

<p style="text-align: center;">DEPARTMENT OF TRANSPORTATION</p> <p style="text-align: center;">FEDERAL AVIATION ADMINISTRATION</p> <p style="text-align: center;">TYPE CERTIFICATE DATA SHEET</p> <p style="text-align: center;">E-297</p>	<p style="text-align: right;">TCDS E-297 REVISION: 26 DATE: December 9, 2002</p> <p>Rolls-Royce Deutschland Ltd & Co KG</p> <p>Model: Dart 525, 528-7E, 528D-7E, 529-7E, 529D-7E, 529-7H 529D-7H, 529-8E, 529D-8E, 529-8H, 529D-8H, 529-8X, 529D-8X, 529-8Y, 529D-8Y, 529-8Z, 529D-8Z, 531 532-7, 532-2L, 532-7L, 532-7N, 532-7P, 532-7R, 535-2 535-7R, 551-7, 551-7R, 552-2, 552-7, 552-7R</p>
--	---

TYPE CERTIFICATE DATA SHEET NO. E 297

Engines of models described herein conforming with this data sheet (which is part of Type Certificate No. E 297) and other approved data on file with the Federal Aviation Administration meet the minimum standards for use in certificated aircraft in accordance with pertinent aircraft data sheets and applicable portions of the Federal Aviation Regulations provided they are installed, operated, and maintained as prescribed by the approved manufacturer's manuals and other approved instructions.

Type Certificate Holder: Rolls-Royce Deutschland Ltd & Co KG
Postfach 1536
D-15827 Dahlewitz
Germany (formerly Rolls-Royce, Ltd., Derby, England)

Model: Dart	525	528-7E, 528D-7E, 531	529-7E, 529D-7E, 529-7H, 529D-7H, 529-8E, 529D-8E, 529-8H, 529D-8H, 529-8X, 529D-8X, 529-8Y, 529D-8Y, 529-8Z, 529D-8Z
Type: Turboprop	2-stage centrifugal compressor; 3-stage turbine; 7 combustion chambers; 0.093 to 1 reduction gearing	--	--
Rating			
Max. Continuous at sea level, equivalent shaft hp., shaft hp., jet thrust (lb.) rpm	1755-1585-424-14500	2027-1835-479-15000	2103-1910-482-15000 2152-1955-493-15000 (Mod 1860)
Takeoff (5 min.) at sea level, equivalent shaft hp., shaft hp., jet thrust (lb.), rpm	1920-1730-474-15000	2027-1835-479-15000	2103-1910-482-15000 2152-1955-493-15000 (Mod 1860)

Page No.	1	2	3	4	5	6	7	8	9
Rev No.	26	25	25	25	25	26	26	26	26

Legend: "--" indicates "Same as Preceding Model"
"---" indicates "not applicable"

