THE MINISTRY OF THE REPUBLIC OF UZBEKISTAN AND SECONDARY EDUCATION

ANDIJAN MACHINE-BUILDING INSTITUTE

THE CHAIR OF LANGUAGES

INDEPENDENT WORK

General Motors

Theme: «_____»

Faculty: **Automatics and Electrotechnology**

Direction: **Mengment and automation of technological process of production**

Course **3**

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ANDIJAN - 2014

TASHKENT, Uzbekistan – General Motors and its local joint venture partner UzAvtosanoat today opened a new state-of-the-art engine plant in Tashkent, 400 kilometers from the automakers' vehicle manufacturing facility in Asaka. It represents GM's most significant powertrain investment in Central Asia.

GM has a 52 percent stake in GM Powertrain Uzbekistan and its partner has a 48-percent stake. The facility, which covers 40 hectares, is GM's first engine plant in Uzbekistan. It will produce more than 225,000 new fuel-efficient Ecotec 1.2L and 1.5L engines for use in GM small passenger cars sold around the world.

The first engines produced at the plant starting this month will be installed in the Chevrolet Spark mini car that commands 94 percent share of the Uzbekistan domestic market and is exported to Russia and the Commonwealth of Independent States.

The plant features a lean manufacturing footprint and has adopted GM's advanced global manufacturing processes and technology. It is one of only a few GM powertrain plants in the world with co-located assembly and foundry facilities and will be Central Asia's only manufacturing plant capable of producing finished machined components such as cylinder heads, cylinder blocks and crankshafts.

GM International Operations Vice President of Manufacturing and Labor John Buttermore and GM Korea President and CEO Mike Arcamone were joined by Uzbekistan Deputy Prime Minister and UzAvtosanoat Chairman Ulugbek Rozukulov for the inauguration of the new plant. GM Powertrain Uzbekistan employees, contractors, and suppliers were also present.

"GM is committed to growing our manufacturing footprint throughout Central Asia," said Buttermore. "Through our strong partnership with the Uzbekistan government and UzAvtosanoat, this engine plant will enable us to deliver on our promise of providing a broader range of small, fuel-efficient engines to our customers around the world.

"Producing engines locally strengthens our commitment to the development of a strong local automotive industry, which can help guide the economic growth of the entire Central Asian region," Buttermore said. "It is also a sign of the emerging talent in the Uzbek industry and our faith in its capability."

The new facility, which will employ up to 1,200 people, has adopted cutting-edge computer equipment to enhance precision and ensure high build quality and the flexibility to switch between production of engine variants in line with changing market demand.

GM has also employed advanced environmental-protection processes throughout the facility, including the most modern wastewater treatment technology in Uzbekistan with the purest

discharge of any facility of its kind within GM. A final reverse osmosis treatment system ensures water leaving the plant will be as clean as drinking water

The Uzbekistan plant joins facilities in China and Korea as a producer of GM's new Ecotec 1.2Land 1.5L engines. Both engines use a cast-iron block and aluminum head, with dual overhead camshafts and four valves per cylinder. They are both Euro V emissions compliant.

The engine facility is the second manufacturing joint venture between GM and UzAvtosanoat. GM Uzbekistan, located in Asaka, was established in March 2008 by the two companies. GM holds a 25 percent stake in the joint venture, with the remaining 75 percent held by UzAvtosanoat.

