Company Profile

- Headquartered in Livonia, Michigan, US
- More than 65,000 employees worldwide
- Balanced global presence, with approximately 185 facilities in 24 countries, including 13 test tracks and 22 technical centers
- Serves all major vehicle manufacturers worldwide
- Leading developer and supplier of active and passive safety systems
- Ranks among the world’s leading automotive suppliers
The Safety Everyone Deserves

TRW is all about safety

- Broadest portfolio of any supplier
- Approximately 90% of TRW’s business is safety
- Committed to making technology affordable for all
- Committed to helping to protect people
- Committed to education about road safety – particularly in emerging markets
Strategic Priorities

- Strategic Priorities are ingrained into TRW’s daily business activities and are used as navigation points to guide the allocation of resources to support research and development, manufacturing investments and growth initiatives.

**Best Quality**
- Drive quality in everything we do – products, launches, engineering
- Ensure we make the product right the first time and deliver only quality products on time to our customers

**Global Reach**
- Position businesses globally to service key customers and grow with new markets
- Pursue opportunities to diversify customer base

**Innovative Technology**
- Offer leading-edge systems & products that add value for our customers
- Leverage leadership in active and passive safety systems to develop integrated product solutions

**Lowest Cost**
- Relentlessly drive down costs to offer customers superior value
- Utilize manufacturing programs (Six Sigma and Operational Excellence) to manage costs to optimal levels
Global Leadership in Safety – Segments

2013 Full Year Sales of $17.4 Billion

- **66%**
- **19%**
- **4%**
- **11%**

**Chassis Systems**

“Active Safety”

- $11.5 billion in sales
- Primary products:
  - Steering systems
  - Foundation brakes
  - Slip control
  - Actuation
  - Suspension
  - Chassis aftermarket

**Electronics**

“Active & Passive Safety”

- $0.7 billion in sales
- Primary products:
  - Safety electronics
  - Driver assist systems
  - Chassis electronics
  - RF electronics
  - Powertrain electronics

**Occupant Safety Systems**

“Passive Safety”

- $3.3 billion in sales
- Primary products:
  - Airbags
  - Seat belts
  - Steering wheels

**Automotive Components**

- $1.9 billion in sales
- Primary products:
  - Body controls
  - Engine valves
  - Fasteners

89% of sales derived from safety-related products
Industry Leading Diversification

- Broad customer base and platform distribution
- Ability to leverage technology and products across customers and regional markets
- Limits dependence on single market fluctuations and cycles
- Scale provides leverage to optimize cost structure

**Product**
- ABS/ESC & Other Brake Control: 8%
- Steering Systems: 16%
- Foundation Brakes: 16%
- Electronics: 4%
- Steering Wheels: 4%
- Airbags: 10%
- Seat Belts: 7%
- Engine Valves: 3%
- Body Controls: 5%
- Fasteners: 3%
- Linkage & Susp’n: 2%
- Aftermarket: 7%
- Chassis Modules: 15%

**Customer**
- Volkswagen: 25%
- Other: 12%
- Ford: 19%
- GM: 10%
- Chrysler: 10%
- Fiat: 4%
- BMW: 4%
- Daimler: 4%
- Toyota: 2%
- Honda: 2%
- Ren-Nis: 3%
- PSA: 2%
- Hyundai: 2%
- COEMs: 2%
- Other: 1%

**Geographic**
- Europe: 41%
- North America: 36%
- Asia-Pacific: 19%
- Rest of World: 4%

Note: Based on TRW full year 2013 sales of $17.4B
Supporting Customers Globally

TRW operations cover every major vehicle producing region and are aligned to match the future needs of our customers

Europe
• 2013 Sales of $7.1B
• All products and aftermarket

Asia Pacific
• 2013 Sales of $3.3B
• All products and aftermarket

North America
• 2013 Sales of $6.3B
• All products and aftermarket

RoW(1)
• 2013 Sales of $0.7B
• Primarily Chassis and aftermarket

(1) Primarily South America
Manufacturing sites, technical centers, test tracks and joint venture facilities (As of February 2014)
# Safety Drivers

