



Menatek Defense Technologies



MENATEK
Defense Technologies

Menatek Defense Technologies
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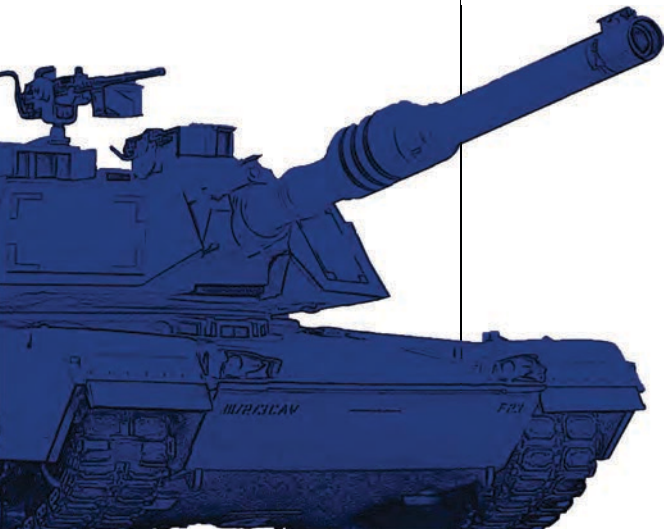
1 PART

About Us

Menatek is the leading high-tech manufacturer and largest supply chain manager of Turkey and the MENA Region.

Customer list is consist of but not limited to international vehicle manufacturers as well as **US Army, Turkish Army, NSPA and more.** Utilizing 50 years of specialized know-how on heavy to light military vehicles, all types of tactical & combat platforms and its wide range of strategic suppliers; Menatek provides a comprehensive and effortless environment on manufacturing, testing and supplying its customers. We are proud to say that all products and suppliers get inspected and audited by Menatek Defense Technologies in accordance with it's '**MDT Supplier Quality**' Standards.

After established in 1997, started off as a spare part supplier for the after-market of the Turkish Army, today Menatek has over **7250** different components in its inventory. Menatek works with the most capable suppliers around the world, comprising processes such as; **Ultra Precise CNC Machining & Grinding, Gear Manufacturing** (Up to DIN 4 Quality), **Forging** (Open & Close Die, Aluminum, Ring Roll Forging), **Casting** (Sand, Investment, Shell-Mold, Gravity-Die, Die Casting), **Extrusion** (Aluminum, Steel, Titanium), **Cold Forming** (Deep Drawing, Flow Forming), **Heat Treatment** (QT, Sub-Zero, HIP and others), **Vulcanization** (Rubber Injection)



1^A

EXPERTISES

Expertises

Subsystems Manufacturing

Suspension, Brake System, Running Gear, Chassis,
Powertrain, Optronics, Heating & Cooling, Lubrication

Services

ENGINEERING

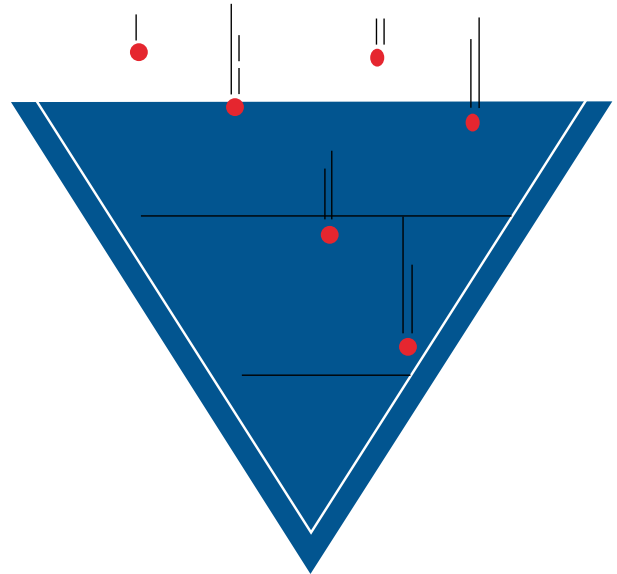
Product Development
Test Unit Design & Manufacturing

MANUFACTURING

Build to Print
Project Management:
Supply Optimization
Weekly Production Reports
Cost-Cutting Plan

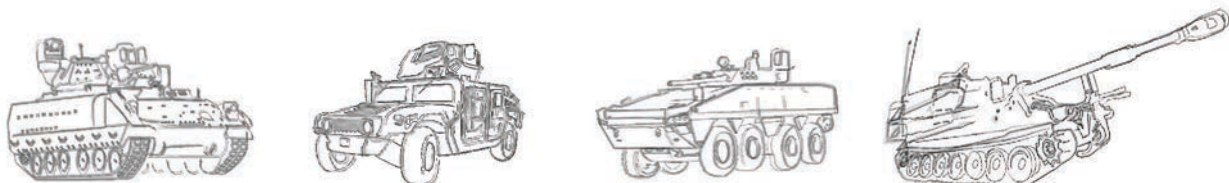
SUPPLY CHAIN MANAGEMENT

'ERP Software' developed by Menatek
Ultra Precise CNC Machining & Grinding,
Gear Manufacturing (Up to DIN 4 Quality),
Forging (Open & Close Die, Aluminum, Ring Roll Forging),
Casting (Sand, Investment, Shell-Mold, Gravity-Die, Die Casting),
Extrusion (Aluminum, Steel, Titanium), **Cold Forming** (Deep Drawing,
Flow Forming), **Heat Treatment** (QT, Sub-Zero, HIP and others),
Vulcanization (Rubber Injection)



