

System Upgrades

The National Airport Pavement Test Vehicle

Presented to: APT International Alliance Subcommittee
2010 TRB Conference

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Pavement Test Vehicle Facts & Figures



- Commissioned 1999
- Vehicle Weight = 1,200,000 lbs
- Max Tire Load = 75,000 lb (Per Tire)
- 16 Electric Motors - 48 HP Each
- Top Speed – 15 MPH
- Fully Programmable Load Control
- Fully Programmable Position Control
- Controlled Aircraft Wander Simulation
- Laser Data Communication System
- 8 Camera Closed Circuit Video System

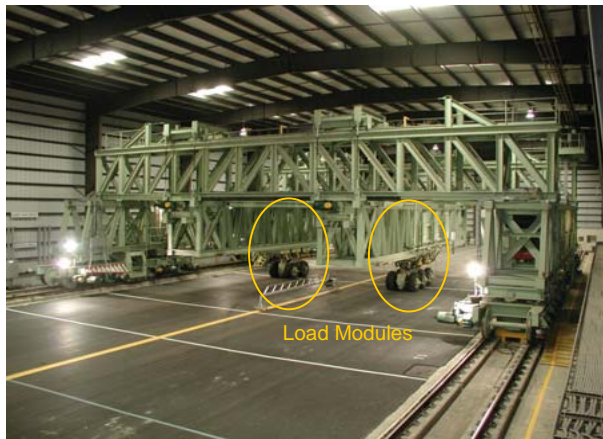
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Existing Pavement Test Vehicle



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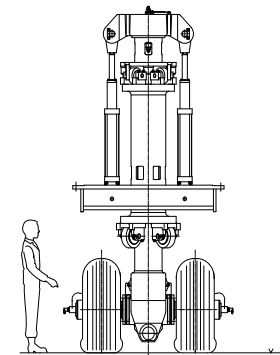


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Test Vehicle Upgrade Four New Load Modules

- **Purpose:**
 - Modify the NAPTF Test Vehicle to accommodate 8- and 10-wheel landing gear configurations.
 - Allow the FAA to conduct full-scale testing of future landing gear designs.
- **New Capabilities:**
 - +/- 5 degrees of steering.
 - Larger rims with redesign for tire removal/installation without bearing removal.
 - Radial tires with greater load capacity than current bias ply tires.



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Module Tires

Tire Size	Ply Rating	Rim Diameter	Rim Width	Max Inflated Dia	Max Inflated Width	Rated Load
49 x 19*	34	20	13.25	48.75	17.25	60,700
50 x 20	34	22	15	51.75	18.75	61,625
52 x 21	36	22	16	53.85	21.85	66,500
1400 x 530	40	23	16.25	56.85	21.7	74,950

* Current Test Vehicle Rims are 20" Dia x 14.5" Tires are 49 x 19.0 - 20 - 34 Ply (Bias Ply)

Aircraft	Tire Size	Gross Weight (lbs)	% on Landing Gear	# Main Gear Wheels	Max Tire Loading (lbs)
Boeing 777-200	50 x 20 R22 - 32PR	537,000	95.4	12	42,692
Boeing 747-400ER	50 x 20 R22 - 34PR	913,000	93	16	53,066
Boeing 787-8	50 x 20 R22 - 34PR	484,000	95	8	57,475
Boeing 747-8	52 x 21 R22 - 34PR	978,000	93	16	56,848
Boeing 777-200LR	52 x 21 R22 - 36PR	768,800	92.5	12	59,282
Boeing 777-300ER	52 x 21 R22 - 36PR	777,000	92.5	12	59,894
Airbus A380 (F)	1400x530R23-40PR	1,305,000	95	20	61,988
Airbus A380 (P)	1400x530R23-40PR	1,239,000	95	20	58,853
Airbus A340-600	1400x530R23-40PR	840,400	93	12	65,131



Module Assembly



Workers Assembling Module



Steering Demonstrated



New Module Installation (Nov/2008)



Construct Pit



Top Portion in Pit
Ready to Install



Lower Module Portion
Hoisted into Position



Test Vehicle Upgrade

- New Module Installation Completed Dec/2008



Antonov AN-124-100



Test Vehicle Upgrades FY 2009

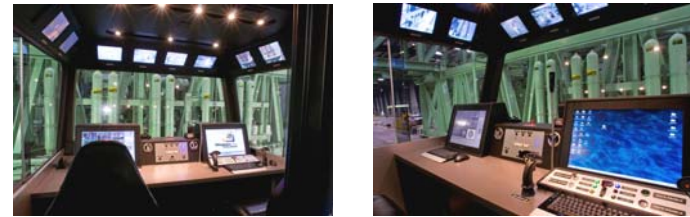
- Modernize Control Cab



Existing Control Cab



Control Cab Completed (April/2009)



Test Vehicle Upgrades FY 2009

- **Replace Existing Tires/Rims on Existing Load Modules (12 Sets Required).**



Test Vehicle Upgrades FY 2009

- **Replace Carriage Control System.**
- **Replace/Upgrade Load Controls (All Modules).**
- **Ryan Rutter to provide details.**



Test Vehicle Upgrades FY 2009

- **New Carriage Control PLC Cabinets**
- **2-3 weeks per panel**
- **Over 500 terminations per panel**



Test Vehicle Upgrades FY 2009

- **New Load Control PLC Cabinets**
- **2 weeks per panel**
- **100-200 terminations per panel**



Test Vehicle Upgrades FY 2009

Sample Load Profile:

