

Servo Fuel Injections Test Bench

Servo fuel injector test bench is designed and manufactured for testing and evaluating of various piston engine fuel injectors of commercial aircrafts and helicopters. These injectors are usually used in light weight, training aircrafts. All the related components' characteristics (such as fuel pressures, simulated air pressure and fuel flow) are provided by proper tools and evaluated by related transducers. These data is available on the data acquisition system, so the operator can simulate all the flying conditions on the ground and perform any test procedure on the component to satisfy its proper operation during flight.

Relevant fuel injector tests are implemented in the data acquisition system and related reports are produced due to the corresponding tests. Explosion proof protection have been implemented on this device, so that the operator can perform the injector calibration by the calibrating fluid of Naphtha or the aircraft alternatively.



Features	
Electrical Supply	AC, 3 Ph, 380 V, 50 Hz, 10 A
Compressed Air Supply	5 Bar1 x 3 kW, 200 Bar, 6 lpm
Calibrating Fluid	Naphtha
Filtration	10 µ on supply line 25 µ on return line
Fuel Inlet Pressure	Boost and Normal fuel supply conditions 0 ~ 87 psi with accuracy of ± 0.2 % FS
Fuel Flow	0 ~ 161 pph with accuracy of ± 1 % Reading
Low Range Differential Air Pressure	-9 ~ 30 in H2O with accuracy of ± 0.15 % FS
High Range Differential Air Pressure	-9 ~ 60 in H2O with accuracy of ± 0.15 % FS
Differential Fuel Pressure	-100 ~ 100 in Fuel with accuracy of ± 0.15 % FS
Differential Absolute Air Pressure	-9 ~ 30 in Hg with accuracy of ± 0.15 % FS
Data Acquisition	DAQ card, 16 AI channels, 250 kS/s
Dimensions	2.2 m Width × 1 m Depth × 2.2 m Height

Servo Fuel Injections Test Bench

Fuel Control Unit Tester is designed and manufactured to perform functional tests on Fuel Control Units. The system consists of four separate units: Mounting Unit, Hydraulic Unit, Data Acquisition Unit and Drive Unit. The Tester has two distinct circuits for oil and fuel and employs two centrifugal boost pumps to deliver required fuel and oil flow. A pneumatic circuit is also integrated into the tester to simulate air condition of the compressor discharge pressure (CDP). A high speed controllable drive also provides the required rotational speed and torque for the FCU pump.



Features		
Drives Power		3 kW & 11 kW
Drives Rotational Speed		12000 rpm & 5000 rpm
Fuel		MIL-C-7024 TYPE II
Fuel Boost Flow		8000 pph
Fuel Boost Pressure		60 psi
Fuel Flowmeter Range		4500 pph (Accuracy 0.5% FS)
Fuel Pressure Sensor Range		0-1500 psi (Accuracy 0.5% FS)
Oil		T15 Hydraulic Oil
Oil Boost Flow		10 lit/min
Oil Boost Pressure		4 bar
Oil Flowmeter Range		0.2-2 lit/min (Accuracy 0.5% FS)
Oil Pressure Sensor Range		0-16 bar (Accuracy 0.5% FS)
Air Regulated Pressure		0-8 bar
Data Acquisition		16 Analog Channels, 16 Bit, 250 kS/s

Nozzle Manifold Test Bench

Testing of a series of nozzles in a manifold assembly is done by nozzle manifold test bench. Inspecting the uniformity of spraying a series of nozzles in a manifold combination or a half manifold version is done using this test bench.



Features	
Operating Fluid	MIL-C-7024 TYPE II
Electrical Supply	AC, 3 Ph, 380 V, 50 Hz, 30 A
Hydraulic Power	7.5 kW, 1500 psi, 4200 pph
Uniformity system	12 cells
Working Fluid Pressure Range	0 to 1000 psig
Working Fluid Flow Range	0 to 4000 pph
Working Fluid Temperature Range	0 to 80 °C
Pressure Transducer Accuracy	±0.5 % FS
Flow Transducer Accuracy	±0.1 % FS
Working Fluid Temperature Accuracy	±1 % FS
Filtration	10 µ
Cooling System Requirement	Cold water @ 10 gpm, 20 °C
Data Acquisition	Delta PLC
Dimensions	1.8 m Width × 1.4 m Depth × 1.9 m Height

Air Blast & High Pressure Spray Nozzle Tester

The atomization verification system is designed to achieve the qualitative and quantitative atomization characteristics of fuel injection. Qualitative data included the spray quality which is possible to view through the transparent atomization chamber and also may detect with camera. Quantitative data included in the flow rate, pressure temperature, spray angle and spray pattern.



