Operated Potentiometer
mph	miles per hour
MPS	Marine Power System
MPU	Magnetic Pick-Up
MR	Medium Range, Mid-Range
MRF	Material Recovery Facility
MSA	Metropolitan Statistical Area
MT	Multi-Torque
MTBF	Mean Time Between Failures
MUI	Mechanical Unit Injector
MW	Megawatt
MWh	Megawatt Hour
NA	Naturally Aspirated
NAAQS	National Ambient Air Quality Standard
NACD	North American Cat Dealers, North American Commercial Division
NARUC	North American Regulatory Utility Commission
NC	No Charge, No Connection
NEMA	National Electrical Manufacturers Association
NERC	North American Electric Reliability Council
Net	Installed net price
NFPA	National Fire Protection Association
NI	Not Installed list price
NI Net	Not Installed net price
NIMBY	Not In My Back Yard
NMOC	Nonmethane Organic Compound
NMMm³/D	Normal million meters cubed per day

GLOSSARY OF TERMS



NO	Nitrogen Oxide
NOPE	Not On Planet Earth
NO_xRACT	NO _x Reasonable Available Control Technology
NPI	New Product Introduction
NPR	Numerical Parts Record
NSPS	New Source Performance Standards
NYMEX	New York Mercantile Exchange
OA	Outside Air
OASIS	Open Access Sametime Information System
OD	Outside Diameter
ODP	Open Drip Proof
OEM	Original Equipment Manufacturer
OFA	Overfire Air
OIL	Office Information Letter
OLPL	On-Line Price List
OPSS	Oil Pressure Step Switch (ESS)
OPT	Overhaul Protection for Trucks
OS	Overspeed (ESS)
OSHA	Occupational Safety and Health Administration
OTAG	Ozone Transport Assessment Group
OTO	On-Time-Only (pricing)
PABACS	Parts Book Automated Compiling System
PAN	Product Activity Notice
PAR	Performance Analysis Report
PAT	Product Acceptance Test
PATS	Peoria Area Telephone System
PC	Personal Computer, Pre-Combustion Chamber
PCNA	Prechambered Naturally Aspirated
PCT	Prechambered Turbocharged

PCTA	Prechambered Turbocharged Aftercooled
PEEC	Programmable Electronic Engine Control
PEEL	Programmable Electronic Engine Control
PES	Parts Exchange Service
PET	Product Evaluation Test
PGS	Packaged Generator Set
PI	Personal Involvement
PID	Photo Ionization Detector
PIMS	Parts Marketing Information
PINS	Percentage of Industry Sales
PIP	Product Improvement Program
PIR	Product Inspection Report
PIS	Product Information System
PLC	Programmable Logic Controller
PM	Participative Management, Particulate Matter, Permanent Magnet, Personality Module, Predictive Maintenance, Preventive Maintenance
PMACT	Presumptive pre-rule estimate of MACT to discuss/review impact of process prior to promulgating
PME	Permanent Magnet Excitation
PMIS	Parts Marketing Information System
PMS	Problem Monitoring System
PNPI	Part Number Price Inquiry
POC	Precursor Organic Compound
POPS	Percent of Potential Sales
POPS-C	Percent of Potential Sales – Cat
PPG	Peoria Proving Grounds
ppm	parts per million
ppmv	parts per million by volume
PPP	Power Protection Program
PQS	Power Quoter System
PRCM	Programmable Relay Control Module

PRO	Professional
PROSPECT	Probability of On-Site Power Economic Test
PRV	Prerotation Valve
PS	Pferdestärke (horsepower)
PSA	Power Systems Associates
PSD	Power Systems Distributor, Prevention of Significant Deterioration
psi	pounds per square inch
psig	pounds per square inch gauge
PSP	Product Support Program
PSQ	Power Systems Quote, Product Support Quotation
PSSR	Product Support Service Representative
PT	Pressure Time Potential Transformer
PTO	Power Take-Off
PUC	Public Utility Commission
PURPA	Public Utility Regulatory Policies Act
PVC	Polyvinyl Chloride
PWM	Pulse Width Modulated
QF	Qualifying Facility
QIR	Quality Inspection Report
QWS	Quote Writer System
RACT	Reasonable Available Control Technology
RAN	Remote Annunciator
Ratio	Fan drive ratio
RBT	Rotating Bushing Track
RDM	Relay Driver Module
RECLAIM	REgional CLean Air Incentive Market
REMAN	Remanufactured
RFI	Radio Frequency Interference, Request For Investment
RFM	Rental Fleet Management
RFP	Request For Proposal