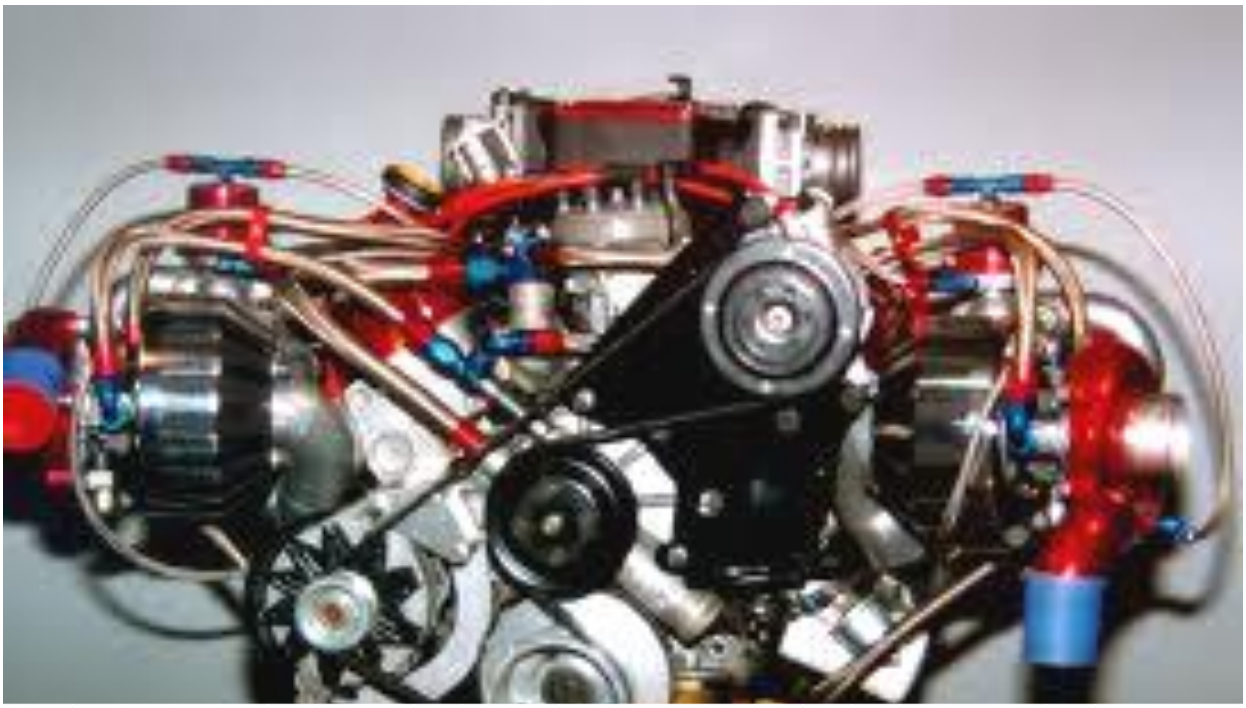
GM Uzbekistan employs approximately 6,600 people and produces more than 200,000 Chevrolet passenger vehicles annually for domestic sale and export to neighboring markets such as Russia and the Commonwealth of Independent States.

Several of the new engine plant's employees graduated from Torino Polytechnic University and three colleges in Tashkent, with which GM has partnered to help develop technical and managerial skills for the nation's automotive industry.

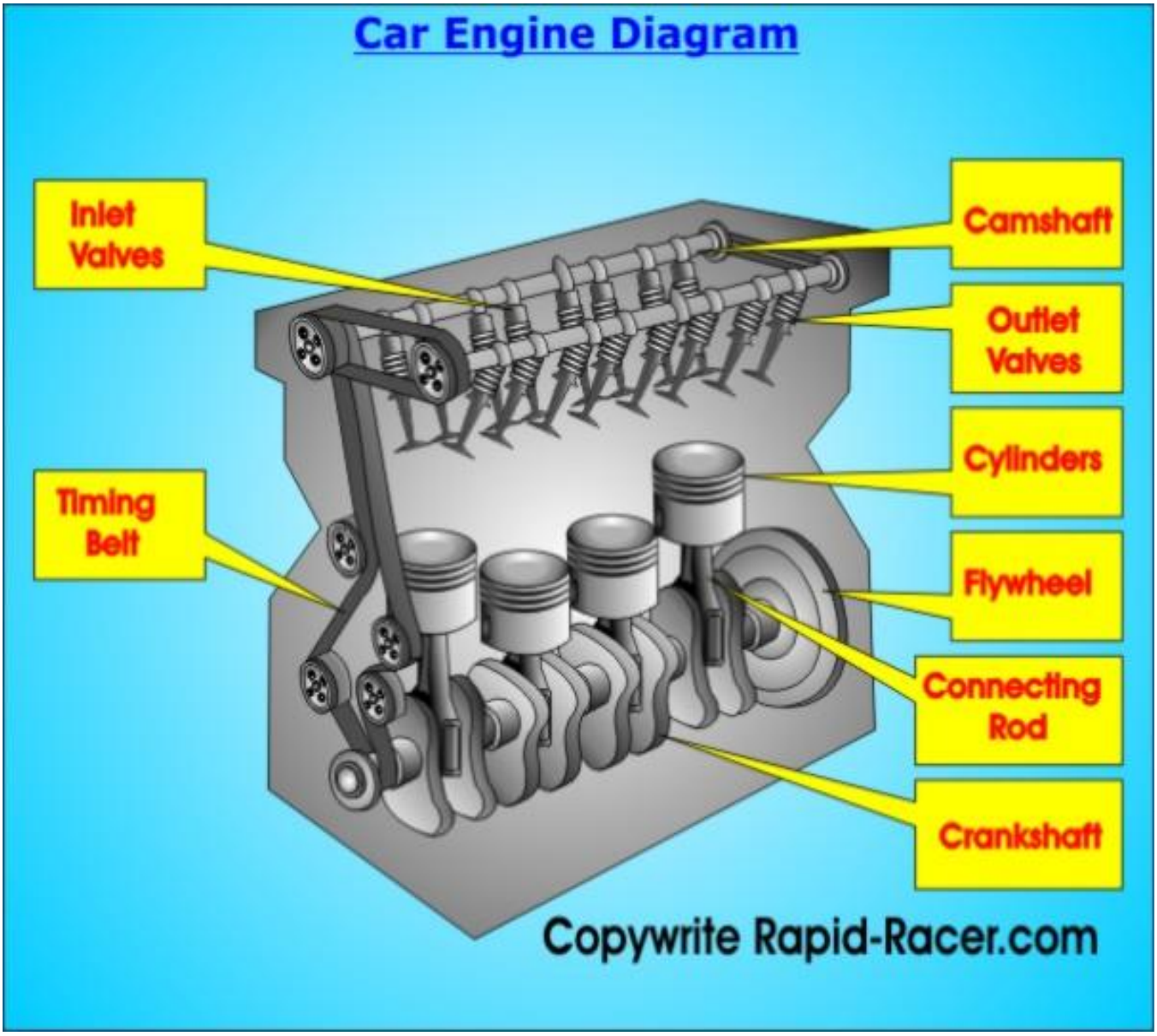
GM's work with these educational institutions has been recognized by the U.S. Department of State as a finalist for its annual Award for Corporate Excellence in 2011.

