

When Will The Market Recover?



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AeroStrategy
Management Consulting

Ann Arbor, Michigan • Amersham, United Kingdom • Singapore
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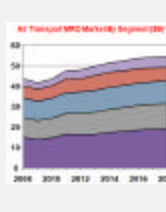
AGENDA

- **MRO Market Outlook**
- PMA Market Outlook

Two Major Factors Influence Aircraft MRO Activity...



1. Fundamental Demand For Aircraft MRO



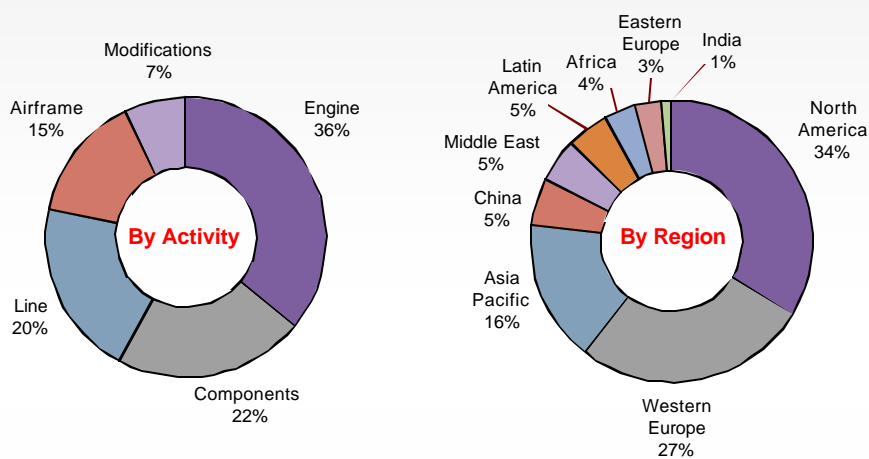
- Predicted airline maintenance spending as a result of aircraft demographics, utilization, equipment reliability, maintenance programs and regulations
- A good predictor of supplier MRO and aftermarket activity in normal times

2. MRO Supply Chain Practices

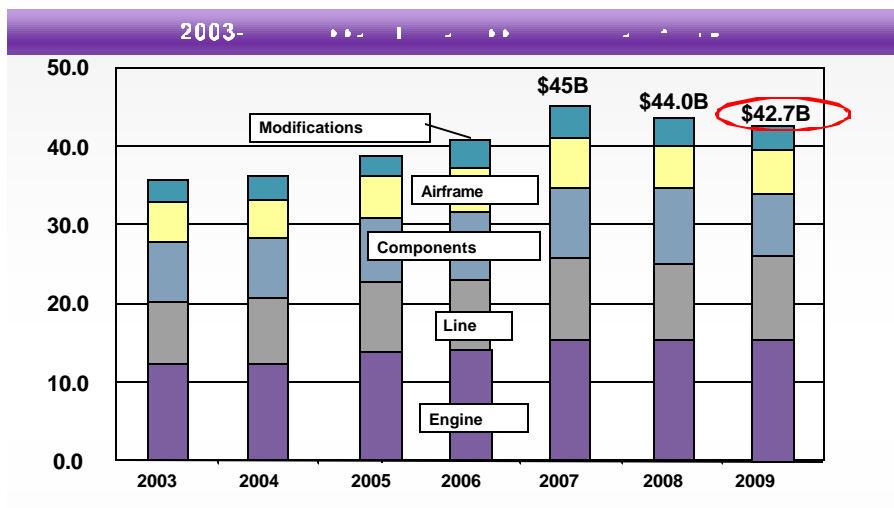


- Inventory stocking & destocking, use of surplus components, deferred and reduced scope maintenance
- All of the above act as a buffer between fundamental demand and realized revenue by OEMs and MRO suppliers
- Important in times of crisis

...And The First Factor, Fundamental Air Transport MRO Demand Is \$42.7 Billion In 2009...