RH	Right Hand
RMN	Remanufactured Parts Information
RMS	Root-Mean-Square
rpm	Revolutions Per Minute
ROI	Radius Of Influence, Return On Investment
ROP	Repair Opportunity Planner
rpm	Revolutions per minute
RSP	Retail Sales Analysis
RTD	Resistance Temperature Detector, Resistive Thermal Device
RTG	Regional Transmission Group
RTS	Ready To Ship
S	Single turbocharger
SA	Sound Attenuated
SAE	Society of Automotive Engineers
SC	Speed Control
SCA	Supplemental Coolant Additives
SCAC	Separate Circuit AfterCooled
scfm	standard cubic feet per minute
SCM	Status Control Module
SCR	Silicon-Controlled Rectifier
SCRS	Service Claim Reporting System
SDC	Software Distribution Center
SE	Self Excited, Single Element
SEMS	Smart Engine Monitoring System
SER	Special Engineering Request
SFE	Strategy For Excellence
SHP	Shipment PINS
SI	Spark Ignited
SIMS	Service Information Management System
SIRS	Service Information Retrieval System
SIS	Service Information System
Size	Refers to radiator size

GLOSSARY OF TERMS



SLAM	State Local Air Monitor	TIF	Technical Information File, Telephone Influence Factor
SM	Service Meter	TIM	Technical Instruction Modules
SMART	Software Management And Release Tracking System	TMI	Technical Marketing Information
SMCS	Service Management Control System	TOPP	Truck Owner Protection Plan
SO	Shipping Order	TPA	Truck Performance Analysis
SOD	Sales Order Division	TPM	Truck Payload Measurement System
SOF	Soluble Organic Fraction	tpy	tax per year
SOL	Start On Line	TRANSCO	Transmission Company
S•O•S	Scheduled Oil Sampling	TRG	Time Requirement Guide
SOQ	Statement Of Qualification	TSO	Time Sharing Option
SPA	Software Publishing Association	TSP	Total Static Pressure
SPAR	Special Price Assistance Request	TSS	Technical Support System
sq ft	square foot	tpy	tax per year
sq in	square inch	TT	Twin Turbocharged
SR	Slave Relay	TTA	Twin Turbocharged-Aftercooled
SSG	Machine Shipments/Sales/ Inventory	UCC	Uniform Commercial Code
SSI	Shipments, Sales & Inventory	UKO	Underground Knock Out
STA	Series Turbocharged-Aftercooled	UL	Underwriters Laboratory
STD	Standard	UPS	Uninterrupted Power System
STR	Service Transaction Reporter	UTEPP	Used Truck Engine Protection Plan
T	Turbocharged	UTN	Update To New
T & D	Transmission and Distribution	V	Volt
TA	Turbocharged-Aftercooled	VDC	DC to DC Voltage Converter (75 to 24 Vdc)
TAC	Toxic Air Contaminant	VF	Vacuum Fluorescent
TC	Technical Center, Top Center	VFD	Vacuum Fluorescent Display Variable Frequency Drive
TDR	Time Delay Relay (ESS)	VI	Viscosity Index
TEAO	Totally Enclosed Air-Over	VIMS	Vital Information Management System
TEFC	Totally Enclosed Fan-Cooled	VIV	Variable Inlet Vane
TEMP	Targeted Engine Marketing Plan	VMIS	Vehicle Management Information System
Temp Rise	Generator temperature rise in degrees centigrade above 40° C ambient	VOB	Vehicular Off-Board Bundle
TEP	Truck Engine Pro	VOC	Volatile Organic Compounds
TEPS	Truck Engine Parts & Service		
THF	Telephone Harmonic Factor		

VOP	Valve Opening Pressure
VPI	Vacuum Pressure Impregnated
WE	Engine Weight
WG	Generator Weight
WIRECO	Wires Company
WPM	Wheel Loader Payload Measurement

WP	Weather Protective
WSA	World Sales Analysis
WT	Total Assembled Unit Weight
WTE	Waste-to-Energy
Y2K	Year 2000

P.C. RELATED TERMS

A

About – Place in Help menu. Displays the About window.