VEHICLE GROUPS

MBT AAV APC IFV ARV LAV MLRS HOWITZER



1 ^B

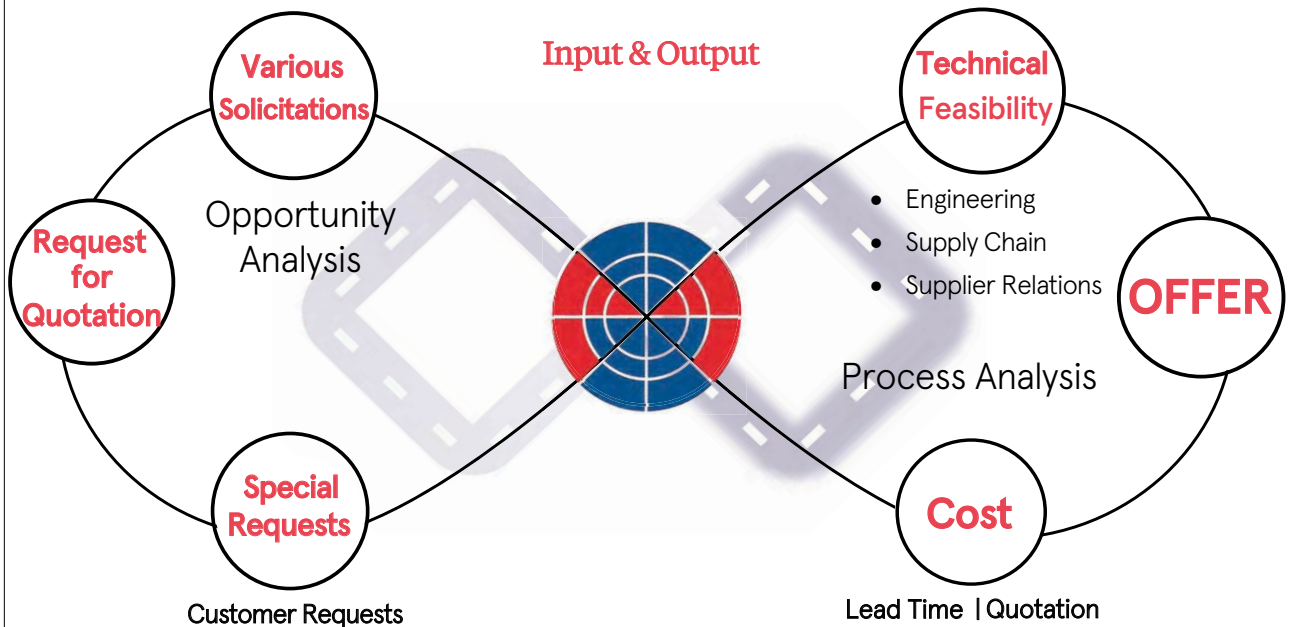
OFFER EVALUATION

Offer Evaluation

Various solicitations & business opportunities - *obtained through customers* - which are evaluated by creating appropriate routes according to incoming requests. Engineers carry out technical feasibility work in case the request is commercially feasible.

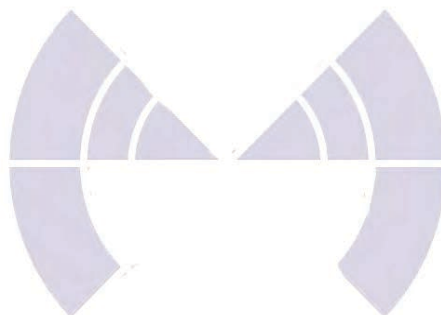
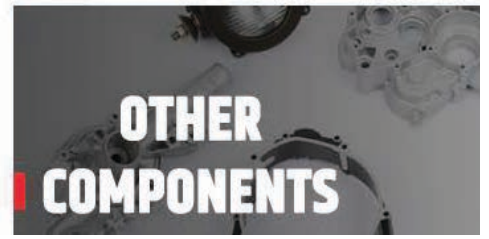
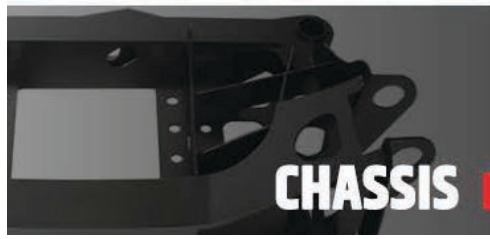
Supply Chain Managers prepare the requests as business packages. These requests are subjected to supply and cost analysis after quotation process with strategic partners.

After determining with strategic suppliers to suitability of opportunity, the offer contains the price, project calendar and technical details to transmit to the customers.





Subsystems



2

A

Suspension



Rotary Damper



Torsion Bar



Support Arm



Support Arm Assembly



Linear Damper



Suspension Housing

Manufacturing suspension system components, assembling them and testing the complete systems for both tracked and wheeled vehicles are Menatek's expertise. More elaborately, Menatek can manufacture rotary dampers, torsion bars, complete wheel stations etc. and test them according to military specification.

Running Gear



Idler Arm



Track Adjuster



Track Shoe Body



Sprocket Assembly



Rim



End Connector

Just like suspension systems, Menatek can provide its customers with complete track shoe assemblies.

2

B

Powertrain



Power Take-Off (PTO)



Cam Stator



Planetary Gears



Lubrication Cover



Transmission Cover



Final Drive Assembly



Lamelle



Transmission Cover

Menatek have the ability to produce and test complex Transfer Case, PTO, Final Drive and axle boxes, which perform parallel, differential, planetary and angle transfer.

In addition to these, Menatek is also capable of providing a pistons, piston rings & sleeves, connecting & main bearings, forged and cast crankshafts, connecting rods, camshafts, inlet and outlet exhaust valves, flywheels, clutches, transmission housings & covers,

Brake Systems



Brake Ring Assembly



Brake Linings

Menatek provides its customers with hydraulic and pneumatic brake system manufacturing, assembly and testing for tracked and wheeled armoured vehicles.