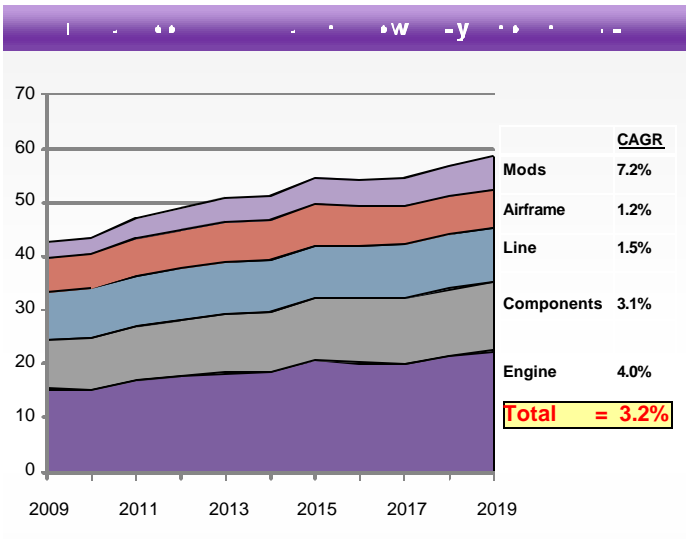


...Which Is \$2.3B Lower Than The 2007 Peak



Recession = Three Years Of Lost Growth!

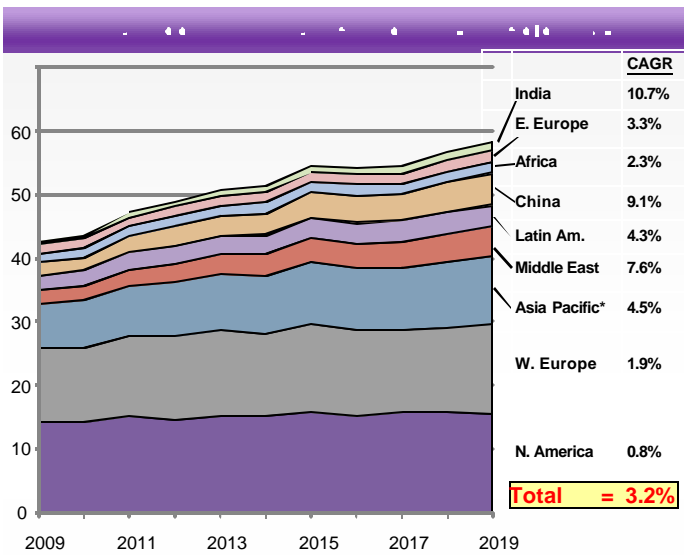
Fundamental MRO Demand Is Expected To Recover And Reach \$58 Billion By 2019



Category	CAGR
Mods	7.2%
Airframe	1.2%
Line	1.5%
Components	3.1%
Engine	4.0%
Total	3.2%

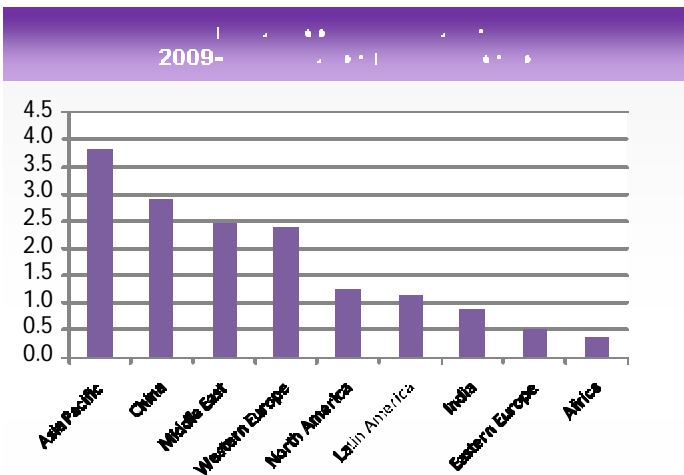
- The MRO market is expected to recover early next decade and reach \$58B by 2018 – a 3.2% CAGR (excludes inflation)
- Airframe maintenance will have the lowest growth due to retirements and introduction of less maintenance intensive aircraft

India, China And The Middle East Will Be The Fastest Growing Regions...



- India, China and the Middle East will be the fastest growing regions
- North America and Western Europe, the largest markets, will be relatively flat

...And Absolute Market Growth Will Be Driven By China And The Rest Of Asia-Pacific

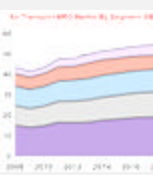


- Asia-Pacific (excluding China and India) will have the highest absolute increase in MRO spending
- MRO spending in China will increase by \$3B
- Despite high growth, Indian MRO spending will increase by <\$1B

The Second Factor, MRO Supply Chain Practices Attenuate Fundamental MRO Demand In Times Of Crisis...