Acrobat – A group of programs developed by Adobe Systems, Inc. for creating and distributing electronic documents.

Acrobat Reader – A program that provides the means to view a document that's in a PDF format.

Add – Adds the current record to the database or adds a record from the database to the subset of records the user is working with.

Apply – Changes settings or attributes. Pressing the Apply button causes the settings to take effect and let the user see the effects of the changes without closing the dialog box. Applied changes are not saved to the database or the file until the user accepts the changes, usually by clicking on the OK button.

Audio Video Interleave (AVI) – A format for storing audio and video files. Files in this format have an .avi extension. AVI files are limited to 320 x 240 resolution and 30 frames per second.

B

Bitmap – A representation, consisting of rows and columns of dots, of graphics image in computer memory. The value of each dot (whether it is filled in or not) is stored in one or more bits of data. The density of the dots, known as resolution, determines how sharply the image is represented. This is often expressed in dots per inch (dpi) or simply by the number of rows and columns, such as 800 x 600.

Browser – A short term for Web Browser. A software application used to locate and display Web pages, such as Internet Explorer or Netscape.

C

Calculate – Refreshes the information to reflect any user changes to the window. The application must recalculate before the user exits, saves, prints, or displays a report.

Cancel (ESC) – Closes the window while preserving the last updated changes, discards any unsaved changes, and transfers input focus to the application or box that generated the dialog box or halts execution of a task such as printing, calculating, etc.

Cascade – Place in Window menu. Overlaps windows so the current active window is visible, but only the title bars of the other windows are visible above and to the left of the active window.

Change – Opens a dialog where the user can edit a record. The dialog should have an OK button to accept the edits and a Cancel button to disregard any changes.

Clear – Place in Edit menu. Removes the contents of a control or window without removing the window.

Close –

For primary window (ALT + F4)

Place in System menu.

Exists the application.

Closing does not automatically save uncommitted changes, but prompts the user to save.

For secondary window (CTRL + F4)

Place in File menu.

Closes the current window and all related windows.

Closing does not automatically save uncommitted changes, but must prompt the user to do so.

Connect – Connects to a remote computer. This should usually be done automatically within a task. Avoid using.

Contextual (Shift + F1) – Place in Help menu. Converts pointer to a question mark pointer and lets the user click on the object when the user would like an explanation.

Cookie – A message given to a Web browser by its server. The browser stores the message in a text file. The message is then sent back to the server each time the browser requests a page from the server. The main purpose of cookies is to customize web pages. A cookie is used to store the number of (image) Results Per Page you wish to view.

Copy (CTRL + C) – Place in Edit menu. Copies the highlighted object to the clipboard, but leaves it in the current record.

Create – Places additional objects into the application. May be used with modifiers such as Create Line, Create Point, Create Window, etc.

Cut (CTRL + X) – Place in Edit menu. Transfers the highlighted object to the clipboard and removes it from the current record.

D

Default – Returns the setting to the previously defined default settings.

Delete – Place in Edit menu. Erases a selected object or removes the record from the database.

Directory – Lists the contents of a directory.

Disconnect – Disconnects from a remote server. This is usually done automatically within a task. Avoid using.

Download – To copy data (usually an entire file) from a main source to one's own computer.

E

Exit (ALT + F4) – Place in File menu. Closes the current application and all windows associated with it.

Export – Place in File menu. Allows a user to save all or part of the open file as a different file and/or a different format.

F

File Transfer Protocol (FTP) – The protocol used on the Internet for sending files.

Find – Place in Edit menu. Enables the user to enter criteria which the application uses to locate all instances of an object meeting that criteria.

Frame – Refers to the separate sections of the browser display area.

G

General – Place in Help menu. Displays general information about the window or application.

H

Help (F1) – Launches context sensitive help. It should always be the lowest or furthest right of the buttons.

Hide – Initiates the hiding of currently displayed objects in the application window.

HyperText Markup Language (HTML) – The authoring language used to create documents on the World Wide Web.

I

Import – Place in File menu. Allows a user to open a file that has a format different from the default data storage format of the application. That file may also be included in an open file.

Include – Place in File menu. Allows a user to read a file that has the default data storage format and whose information is added to the information already read into the application.

