Charkheshgar co.

Design, production and supply of all types of gearboxes, steering systems and spare parts

Commercial and passenger cars

Variety of products, high quality products, customer satisfaction

The first manufacturer of heavy gearboxes in the country

Charkheshgar Company is the only manufacturer of heavy gearboxes and their parts for passenger cars, vans, two-wheel drive vehicles and all kinds of off-road vehicles such as tractors. Also, this company is the only manufacturer of heavy gearboxes for all types of trucks, vans, tractors, minibuses and cars in Iran. The company's products cover 4 to 16-speed gearboxes and a maximum input torque from 190 Nm to 2200 Nm.

see all products

We offer the best

Charkhshgargar Company is the supplier of these gearboxes due to the variety and circulation of domestic car production. The company has taken an important step towards the production of passenger gearboxes. At present, it has the ability to produce passenger gearboxes.The light gearboxes of Charkheshgar Company are S5-42 and S5-24 trucks, as well as Nissan 4-speed gasoline pickup, Nissan 5-speed gasoline pickup and 5-speed diesel pickup.

Production of steering boxes for all types of heavy and light vehicles

The company currently manufactures and supplies mechanical and hydraulic shoulder gearboxes for passenger cars and is developing a new generation of electric steering wheels according to its vision. The rotating company also supplies the complete hydraulic steering system of heavy vehicles

see all products

About Charkheshgar Company

Charkheshgar Company was registered as a private limited company in year 1348 and in purpose of establishing, maintaining and operating British Leyland diesel engines factories under number 13389 in the Tehran Companies Registration Office and in year 1349 received an establishment license for the production of diesel engines.

Design and manufacturing Gearbox and Gears

Undoubtedly, growth and development are one of the most basic needs of organizations to achieve excellence. What is proposed as the main competitive advantage in organizations with economic goals is development at a pace that is

appropriate and in line with the surrounding world. In other words, competition is the main motivation for the growth and development of companies. Research, on the other hand, is the catalyst of success in all organizations and the difference is only in its goal and achievements.

A research and development department has been established in the Charkheshgar company, for the purpose of designing and developing new products, as well as reverse engineering and localization of the required products. By forming specialized working teams in the required fields, the company is engaged in carrying out relevant activities. Team work with expert leading is one of the main strategies of this unit, which is always considered in all activities, and the success of this department is due to the continuous efforts of all its employees.

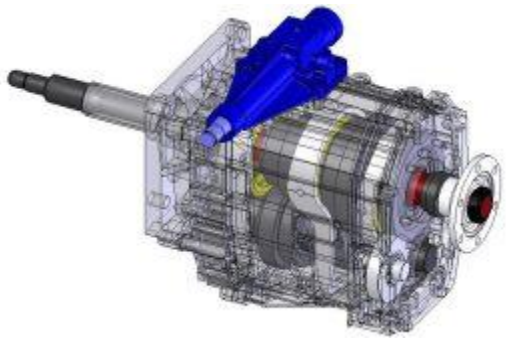
The activities carried out in R&D department include various sections that can be generally presented under the following items:

1. Product design:

a) Designing the general platform of the gearbox Concept design:

According to the planned need, based on the technical knowledge and experience gained from years of research and examination of various types of common gearbox systems, the stages of designing the general platform of the gearbox are carried out, which includes the following two parts:

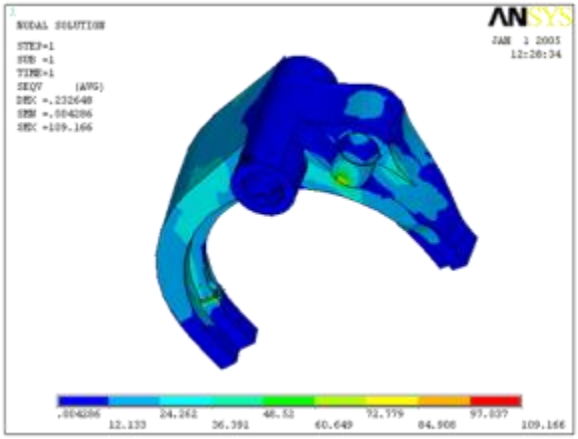
- Compilation of a comprehensive constitution of gearbox design
- Preparation of standards and resources