1. Fundamental Demand For Aircraft MRO



- Predicted airline maintenance spending as a result of aircraft demographics, utilization, equipment reliability, maintenance programs and regulations
- A good predictor of supplier MRO and aftermarket activity in normal times

2. MRO Supply Chain Practices



- Inventory stocking & destocking, use of surplus components, deferred and reduced scope maintenance
- All of the above act as a buffer between fundamental demand and realized revenue by OEMs and MRO suppliers
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...And Operators Have Numerous Options For Reducing Maintenance Spend In Times Of Crisis

Engines



- Reduced scope of maintenance – more “repair” and less “replace”
- Defer replacement of expensive life limited parts until they reach absolute cycle limits (e.g. short-stub engines)
- Greater leverage of spare engines in lieu of overhauls
- Acquisition of surplus engines for mature aircraft
- Renegotiate MRO contracts

Components



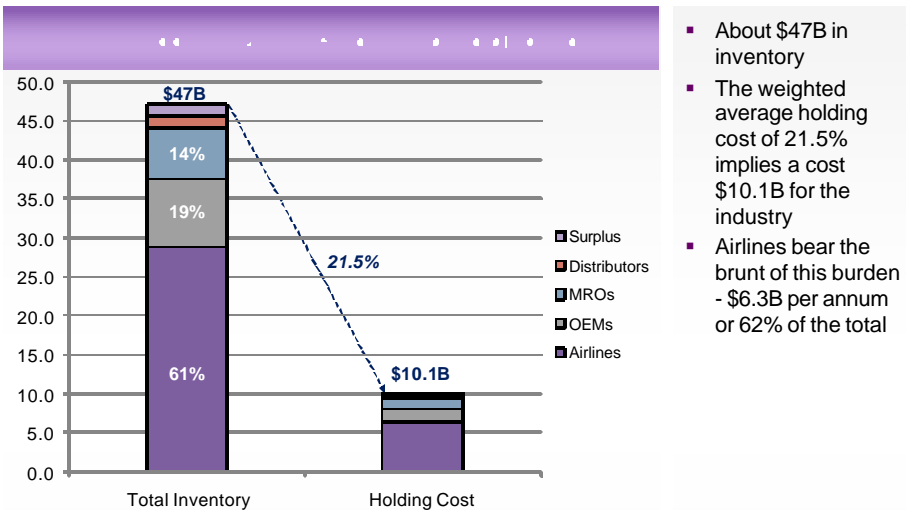
- Burn down rotatable inventory in lieu of component MRO repair
- Reduced scope maintenance – more “repair” and less “replace”
- Acquisition of surplus rotables for mature aircraft
- Renegotiate MRO contracts

Airframe Heavy



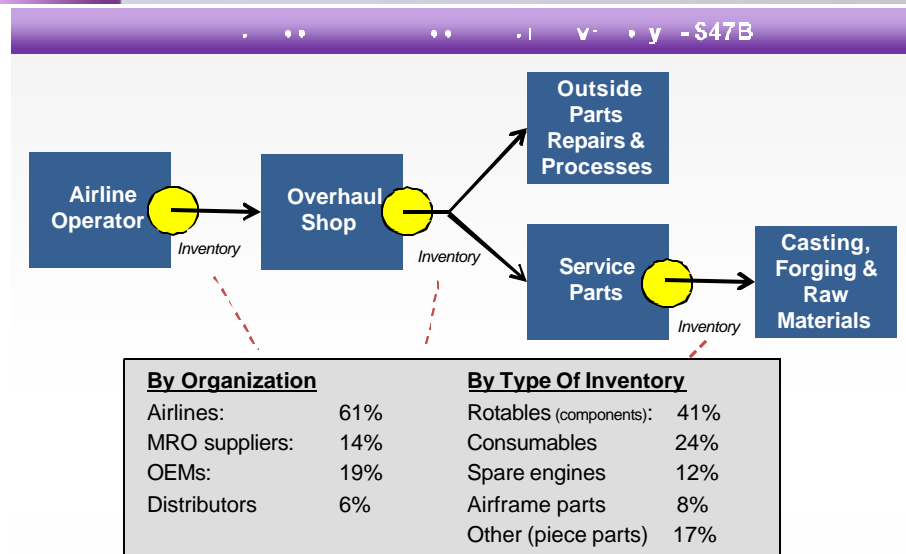
- Reduce utilization and rotate in-service aircraft to minimize heavy maintenance checks required by hour/cycle limits
- Park older aircraft approaching expensive heavy checks
- Reduce discretionary modifications (e.g. Interior upgrades, painting)

One Alternative Is To “Destock” Some Of The \$47 B Of Inventory In The MRO Supply Chain...



