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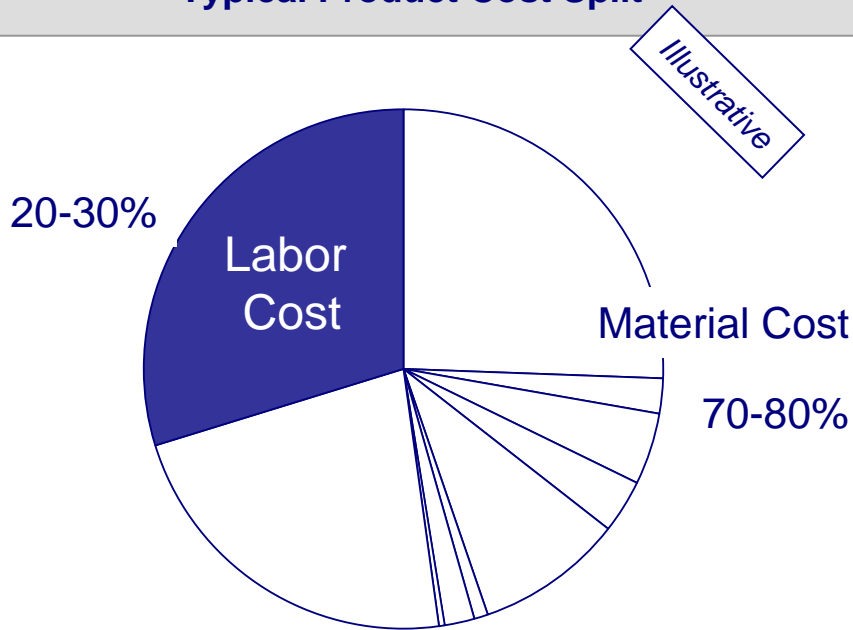
# Ricardo Strategic Consulting