<table>
<thead>
<tr>
<th>Consumers</th>
<th>Governments/Industry Bodies</th>
<th>Manufacturers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consumers regularly look for vehicle safety information before making their purchase decision</td>
<td>NHTSA focused on active and passive safety regulation</td>
<td>Safety products and features help differentiate vehicles</td>
</tr>
<tr>
<td>NCAP / IIHS safety ratings cited as important factors in studies on buying behavior</td>
<td>Around the world, New Car Assessment Programs (NCAP) are raising the bar for active and passive safety</td>
<td>Adopting voluntary safety standards in response to market demand and regulatory trends</td>
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<tr>
<td></td>
<td>Decade of Action for Safety led by World Health Organization</td>
<td>Advertising and marketing heavily focused on safety message – particularly driver assist systems</td>
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Towards Active Safety

Industry focus moving from post-crash passive safety towards pre-crash accident avoidance and collision mitigation to achieve next major improvements in road safety, in particular for pedestrians and other vulnerable road users.
• Focuses attention on our innovation and ingenuity
• Leadership in active and passive safety helps differentiate TRW in the marketplace

• TRW effectively competes and manages its business across the spectrum of safety
• Underscores our role as a strong intellectual partner to our customers
Focus on Three Global Megatrends

<table>
<thead>
<tr>
<th>Global Trends</th>
<th>TRW Approach</th>
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<tbody>
<tr>
<td><strong>Focus on Safety</strong></td>
<td><strong>Advanced Thinking</strong></td>
</tr>
<tr>
<td>▪ Increasingly stringent New Car Assessment Program testing/regulation in many markets</td>
<td>▪ Broadest portfolio and deepest expertise of active and passive systems in the industry</td>
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<tr>
<td>▪ Push for advanced active safety technologies</td>
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<tr>
<td><strong>Affordability</strong></td>
<td><strong>Smart Thinking</strong></td>
</tr>
<tr>
<td>▪ Making advanced safety affordable → penetrate beyond premium cars</td>
<td>▪ Adding content through integration</td>
</tr>
<tr>
<td>▪ Growth in emerging markets → low cost safety products required</td>
<td>▪ Low cost, scalable solutions</td>
</tr>
<tr>
<td>▪ Smaller vehicles → packaging and cost constraints</td>
<td>▪ Investment in footprint in emerging market (Brazil/India/China)</td>
</tr>
<tr>
<td><strong>Emissions/Fuel Efficiency</strong></td>
<td><strong>Green Thinking</strong></td>
</tr>
<tr>
<td>▪ CO₂ / fuel economy regs → weight, drag, accessory load reduction</td>
<td>▪ Efficiency solutions beyond powertrain</td>
</tr>
<tr>
<td>▪ Powertrain electrification → non-standard solutions for compatibility</td>
<td>▪ Hybrid enabling braking and steering systems</td>
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<tr>
<td></td>
<td>▪ Smaller, lighter and ‘green’ products</td>
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</table>
Advanced Thinking

Our Cognitive Safety Systems are always there and always aware. Our systems are raising the intelligence of safety: smarter cars are safer cars.

Passive Safety:
- Self-adaptive vent airbags
- Seat belt energy management solutions
- New bag shapes and locations

Active Safety:
- Video and radar sensors with data fusion to enable advanced driver assist functionality such as lane keeping leading to semi-automated functions
- Automatic emergency braking (higher speeds) collision mitigation braking (city driving)

Active / Passive Safety Integration:
- Pre-crash functionality
- Collision avoidance and mitigation
- Safety Domain ECU

Radar-based driver assist systems can enhance the driving experience and, when combined with advanced electronic stability control brake systems, they can enable collision avoidance and mitigation.
Smart Thinking

Smart thinking is all about value: TRW is delivering enhanced value to make safety affordable for all – whether that's through modularity, integration or cost optimization.

Making Advanced Safety Affordable:
- Affordable mid range 24 GHz radar applications
- EBC460 modular ESC family
- Scalable, modular electric power steering
- Scalable camera
- Electronics integration

Low Cost & Small Vehicle Solutions:
- SPR4 retractor pretensioner
- Electric park brake
- Roof airbag

Emerging Markets Solutions:
- Scalable BRIC ACU
- Modular airbag and inflator kits
- Value line ABS

TRW's Active Control Retractor 2 basic system will allow this advanced pre-crash technology to be used more widely in established and emerging markets.
Improved fuel efficiency and reduced emissions are global targets: TRW offers a range of technologies to meet these goals.