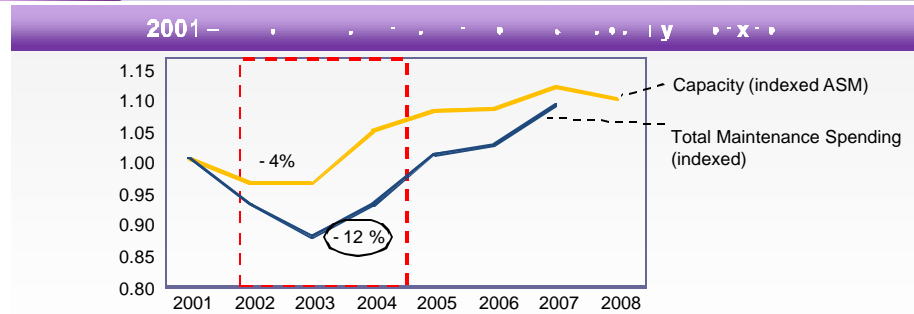
- About \$47B in inventory
- The weighted average holding cost of 21.5% implies a cost \$10.1B for the industry
- Airlines bear the brunt of this burden - \$6.3B per annum or 62% of the total

...And Operators Hold 60% Of MRO Supply Chain Inventory; ~40% Is Aircraft Rotables



By Organization		By Type Of Inventory	
Airlines:	61%	Rotables (components):	41%
MRO suppliers:	14%	Consumables	24%
OEMs:	19%	Spare engines	12%
Distributors	6%	Airframe parts	8%
		Other (piece parts)	17%

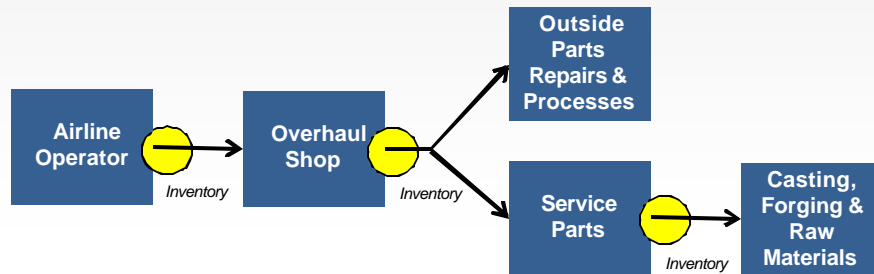
The 2002/2003 U.S. Airline Industry Crisis Highlights The Impact Of Destocking And Deferred Maintenance



- The last airline crisis was in the U.S. in 2002/2003
 - Post 9.11 shock = reduced demand and yields
 - Several airlines entered Chapter 11 and restructured
 - Airlines aggressively pursued cash conservation
 - US capacity reduced by 4%
- Airlines reacted by burning off inventory, deferring non-essential maintenance, increasing outsourcing, and parking older aircraft
- The net result was a 12% decrease in maintenance spend – three times the level of ASM reduction

The Near-Term Impact Of Destocking Will Be Greatest For Downstream Suppliers

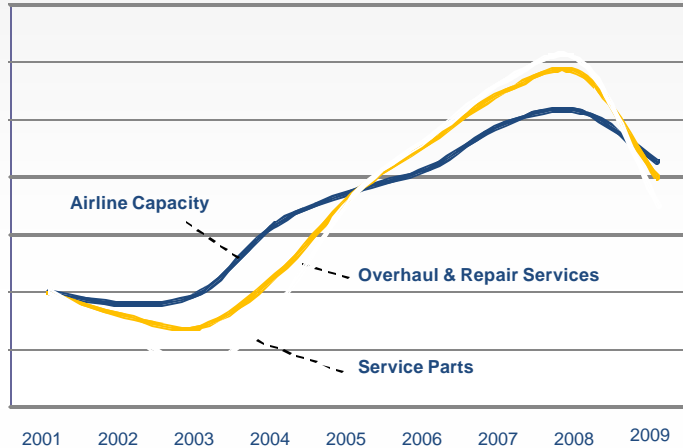
Impact on MRO Demand Buyers



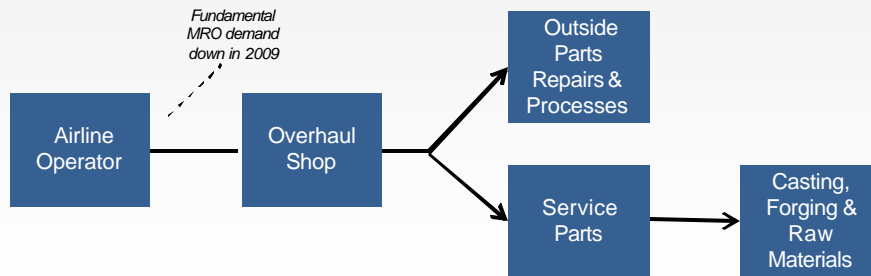
Near-term impact of inventory reduction on MRO demand

Moderate Significant Very Significant

...Resulting In Larger Swings In Parts Demand Than Overhaul & Repair Services



Most OEMs Experienced A 10-20% Reduction In Aftermarket Revenue In 2009...