Since the brake system is a safety-critical system, all components and the system itself go through plenty of tests to verify the endurance and performance of the manufactured components and assembled system.

Heating & Cooling



Radiator



Dust Blower



NBC Cooler



Fan Housing



Axial Fan



Dust Blower

One of the services that Menatek provides; heating and cooling system components for engine, transmission, filtration etc.

Menatek have high knowledge about radiator production. Leopard 1 radiator was managed to produce locally for the first time by Menatek. As well as Leopard 2, which has cylindrical panel.

Lubrication



Engine Oil Pump



Pump



Pump



Liquid Pump Body



Water Pump

Menatek's other product line is lubrication system components. Menatek is capable of manufacturing and testing various kinds of engine and transmission oil pumps.

2

D

Chassis



Control Arm



Roll Bar



Structural Frame



Control Arm



Steering Gear Assembly



Suspension Bracket

Menatek offers many components for chassis including but not limited to control arms, drag links, steering boxes, steering links, ball joints, structural frames, roll bars, fuel tanks and etc.

Other Components



Gear Box Body



Cylinder Head



Fuel Tank Fillers



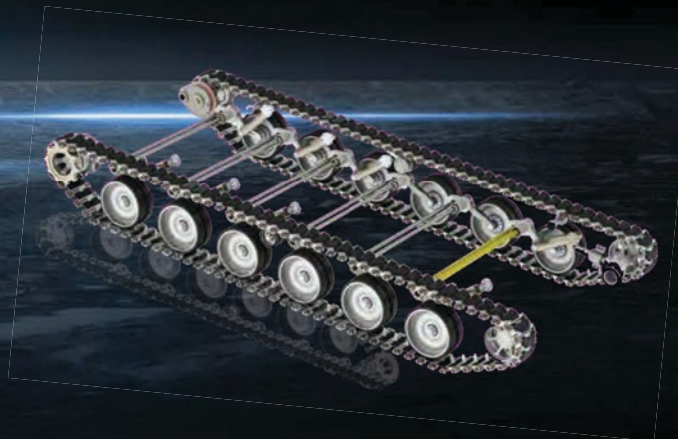
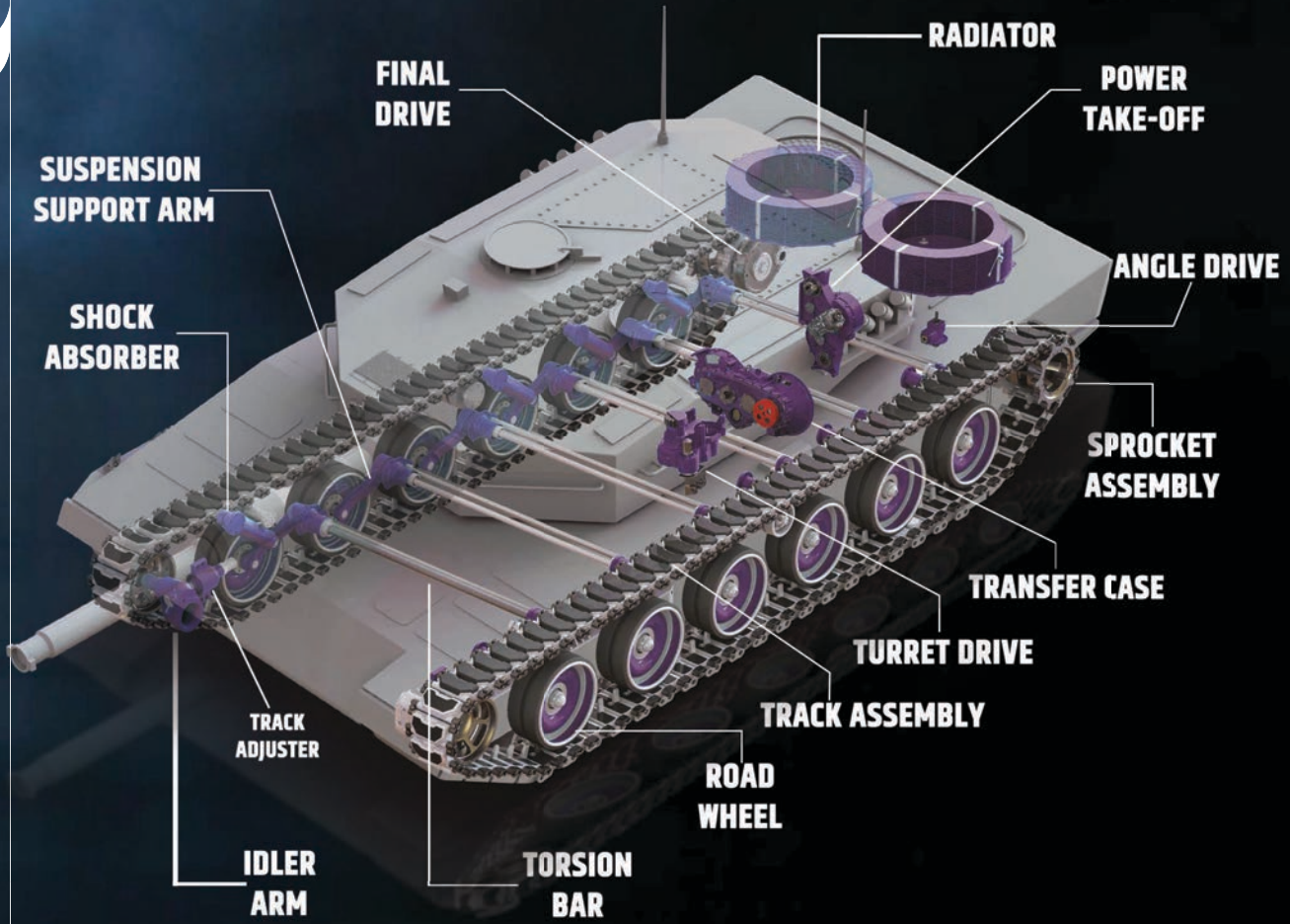
Various Components

Menatek also manufactures ammunition feeder parts, fuel tank fillers, tank lifters, composite fuel tanks including self-sealant fuel tanks etc

2

MAIN COMPONENTS &
RUNNING GEAR

MAIN COMPONENTS & RUNNING GEAR



2

Radiator

Radiator

Radiators are heat exchangers used for cooling internal combustion engines. These types of engines are often cooled by circulating water or oil-based engine coolant through the engine block, where it is heated, then through the radiator where it loses heat to the atmosphere, and then returned to the engine by the help of a circulation pump.