## Remanufacturing of Commercial Vehicle Components in North America and Europe

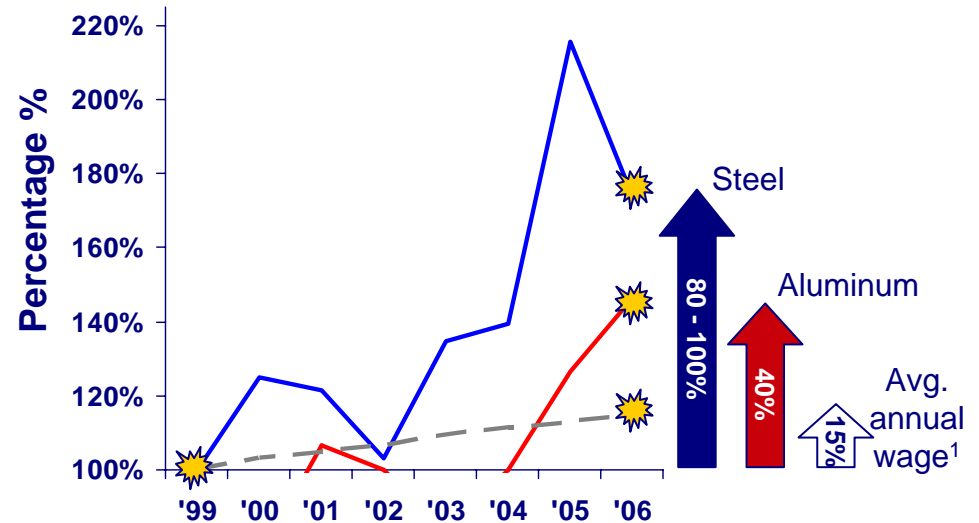
August 20, 2008

# Significant increase in raw material costs relative to labor costs provide an incentive to review reman

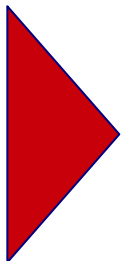
Typical Product Cost Split



Market Cost Changes



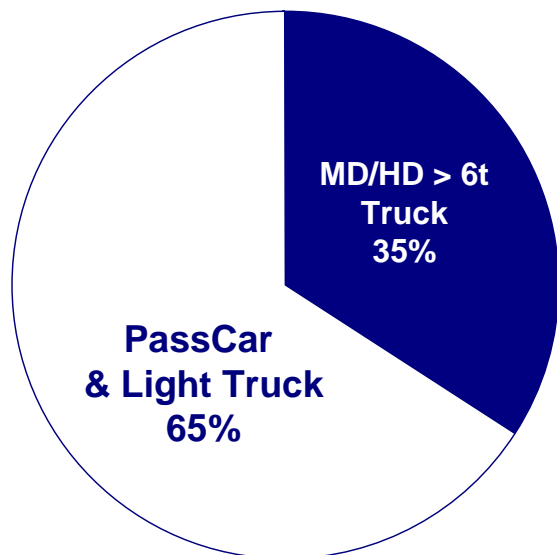
Data points have been taken on January 1<sup>st</sup> of each year for consistency  
<sup>1</sup>: In Western Europe

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 Increasing energy and raw material costs in North America and Europe improve salvageable value of components, improving remanufacturing economics
- However, low cost imported products (e.g. rotating electronics) compete with remanufacturing often on price if not quality ...while simultaneously eliminating the complexities of core management

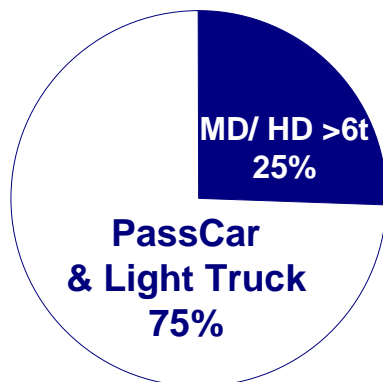
# Vehicle remanufacturing sales in WE and NAFTA aftermarkets are weighted towards passenger car and light truck segments

## 2006 Vehicle Remanufacturing Sales (1)

### U.S.



### Europe



## Reman Market Drivers

- ❑ **Increasing wages** and shop technician shortages improve value proposition for “technician in a box”
- ❑ **Increasing number of ECUs** in vehicles and increasing product change frequency drives need for remanufactured solutions to produce service components cost effectively
- ❑ **Rising average truck life** (in region) drives increasing replacement requirements of older vehicles with obsolete components
- ❑ Increasing OEMs push for **reduced pricing options**
- ❑ Growing general “**green**” / **sustainability movement** in the automotive industry

***Although individual components and segments require separate business cases, overall remanufacturing is a viable business proposition***

Sources: 2006 Frost & Sullivan; 2005 SMMT/Oakdene Hollins report; 2008 Ricardo interviews and analysis

(1) Includes off highway volumes produced by on-highway OEs with off-highway portfolios



# Key remanufactured vehicle components are provided by a broad group of NA and EU based companies



Examples

### Engines

- Complete Engines
- Water Pumps
- Turbochargers
- Heads/ Blocks
- Vacuum Pumps (LVs<sup>1</sup>)
- Fuel Systems (HVs<sup>2</sup>)



### Core Brokers

- ❖ LKQ
- ❖ MCI
- ❖ Knopf
- ❖ Premier Comp
- ❖ Swedecore
- ❖ Euro Motoren Nederland B.V.
- ❖ La Concorde Sarl

### Electronics



**Rotating Electrical<sup>1</sup>**


- Starters
- Alternators





**Control Modules**

- ABS Modules
- Powertrain Module
- Brake Modules
- Fuel Injection Control Modules






A Division of 



**Other**




- Radios
- Navigation and Entertainment Sys.