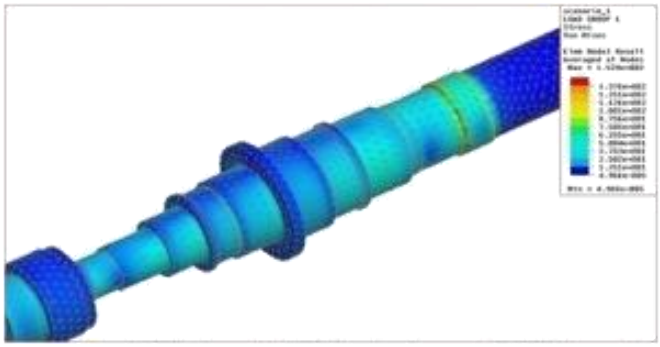


b) Design and analysis of the internal components of the gearbox:

Using expert personnel and taking advantage of world-class knowledge, along with making use of gear and gearbox design and finite element analysis software, different internal parts of the gearbox considering their designs and assemblies were evaluated in diverse working conditions. This section includes several steps, some of which are mentioned below:

- Design and optimization of shafts and bearings
- Design of synchronizer assemblies
- Design and analysis of gearbox casing
- Designing the mechanism of shifting forks
- Analysis of lubrication and ventilation in gearbox
- Analysis of stress, strain, fracture and failure of the internal parts of the gearbox





c. Research and design of various types of shifting mechanism systems:

Modifying the speed and torque in the gearbox according to the speed and torque input from the vehicle engine is carried out using the gear changing mechanism. This includes different types and can be designed and utilized based on gearbox types, type of vehicles and constraints of installation of the parts in the assembly complex. One of the activities of the research and development department is to determine the type of mechanism needed to implement the gear change and its design.

- Compilation of design knowledge of various mechanisms (Servo Shift-Cable-Linkage)
- Analysis of gear shifting mechanism forces in various gearboxes

2. Developing various production software:

With the help of top experts in the research and development department, the knowledge-based essentials of software within the unit have been examined and evaluated, and according to the defined needs, the required software, are designed and used. Among the activities carried out in this field, we can refer to the items mentioned below.

a. Compilation of the software for selecting and adapting all types of gearboxes to the vehicle

b. Development of gear profile control software (K-chart…)

c. Compilation of software for extracting gear shifting diagram

Heat Treatment

Gas carburizing

Carburizing or Surface carbonation it refers to heat treatment in which the parts are surface hardened and at the same time, it has a relatively softer brain which are very resistant to mechanical stress and have high strength and toughness. In gas carburizing, carbon enters the furnace chamber by carrier gases which has constant pressure and atomic carbon diffiusion the surface of the part at a temperature above 900 degrees Celsius. In this way, a piece is made that its core is low in carbon and its surface is high in carbon.In the heat treatment unit of the Charkheshgar company, gas carburizing is carried out by two-shell furnaces of Aichiline.

Nitriding

Nitriding or nitrogenation is the same inserting atomic nitrogen in the surface layer of steel. In nitriding, the hardening agent is the formed metal nitride surface. Nitriding is done in the temperature range of 550 to 650. It should be noted that in

this operation, there is no need for rapid cooling after heat treatment and the piece is cooled in the ambient air.

Carbonitriding

Carbon-nitrogenation is a surface hardening operation that in it, both nitrogen and carbon elements are absorbed on the surface and in this way, the absorbed nitrogen increases the hardness of the given carbon surface. The temperature range of carbonitriding is 800-875 degrees Celsius.

Hardening

When there is no need for carbon diffiusion in the surface hardness and only hardening is required in these cases, it is done by raising the temperature of the parts to the austenity range and then quenching which is done with a small potential of carbon or under nitrogen without the intervention of any other gas which is done in the heat treatment of Charkheshgar Co. by hot oils which has a temperature between 100 to 150 degrees Celsius and it prevents high dimensional changes as well as cracks.