Menatek have the capability to design and manufacture a variety of Radiators which are used on well-known vehicles such as Leopard 1 & 2 MBT, M48 MBT, M60 MBT, M88 Recovery Vehicle, M2 Bradley IFV, M109 Howitzer, M113 APC and more.



2

Power Take-Off

PTOs are complex gearboxes used to take power from a power source such as an engine or a transmission and transmit it to various mechanical and/or electromechanical components such as generators, pumps and etc.

Menatek have the capability to design and manufacture a variety of PTOs used on different vehicles for different applications.

Power Take - Off



2

Angle Drive

Angle Drive

Angle Drives are gearboxes used to direct and transmit the power of a driving unit such as a motor. Spiral bevel gears are used in Angle Drives to change the direction of the transmission by 90 degrees with respect to the driving shaft.

Menatek have the capability to design and manufacture a variety of Angle Drives used on different vehicles for different applications.



2

Sprocket Assembly

Sprocket Assembly

Sprocket assembly is a component of running gear of military tracked vehicles which takes role in driving the track assembly. It conducts the torque from final drive to track assembly. It is consist of two different main parts; (2ea) sprocket gear and sprocket carrier.

Menatek Defense Technologies are capable of manufacturing sprocket wheel and sprocket carrier which are used on well-known vehicles such as M48 MBT, M60 MBT, M88 Recovery Vehicle, M1 Abrams MBT, M2 Bradley IFV, M109 Howitzer, M113 APC and more.



**SPROCKET
ASSEMBLY**

2

Transfer Case

Transfer Cases are power transmitting gear boxes used where parallel, angled or differential power transmission is needed throughout the driveline of various tracked and wheeled vehicles.

Menatek have the capability to design and manufacture a variety of Transfer Cases used on different vehicles for different applications.

Transfer Case

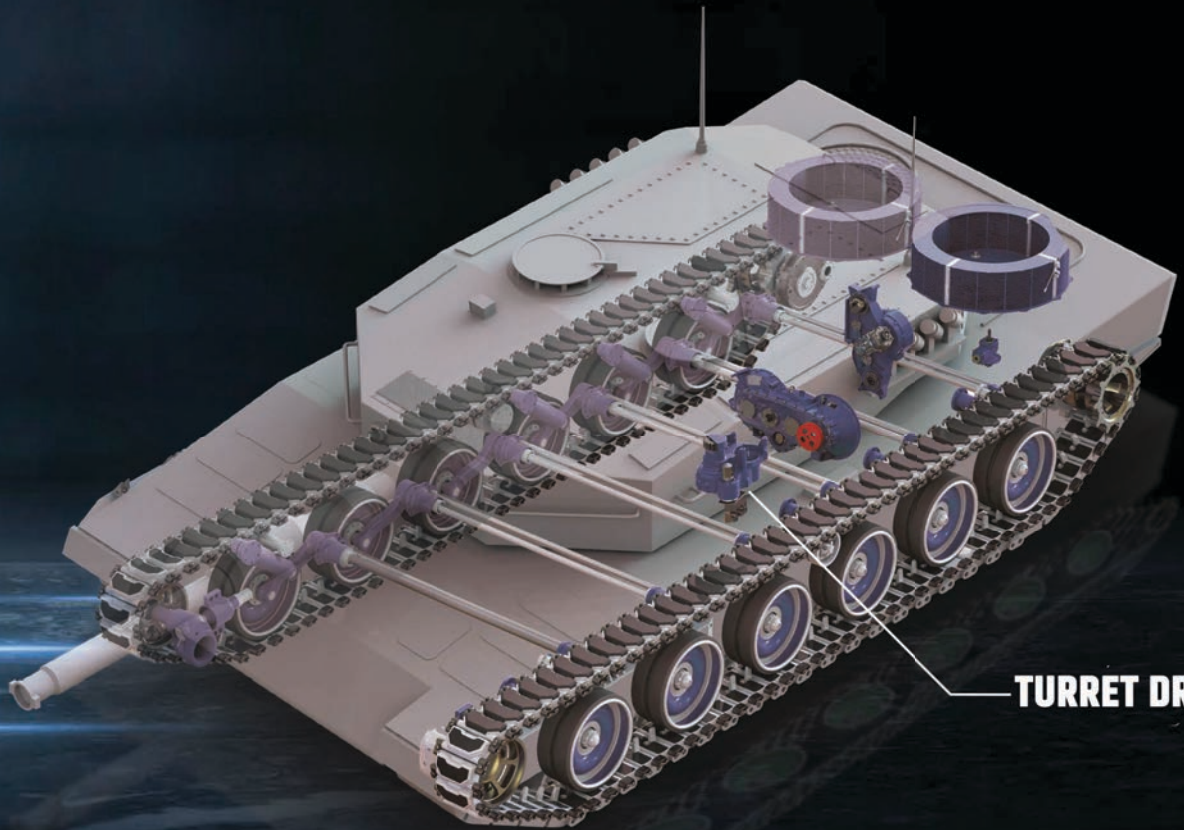


2

Turret Drive

Turret drive is the main gear box assembly that constitutes the body that delivers mechanical and hydraulic alignment force needed to turn the tank turret precisely.

