JAPAN CIVIL AVIATION BUREAU
MINISTRY OF LAND, INFRASTRUCTURE, TRANSPORT AND TOURISM

No.15
Revision 1
Mitsubishi
YS-11
YS-11-100R
March 1, 2017

TYPE CERTIFICATE DATA SHEET No.15

This data sheet which is a part of type certificate No.15 prescribes conditions and limitations under which the product for which the type certificate was issued meets the airworthiness requirements of the Japan Civil Aeronautics Law and Regulations.

Type Certificate Holder: Mitsubishi Heavy Industries, Ltd.
16-5, KONAN 2-CHOME, MINATO-KU
TOKYO, 108-8215
JAPAN

Note: Nihon Airplane Manufacturing Company (NAMC) transferred TC No.15 to Mitsubishi Heavy Industries, Ltd. on September 7, 1982.

I - Model YS-11 (Transport Category), Approved August 25, 1964

Engines: 2Rolls-Royce Dart Mk. 542-10 or Mk. 542-10J or Mk. 542-10K (Turboprop)
Reduction gearing 0.0775 : 1
See NOTE 4 regarding intermixing of engines.

Fuel: (Fuel shall conform to the specifications listed or to subsequent revisions thereof.)

Grade(type)	Specification
Kerosine Type (AVTUR: JP.1)	D.Eng.R.D.2453 Issue 5 (2) D.Eng.R.D.2494 Issue 10 A.S.T.M. D1655-89 Jet A A.S.T.M. D1655-89 Jet A-1 CAN/CGSB-3.23-M86 (Canadian) MIL-T-83133A (JP.8) I.A.T.A. 1988 Kerosene type
Wide-Cut Fuels (AVTAG: JP.4)	D.Eng.R.D.2454 Issue 4 (2) D.Eng.R.D.2486 Issue 9 A.S.T.M. D1655-89 Jet B I.A.T.A. 1987 JP.4 type CAN/CGSB-3.22-M86 (Canadian) MIL-T-5624N JP.4 grade
High Flash Point (AVCAT: JP.5)	D.Eng.R.D.2452 Issue 2 (3) D.Eng.R.D.2498 Issue 7 3-GP-24Ma (86) (Canadian) MIL-T-5624N JP.5 grade

Water/Methanol: Rolls-Royce AEP-1-W/M, latest issue.

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Oil	Aero Shell Turbine Oil 750	Enco Turbo Oil 274 (Enco 274)
	Castrol 98 Gas Turbine Oil	Esso Turbo Oil 35 (E.T.O. 35)
	Castrol 98 U.K. Synthetic	Enco Turbo Oil 35
	Aviation Oil (Castrol 98 U.K.)	Texaco Synthetic Acft. Turbine
	Esso Aviation Turbo Oil 35	Oil 35 (T.S.A.T.O. 35)
	(E.A.T.O. 35)	Caltex Synthetic Turbo Oil 35
	Esso Extra Turbo Oil 274	Regent Synthetic Turbo Oil 35
	(E.E.T.O. 274)	

Engine Limits

Dart MK 542-10, MK 542-10J and MK 542-10K Engine

	Static Sea Level Rating (I.S.A.)			
Ratings (Min. Performance)	Propeller Shaft Horsepower (S.H.P.)	Total Equivalent Horsepower (T.E.H.P.)	Engine Speed (R.P.M.)	Maximum Duration (Minutes)
Takeoff (Wet)	2,680 *	2,966 **	15,000	5
Takeoff (Dry)	2,305	2,559	15,000	5
Max. Continuous	2,305	2,559	15,000	Unrestricted

The above static ratings are based on engine operations with the aircraft service accessories unloaded and no bleed air extraction.

*This power is constant despite of changes in power extraction through the gear box.
**The power permitted through the gear box is not included, which is 70 H.P. maximum.