Near-term reduction in supplier revenues

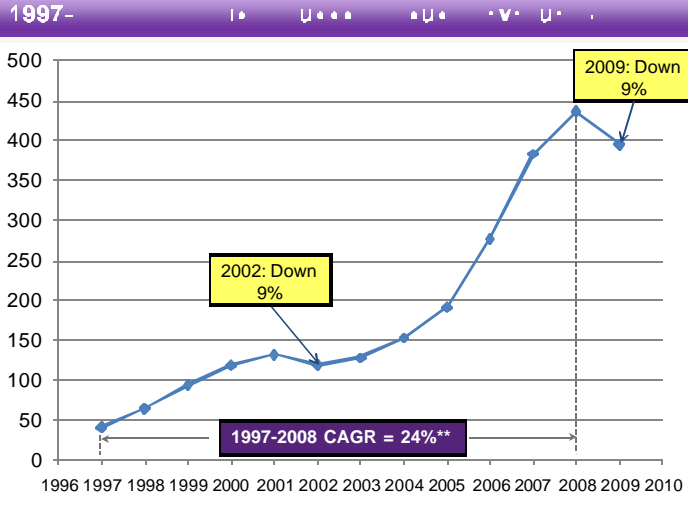
(10 – 15%)

(15 – 30%)

(20 – 40%)

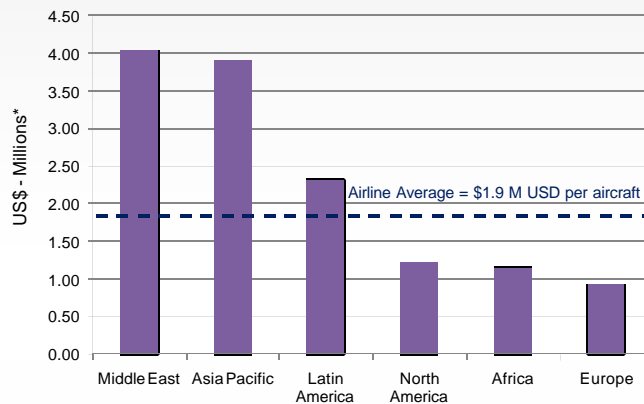
- AeroStrategy estimates that OEMs and MRO suppliers will see between a 10 and 40% reduction in 2009 due to the industry crisis – depending on the position in the supply chain and on the supplier's portfolio
- Most OEMs had a 10 – 20% reduction in aftermarket revenue in 2009 – based on a blend of service parts and overhaul services

...As Evident By The 9% Decline In Revenue For HEICO's Flight Support Group In 2009

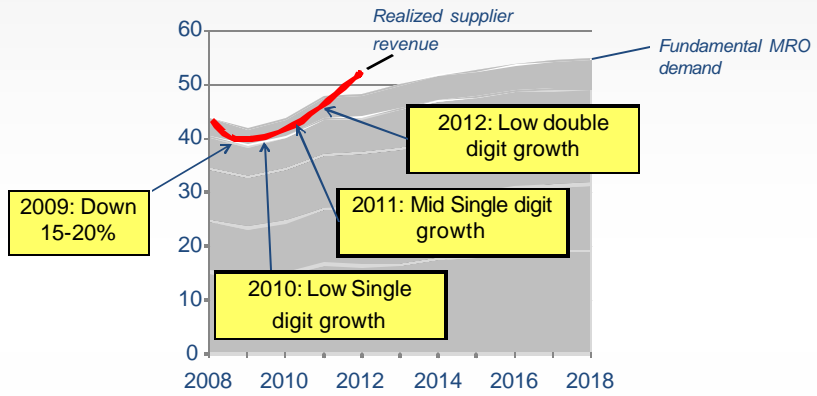


Note:
* Flight support group includes distribution, repair and PMA business
** Growth rate includes organic growth and acquisitions