Features

Operating Fluid	MIL-C-7024 TYPE II
Pattern evaluation system	Six 60 degree Section for all 360 degree atomization
Working Pressure Limit	0 to 700 psig
First Level pressure Transducer Accuracy	±0.5 % FS
Angle pressure Gauge Accuracy of both Path	5 psi
Spray angle Evaluation system	Consist of Mechanical and Optical System
Two-stage Filtration	3 μ

Flow Meter

Functional Limit	0 to 1300 PPH
Accuracy	±0.3 %FS

Thermometer

Functional	0 to 70°C
Accuracy	±0.5 %FS

It is Capable of Testing 10 Different Types of Fuel Nozzles such as:

TAY 650-15 Engine	CF6 Series Engine
GTCP36-150 Engine	LF507/ALF502 Series Engine
JT8D Series engine	PW100 Series Engine

Fuel Control Unit Test bench

Fuel required to be delivered to the fuel nozzles is regulated by fuel control unit in turbine engines based on engine's operating condition. This unit adjusts the fuel supplied to the nozzles in accordance with direct and indirect signals sent to its actuators and control components, reflecting the engine's operating conditions.

These signals include rotational speed, compressor pressure, and the fuel supplied to the nozzles. This test device has the capability to test nine different types of fuel control units.



FCUs & FCU Pumps

JT8D, LF507-1F, LF507-1H, ALF502, PT6, LTS, GTCP331, GTCP85, T62

Features

Overall Dimensions	Width: 6.5m – Depth: 1.6m – height: 2m
Electrical Supply	380 VAC , 3 Ph, 50 Hz, 250 A
Operating Fluid	MIL-C-7024 Type II
Flow Rate	Low Flow Line: 4,000 pph High Flow Line: 20,000 pph High Pressure Line: 2000 psi, 4000 pph
Drives	Low Power Drive: 9kw, 12,000 rpm High Power Drive: 75kw, 7,200 rpm
Cooling System Requirement	Low Flow Line: Cold Water @ 75 lpm, 20 °C High Flow Line: Cold Water @ 300 lpm, 20 °C
Fuel Control Boost Pressure	5 ~ 50 psi (Manual & Automatic)
Fuel Control Return Pressure	0 ~ 1500 psi (Manual & Automatic)
Pneumatic	2 x 7 Bar High Pressure Line 2 x 30 Bar High Pressure Line 2 x Vacuum Line
Filtration	10 µ
Data Acquisition	PLC (Siemens)

Instrumentation

Fuel Pressure	10 x Pressure Transducers for test bench condition monitoring 15 x Pressure Transducers for FCU Monitoring (60 psi to 2,300 psi), 0.25% FS 9 x Differential Pressure Transducers for FCU Monitoring (±0.9 psi to 2,000 psi), 0.5% FS 3 x Absolute Pressure Transducers for FCU Monitoring (30 psia to 150 psia), 0.05% FS
Fuel Flow	4 x Flowmeters (20 pph to 16,000 pph), 0.1% FS
Temperature	8 x 0 ~ 120 °C, 0.5% FS
Motor Speed	2 x Photomicro Sensors
Voltage & Ampere	Voltmeters & Ammeters for FCU torque motor & solenoid conditions
Frequency	For monitoring FCU Conditions

Fuel Manifold Assembly Test Bench

Flow & uniformity tests of nozzle manifold assembly testing is done by this test bench. Visual investigation of nozzle spray is able using fuel manifold assembly test bench.



Features

Dimensions	1.9 m Width x 1.2 m Depth x 1.8 m Height
Electrical Supply	380 VAC , 3 Ph, 50 Hz, 40 A
Hydraulic Power	Line 1: 2000 psi, 1600 pph Line 2: 2000 psi, 500 pph
Cooling System Requirement	Cold Water @ 40 lpm, 20 °C
Operating Fluid	MIL-C-7024 Type II
Filtration	10 μ
Uniformity Measurement	Fluid Weight Basis
Data Acquisition	PLC

Instrumentation

Fuel Pressure Transducer	0 ~ 600 psi, ± 0.1 %FS
Fuel Temperature Transducer	0 ~ 120 °C, ± 0.5 %FS
Fuel Flow	0 ~ 1600 pph, ± 0.2 %Reading

Fuel Actuator Test Bench

Fuel Actuator test bench is designed and manufactured for testing and evaluation for various types of linear fuel actuators used in aircrafts. These actuators are mainly used for engines' adjustments. Test bench provides three separate hydraulic supplies, two of them are for actuators' hydraulic circuits and the third one specifically designed to simulate actuators endurance test condition. All the actuators' parameters (such as Inlet & Outlet Pressures and Temperatures, Actuator Position and Resolver Angle) are evaluated by related transducers during test period. These data are available on the data acquisition system. Relevant actuator tests are implemented in the data acquisition system and related reports are produced due to the corresponding tests.



Features	
Electrical Supply	AC, 3 Ph, 380 V, 50 Hz, 40 A
Operating Fluid	MIL 7024 Type II
Hydraulic Power	2 × 1.5 kW, 200 Bar, 5 lpm 1 × 3 kW, 200 Bar, 6 lpm
Filtration	10 μ on All three lines – 5 μ on Cooling Line
Fuel Inlet Pressure	3 × 0 ~ 100 Bar with accuracy of ± 0.1 % FS
Actuator Position	0 ~ 40 mm with accuracy of ± 0.1 % FS
Resolver Angle	0 ~ 360° with accuracy of ± 0.05°
Oil Temperature	5 ~ 80 °C with accuracy of ± 1 % FS
Data Acquisition	Siemens Simatic S7-1200, 16 AI channels
Dimensions	2.1 m Width × 1.2 m Depth × 1.8 m Height