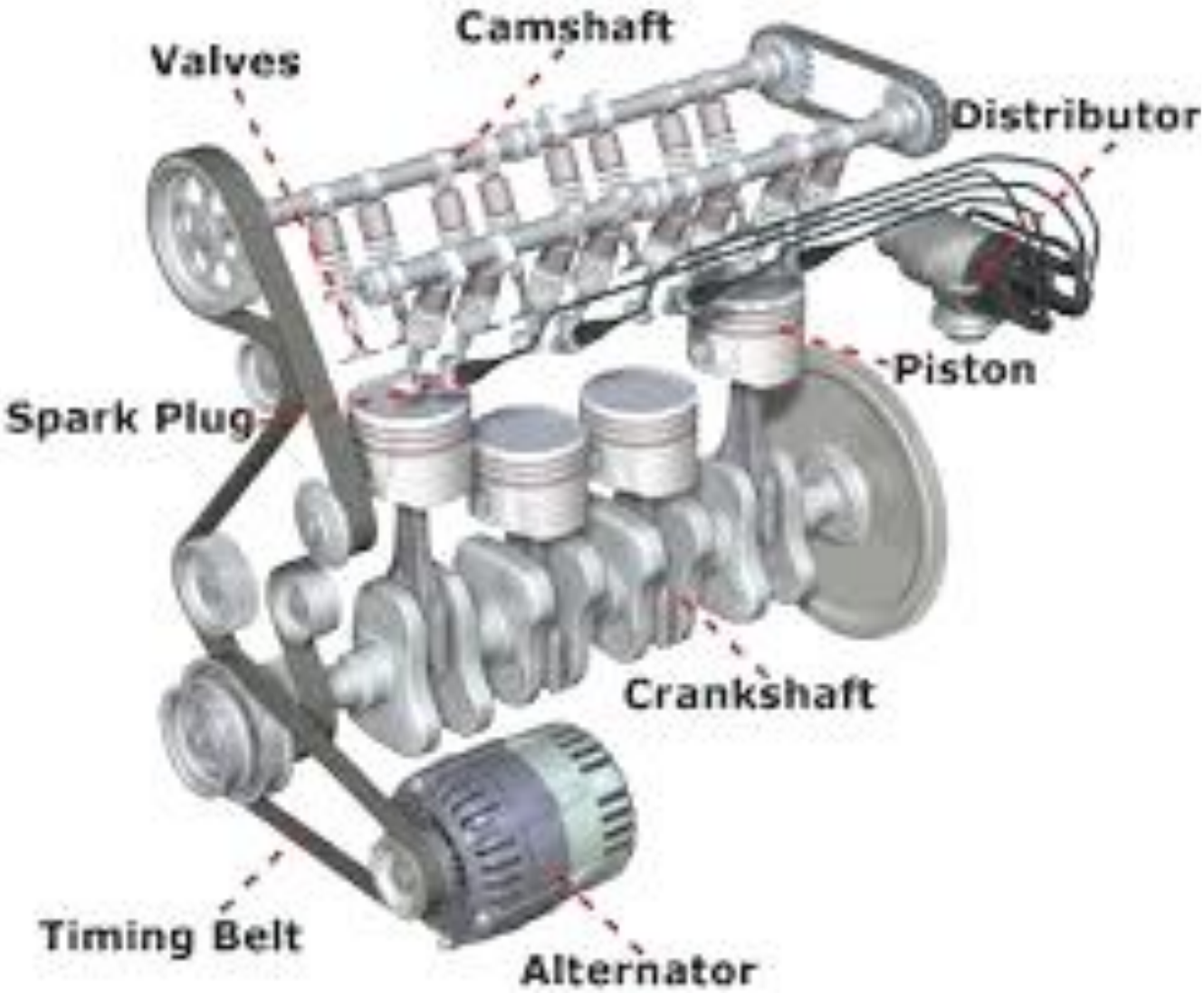
About General Motors:

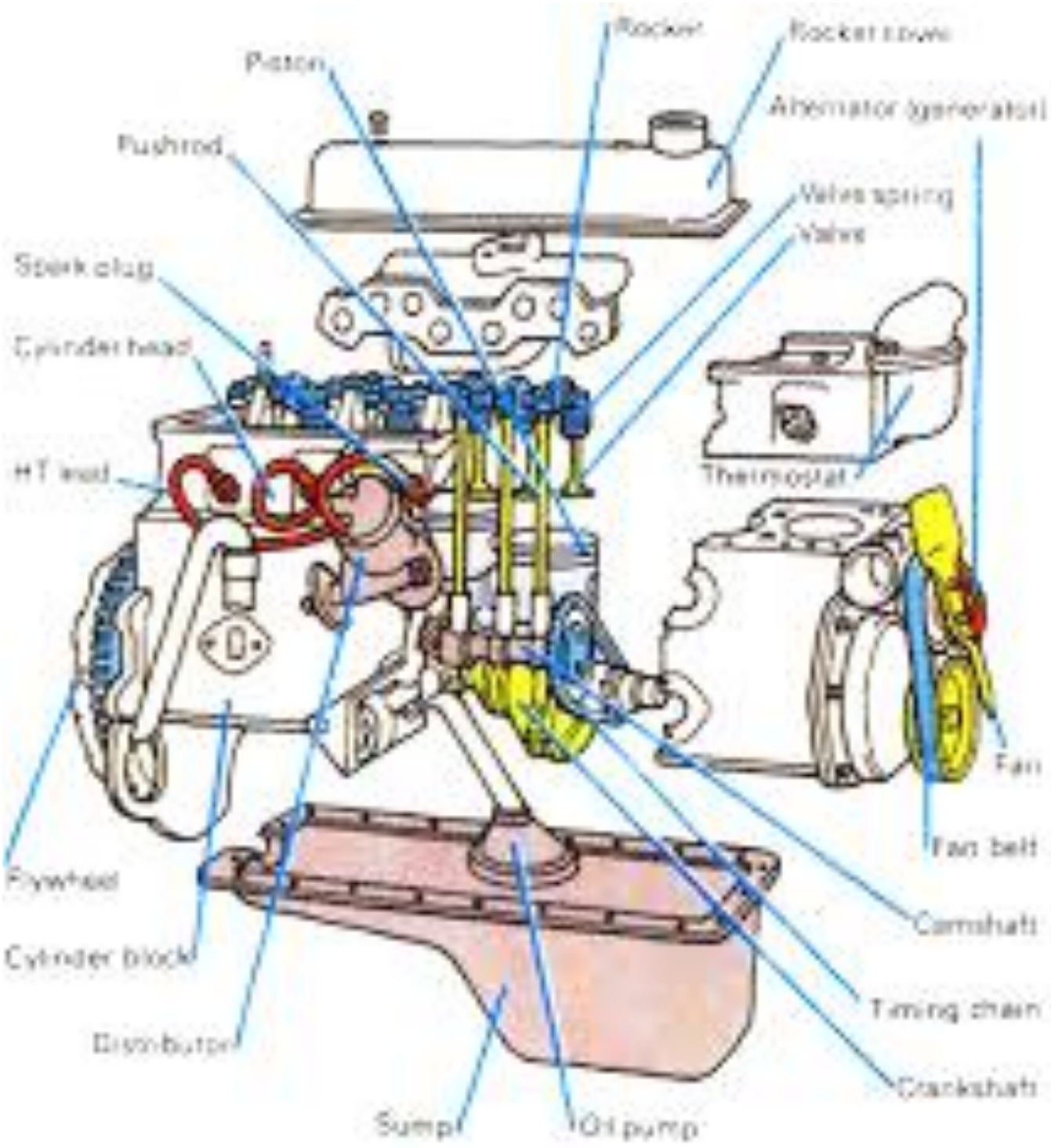
General Motors Co. (NYSE:GM, TSX: GMM) and its partners produce vehicles in 30 countries, and the company has leadership positions in the world's largest and fastest-growing automotive markets. GM's brands include Chevrolet and Cadillac, as well as Baojun, Buick, GMC, Holden, Isuzu, Jiefang, Opel, Vauxhall and Wuling. More information on the company and its subsidiaries, including OnStar, a global leader in vehicle safety, security and information services, can be found at http://www.gm.com.



