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THE CURRENT SITUATION AND DEVELOPMENT OF IRAN AUTOMOTIVE INDUSTRY

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Introduction

The automotive industry in Iran has been established since 1958. It was started with producing a Jeep vehicle. Then the Saika, Iran Khodro and Saipa companies began with the production of Fiat, Paykan and Zhian (brand of Citroen) automobiles in 1960, 1965, and 1966, respectively.

In 1973, IRAN JEEP Company sold 45% of its share to GM Company, and the latter commenced the production of the Chevrolet Nova, Buick and Cadillac.

The growth of the Iranian automotive industry was slow and all cars were assembled as CKD until 1990. However, in the decade of the 1990s, the growth was considerable and it has been continuing strongly in the current decade. At the moment, the volume production of all vehicles in Iran is close to 900,000 units per year. The Iran automotive industry in the current decade has achieved great progress in design and manufacturing fields.

The production of the SAMAND car by Iran Khodro indicates there is a high capability for engineering design, validation process and preparation for the mass production stage in Iran. Nowadays, there are several companies producing different types of vehicles such as passenger cars, vans, trucks, busses and mini-busses in Iran. In Table I, the active companies and the respective production volume and Iranian market share in 2004 are shown.

Table I. Iranian carmakers with production volume and market share.

Company's name	***Volume of production(car/year)***	***Market share (%)***
Iran Khodro	435,434	59%
Iran Khodro diesel	11,106	1%
Sapia	219,631	30%
Saipa diesel	8,031	1%
Pars Khodro	29,173	4%
Zamyad	32,595	4%
Bahman motor	8,750	1%
Morattab	1,369	0%
Shahab Khodro	745	0%
Kerman motor	3,432	0%
Zagroos Khodro	810	0%

From Table I it is evident that Iran Khodro is the biggest car maker in Iran while Saipa is the second largest car manufacturer. Besides, Iran Khodro Company is the biggest carmaker in the entire Middle East. In the following, the five most significant carmakers in Iran are introduced in more detail.

Iran Khodro Company

Iran Khodro is the biggest automobile manufacturing plant in Iran and holds 65 per cent of the Iranian car market. Its position is further strengthened by high import duties.

It was established as the Iran National Industrial Corporation back in 1962 and started the production with a type of Mercedes Benz Bus in 1962. This was followed with Commer Van of the Rootes Group of the UK, which later became Chrysler UK, Talbot and Peugeot UK. In the years to come, the Iran National Industrial Corporation achieved an agreement to build the national Iranian car, named “Paykan”, which went into production in 1967. The car was a version of the Hillman Hunter, which was initially assembled as CKD, but lately, 97 per cent of its parts originated from local manufacturing.

When the British Talbot Company shut down in the early 1980s, Peugeot took over the company. The local assets were taken over by Iran National, which obtained its new name “Iran Khodro”. After the Islamic Revolution,. Iran Khodro and Peugeot concluded an agreement to produce the Peugeot 405 in Iran starting from 1990.

In 2001, the production of the Peugeot 206 started, and then in 2002, the “Samand” was developed based on the Peugeot 405 and hailed as the first truly Iranian automobile being put into production.

In September 2003, a plan for a joint venture was negotiated with the French car maker Renault. As a result Iran Khodro will produce a low-priced passenger car, the "L-90" model, to eventually replace the old Paykan. The L-90 is a family-size car which was developed to meet a target price of 5000 Euros for new markets requiring lower-cost, instead of sophisticated technology. The vehicle current line up in Iran Khodro is consisting of the Samand, Peugeot RD, Peugeot 405, Peugeot Pars and Peugeot 206.

Saipa Company

The SAIPA Company was established in 1966 and has a colorful history of car assembling, including the Citroen Dyane, Renault 21, Nissan Patrol, and the Renault 5 which is still being produced, although it is almost 30 years old. Recent developments included a license agreement with the South Korean Kia Motors for the Pride mini car and with the French Citroen company for the Xantia family car. SAIPA became a full range auto manufacturer after it merged with three other major companies, Zamyad, Iran Kaveh and Pars Khodro in 1999 hold a substantial market share in Iran.