	MK 542-10	MK 542-10J and MK 542-10K
Maximum turbine gas temperature		
Momentary maximum during starting	930°C	930°C
Takeoff (5 min. limit)		
with water/methanol	890°C	
(If not modified by S/B 77-8.)		915°C
(If modified by S/B 77-8.)		940°C
without water/methanol	865°C	865°C
Maximum Continuous		915°C
(If not modified by S/B 71-25.)	890°C	
(If modified by S/B 71-25.)	905°C	
Maximum oil inlet temperature		
All operations	120°C	120°C

Propeller and Propeller Limits

2 Dowty Rotol Type (c) R.209/4-40-4.5/2
Hydraulic, constant speed and feathering
Hub: 4 blade, No. 40 blade shank size to fit No. 4 1/2 S.B.A.C. shaft.

Takeoff rating 2,680 shaft h.p.
Blade: RA.25952
Diameter: 14 ft. 6 in. (nominal)
Minimum allowable for repairs 14 ft. 3 in.
No further reductions are permitted
Pitch setting at 0.7 radius
Feathered: 84°15'
Cruise Pitch Lock 27°30'
Flight fine 14°
Ground fine 0°

Airspeed Limits (CAS)

V_{MO}(Maximum operating) SL-13,600 ft.	245 knots (282 m.p.h.)
M_{MO} (Maximum operating) above 13,600 ft.	0.475
V_A (Maneuvering)	151 knots (174 m.p.h.)
V_{FE} (Flap extended 10° and below)	200 knots (230 m.p.h.)
V_{FE} (Flap extended above 10° to 20°)	165 knots (190 m.p.h.)
V_{FE} (Flap extended above 20° to 35°)	135 knots (155 m.p.h.)
*V_{LO} (Landing gear operating-extension)	210 knots (242 m.p.h.)
**V_{LO} (Landing gear operating-extension)	165 knots (190 m.p.h.)
V_{LO} (Landing gear operating-retraction)	135 knots (155 m.p.h.)
*V_{LE} (Landing gear extended)	210 knots (242 m.p.h.)
**V_{LE} (Landing gear extended)	165 knots (190 m.p.h.)

*Applicable to airplanes with P/N 01-18062-1, -2 M.L.G. door assembly.
**Applicable to airplanes with P/N 01-18121-501, -502 M.L.G. door assembly.

C.G. range — Landing Gear extended flap up*

Weight (lb.)	Forward %MAC	Forward STA.(in)	Aft %MAC	Aft STA.(in)
51,800	21.5	-84.8	36.0	-66.5
35,270 and below	15.0	-93.0	36.0	-66.5

Straight line variation between points given.

*The airplane is safe and operable with flaps and gear in any position provided the center of gravity falls within limits specified with flaps up and gear down.

Landing gear retraction moment change is -99,800 in.lb.
Flaps down (20 degrees) moment change is +5,990 in. lb.
Flaps down (35 degrees) moment change is +10,420 in.lb.

Maximum Weights — Takeoff 51,800 lb.; Landing 49,600 lb.

Maximum Zero Fuel Wt. 45,640 lbs.

Minimum Crew 2 (Pilot and Copilot)

Maximum Passengers 59-Limited by emergency exit requirements.
Additional 5 passengers are permitted if 2 inflatable slides are installed.

Maximum Baggage

Compartment	Capacity (lb.)	Max. Load (lb./ft 2)	Arm (in.)
Right forward			
* for 52 seats			
38 in pitch type	1,500	100	-350
** for 52 seats			
34 in pitch type	2,500	100	-324
*** for 60 seats			
34 in pitch type	1,200	100	-358
Left forward			
**** for 52 seats			
34 in pitch type only	1,000	100	-292

Aft	2,000	100	+291
Belly	1,100	65	-252

* Location of right forward cargo compartment: F.STA-9,900 to F.STA-7,900 †
** Location of right forward cargo compartment: F.STA-9,900 to F.STA-6,870 †
*** Location of right forward cargo compartment: F.STA-9,900 to F.STA-8,280 †
**** Location of left forward cargo compartment: F.STA-8,280 to F.STA-6,870 †
† F.STA. units are in millimeters.

