



# VW Lexicon

## Some Definitions and Descriptions

### Working from the transmission back through the engine

————— This article was used with permission from: Rob and Dave's air-cooled VW pages —————

The **Transmission** is a box containing many gears, shafts, retainers, shifting mechanisms which is complicated in the extreme, but operates on the simple principle that a larger gear will make less revolutions when driven by a smaller gear. In the VW, high gear is arranged so the twist from the engine makes almost the same number of revolutions going out as when it came in.

The **Clutch** is a spring-loaded friction device which connects and disconnects the engine from the transmission for starting, idling and shifting. The **Flywheel** (see right) provides one face and the **Clutch Assembly** (see below) provides the other with the two-surfaced clutch plate between.

The **Clutch Assembly** is spring-loaded and presses the clutch plate between its surface and the surface of the flywheel to make the connection between the engine and the transmission. When you push on the clutch pedal in the car, you are actually compressing the springs in the clutch assembly through a lever and the clutch release bearing ("**Throw-Out Bearing**") and letting the clutch plate

run free, effectively disconnecting the engine from the transmission.

The **Flywheel** is a round, heavy machined chunk of steel attached to the rear of the crankshaft. The flywheel serves a triple purpose. The machined face acts as part of the clutch. There are teeth all around the outer circumference which the starter assembly engages to turn the engine over for starting. It also serves as a heavy rotating body bolted to the end of the crankshaft to maintain the revolving inertia of the engine through its cycles.

The **Crankshaft** is fastened to the flywheel with four pins and a gland nut (which has LOTS of torque on it! Do we have experience to share!). It runs in four bearings, called main bearings, which are massive and pressure-lubricated. The crankshaft has four cranks, or throws, which serve to translate the back and forth movement of the pistons, through the connecting rods, into the round and round motion of the crankshaft and flywheel assembly. The connecting rod bearings are also pressure lubricated. Both the



**Flywheel:** 13 Pound Lightened Cast Steel, 8 Dowel, 12 Volt.  
Item # 306-809



**Crankshaft:**  
74mm Counter-Weighted 4140 Forged Chromoly. Item # 320075





main and connecting rod bearings are thin shells which can be replaced as they wear.

The crankshaft has a funny sideways gear, called a **Worm Gear**, pressed on the shaft next to the cam shaft drive gear. This worm gear turns the distributor drive gear which has a slot on top that turns the **Distributor** and an off-center bump which operates the **Fuel Pump** through a push rod.

The **Crankcase** is a split aluminum casting machined in the proper places, which contains that portion of the engine known as the "bottom end" -- the crankshaft and the cam shaft. The crankcase also acts as an oil sump to collect, store, and help cool the oil that is pumped through the bearings by the oil pump. The oil pump fits into a slot in the end of the cam shaft and turns with it.

The main bearings and the **Cam Shaft** bearings run through the case so that one half of the bearing is on each part of the case. The cam shaft is geared to the crankshaft and has cams or lobes which operate the cam followers, which in turn push the push rods which operate the valves.

The **Crankshaft Pulley** is attached to the opposite end of the crankshaft from the flywheel, outside of the crankcase in the

engine compartment. The crankshaft pulley drives the generator or alternator with a belt.

The **Pistons** move back and forth in the cylinders in accordance with the strokes of the combustion cycle (see above) and are sealed to the machined sides of the cylinders by piston rings. The pistons are attached to the connecting rods by piston pins which go through the pistons horizontally.

The **Cylinder Heads** fit over the cylinders and contain the **Valves** and **Valve Train**.

The valve train consists of the push rods, which push the bottom of the **Rocker Arms** which in turn push the valve inward to open it. The valves are returned to the closed position by the valve springs. There are two valves to each cylinder, one intake and one exhaust, and they are operated by the valve train to let the fuel mixture into the cylinder (intake) and then let the burned gases out after the cylinder is fired (exhaust). The heads and cylinders are held tight to the crankcase by long studs which are screwed into the crankcase. The head nuts tighten this assembly down to the crankcase.

The Volkswagen engine is air-cooled, which means that the heat of combustion in the cylinders and heads is carried away by the flow of

air. These parts are cast with fins to aid in the removal of heat. A blower (**Fan**) is provided to force air down through the spaces between the fins to carry the heat to the atmosphere. The entire engine is shrouded by sheet metal to hold the flowing air to the most efficient patch. The fan in Type I and Type II engines is attached to the front (front) of the generator or alternator and is thus driven with the generator or alternator by a belt from the crankshaft pulley. The fan is encased in a **Fan Housing** which is attached to the shrouding to make an air-tight assembly. The cooling air is sucked from the front of the fan housing and blown down through the cylinders. Also in this fan housing (or just outside of it to the front in the "dog-house" design), bolted to the top of the crankcase, is an oil cooler which stands up in the stream of air like a radiator and cools the oil which is pumped through it.

The definitions and descriptions above are adapted from John Muir's classic, *"How to Keep Your Volkswagen Alive -- A Manual of Step-by-Step Procedures for the Compleat Idiot"* by John Muir, 1976 Edition, pp. 10-14

This article was used with permission from:  
**Rob and Dave's air-cooled VW pages**  
And is reprinted here as a FREE service  
[www.vw-resource.com](http://www.vw-resource.com)