There Is Still Room For Continued Destocking – Particularly In The Middle East And Asia-Pacific



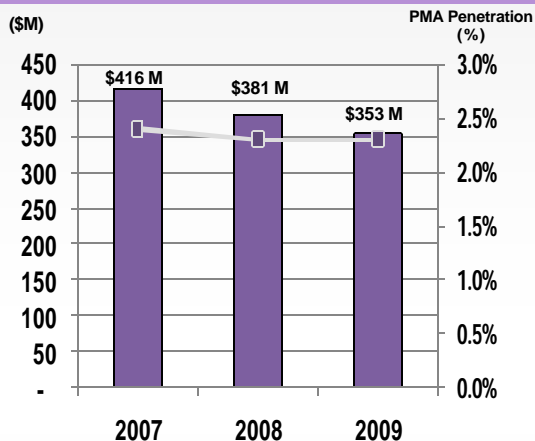
AeroStrategy Anticipates A Return To MRO Growth In 2010 With The Makeup For "Destocking" In 2011/2012



AGENDA

- MRO Market Outlook
- **PMA Market Outlook**

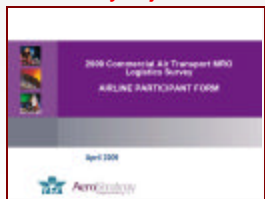
The 2009 PMA Market Contracted By An Estimated 8%



- 2009 PMA market is down 8% versus 2008, from \$381M to \$353M
- Since the peak in 2007, the PMA market has fallen by 17%
- Several factors drove the PMA market contraction
 - Airline use of buffers
 - Deferred maintenance
 - Work scopes (e.g. more repair and less replace)
 - Cannibalization of surplus aircraft and engines
 - Lack of airline resources devoted to PMA approval process
 - OEM defensive measures

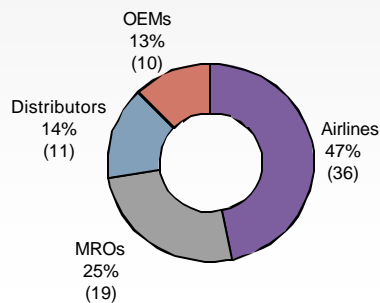
AeroStrategy Conducted The Survey In Conjunction With IATA; Respondents Include More Than 70 Companies

Survey Objectives



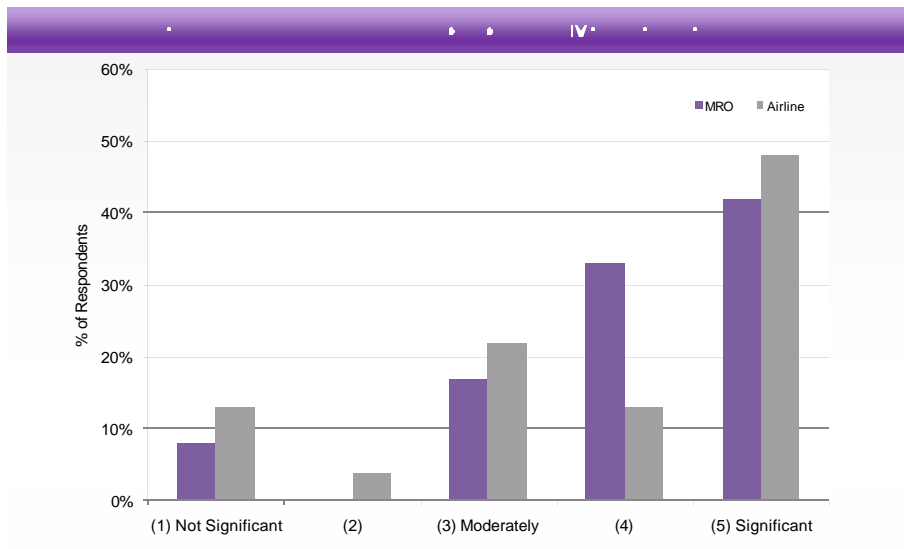
- Sent survey instrument to more than 200 airlines via IATA and 100+ airlines, OEMs and distributors via AeroStrategy
- Survey questions included
 - Current inventory value and type
 - Location of inventory
 - Inventory turns and costs
 - Anticipated changes in inventory levels
 - Use of pooling, vendor-owned inventory, and PMA parts