Fuel Capacity	Total Refuel* lb. (US Gal.) ea.	Usable lb. (US Gal.)ea.	Arm (in.)
When two scavenge pumps per aircraft are installed.			
2 integral tanks (main)	4,333 (666)	4,235 (651)	-63.6
Bag tanks (optional)			
R.H.	2,339 (359)	2,327 (357)	-70.1
L.H.	1,496 (230)	1,484 (228)	-70.1
When four scavenge pumps per aircraft are installed.			
2 integral tanks (main)	4,333 (666)	4,309 (663)	-63.6
Bag Tank (optional)			
R.H.	2,339 (359)	2,327 (357)	-70.1
L.H.	1,496 (230)	1,484 (228)	-70.1

*"Total Refuel" capacity includes Unusable and Usable Fuel.

Fuel weights are based on 6.5 lb./U.S. gal.

See NOTE 1(c) for system fuel.

Water/Methanol Capacity
1 bag tank in left-hand wing: 870 lb. (111 U.S. gal.) -70.1 in.

W/M weight is based on 7.85 lb./U.S. gal.

Oil Capacity
Engine oil
Tank capacity 38.5 lb. (38.5 U.S. pint) ea. -200.4 in.
(Applicable to the aircraft without R/R Mod. 1384)

Tank capacity 43 lb. (43 U.S. pint) ea. -200.4 in.
(Applicable to the aircraft with R/R Mod. 1384)

Gear box oil 6 lb. (6 U.S. pint) ea. -134 in.
See NOTE 1(C) for system oil.

Maximum Operating Altitude 20,000 ft.

Other Operating Limitations
See Japan Civil Aviation Bureau Approved Flight Manual, YS-FM-001.

Manufacture's Serial Numbers
2003～2007, 2012, 2014～2017, 2020～2022, 2026～2032, 2035～2049

II - Model YS-11A-100R (Transport Category), Approved (July 3, 1972)

Engines 2Rolls-Royce Dart Mk. 543-10 or Mk. 543-10K (Turboprop)
Reduction gearing 0.0775 : 1
See NOTE 4 regarding intermixing of engines.

Fuel (Fuel shall conform to the specifications listed or to subsequent revisions thereof.)

Grade(type)	Specification
Kerosine Type (AVTUR: JP.1)	D.Eng.R.D.2453 Issue 5 (2) D.Eng.R.D.2494 Issue 10 A.S.T.M. D1655-89 Jet A A.S.T.M. D1655-89 Jet A-1 CAN/CGSB-3.23-M86 (Canadian) MIL-T-83133A (JP.8) I.A.T.A. 1988 Kerosene type
Wide-Cut Fuels (AVTAG: JP.4)	D.Eng.R.D.2454 Issue 4 (2) D.Eng.R.D.2486 Issue 9 A.S.T.M. D1655-89 Jet B I.A.T.A. 1987 JP.4 type CAN/CGSB-3.22-M86 (Canadian) MIL-T-5624N JP.4 grade
High Flash Point (AVCAT: JP.5)	D.Eng.R.D.2452 Issue 2 (3) D.Eng.R.D.2498 Issue 7 3-GP-24Ma (86) (Canadian) MIL-T-5624N JP.5 grade

Water/Methanol Rolls-Royce AEP-1-W/M, latest issue.