Index – Place in Help menu. Displays an index of available help from which the user can choose.

Insert – Place in File menu. Other than use in spreadsheets, this is a data processing term, and should be used only for applications whose users have a data processing background.

Internet Explorer – Microsoft's Web Browser.

Intranet – A network based on TCP/IP protocols (an internet) belonging to a corporation, accessible only by the corporation's employees or others with authorization. An Intranet Web site looks and acts just like any other Web site, without unauthorized access.

J

Joint Photographic Experts Group (JPEG) – A lossy compression technique for color images. It can reduce the file size by 5 percent though some detail is lost in the compression.

Lossy – Need source for definition

L

Link – A reference to another document. A link will take you to other documents when you click on them.

M

Maximize (ALT + F10) – Place in System menu. Enlarges a window to its maximum size for the screen size or primary window which contains it. It is not available when the window is maximized.

Minimize (ALT + F9) – Place in System menu. Shrinks the window down to an icon and hides all the associated windows and dialog boxes.

More – Increases the number of records displayed in a table. It is appropriate to use a More button if the contents of the table is buffered rather than populated all at once.

Move (ALT + F7) – Place in System menu. When the user selects the Move option, an outline of the window appears, the pointer changes to move the pointer, and the user is able to move the window or a window outline to a new location by dragging the title bar or using arrow keys.

Moving Picture Experts Group (MPG or MPEG) – The family of digital video compression standards and file formats. Achieves high compression rate by storing only the changes from one frame to another, instead of each entire frame. The video information is then encoded using a technique called Discrete Cosine Transform (DCT) — a technique for representing waveform data as a weighted sum of cosines.

Musical Instrument Digital Interface (MIDI) – A standard used by the electronic music industry for controlling devices such as sound cards that emit music.

N

Navigator – Netscape Communication's Web Browser.

New – Place in File menu. Creates a new work area, record, or document.

Next (CTRL + F6) – Place in System menu. It is only available on secondary windows. Switches focus to next secondary window or the next record.

No – Indicates a negative response to a question message and closes the dialog box. The question should be worded so it is obvious what will happen if the user selects No.

O

OK (ENTER) – Accepts the information in the window as it is, preserves all changes, closes the dialog box, and transfers input focus to the application or box that generated the dialog box.

Open (CTRL + O) – Place in the File menu. Opens the file list dialog box. The user can then select an existing file. The file list dialog box displays the last path used by the application when opened.

P

Paste (CTRL + V) – Place in Edit menu. Inserts contents of clipboard into record at the insertion point.

Pause – Temporarily stops a system action and allows the user to continue the action later. Generally used with Resume.

PCD – A file format, developed by Eastman Kodak, for storing digital photographs. Transparencies or negatives are scanned using fast, high performance scanners. The computer file created is color balanced and then converted into a 5 or 6 resolution image pack. These image packs are written to a Photo CD that can hold up to 100 high-resolution image packs. A set of thumbnail prints is also produced as a visual reference of what is on each disc.

Plug-In – A hardware or software module that adds a specific feature to a larger system.

Portable Document Format (PDF) – A file format which captures formatting information from a variety of desktop publishing applications. To view a file in PDF format, you need Adobe Acrobat Reader.

Preferences – Place in View menu. Selects conditions or establishes application parameters. For example: tolerance bands, colors, export formats, etc. Preference conditions are saved at shutdown and are used the next time the application is accessed by user.

Previous – Switches focus to previous secondary window or the previous record. It is only available on secondary windows.

Print (CTRL + P) – Place in File menu. Submits current file to an output device. If appropriate, displays standard Print dialog box. Can also be used for printing reports.

Print Preview – Place in File menu. Displays the selection to be printed in a window so the user can verify the output.

Print Setup – Place in File menu. Displays a standard Print Setup dialog box to enable the user to switch between printers or specify printer options.

Protocol – A format for transmitting data between two devices (i.e. disk drives, printers, mice, or modems).

R

Redo (F4) – Place in Edit menu. Repeats last action.

Refresh (F5) – The F5 key is also used to refresh data entered by the user generally in conjunction with a graph.

Rename – Place in File menu. Changes or creates the name of a selected object. This may include currently unnamed objects.

Replace (CTRL + H) – Displays a dialog box which enables the user to replace words or phrases for the entire document.