Pars Khodro Company

Pars Khodro was an affiliate of the American Rambler company and manufactured various versions of the Jeep off-roader during the 1960s. In 1973 it was sold to General Motors and began assembling American saloon cars but kept its Jeep line intact. The Islamic Revolution brought the plant to a halt but a couple of years later production restarted with the Nissan Patrol. Pars Khodro was recently bought by SAIPA who transferred its Renault 5 line to be from then manufactured at Pars Khodro under the brand name Sepand.

Kerman Motor Company

Established in the early 1990s by the Iranian Government and Daewoo Motor Corporation which holds 49 per cent of the shares, Kerman first produced the Cielo mid-size passenger car. In 2000, the Matiz small car was added to the range. General Motors imposed a boycott on Iran, thus the supply of kits was stopped which forced the company to halt their operations. New partners were quickly found: Hyundai in South Korea and Volkswagen in Germany. New subsidiaries were set up and production of various models was under way by 2005. Another Kerman subsidiary, Modiran Pars is readying itself for assembly of the Chinese Chery QQ.

Bahman Motor

This company was founded in 1952 as shipping and forwarding agent under the name of Iran Khalidj Co. Vehicle assembly started in 1959, based on the license purchased from the Japanese Mazda Company. The first products were light duty pick-ups. After Islamic revolutions in 1979, the IDRO (Industrial Development and Renovation Organization affiliated to Ministry of Industry) office bought more than 50 per cent of the stocks. In 1990 privatization started and the company was floated on the Tehran Stock Exchange. From 1998 the company continues its activity as a holding company with the name of Bahman Group. Currently they assemble the B2000 truck and the 323 models of the Mazda family

Samand, the First National Iranian Car

Samand, the National Automobile, began the production project in 1996 and completed in 2000. After three decades of production of the Paykan, with no alteration in its form or structure, the need to design and manufacture a new automobile quite different from the present type was strongly felt. Therefore, the Iran Khodro management decided to design and produce prototypes of the national automobile, called Samand, in the Iran Khodro Research Center with cooperation of Iranian experts and engineers, in line with the national development strategies and in competition with foreign automobile manufacturing companies.

In this automobile, the most modern systems of safety and comfort have been anticipated, including seat belts for all passengers, central lock, powered window winders, air conditioner, radio cassette player, left and right wing mirrors adjustable from the interior, air bag system, anti break system, etc. This automobile has been designed by the aid of Iranian and foreign consultants. Its engine has a size of 1761 cm^3. There was no carry-over from the present Paykan. It is a completely new and modern automobile with high safety, front axle, numerous accessories, and newly designed body.

It will be even of higher quality than the Peugeot 405. By the design and manufacturing of Iran Samand, Iran will join the automobile making countries of the world. Annual production level will start with 5000 units, to be increased gradually to over 200,000 units within five years.

Figure 1. Iranian brand car "SAMAND" made in Iran Khodro.

Application of Microalloyed Steels in the SAMAND Car

The body-in-white weight of the Samand is 330 kg, which includes 96.5% mild steels, and 3.5% HSLA steels in the range of 250 – 400 MPa yield strength. Table II shows some parts of Samand made from HSLA steels.

Table II. Typical parts of the Samand car made from high strength steel.

Part name	Grade of Steel	Thickness(mm)
Jacking reinf.	E390D	2
RR axle Cross member	ZSTE380	1.2
Engine mounting flange	ZSTE340	1.5
Side impact beam	HE335D	1.2
Door stop base	E275D	2.5

Production of Nb Microalloyed Steels in Iran

With regard to importance and utilization of high strength low alloy steels in pipelines, pressure vessels and especially in auto bodies, SAPCO a subsidiary of Iran Khodro in cooperation with Mobarakeh Steel Complex Company, being the largest steel producer in Iran, achieved the production of Nb microalloyed steel in 2004. In this project, some grade of hot rolled HSLA steel such as HE275D, HE335D, HE390D according to the PSA norm B53 3316 was manufactured successfully. Nb is used as a microalloying element in these steels. At the moment, Mobarekeh Steel Complex supplies the mentioned grades of HSLA steels as well as some API grades to their customers.