MRO Inventory and Supply Chain Logistics Survey Respondents

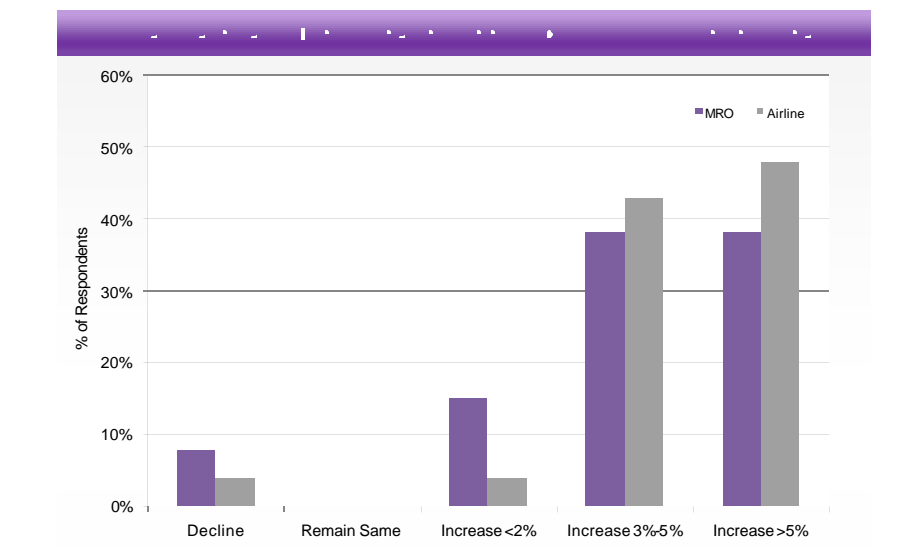


- 36 airlines with over 3,800 aircraft in total
- 19 MROs with over \$11B in MRO revenue
- 11 distributors and surplus dealers with inventory valued at \$2.6B
- 10 OEMs with nearly \$3.5B in spare parts sales volume

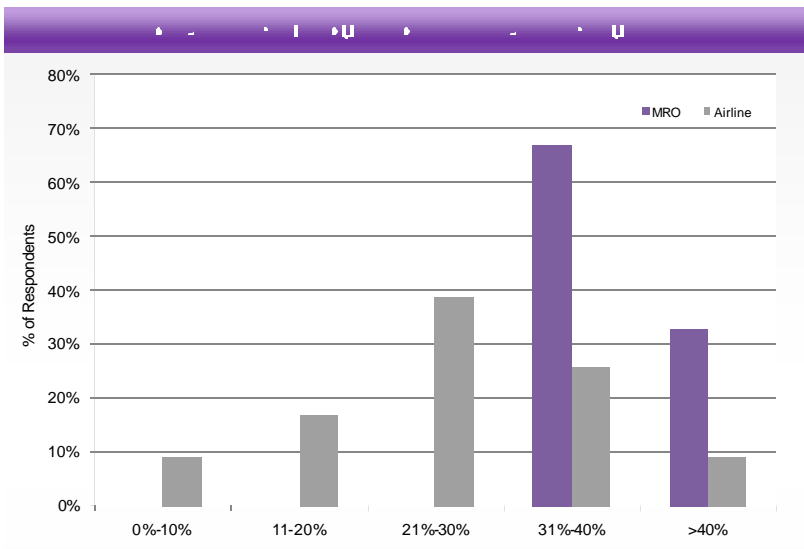
The Majority Of Airlines And MROs Feel That OEM Pricing Policy Significantly Drive The Usage Of PMA...



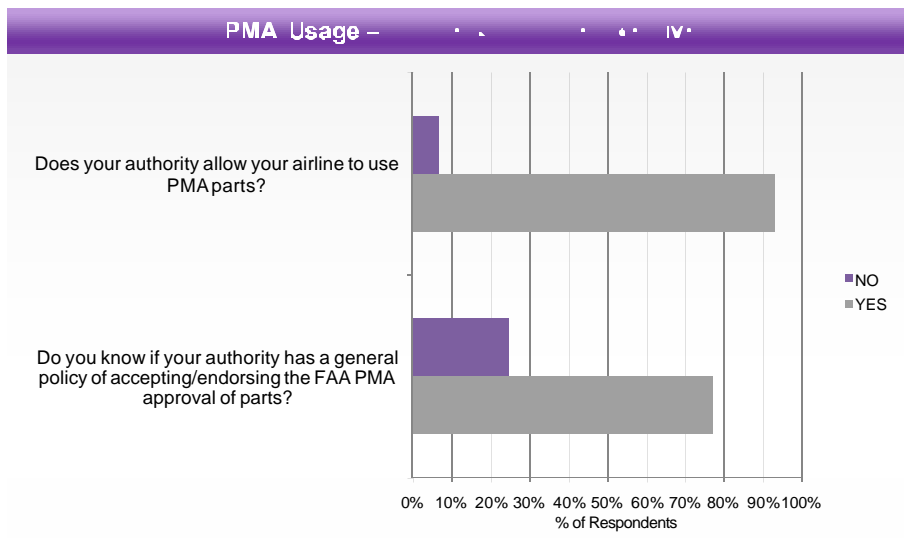
...And Have Seen Price Increase From The OEMs Of At Least 3% In Recent Years...