Model: Dart (Continued)	525	528-7E, 528D-7E, 531	529-7E, 529D-7E, 529-7H, 529D-7H, 529-8E, 529D-8E 529-8H, 529D-8H, 529-8X, 529D-8X, 529-8Y, 529D-8Y, 529-8Z, 529D-8Z
Takeoff (5 min.) at sea level, with w/m injection: equivalent shaft hp. shaft hp., jet thrust (lb.) rpm (529-8K, 529D-8K, 529-8Y, 529D-8Y, 529-8Z, 529D-8Z) (532-7, 532-7N, 532-7P) (532-2L, 532-7L, 535-2) (532-7R, 535-7R)	1955-1765-474-15000	2062-1870-479-15000	2143-1950-482-15000 (For Models above except 529-8X, 529D-8X, 529-8Y, 529D-8Y, 529-8Z, 529D-8Z) *2183-1990-482-15000 (See NOTE 13) *2196-1990-514-15000 (See NOTE 13) *2250-2040-524-15000 (See NOTE 13) *2293-2080-532-15000 (See NOTE 13) 2297-2085-529-15000 (535-7R Mod 1860) (*Applies only to models listed at left side of page).
Propeller Shaft Type	SBAC No. 4	--	--
Fuel Control	Lucas CCU 39/30AM	Lucas CCU 36/27 AS for 531 Lucas CCU 39/38 AY for 528 series	Lucas CCU 69/55 AY for 529-8 series Lucas CCU 39/38 AY for 529-7 series
Water Methanol Control Unit	RK 39831	RK 40195 for 528 series; RK 39831 for 531.	RK 40196 for 529-8 series; RK 40195 for 529-7 series.
Fuel	See NOTE 6	--	--
Oil Types	See relevant Rolls-Royce Operating Instructions Manual (NOTE 14)	--	--
Oil Capacity	4 U.S. gal. integral tank	--	--
Principal Dimensions			
Length overall (in.)	97.6	--	--
Diameter (in.)	37.9	--	--
C.G. Location			
Aft of mounting feet (in.)	2.4	--	--
Weight (dry), (lb.)			
Includes all controls, exhaust unit, igniters, thermocouples, oil tank and fuel pump	1260	1270 for 528 series 1270 for 531	1260 1273 (Mod 1860)
Ignition System	Alternatives		
High energy type with transformers	LUCAS NB34, NB38, NB2503, NB5707, NB5706, NB5714.	--	--
HE units	LUCAS C10/TS, C63/TS, C65/TS, C67/TS, C69/TS	--	--
HE igniters	SMITHS LR 104series SMITHS KR 104 series Champion CR 104 series (Champion FHE-19-6H) AC Type YA20 1 through 12	-- -- -- -- --	-- -- -- -- --

Model: Dart (Cont'd)	532-2L, 532-7, 532-7L 532-7N, 532-7P, 532-7R 535-2, 535-7R	551-7, 551-7R	552-2, 552-7, 552-7R
Type: Turboprop	2-stage centrifugal compressor; 3-stage turbine; 7 combustion chambers; 0.093 to 1 reduction gearing	--	--
Rating			
Max. Continuous at sea level, equivalent shaft hp., shaft hp., jet thrust (lb.) rpm	2075-1880-488-15000 (for models above except 535-2 & 535-7R) 2225-2030-487-15000 (for models 535-2 & 535-7R only)	2346-2164-455-15000	2370-2167-508-15000
Takeoff (5 min.) at sea level equivalent shaft hp., shaft hp., jet thrust (lb.) rpm	2260-2060-500-15000 (535-7R Mod 1860) 2027-1835-479-15000	2346-2164-455-15000	2370-2167-508-15000
Takeoff (5 min.) at sea level, with w/m injection: equivalent shaft hp. Shaft hp, jet thrust (lb.) rpm	--	2417-2225-479-15000 (For Model 551-7) 2319-2136-457-15000 (For Model 551-7R)	2390-2185-512-15000 2433-2225-519-15000 2343-2140-508-15000
Propeller Shaft Type	SBAC No. 4	--	SBAC No. 4
Fuel Control	Lucas CCU 82/67AS or 36/27AS	Lucas CCU509-110-CA	<u>Mk552-2</u> Lucas CCU520-/113CB or CCU519/112CB <u>Mk552-7, -7R</u> Lucas CCU509/110CA or CCU504/108CA
Water Methanol Control Unit	RK 40195 for 532-7, 537-7L, 532-7R, 532-7P, 535-7R; RK 42153 for 532-7N; RK 39831 for 532-2L and 535-2.	RK 44317A	<u>Mk552-2</u> Rolls-Royce RK48264A <u>Mk552-7, -7R</u> Rolls-Royce RK30403A
Fuel	See NOTE 6	--	--
Oil Types	See relevant Rolls-Royce Operating Instructions Manual (NOTE 14)	--	--
Oil Capacity	4 U.S. gal. integral tank	--	--
Principal Dimensions			
Length overall (in.)	97.6	--	--
Diameter (in.)	37.9	--	38.0
C.G. Location			
Aft of mounting feet (in.)	2.4	1.7	<u>Mk552-2</u> +1.4 <u>Mk552-7, -7R</u> + 1.6
Weight (dry), (lb.)			
Includes all controls, exhaust unit, igniters, thermocouples, oil tank and fuel pump	1270 1273 (535-7R Mod 1860)	1264	1273
Ignition System	<u>Alternatives</u>		
High energy type with transformers	LUCAS NB34, NB38, NB2503, NB5707, NB5706, NB5714.	--	--
HE units	LUCAS C10/TS, C63/TS, C65/TS, C67/TS, C69/TS	--	--
HE igniters	SMITHS LR 104 series SMITHS KR 104 series Champion CR 104 series (Champion FHE-19-6H) AC Type YA20	-- -- -- --	-- -- -- --
NOTES:	1 through 12	--	--