**Technology Highlights:**

- Hybrid enabling braking systems, such as Integrated Brake Control (IBC)
- Electric steering (EPS / EPHS)
- Tire pressure monitoring systems
- Lightweight, low drag caliper
- Reduced-weight airbag modules
- Use of innovative bio materials for airbags

TRW offers a range of solutions, including electric steering, that help enable and support fuel efficient driving.
Braking Systems

**Vehicle Dynamic Control Systems:**
- Anti lock braking systems (ABS)
- Traction control systems (TCS)
- Electronic stability control systems (ESC)
- Integrated Brake Control System (IBC)
- Slip control sensors
- Electronic brake management systems
- Hybrid /Electric vehicle brake control systems

**Foundation Brake Systems:**
- Electric park brake systems (EPB)
- Disc brake assemblies and components, including calipers, rotors and knuckles
- High performance calipers
- Drum brake assemblies and components, including drum brakes, hubs and drums
- Brake proportioning valves

**Brake Actuation Systems:**
- Mechanically actuated boosters and master cylinders
- Electronically actuated boosters and master cylinders, including the patented Electrically Controlled Actuation (ECA) and the ECA system with Brake Assist
- Low/No vacuum applications incl. hydraulic boost systems
- Sensors & Switches
Electrically Assisted Steering (EAS) Systems:
- Rack (belt) drive electrically powered steering (EPS)
- Column drive EPS
- Electrically powered hydraulic steering (EPHS)

Light Vehicle Steering & Suspension Systems and Components:
- Manual, mechanical and power rack and pinion steering gears
- Control arms, suspension ball joints, conventional linkages
Commercial Steering Systems

Power Steering Gears (fully integral):
- TAS
- THP – high pressure
- PCF – positive center feel
- Variable ratio

Hydraulic Power Steering Pumps:
- EV - compact
- PS – large displacement
- EPHS – Electrically driven hydraulic power steering pump

Column Drive – Torque Overlay

Steering Columns:
- Fixed
- Tilt
- Tilt / telescope
- Power adjusted

Intermediate Columns

Steering Linkages

Suspension Ball Joints

Electronically Controlled Multi-Axle Steering (EMAS)
Driver Assistance Systems

Radar – Convenience Applications:
- 24 GHz mid range radar or 77 GHz long range radar
  - For adaptive cruise control including follow-to-stop capability

Radar – Safety Applications:
- 24 GHz mid range radar or 77 GHz long range radar
- Range of features available for
  - Distance warning
  - Collision warning
  - Emergency brake assist
  - Collision mitigation by braking (stand-alone)
  - Automatic emergency braking (with camera)

Camera – Convenience and Safety Applications:
- Scalable camera family
  - Base version capable of lane departure warning or lane keeping via EPS system
  - Enhanced models with object recognition capability for traffic sign recognition, pedestrian detection, forward collision warning, collision mitigation by braking (stand-alone) and automatic emergency braking (with radar)
- Convenience features include automatic headlight control
Safety Electronics

Crash Sensing Electronics:
- A full range of safety electronics, including remote crash sensors and airbag control electronics

Airbag Control Units:
- Global airbag control module with optional integrated inertial sensors for ESC systems
- Low-cost airbag control module for emerging markets with optional integrated inertial sensors for ESC

Crash Sensors:
- Remote acceleration sensor
- Remote pressure sensors
- Rollover sensor

Pedestrian Protection Systems
Radio Frequency Products

RF Electronics:
- A full range of RF electronics products, including tire pressure monitoring systems (TPMS), remote keyless entry (RKE) and passive entry (PE) systems

TPMS:
- Clamp-in and snap-in sensors
- Dedicated TPMS receivers
- Integrated RKE / TPMS receivers

RF Entry Systems:
- RKE keyfobs and receivers
- PE keyfobs and receivers
- PE stop / start switches and immobilizers
- Integrated RKE / TPMS and RKE / PE / TPMS receivers
Inflatable Restraint Systems

The Complete Airbag Portfolio:

- Frontal and rear impact protection: driver, passenger and knee airbags, as well as active seat ramps and active headrests
- Side impact protection: side and curtain airbags for first impact and rollover systems

Restraint System Development:

- Crash simulation, math modeling, system testing and analysis
Inflators

A Complete Portfolio of Inflators:
- Driver, passenger, knee, side and curtain airbags
- Single and dual stage options
- Pyro, hybrid and cold gas options

Actuators:
- Seat belts, pedestrian protection, rollover protection and active headrest systems

Electrical igniters:
- Plastic and glasssocket options
Seat Belt Systems

- Retractor and buckle assemblies
- Pyrotechnic retractor, buckle and anchor pretensioners
- Adaptive energy management devices – declining, progressive, switchable or self-adaptive
- Height adjusters and webbing guide loops
- Seat integrated restraints
- Active Control Retractor (ACR)
- Active Buckle Lifter (ABL)
- Buckles
Steering Wheel and Driver Airbag Systems

- A full range of steering wheels, from base wheels to top-of-the-line, that include leather wrap, wood, heating elements, multifunction switches and decorative bezels
- Magnesium, aluminum or steel and hybrid construction armatures
- Polyurethane or injection-molded rim
- Simulation of armature performance
- “Floating” and guided horn mechanisms enabling small gaps between wheel and airbag module
- Vibration suppression
- Lane departure warning
- Snap-in airbag module attachment
- Compact driver airbag system
**Body Control Systems**

### Complex Switches
- Steering wheel switches
- Window lift switch
- Electric park brake switch
- Multi function controller
- Mirror switch
- Headlamp switch

### Steering Column Control Modules (SCCM)
- Steering column module (SCCM)
- Clockspring
- Steering angle sensor

### Access Systems
- Mechanical steering lock
- Electrical steering lock

### Integrated Electronic Control Panel (IECP)
- IECP incl. HVAC functionality
- Small IECP

### HVAC
- Automatic HVAC control
- Remote Climate Control Module
- Manual Electric HVAC control

### Sensors
- Rain/light/humidity sensor
- Brakelight sensor
- Clutch sensor
- Seat belt reminder sensor
Engineered Fasteners & Components

**Fastening Systems:**
- Trim fasteners
- Pipe and hose fasteners
- Hole plugs
- Wire harness fasteners

**Interior Components:**
- Cockpit components
  (e.g. panels and facias, cupholders, ashtrays)
- Overhead components
  (e.g. grab handles, coat hooks)
- Airflow components
  (e.g. pressure relief valves, air registers)

**Technical Components:**
- Safety products
  (Airbag components, seat belt products)
- Chassis products
  (Throttle valves, ball sockets)
- Lighting products
  (Lampholders)
- Wiring Components
  (Cable channels, brackets)
## Engine Components

<table>
<thead>
<tr>
<th>Engine Valves</th>
<th>Valve Cotters</th>
<th>Valve Rotators</th>
<th>Retainers</th>
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<tbody>
<tr>
<td>Inlet and exhaust valves seal the combustion chamber, controlling the gas exchange process in internal combustion engines</td>
<td>Valve cotters attach the valve spring retainer or, alternatively, the rotator to the valve</td>
<td>Rotators -- typically used on heavy duty, marine and stationary engines -- turn the valves constantly and ensure trouble-free operation</td>
<td>TRW precision retainer caps transfer the valve spring loads to the valve via valve cotters</td>
</tr>
</tbody>
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<table>
<thead>
<tr>
<th>Cup Tappets</th>
<th>Rocker Arm Assemblies</th>
<th>Valve Seat Inserts</th>
<th>Valve Guides</th>
</tr>
</thead>
<tbody>
<tr>
<td>The mechanical bucket tappets are positioned between camshaft and valves. They transmit the movement of the cam to the end of the valve stem, thereby activating the valve</td>
<td>A rocker arm assembly is an indirect valve actuating system. They transform the rotational movement of the cam lobe into a linear stroke and actuate the valves</td>
<td>Valve seat inserts*, together with the valves, serve to seal off the combustion chamber of the cylinder head and conduct part of the combustion heat from the valve</td>
<td>Valve guides* are used to support the side forces operating on the valve stem. They also absorb part of the combustion heat transferred to the valve</td>
</tr>
</tbody>
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* cast product