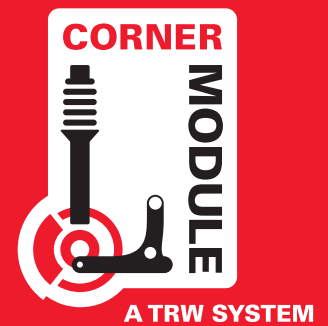




## TRW Chassis Program

**The Global Leader in Safety Systems**





## Safety from Original Equipment experience

TRW is one of the world's leading providers of Original Equipment chassis systems. TRW employs more than 4000 engineers, scientists, designers and technicians in 27 countries, to ensure parts work harmoniously in every type of passenger vehicle.

With this global presence, TRW now manufactures one quarter of the world's chassis components - leading the market in the design, development, manufacture and integration of chassis systems for passenger vehicles.

With over 40 vehicle manufacturers as customers, TRW's Original Equipment business has to adapt its technologies to the demands of very different vehicles, from the most basic in developing countries to some of the most sophisticated vehicle systems in the world.

And because we designed and built the Original Equipment component, we can provide parts for the Aftermarket that meet the highest performance standards available.

## TRW Manufacturing



# Original Equipment experience for our Aftermarket chassis program

Our direct relationship with the vehicle manufacturers means we have the inside track for developments and production of individual elements such as ball joints, tie rod ends, inner tie rods, control arms and stabilizer links as well as the chassis system as a whole.

The TRW chassis program, includes all installation hardware accessories across the program and covers more than 95% of the vehicles in operation.

The program consists of:

- Control Arms
- Inner Tie Rods
- Stabilizer Links
- Ball Joints
- Tie Rod Ends and Assemblies
- Idler & Pitman Arms
- Bushings

From start to finish TRW is driven by safety. From the quality of our products and our outstanding customer service to the reliability of our parts, your customers will be glad you choose TRW.



All TRW chassis parts are manufactured in our fully accredited facilities in North America, Europe and Asia Pacific.

Our newest factory addition in Johor Bahru (JB), Malaysia, supplies Aftermarket customers across the globe. Our Aftermarket and Original Equipment Service businesses receive many of their chassis products from the JB factory. With TRW's high process and quality standards implemented at JB, customer requirements can always be fulfilled with confidence.

The Company has invested more than \$1million on test equipment at JB, and takes great pride in its ability to produce Aftermarket parts that are of Original Equipment quality.



# Ball Joints and Tie Rod Ends

TRW's state-of-the-art ball joint program includes the latest, high performance designs which incorporate the following features:

- Long lasting dust covers made from the highest quality rubber that eliminate dust and water from entering the ball joint, improving the reliability and life-span of the part
- Manufactured using forged or cold formed steel
- Low friction plastic bearings that enhance damping and reliability
- Original Equipment quality hardware installation accessories



# Control Arms

The TRW control arm program includes upper and lower control arms for both front and rear chassis systems.

- Aluminum and steel control arms, manufactured to match the Original Equipment material design
- Built-in rubber bushings or standard steel/plastic joints
- Original Equipment quality hardware installation accessories



# Stabilizer Links

TRW stabilizer links are manufactured from aluminum, corrosion resistant steel or glass-fiber reinforced plastic to match the Original Equipment design, which provides improved fuel economy, lower emissions and excellent driving comfort.



# Inner Tie Rods, Idler & Pitman Arms and Bushings

TRW's range of inner tie rods, idler & pitman arms and bushings meets all Original Equipment standards for quality and performance.



# Tested for your safety

TRW sets the standard within the Aftermarket, with a testing program that goes beyond the ordinary to ensure every chassis part we produce meets stringent vehicle manufacturer quality standards, in line with the Original Equipment specification.

To help make sure that our parts can go the distance, TRW utilizes on the road tests and the most advanced test machines available, in both our Original Equipment and Aftermarket facilities as well as at independent testing labs. So you can be sure that TRW parts are tested for your safety.

## Our tests include the following:

- Acoustic measurements to ensure driver comfort
- Strength tests for durability
- Environmental resistance tests for all weather conditions
- Wear and drive tests
- Assembly technique testing of all critical safety features
- Dynamic testing of complete units to ensure leak free performance
- Extensive on-road testing at TRW tracks around the world



### Environmental test:

This machine has a temperature range of -60°F up to 360°F – This tests our parts to the extreme and covers most driving styles and conditions. The machine simulates high and low humidity rates and has a mud water spray system to add another condition that the ball joint will need to operate under, in order to pass the test. Under test conditions, the machines rotation angle range is +/- 50° and the articulation angle range is +/- 30°.

**Push / Pull Out  
Elasticity Test**



This machine simulates and analyzes the reaction of a car wheel when it goes through a pot hole or over a bumpy road surface.

**Wear Test**



The wear test machine simulates real driving conditions, to ensure that the parts are capable of withstanding all driving styles.

The endurance test machine puts the parts through their paces in extreme conditions over many cycles, so that the factory can release the parts knowing they will last.

**Endurance test machine**



The torque test machine tests the movement of the car wheels, to ensure that all TRW chassis parts work well together and allow easy movement of the wheels.

**Torque test machine**





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