Menatek have the capability to design and manufacture a variety of Turret Drives used on different vehicles for different applications.



TURRET DRIVE

Turret Drive

2

Track Assembly

Track Assembly

Track Assembly is a unique component which provides the vehicle mobility. By transmitting the torque coming from the final drive into directional movement, it enables the tracked platforms to move in almost all types of terrain. Track assembly composes of track body & pad, center guide, pins and end connectors.

Menatek have the capability to produce a variety of track assemblies which are used on well-known vehicles such as M48 MBT, M60 MBT, M88 Recovery Vehicle, M1 Abrams MBT, M2 Bradley IFV, M109 Howitzer, M113 APC and more.



**TRACK
ASSEMBLY**

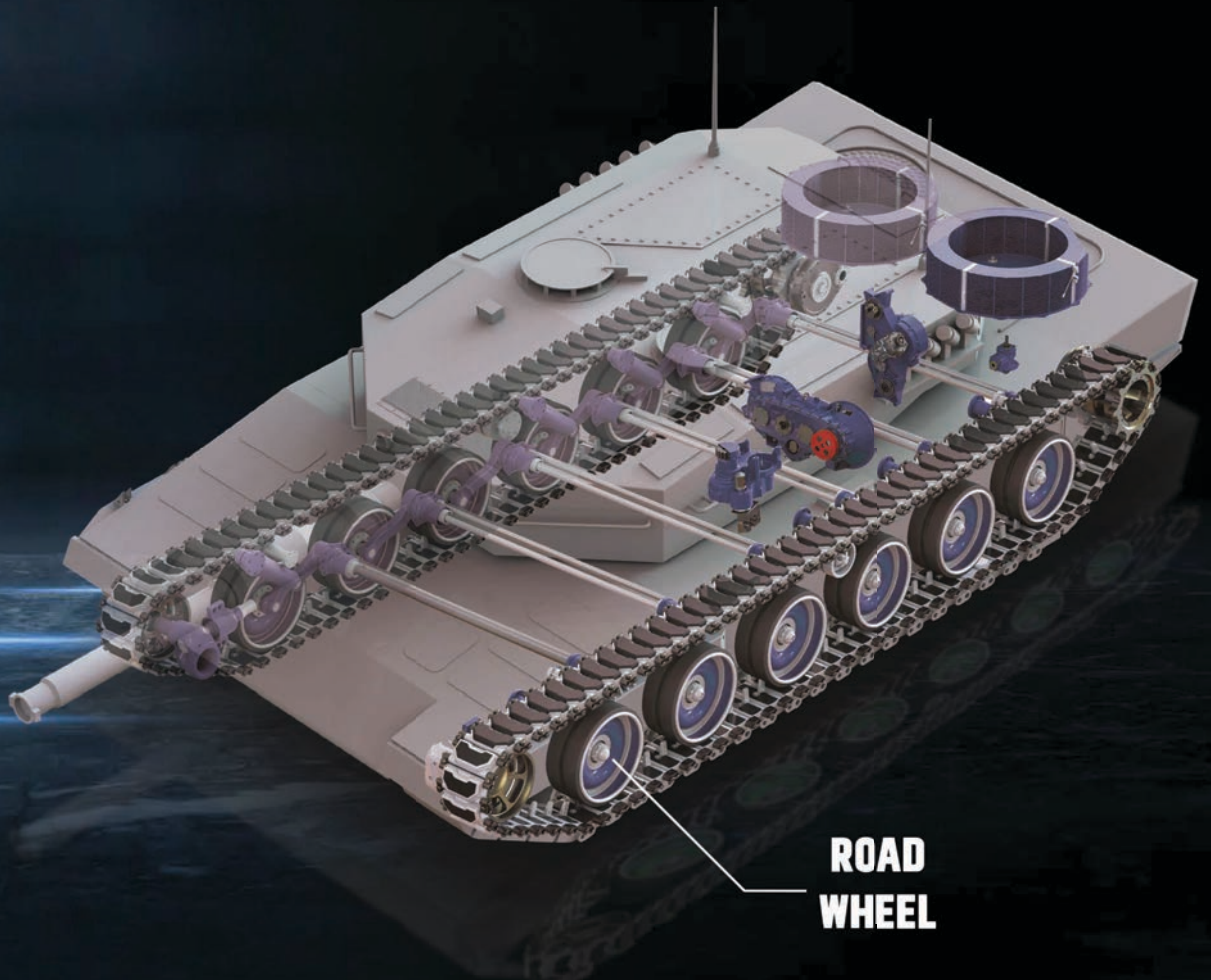
2

Road Wheel

Road Wheel

Road Wheels are other important components of running gear which create the interference between the support arm and the track assembly. They are basically metal rims vulcanized with a tough rubber around. Constantly working under high pressure and friction, the rubber's recipe and adhesion strength to the rim are key points to Road Wheel production.

Menatek have the capability to produce a variety of Road Wheels which are used on well-known vehicles such as M48 MBT, M60 MBT, M88 Recovery Vehicle, M1 Abrams MBT, M2 Bradley IFV, M109 Howitzer, M113 APC and more.



**ROAD
WHEEL**

2

Torsion Bar

Torsion bar is one of the most crucial part belong to running gear of military tracked vehicles. It is basically a spring which works under torsional load. Menatek Defense Technologies have been working on torsion bars since 2010 and the efforts of the Menatek team had turned into proficiency on manufacturing torsion bars. Menatek, now, can design, manufacture and cycle test torsion bars for different platforms such as AAVs, IFVs, MBTs according to vehicle specifications.