Reset – Returns the settings to the state before the dialog box was displayed and does not remove the dialog box. Reset is useful for complex dialog boxes.

Restore (ALT +F5) – Place in System menu. Returns the window to its intermediate size. It is available only when window is maximized or minimized.

Resume – The user wants the computer to continue a task that is has stopped without user intervention. Those functions which have been stopped and can be continued have a dialog box to let the user continue.

Retry – The user wants the system to try an unsuccessful action again. This does not continue from current status but tries to do the last operation from the beginning. Normally used for abnormal termination not due to user action.

RETURN – The distinct name of the data entry key found in the alphanumeric portion of the keyboard. Although pressing the ENTER and RETURN keys often produces the same result, they are different keys.

Revert – Returns the contents of a document to what they were before unsaved changes were made. It is equivalent to closing the file without saving and opening it again.

Rollback – Place in File menu. This is a data processing term and should be used only for applications whose users have a data processing background. Returns the data base to the status at entry of application or last Commit. This cancels changes made by Delete, Insert, and Update.

Run – Initiates an action once all settings have been made and parameters entered. Specific term is preferred. An example might be using “Load” after setting all parameters to load a structure.

S

Save (CTRL + S) – Place in File menu. Saves the current file without removing the window.

Save As – Displays a standard Save As dialog box which enables the user to change the name of the file, directory of the file, or format of the file so the user can have similar but distinct files.

Search Engine – A program that searches documents for specified key words and returns a list of documents based on the key words that were found.

Select – Allows an item or items to be chosen for use by other operations.

Select All – Place in Edit menu. Selects all the current information.

Setup – Selects conditions or establishes application parameters such as tolerance bands, colors, export formats, etc.

Shovelware – A type of promotional software that's of questionable value.

Show – Displays existing objects in the application window which were previously hidden.

Size (ALT + F8) – Place in System menu.

Outline of window appears, pointer changes to sizing pointer, and the user is able to size the window outline by dragging a window frame or using arrow keys. Size is completed when the user releases the mouse button or presses ENTER. Size is available only when the window is in its intermediate size.

Split – Place in System menu. Available only when window can be split. Displays a horizontal or vertical bar which the user can move to the location where the user wants the window broken into two separate panes. This lets the user scroll the information in one pane while leaving the information in the other pane stationary.

Stop – Tells the system to stop the current task. Used as a button to halt execution of a task such as printing, calculating, etc.

T

Tagged Image File Format (TIFF) – A file format for storing bitmapped images.

Tile – Place in Window menu. Arranges the open windows so that they do not overlap.

Tutorial – Place in Help menu. Begins a tutorial of how to use the window or application.

U

Undo (CTRL + Z) – Place in Edit menu. Allows the user to reverse the effects of a previous operation. There are two forms of Undo — single level and multilevel.

Using Help – Place in Help menu. Displays directions on how to use Help.

V

View – Sets the display conditions. Typical terms used are angle, direction size, filter, number, layer, etc.

W

WAV – A format for storing sound in files. WAV sound files end with a .wav extension and can be played by nearly all Windows applications that support sound. WAV files tend to be large. One minute of audio can require more than 1MB of storage.

Window – A rectangular area on the screen that contains an application area, title bar, borders, etc. When used as a menu selection, the options will apply to control of the window: move, size, minimize, etc.

Y

Yes – Indicates a positive response to a question message. The question should be worded so it is obvious what happens if the user selects Yes.