Oil

Aero Shell Turbine Oil 750	Enco Turbo Oil 274 (Enco 274)
Castrol 98 Gas Turbine Oil	Esso Turbo Oil 35 (E.T.O. 35)
Castrol 98 U.K. Synthetic Aviation Oil (Castrol 98 U.K.)	Enco Turbo Oil 35
Esso Aviation Turbo Oil 35 (E.A.T.O. 35)	Texaco Synthetic Acft. Turbine Oil 35 (T.S.A.T.O. 35)
Esso Extra Turbo Oil 274 (E.E.T.O. 274)	Caltex Synthetic Turbo Oil 35
	Regent Synthetic Turbo Oil 35

Engine Limits
Dart MK 543-10, MK 543-10K Engine

	Static Sea Level Rating (I.S.A.)			
Ratings (Min. Performance)	Propeller Shaft Horsepower (S.H.P.)	Total Equivalent Horsepower (T.E.H.P.)	Engine Speed (R.P.M.)	Maximum Duration (Minutes)
Takeoff (Wet)	2,680 *	2,966 **	15,000	5
Takeoff (Dry)	2,305	2,559	15,000	5
Intermediate Contingency	2,305	2,559	15,000	Unrestricted
Max. Continuous	2,305	2,559	15,000	Unrestricted

The above static ratings are based on engine operations with the aircraft service accessories unloaded and no bleed air extraction.

*This power is constant despite of changes in power extraction through the gear box.

**The power permitted through the gear box is not included, which is 70 H.P. maximum.

	MK 543-10 and MK 543-10K
Maximum turbine gas temperature	
Momentary maximum during starting	930°C
Takeoff (5 min. limit)	
with water/methanol	940°C
without water/methanol	865°C
Intermediate Contingency	940°C
Maximum Continuous	865°C
Maximum oil inlet temperature	
All operations	120°C

Propeller and Propeller Limits

2 Dowty Rotol Type (c) R.209/4-40-4.5/2
Hydraulic, constant speed and feathering
Hub: 4 blade, No. 40 blade shank size to fit No. 4 1/2 S.B.A.C. shaft.

Takeoff rating 2,680 shaft h.p.
Blade: RA.25952
Diameter: 14 ft. 6 in. (nominal)
Minimum allowable for repairs 14 ft. 3 in.
No further reductions are permitted
Pitch setting at 0.7 radius
Feathered: 84°15'
Cruise Pitch Lock 27°30'
Flight fine 14°
Ground fine 0°

Airspeed Limits (CAS)

V_{MO} (Maximum operating) SL-13,600 ft.	245 knots (282 m.p.h.)
M_{MO} (Maximum operating) above 13,600 ft.	0.475
V_A (Maneuvering)	151 knots (174 m.p.h.)
V_{FE} (Flap extended 10° and below)	200 knots (230 m.p.h.)
V_{FE} (Flap extended above 10° to 20°)	165 knots (190 m.p.h.)
V_{FE} (Flap extended above 20° to 35°)	135 knots (155 m.p.h.)
*V_{LO} (Landing gear operating-extension)	210 knots (242 m.p.h.)
**V_{LO} (Landing gear operating-extension)	165 knots (190 m.p.h.)
V_{LO} (Landing gear operating-retraction)	135 knots (155 m.p.h.)
*V_{LE} (Landing gear extended)	210 knots (242 m.p.h.)
**V_{LE} (Landing gear extended)	165 knots (190 m.p.h.)

*Applicable to airplanes with P/N 01-18062-1, -2 M.L.G. door assembly.
**Applicable to airplanes with P/N 01-18121-501, -502 M.L.G. door assembly.

C.G. range — Landing Gear extended flap up*

Weight	Forward		Aft	
(lb.)	%MAC	STA.(in)	%MAC	STA.(in)
51,800	21.5	-84.8	36.0	-66.5
35,270 and below	15.0	-93.0	36.0	-66.5

Straight line variation between points given.

*The airplane is safe and operable with flaps and gear in any position provided the center of gravity falls within limits specified with flaps up and gear down.

Landing gear retraction moment change is -99,800 in.lb.
Flaps down (20 degrees) moment change is +5,990 in. lb.
Flaps down (35 degrees) moment change is +10,420 in.lb.

Maximum Weights	Takeoff	51,800 lb.
	Landing	49,600 lb.
Maximum Zero Fuel Wt.	45,640 lbs.	
Minimum Crew	2 (Pilot and Copilot)	
Maximum Passengers	59-Limited by emergency exit requirements. Additional 5 passengers are permitted if 2 inflatable slides are installed.	