The company can design & manufacture torsion bars with body diameter up to 80 mm, length from 1.300 to 2.800 mm and preset torsion bars up to 180.000 Nm. Menatek have the know-how for to manufacture a wide range of torsion bars used on well-known vehicles such as M48 MBT, M60 MBT, M88 Recovery Vehicle, M1 Abrams MBT, M2 Bradley IFV, M109 Howitzer, M113 APC, Leopard 1 MBT, Leopard 2 MBT and more

Torsion Bar



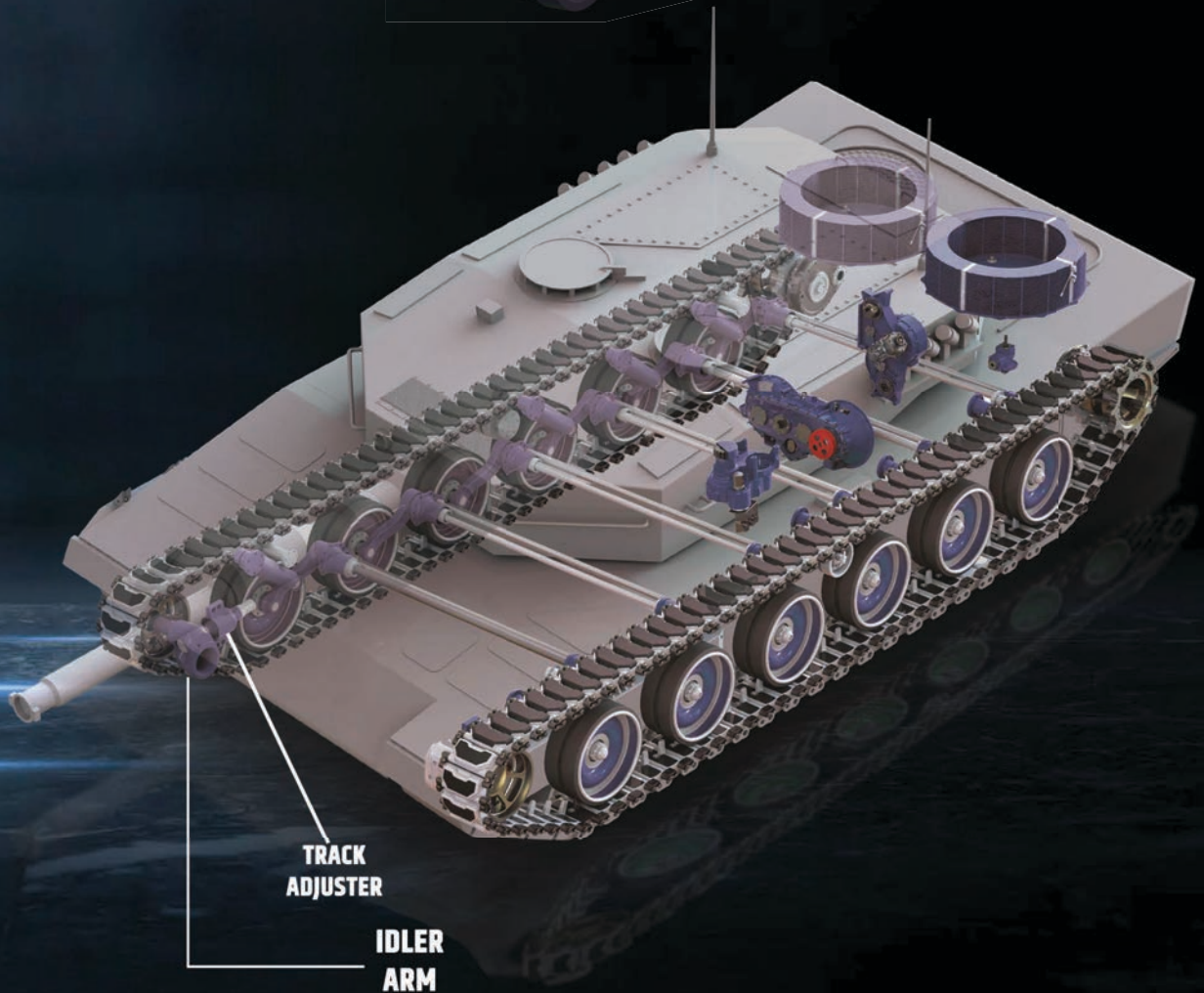
2

Track Adjuster & Idler Arm

Track Adjuster & Idler Arm

Track Adjuster is an important component which adjusts the tension of track assembly by collapsing and extending when needed. Track adjuster works together with the idler assembly to provide the right amount of flexibility for the track assembly.

Menatek have capability to design and manufacture a variety of track adjusters which are used on well-known vehicles such as M48 MBT, M60 MBT, M88 Recovery Vehicle, M1 Abrams MBT, M2 Bradley IFV, M109 Howitzer, M113 APC and more.



2

Shock Absorber

Shock absorber is a suspension component which damps jounce and rebound motion of the road arms & wheels. There are two major types of shock absorbers which are used on military vehicles; linear dampers and rotary dampers. Duty of both types is to absorb energy by dissipating it in the form of heat.

Menatek Defense Technologies is capable to supply shock absorber which is used on well-known vehicles such as M48 MBT, M60 MBT, M88 Recovery Vehicle, M1 Abrams MBT, M2 Bradley IFV, M109 Howitzer, M113 APC and more. Additionally, Menatek have ability to design linear & rotary dampers except of manufacturing and testing.

Shock Absorber

**SHOCK
ABSORBER**



2

Support Arm Assembly

Support Arm Assembly

Support Arm Assembly is the main component of the suspension system which enables movement of wheel and takes role in conducting the displacement of wheel into other suspension components such as rotary damper, shock absorber or torsion bar.