CAR ENGINE DIAGRAM




Camshaft
Valves
Distributor
Piston
Spark Plug
Crankshaft
Timing Belt
Alternator


Rocker
Rocker cover
Piston
Alternator (generator)
Pushrod
Valve spring
Valve
Spark plug
Cylinder head
Thermostat
HT lead
Fan
Fan belt
Flywheel
Camshaft
Cylinder block
Timing chain
Distributor
Crankshaft
Sump
Oil pump

The Four-Stroke Petrol Engine

The internal combustion engine is called so because fuel is burned directly inside the engine itself. Most automobile engines work on a 4-stroke cycle. A cycle is one complete sequence of 4 strokes of the piston in the cylinder. The operating cycle of the four-stroke petrol engine includes: inlet stroke (intake valve opens), compression stroke (both valves closed), power stroke (both valves closed), exhaust stroke (exhaust valve is opened).

To describe the complete cycle, let's assume that the piston is at the top of the stroke (top dead center) and the inlet and the exhaust valves are closed. When the piston moves down the inlet valve opens to intake a charge of fuel into the cylinder. This is called the inlet (intake) stroke. On reaching the lowest position (bottom dead center) the piston begins to move upward into the closed upper part on the cylinder, (he inlet valve is closed and the mixture is compressed by the rising piston. This is called the compression stroke. As the piston again reaches the top dead center the spark plugs ignite the mixture, both valves being closed during its combustion. As a result of burning mixtures the both valves being closed during its combustion. As a result of burning mixtures the gases expand and great pressure makes the piston move back down the cylinder. This stroke is called the power stroke. When the piston reaches the bottom of its stroke, the exhaust valve is opened, pressure is released, and the piston again rises. It lets the burnt gas flow through the exhaust valve into the atmosphere. This is called the exhaust stroke which completes the cycle. So the piston moves in the cylinder down (intake stroke), up (compression stroke), down (power stroke), up (exhaust stroke).

The heat released by the fuel is transformed into work so that the reciprocating movement of the pistons is converted into rotary movement of a crankshaft by means of connecting rods.

Ichki yonuv dvigateli deyilishiga sabab- yoqilg'i to'g'ridan to'g'ri motorning ichida yongani sababli ichki yonuv dvigateli deb ataladi.Ko'p avtomobil motorlari 4 taktli sikl ish bajaradi.

Sikl bu- slindrdagi porshenning 4 taktini ketma-ket bajarilish tartibidir.

4 taktli benzin motorining ishlash prinsipi o'z ichiga

1. Kirish takti (kirish klapini ochiq).
2. Siqish takti (ikkala klapin yopiq).
3. Ish takti (ikkala klapin ochiq).
4. Chiqish takti (chiqish klapini ochiq).

Sikl jamlanmasini yig'ishni tasavvur qilamiz: Porshen yuqori o'lik to'chkada va kirish va chiqish klapinlari yopiq. Qachonki porshen pastga tushganda slindrga yoqilg'i quvvatini olish uchun olish taktini klapini ochiladi. Bu uning kirish takti deb ataladi

Porshen pastki o'lik to'chkaga yetganda slindrda yopiq yuqori qismining ichida yuqoriga harakat qilish boshlanadi. Kirish klapini yopiladi va porshenda aralashma siqiladi va bu jarayon shu taktda qayta-qayta davom etadi.