Maximum Baggage

Compartment	Capacity (lb.)	Max. Load (lb./ft 2)	Arm (in.)
Right forward			
* for 52 seats			
38 in pitch type	1,500	100	-350
** for 52 seats			
34 in pitch type	2,500	100	-324
*** for 60 seats			
34 in pitch type	1,200	100	-358
Left forward			
**** for 52 seats			
34 in pitch type only	1,000	100	-292
Aft	2,000	100	+291
Belly	1,100	65	-252

* Location of right forward cargo compartment: F.STA-9,900 to F.STA-7,900 †
** Location of right forward cargo compartment: F.STA-9,900 to F.STA-6,870 †
*** Location of right forward cargo compartment: F.STA-9,900 to F.STA-8,280 †
**** Location of left forward cargo compartment: F.STA-8,280 to F.STA-6,870 †
† F.STA. units are in millimeters.

Fuel Capacity

	Total Refuel* lb. (US Gal.) ea.	Usable lb. (US Gal.)ea.	Arm (in.)
When two scavenge pumps per aircraft are installed.			
2 integral tanks (main)	4,333 (666)	4,235 (651)	-63.6
Bag tanks (optional)			
R.H.	2,339 (359)	2,327 (357)	-70.1
L.H.	1,496 (230)	1,484 (228)	-70.1
When four scavenge pumps per aircraft are installed.			
2 integral tanks (main)	4,333 (666)	4,309 (663)	-63.6
Bag Tank (optional)			
R.H.	2,339 (359)	2,327 (357)	-70.1
L.H.	1,496 (230)	1,484 (228)	-70.1

*"Total Refuel" capacity includes Unusable and Usable Fuel.

Fuel weights are based on 6.5 lb./U.S. gal.

See NOTE 1(c) for system fuel.

Water/Methanol Capacity
1 bag tank in left-hand wing: 870 lb. (111 U.S. gal.) -70.1 in.

W/M weight is based on 7.85 lb./U.S. gal.

Oil Capacity Engine oil
Tank capacity 38.5 lb. (38.5 U.S. pint) ea. -200.4 in.
(Applicable to the aircraft without R/R Mod. 1384)

Tank capacity 43 lb. (43 U.S. pint) ea. -200.4 in.
(Applicable to the aircraft with R/R Mod. 1384)

Gear box oil 6 lb. (6 U.S. pint) ea. -134 in.
See NOTE 1(C) for system oil.

Maximum Operating Altitude 20,000 ft.

Other Operating Limitations
See Japan Civil Aviation Bureau Approved Flight Manual, YS-FM-011.

Manufacture's Serial Numbers
2010, 2011, 2013, 2023～2025, 2034

Data Pertinent to All Models

Datum Station 0 is 42.5 in. aft of wing reference line (55% chord line).

MAC 126.1 in. (L.E. of MAC-111.9 in.)

Leveling Means Leveling clips installed in the nosewheel well.

Control Surfaces Movements

Elevator	Up	27°	Down	13°
Elevator balance tab	Up	6°	Down	12°
Elevator trim tab (L.H.)	Up	10°	Down	15°
Rudder	Right	22°	Left	22°
Spring tab	Right	21°	Left	21°
Trim tab	Right	12.5°	Left	12.5°
Aileron	Up	24°	Down	15°
Aileron spring tab	Up	18°	Down	10°
Aileron trim tab (L.H.)	Up	21°	Down	21°
Flaps			Down	35°

Certification basis Civil Aeronautics Regulation Annex 1 "Technical Standards for Ensuring Safety of Aircraft and Equipment"

Part 3 of the TAIKUSEI-SHINSA-YORYO (JCAB Airworthiness Standards) (Enacted in 1960, the KU-Ken-443, revised in 1964, the KU-KEN-443.)