Menatek is capable of designing and manufacturing arm assemblies in accordance with the customer requirements and military specifications.



2

Final Drive

Final Drive

Final Drive is a crucial component of the running gear, located between the transmission output shaft and sprocket assembly. The purpose of the final drive is to provide the final stage of gear reduction to decrease RPM and increase torque before the power is transmitted to the track shoes.

Menatek Defense Technologies have capability to manufacture and test various Final Drives used on well-known vehicles such as M48 MBT, M60 MBT, M88 Recovery Vehicle, M2 Bradley IFV, M109 Howitzer, M113 APC and others.



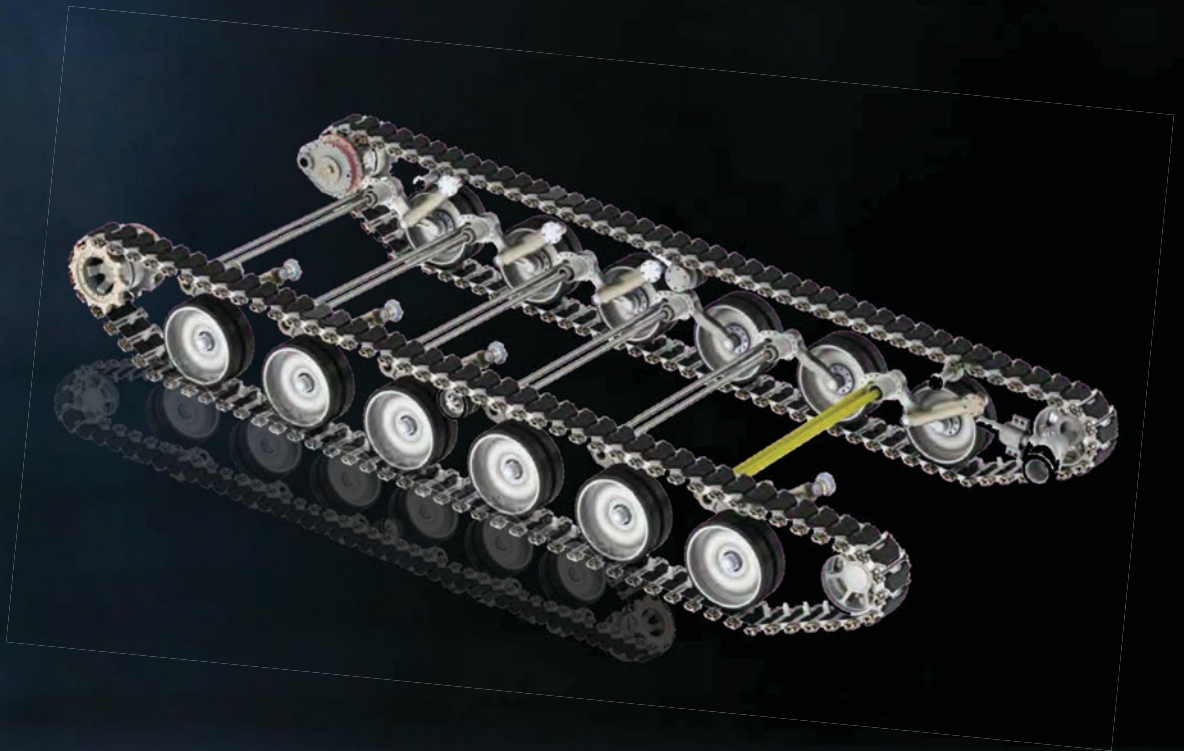
2

RUNNING GEAR

Menatek have the ability to fully design and integrate the Running Gear of tracked vehicles in different categories.

All components of the Running Gear, referenced as Menatek's most manufactured component list, as from gear boxes of final drive to sprocket wheels, track assembly, Road Arms and Torsion Bars.

Menatek Defense Technologies have experienced capability to manufacture and test various Running Gears used on well-known vehicles such as M1 Abrams, M113, M109, M2 Bradley IFV, AAV7, MBT in the past.



RUNNING GEAR

T-154 | T-157 | T-164 | T-107 | T-142 | T-130

3

PART



Menatek have a dedicated core team that composed of highly skilled individuals enabling complicated tasks. They focus on designing special products for military vehicles and high-tech industries.

After all, the team has developed the first line of patented, self-lubricating bearings that can be adapted not only to combat vehicles but to various types of heavy wheeled vehicles and trains.



TORSION BAR



**HYDRO-PNEUMATIC
SUSPENSION SYSTEMS**

3

A

Naz Bearings®



Self-lubricating bearings under the designation “NAZ Bearings®” are all-terrain products engineered specifically to show constant ultra-high performance under heavy dynamic and static loads. These new generation bearings endowed with a robust liner technology and ultra-durable structure to complete two objectives; Survival of the vehicle on the battlefield and uninterrupted logistics.

[Click Here for More](#)

Torsion Bar



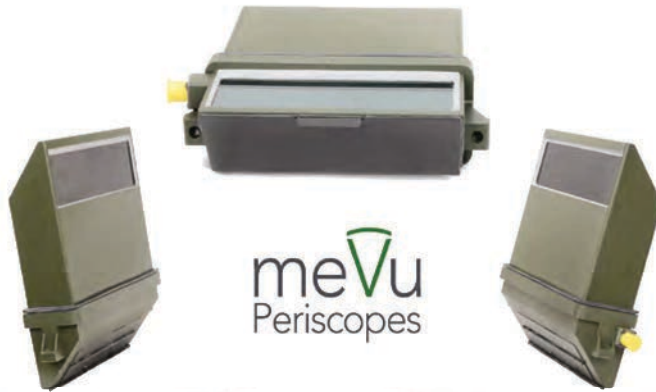
The Torsion bar is a product of mechanical ingenuity. It acts as an energy accumulator for almost all tanks and other military tracked vehicles carrying them through the battlefield in every situation for thousands of kilometres. A bar in production may go through more than ten processes including multiple heat treatments, forging, machining, shot peening and surface treatments. It is with 25 years of combined production experience and rigorous R&D, We as MENATEK perfected the design and production procedures of torsion bars.

[Click Here for More](#)

3

B

Mevu Periscopes



MeVu – M Series is the first and only indigenous Mono-Block glass periscope series manufactured in Turkey. Mono-Block glass body provides ultra-clear peripheral view while offering superior ballistic performance. MeVu - Series offers integrated heating on both Upper and Lower windows.

[Click Here for More](#)

Sur Armor Systems



We introduced a new structural feature that significantly reduces areal density while maintaining the same ballistic resistance. This solution made for plates with protection level over STANAG 4, allows us to harness the strength of exotic materials that cannot be used in conventional composite designs. As a result, we have the ability to strictly control the shockwave propagation throughout the armor matrix.

[Click Here for More](#)

3

C

Hydro-Pneumatic Suspension System

Hydro-pneumatic suspension systems eliminate the need for springs by compressing nitrogen gas. As the most advanced suspension systems used on wheeled vehicles, they are the indispensable choice for modern defense vehicles. Hydro-pneumatic suspension offers an effective damping force through hydraulic principle and a natural progressive spring rate which significantly contribute to mobility and life of the vehicle.

Menatek Defense Technologies have capability to design, simulate and test Hydro-pneumatic suspension systems according to customer requests for heavy to light military vehicles such as 8x8, 6x6 and 4x4



Machine Design

Test Units

Quality being its number one priority Menatek consistently seeks to satisfy its customers' needs. Good price adds value to customers if and only if the end product overlaps the scope of the project. In order to fulfill this objective Menatek also designs, manufactures and sets up necessary test units to guarantee its products quality or its customers need for their own purposes.

In example some of the test units for the assemblies and subsystems manufactured by Menatek are as the following:

Life Cycle Test Units for:

- o Steering Gear Assemblies,
- o Hydraulic Master Cylinders,
- o Wheel Arms,
- o Torsion Bars

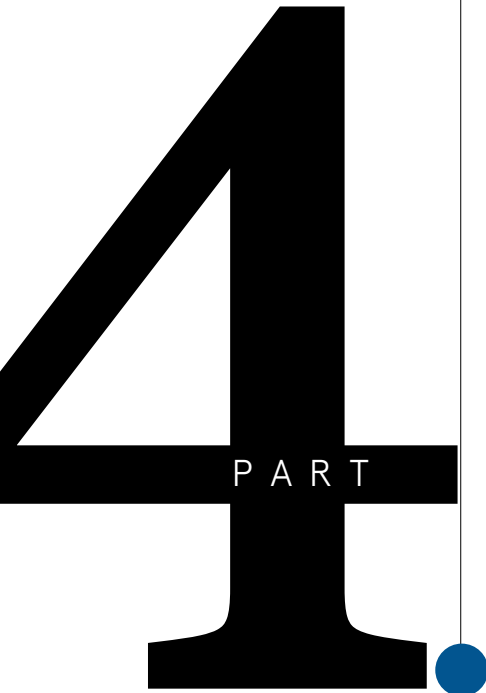
Performance Test Units for:

- o Rotary Dampers,
- o Brake Systems



Menatek is capable of design, manufacture and set up custom test units for Engines and Transmission Systems as well. Menatek uses various types of Dynamometers (Water Dynamometer, Eddy-Current or Alternating Current Dynamometers) to perform the tests of Engines and Transmission Systems according to the customers' requirements. The software of the Test Units is developed by Menatek's well-established partners who are specialized in this area.

Test units can be designed and configured as universal units which enable the customer to test different variations of a specific product.



4

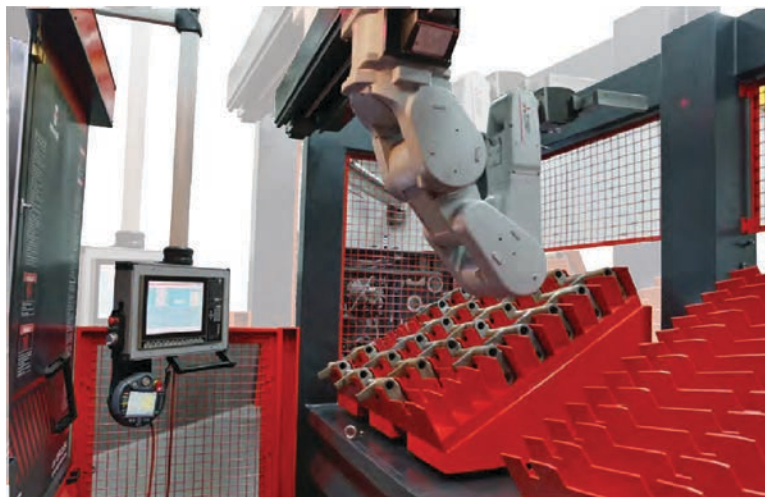
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Special Purpose Machine Design



Menatek TST Machine is tailor-made for serial CNC machining and quality control of track shoe body for vehicles such as MBT, APC, IFV, MLRS. In addition to increasing production rate, 6-axis robotic arm and linear rails eliminate the need for an operator for loading and unloading parts working in synchronization with continuous machining operation.

Thanks to its one-piece extremely rigid cast body, it has the ability to machine tight tolerances with high precision. TST completes all machining operations in the first 5 stations and conducts quality check in the last one. By utilizing fully automated loading, unloading, machining and quality control capabilities TST can manufacture more than 300.000 Track Shoe Body per year.





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