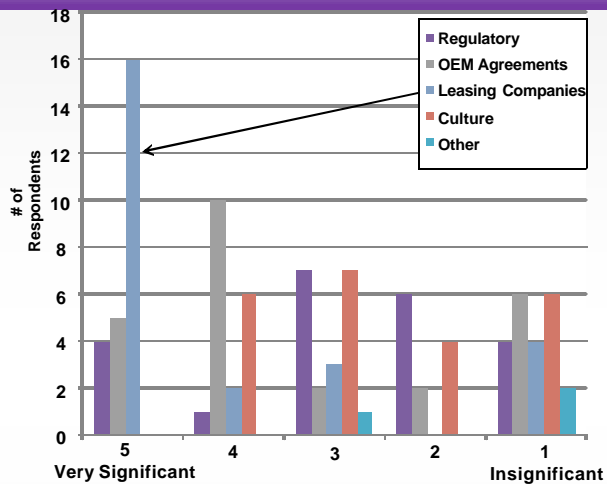
...While The Perception Is That PMA Offers At Least 20% Discount Compared To OEM Parts



Over 90% Of The Airlines In The Survey Have Authority To Use PMA Parts...

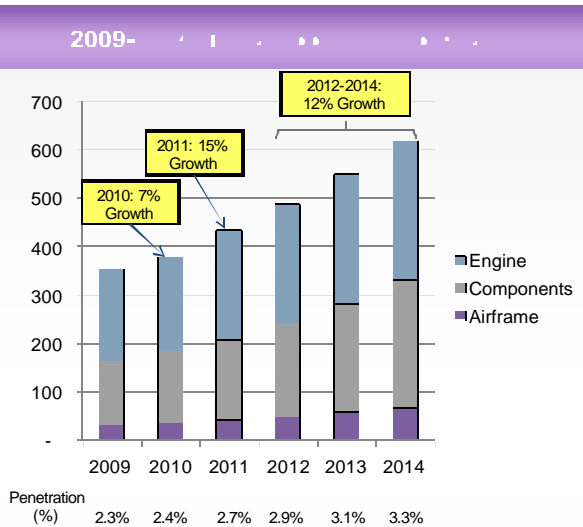


...But Many Airlines Believe That Leasing Companies Are The Largest Barrier To Greater PMA Penetration



"It is not even possible to arrive at a reasonable financial formula to allow a lessee to use substitute materials in return for a higher rent."—Chief Technical Officer of A Leasing Company

The Air Transport PMA Market Is Expected To Reach \$618M Within The Next Five Years



- The PMA market will begin to recover in 2010 with an estimated 7% growth rate
- In 2011, the PMA market is forecasted to spring-back with a robust growth rate of 15%
- Overall, the PMA market is estimated to grow from \$353M in 2009 to \$618M in 2014, a 12% CAGR
- PMA penetration expected to reach 3.3% of total material consumption

* Constant 2009 US\$

Key Messages



- Fundamental air transport MRO demand is \$42.7 billion in 2009, which is \$2.3B lower than the 2007 peak
- In the near-term, use of MRO demand buffers will magnify the recession; most OEMs experienced a 10-20% reduction in aftermarket revenue in 2009
- AeroStrategy anticipates a return to MRO growth in 2010 with the makeup for “destocking” in 2011/2012
- Airlines and MROs in the survey feel that OEM pricing policy drive the usage of PMA and have seen price increase of at least 3% in recent years
- While over 90% of the airlines surveyed have authority to use PMA parts, many airlines believe that leasing companies are the largest barrier to greater PMA usage
- The 2009 PMA market contracted by an estimated 8%, but is expected to reach \$618M within the next five years

Thank You For Your Attention!



Aerospace Globalization 2.0:
The Next Stage



Winds of change
Get Ready for Solar, Wind, Fuel Cell, and Other Clean Energy



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