Special condtions respect to the following subjects apply to the Model YS-11-100R.
KU-KEN-131 (May 9, 1972)

NOTE: Certification basis, in its technical contents, corresponds to FAA CAR 4b, dated Dec 31, 1953, including Amendments 4b1 through4b-12 and SR422B.

Exemption from Part III-3 of the TAIKUSEI-SHINSA-YORYO (JCAB

Airworthiness Standards); Refer to JCAB Issue Paper P-01 “Exemption for fuel tank system fault tolerance evaluation requirements”
Note: Part III-3 is equivalent to the Special Federal Aviation Regulation (SFAR) No.88.

Required Equipment — The basic required equipment as prescribed in the applicable airworthiness regulations (see certification basis) must be installed in the aircraft for type certification. Mitsubishi Report (YSE-0549-2 (Japanese), E/YSE-0547-2(English)) "YS-11 and YS-11A Master Equipment List" contains a list of all required equipment that must be installed as well as optional equipment installations approved by the Japan Civil Aviation Bureau (JCAB).

NOTE 1 (a) Current weight and balance report, including list of equipment included in the certificated empty weight, and loading instructions when necessary must be provided for each aircraft at the time of original certification.

(b) The airplane must be loaded so that the C.G. is within the specified limits at all times, with the effects of fuel use, and crew and passenger movement being considered.

(c) The weight of system fuel and oil as defined below, and hydraulic fluid, must be included in the airplane empty weight.

System Fuel — The weight of all fuel required to fill all lines and tanks up to the zero fuel point on the fuel gauge in the most critical flight attitude.
System fuel includes the unusable tank fuel as defined by CAR 4b.416.

When two scavenge pumps per aircraft are installed.

	Lbs. (U.S. Gal.)	
Unusable (2 integral tanks)	196 (30)	98 (15) ea.
Unusable (2 bag tanks)	24 (4)	12 (2) ea.
Between emergency shutoff valve and engine	8 (1.2)	
Crossfeed line	9 (1.4)	
Between emergency shutoff valve and booster pump	4 (0.6)	
Transfer line (R.H.)	8 (1.2)	
Transfer line (L.H.)	7 (1.1)	
System fuel total	256 (40)	

When four scavenge pumps per aircraft are installed.

	Lbs. (U.S. Gal.)	
Unusable (2 integral tanks)	48 (7)	24 (4) ea.
Unusable (2 bag tanks)	24 (4)	12 (2) ea.
Between emergency shutoff valve and engine	8 (1.2)	
Crossfeed line	9 (1.4)	
Between emergency shutoff valve and booster pump	4 (0.6)	
Transfer line (R.H.)	8 (1.2)	
Transfer line (L.H.)	7 (1.1)	
System fuel total	108 (17)	

System Oil: System oil which must be included in empty weight is the amount of oil normally trapped in the propellers, plus the amount normally trapped in the engines after oil drainage. The total amount of "System Oil" is as follows:

	Lbs. (U.S. Gal.)	
Propeller hub	22 (22)	11 (11) ea.
Engine lubrication system	20 (2)	10 (10) ea.
System oil total	42 (42)	

NOTE 2. This aircraft must be operated in accordance with the Japan Civil Aviation Bureau Approved Airplane Flight Manual.

NOTE 3. Service life limits on structural components are established for all existing versions of the YS-11 and YS-11A in the JCAB Approved Manual YS-MR-101 "YS-11 and YS-11A Service Life Limits."

NOTE 4. When intermixing engines, aircraft performance shall be decided with the limitation of the lower powered engine used.

NOTE 5. Supplemental inspection requirements on structural components are established for all existing versions of YS-11 and YS-11A in the JCAB approved manual YS-MR-201 “YS-11 Supplemental Inspection Document.”

NOTE 6. Corrosion prevention and control program is established for all existing versions of YS-11 and YS-11A in the JCAB approved manual YS-MR-301 “YS-11 Corrosion Control Program.”

...END…