### Transmissions


**Automatic Transmissions (AT / AMT)**

- Complete Transmissions
- Torque Converters

**Manual Transmissions (MT)**

- Clutches
- Complete Transmissions (HVs)



### Chassis/ Other

**Brakes**

- Brake Calipers/ Shoes
- Air Compressors (HV)
- Brake Actuators (HV)




**HVAC**

- A/C Compressors





**Driveline**

- Rack and Pinion Steering (LV)
- CV Driveshafts (HV)
- Axle Carriers (HV)



**Other**

- Fifth wheels (HV)
- Steering Gears (HV)




1 LV: Light Vehicles includes light duty trucks and passenger cars  
 2 HV: Heavy Vehicles includes on-highway commercial vehicles

# Independent reman groups already address the growing market demand, in part working with vehicle OEMs

## Reman Electronics Offerings

- Powertrain Control Modules
- Transmission Control Modules
- Body Control Modules
- Speedometer
- Instrument Cluster
- ICON system
- Diesel Electronic Unit Pumps
- Anti-lock Brake Control
- PCM, TCM, ABS seed core
- Anti-theft control
- Throttle control
- Speed control
- Remote keyless entry
- Generator control
- Heater control
- Temperature Senders
- Starters
- Alternators
- Radios
- Navigation and Entertainment Sys.

## Selected Quotes

Remanufacturing has become very popular as an environmental PR tool - especially “energy recovery” – which is attracting a lot of attention from upper level management

The real strong driver (*for remanufacturing*) is the profit

As the electronics content (*of vehicles*) increase, tooling requirements etc. increase (*as well*). Small repair shops can not remanufacture the components easily and the copy cats are also not easily manufactured

(*With regards to the future of remanufacturing and companies growing in business offerings*) I would stay out of rotating electronics. It is getting tricky and the quality is really good

# The market is highly fragmented with increasing merger and acquisition activity in recent past

*Since 2007*

## Recent M&A Transactions in Vehicle Remanufacturing Industry

Time

Acquiror	Target	Product	Target Location	Acquisition Completed
ArvinMeritor CVS	Trucktechnic SA: 46 employees	CV Brakes	EU-BE	Jul. 03, 2008
CAT Reman Services	Assets of Gremada Industries: 200 employees	Salvage Technology and Mining	NA-ND	Jun. 15, 2008
Centrum Equities	Visteon Corp Non-Core US reman facilities (LTD Parts)	A/C compressors and pumps	NA-TN	Feb. 01, 2008
ArvinMeritor CVS	Mascot Truck Parts, Ltd	CV drivetrain	NA-CN	Dec. 19, 2007
Robert Bosch	Holger Christiansen (from Hella): 8 plants; 900 staff	A/C compressors	EU-DK	Dec. 12, 2007
PROformance Technologies	Automotive Remanufacturers de Mexico	PassCar engines	NA-MX	Oct. 31, 2007
Cardone Industries, Inc.	Assets of REMY Automotive Europe: (3) plants	Ignition, steering racks & pumps, calipers	EU-UK	Jun. 02, 2007
	Crown Remanufacturing	PassCar brakes, rot. elec. strg. drivetrain, elect, motors, pumps	NA-PA	Jun. 01, 2007
CAT Reman Services	Eurenov SA	PassCar and CV engines	EU-PL & FR	Apr. 23, 2007
Detroit Diesel Reman	DMR Electronics	CV electronics	NA-MN	Mar. 01, 2007
CAT Reman Services	Franklin Power	PassCar/CV engines & engine components	NA-IN	Jan. 31, 2007
	International Fuel			
TRW	Brake Engineering	PassCar (some CV) brake	EU-UK	Jan. 22, 2007

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Thank you for your participation!



Thank you to all the companies and subject matter experts lending their time and expert opinion to this research. Information contained within this report is a summary only of selected quotations from interview participants and provides selective but not comprehensive insight into current industry thoughts on the demand for remanufactured components.

Quotation from this research feedback, requires to be properly footnoted. Please contact Ricardo Strategic Consulting upon questions.

Complete analyses are Ricardo confidential and are not to be found within.