The Accomplished Projects in Iran Khodro

By substitution through HSLA steels in the following parts not only was the performance of SAMAND improved, but also its weight was decreased by up to 5 kg.

Replacement of the side impact beam with Nb microalloyed steel

The original concept of this part was a steel tube with 25 mm outer diameter and 2.5 mm wall thickness which was manufactured from low strength steel. This part was placed in the door inner with the aim to reinforce it. Afterwards the concept of this part was changed to a profile shape as shown in Figure 2 specifying a HE335D grade of 1.2 mm thickness. The structural performance of SAMAND under side impact conditions improved, while cost and time was saved and the weight was decreased by 1 kg.

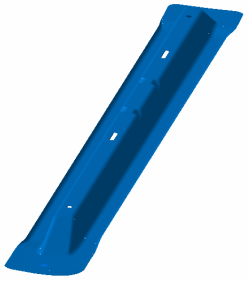

Figure 2. SAMAND side impact beam made from Nb microalloyed steel.

Replacing of the anti-torque link with Nb microalloyed steel

The original specification of this part was a DC03 steel grade of 3 mm thickness. Changing the grade to HE335D of 2 mm thickness, decreased the weight of it by nearly 0.5 kg. This part is shown in Figure 3.

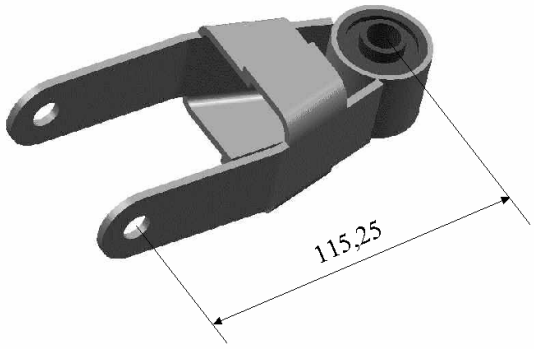

Figure 3. SAMAND anti-torque link made from Nb microalloyed steel.

Light Weighting Projects in Iran Khodro

Currently, several projects concerning the use of new technologies such as TWB and hydro forming and further application of HSS steel are studied in the R&D center of IKCO. The main purpose of these projects is weight reduction.

Samand door inner

The actual material specification of the door inner is mild steel (DX54D) of 0.8 mm gauge. When assembling this part to the door outer, two reinforcement parts are added on the door inner in the lock and hinge area with a thickness of 2.5 mm for both. These reinforcement parts cause an increase of the total door weight. In this project, it is planned to use TWB technology and application of HSS steel in above reinforcement to reduce the total door weight. The weight reduction target is 2 kg for each door.

Samand fender inner

The material of the Samand fender inner is mild steel of 1.2 mm thickness. The total weight of the fender inner is 6 kg. In this project, it is planned to use TWB technology and to apply HSS steel. After these changes, the structural performance will be improved and the weight of part will decrease by up to 1.7 kg.

Samand hood inner

This part has two reinforcements in the hinge areas that are made from mild steel of 2.5 mm thicknesses. In this project, it is planned to use TWB technology and to apply HSS steel. After these changes, torsion and bending stiffness will be improved and simultaneously the part weight will be decreased by up to 0.8 kg.

University Investigations

Considering the development of HSS and UHSS steels by steelmakers for the use in auto bodies and concerning the application of these steels by carmakers, researchers are carrying out many investigations to develop other HSS steels. In Iran, researchers at Isfahan University and Sharif University developed some grades of HSS steel such as TRIP and DP steels in the laboratory. Many efforts are being done by Iranian steelmakers to produce these steel grades.