Tempering

Due to the internal tensions created while cooling rapidly, all hardened pieces are somewhat brittle and brittle due to the return of internal tensions, they are reduced or deleted and therefore the impact strength is increased but instead, the hardness and strength of the hardened part will decrease to some extent.

Induction

Induction operation is the same local hardening that is used when there is no need to harden the whole part and only part of the part needs to be hardened in this case, the temperature is raised by induction devices by creating a magnetic field at the desired point and after heating up to the upper range of 800 quenching is done and hardening is done.

Pinning shot

After heat treatment, depending on the type of treatment the surface of the piece is usually cloudy or has an unacceptable smooth surface, which is polished by the shot pin of the surface of the parts by the grinding of the balls with a certain standard it also has a direct relationship with increasing the fatigue limit of parts.

Fine Measurement

Accurate measurement hall

One of the most important quality factors in transmission production is the desired quality of the produced gears which can be measured by GMM devices. The gear test device of the Charkheshgar Company is one of the reliable brands named HOFLER. This device has the ability to test and measure all types of spur and helical gears, as well as shave, hob, and shapping cutters according to DIN standards and other common gearing standards. This device has the ability to measure the parameters of gears with a diameter of 402mm and a length of 1m.

Gear test

Measuring profile, lead and pitch errors of spur and helical gears are done according to DIN 3961-3962 standards in order to increase the quality and reach the desired quality of transmissions.

Shaving cutter check

The quality of the manufactured gears in the shaving process is obtained from the quality of the shaving tools that the measuring of the profile, lead and pitch errors of these tools is done by the GMM device according to DIN 3961-3962 standards.

Testing hub and shape tools

The most common gear manufacturing methods are the hub and shape method and it is done with relevant tools that these tools should have suitable and desirable

quality. This control can be measured by GMM device for hub tools according to DIN 3968 standard and shape tools according to DIN 1829 standard.

Sharpening Tools

Production tools are divided into two general types or they are disposable and after use, they must be replaced with new tools, which are all types of indexable inserts of this type but other types of tools have the ability to be sharpened and reused. Based on the type of production tools, the Charkheshgar Company has the possibility of sharpening them which provides sharpening services to gear cutting and housing cutting production units in two separate halls with modern and exclusive devices. In Charkheshgar Company, the units of tools and sharpening tools provides its general services in the form of two sharpening salons for gearing and general tools:

1. Sharpening of general cutting tools that can be sharpened, including:

– Types of twist drills (one step, two steps, three steps) in different diameters

– All kinds of simple and spiral taps

– All kinds of milling cutters and shell millings

– all kinds of end mills

– All kinds of special tools

2. Sharpening gear cutting tools including:

– A variety of shaving cutters with an internal diameter of 100 mm from an external diameter of at least 200 mm to 250 mm, which allows the creation of different profiles on the tools by a computer program with accuracy and quality 4 according to DIN3962

– All kinds of hobbing tools with straight and spiral gash, with any number of flutes and bore diameters (22, 27, 32, 40, 50) which are possible with hydraulic mandrels in the best possible accuracy with encoder index and based on DIN 3968 standard.

– A variety of simple and spiral shaping cutters at any desired helix angle, including disc types with common bore diameters, hub type and shank type with different taper morse.

– Round and flat broaching tools in different diameters and lengths

Technical and Laboratory

• Materials and Chemistry Laboratory

The following services are provided by the metallurgical and chemical laboratory of the Charkheshgar Company:

- Measuring surface hardness of parts (HRC, HV, HRB, HB, …)
- Measuring the penetration depth of hardness of parts (carburizing, nitriding, carbonitriding)
- Measuring the core hardness of parts (without destruction and with destruction of parts)
- Preparation of graphs and charts of hardness in different depths of parts
- Determining the type of heat treatment performed on the parts
- Preparing the metallographic structure of ferrous and non-ferrous parts
- Determining the percentage of metallurgical phases
- Determining the type of graphite and the degree of sphericity (Nodule Count) of cast iron parts
- Magnetic crack test of parts
- Measuring the ph of coolant liquid
- Measuring the viscosity of oils
- Salt spray test

It must be mentioned that in addition to the above measurement services, checking and providing analysis of control cases as well as consulting services are performed by the experts and specialists of the laboratory of the company.