P.C. RELATED ACRONYMS

APL	A Programming Language	FDDI	Fiber Distributed Data Interface
AVI	Audio Video Interleave	FDO	Fixed Disc Organizer
BASIC	Beginners All purpose Symbolic Instruction Code	FIFO	First In First Out
BIOS	Basic Input/Output System	FLASH	“Flash”
BPS	Bits Per Second	FTP	File Transfer Protocol
CCD	Charged-Coupled Device	GB	Gigabytes
CD-ROM	Compact Disc Read Only Memory	HTML	Hyper Text Markup Language
CGM	Computer Graphics Metafile	HTTP	Hyper Text Transfer Protocol
COBOL	Common Oriented Business Operations Language	JPEG	Joint Photographic Experts Group
CTS	Clear To Send	LAN	Local Area Network
DCD	Data Carrier Detect	MB	Megabytes
DCR	Divided Clock Receiver	MHz	Megahertz
DIMM	Dual In-line Memory Module	MIDI	Music Instrument Digital Interface
DMA	Direct Memory Access	MMX	Matrix Math Extensions
DPI	Dots per inch	MPEG (MPG)	Moving Picture Experts Group
DRAM	Dynamic Random Access Memory	NS	New Sync
DSR	Data Set Ready	OCR	Optical Character Recognition
DVD	Digital Video Disc	PC	Personal Computer
EAROM	Electronic Alterable Read Only Memory	PCD	Photo CD
EDO	Extended Data Out	PCMCIA	(PC Card) Personal Computer Memory Card International Association
EEPROM	Electronic Erasable Programmable Read Only Memory	PDF	Portable Document Format
EEROM	Electronic Erasable Read Only Memory	PG	Protective Ground
EPROM	Erasable Programmable Read Only Memory	QAL	Quick Access Line
FAQ	Frequently Asked Questions	QM	Equalizer Mode
FAT	File Allocation Table	RAM	Random Access Memory
		RC	Resistor/Capacitor, Receiver Clock
		RD	Received Data

RI	Ring Indicator	TD	Transmitted Data
ROM	Read Only Memory	TELNET	Internet Standard Protocol for Remote Logic
RTB	Read The Book	TIFF	Tagged Image File Format
RTS	Request To Send	TX	Transmitter
RX	Receiver	UART	Universal Asynchronous Receiver/Transmitter
SASI	Shugart Associates Systems Interface	URL	Uniform Resource Locator
SCSI	Small Computer Systems Interface, Small Computer Serial Interface	USB	Universal Serial Bus
SG	Signal Ground	VDT	Video Display Terminal
SIMM	Single In-line Memory Module	VGA	Video Graphics Array
SVGA	Super Video Graphics Array	WAN	Wide Area Network
TC	Transmitter Clock	WORM	Write Once Read Many
TCP/IP	Transmission Control Protocol Over Internet Protocol	www	World Wide Web

TERMS PERTAINING TO THE INTEGRATION OF CAT AND MaK

Balance of Plant – That equipment and construction necessary to support the power generation equipment, as well as other facilities required by specification such as facilities for controls and distribution equipment, personnel, etc.

Caterpillar International Power Systems (CIPS) – The organization within the EPG product group at Mossville responsible for development of the CM EPG product. Will market EPG medium speed engine products directly to select customers and projects.

CPO Scope of Supply – Equipment which carries Cat nameplate or purchased from CPO — normally includes engine, fuel and lube oil handling, and treatment systems and controls — may include generator if purchased from Cat.

Kiel – The manufacturing facility for most M (MaK) and CM (Caterpillar) series engines located in Kiel, Germany. Kiel is the central location of the CPO organization for COSA and CIS, the regional service excellence center for COSA and the source plant for parts for M and CM series engines.

Kiel Designed Product (KDP) – The term used for EPG, Gas, and Petroleum engine applications (previously MaK engines) which will be identified and sold as Caterpillar. The nomenclature of these engines will follow the convention of cylinder/family name/bore size (in cm). For example, the 16CM32 will be a 16 cylinder, Caterpillar CM family engine of 32 cm. bore.

MaK – A Caterpillar business unit located in Kiel, Germany, responsible for marketing and selling medium speed engine products for marine applications. MaK will continue to be used as a trade name for marine propulsion and medium speed auxiliary engines, and will maintain its existing nomenclature convention (i.e. 6M32).

Service Excellence Center (SEC) – Regionally located Caterpillar organizations which will provide medium speed technical support to the existing MaK marine customer base as well as the Caterpillar dealer network. SEC's will be staffed with individuals who are technically competent and experienced with M and CM product as well as support systems. The SEC locations will provide emergency parts supply for maintenance providers and will do regional reconditioning of components such as heads, fuel systems, valve cages, liners, and pistons.

If you have any additional definitions, acronyms, or abbreviations that you would like to see included in this publication, please fax them to: Engine Products Division, Marketing Services, 309-578-6466.



competitive

diagnostics

powerful

economy

electronics

durability

enduring

flexibility

high

velocity

innovative

leader

leadership

performance

programmability

reliable

responsive

robust

serviceability

technology

proven

reliability

dependability