- **Metrology Room**

Providing all kinds of accurate measurement services by the metrology department of the company, as follows:

- Providing graphs of different points of machined parts, gears, shafts, etc. in different magnifications
- Measuring the geometric characteristics of complex parts using precise measuring equipments including items such as: roundness, cylindricalness, sphericity, orthogonality, etc.
- Measuring the quality and roughness of surfaces and preparing their graphs
- Accurate dimensional measurements of gear parts and grooved shafts
- Controlling and reporting the quantitative and qualitative results of parts using the available advanced and precise equipments for reverse engineering in the implementation of new projects.

After-sales services

To provide after-sales service for products under the ZF license, Charkhshgar Company with in cooperation with ZF Germany, ZF Iran Company (Zarrin Fanavar Charkheshgar) has been established and in order to satisfy the customer, a coating system and after-sales service for all manufactured products has expanded (branded and non-branded) throughout Iran.

The acceptance of Zamyad Company products to provide after-sales service is in one of the following forms:

– Acceptance through Zamyad central agencies

– Acceptance directly from the customer

Parts Supply

Charkheshgar Company with advanced facilities regarding the planning and technology of heat treatment furnaces has a potential capacity to provide heat treatment services in the region. Heat treatment services not only reply to the internal production needs of organization but also to the industrial needs of the province to cooperate with the country's industrial units. The sales unit of the company is trustee of concluding contracts and creating a working platform with customers in the fields of heat treatment, accurate measurement and sharpening.

Charkheshgar Company in order to supply the market required parts for its products or to set up a contract for the custom production of parts and products is in contact with suppliers and customers. Recent restrictions have increased the production and circulation of products which has caused to increase response time to customers but however the sales unit is ready to receive proposals from customers for orders of parts or products while maintaining the order's time priority.

To get information about the products produced including transmission, steering box, P.T.O, clutch pump, pneumatic steering column set, bevel box, etc., you can see the product catalogues.

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History

1968: Factory establishment

1974: Start of Leyland diesel engines assembly

1981: Land Rover engines assembly

1986: Signing a contract with the ZF Company of Germany for production of heavy and semi-heavy (commercial) transmissions.

1991: Start of production of ZF: S6-90 and S5-24/3 transmissions

1996: Production of transmissions for Nissan 4-speed and Patrol light vehicles

1999: Production of mechanical steering boxes for light vehicles

2002: Purchase of a part of the company's share by ZF Company of Germany and production of ZF S5-42 transmission

2004: Signing contract with ZF Company of Germany for license of new products and automatic bus transmission assembly of ECOMAT

2008: Assembly of ZF 16-speed transmissions of 16S-221 and 16S-151

2009: Design and production of Nissan diesel 5-speed transmission and Nissan gasoline 5-speed

2014: Capital increase by 100%

2015: Design and production of steering column for bus and truck

2016: Selection of Charkheshgar Company as the outstanding industrial unit of the province and the outstanding industrial unit of the country

2016: Opening JHQ Renault passenger transmission assembly line

2018: Selection of R&D Department of Charkheshgar Company as the outstanding R&D unit of the province

2019: Design and production of 12-speed transmission of S6-90 + GV for IKD

2020: Design and production of Power-Take-Off (P.T.O.) set for heavy transmissions

2021: Start of mass production of PTO in mechanized assembly line

2021: Localization of 17 pieces and sets of Atros bus steering system for IKD

2021: Design and optimization of S6-90 transmission into S6-90 SAE1 transmission

2022: Localization of Bevel box for the steering system of various types of buses

2022: Localization of clutch master pump for the clutch system of various types of trucks

2022: Localization of pneumatic steering column of steering system for various types of heavy duty vehicles