Certification Basis

1. For Dart 525 series, 528 series, 529-7E, 529D-7E, 529-8E, 529D-8E, and 531: CAR Part 10 and British Civil Airworthiness Requirements Section C Issue 4.

Section C Issue 4 is equivalent to the applicable parts of CAR 13 effective June 15, 1956. Special Conditions equivalent to PART 13 Amendment 13-1 and 13-2 were applied in addition to Section C issue 4.

2. For Dart 529-7H, 529D-7H, 529-8H, 529D-8H, 529-8X, 529D-8X, 529-8Y, 529D-8Y, 529-8Z, 529D-8Z, 532-2L, 532-7, 532-7L, 532-7N, 532-7P, 532-7R, 535-2, 535-7R CAR Part 10 and British Civil Airworthiness Requirement Section C issue 5, dated July 1, 1962.

Section C Issue 5 is equivalent to the applicable parts of CAR Part 13 effective June 15, 1956, and Amendments 13-1 through 13-5.

3. For Dart 551-7, 551-7R, 552-2, 552-7, 552-7R CAR Part 10 and British Civil Airworthiness Requirement Section C Issue 6, dated June 15, 1966.

Section C Issue 6 contains all the requirements of Issue 5 and is therefore equivalent to the applicable parts of CAR Part 13 effective June 15, 1956 and Amendments 13-1 through 13-5.

Date of Application for Type Certificate May 17, 1956. Engine Type Certificate No. 297 issued December 2, 1957. For subsequent additions see NOTE 12.

Import Requirements:

To be considered eligible for installation on U.S. registered aircraft, each engine (or propeller) to be exported to the United States shall be accompanied by a Certificate of Airworthiness for export or certifying statement endorsed by the exporting cognizant civil airworthiness authority which contains the following language:

(1) This engine (or propeller) conforms to its United States type design (Type Certificate Number E273) and is in a condition for safe operation.

(2) This engine (or propeller) has been subjected by the manufacturer to a final operational check and is in a proper state of airworthiness.

Reference FAR Section 21.500 which provides for the airworthiness acceptance of aircraft engines or propellers manufactured outside of the U.S. for which a U.S. type certificate has been issued.

Additional guidance is contained in FAA Advisory Circular 21.23, Airworthiness Certification of Civil Aircraft, Engines, Propellers and Related Products, Imported into the United States.

NOTES**NOTE 1.**

Maximum permissible temperatures: Turbine gas temperature, (°C)	525	528-7E 528D-7E	529-7E, 529D-7E, 529-8E, 529D-8E, 529-7H, 529D-7H, 529-8H, 529D-8H	529-8X 529D-8X	529-8Y 529D-8Y	529-8Z 529D-8Z
Takeoff (wet)	810	860	860	--	--	--
Takeoff (dry)	780	810	825	--	--	--
Maximum Continuous	760	850	850	870	910	920
Maximum Transient for starts	930	--	--	--	--	--
Max. Overtemperature (5 sec. limit)	950	--	--	--	1000	--
Oil inlet temperature range, °C	minus 15 to + 115	minus 15 to + 120	--	--	--	--
Min. start	minus 30	--	--	--	--	--
Min. wet takeoff						
- aircraft static	40	--	--	--	--	--
- aircraft rolling	40	--	--	--	--	--

NOTE 1 (Continued)						
Maximum permissible temperatures: Turbine gas temperature, (°C)	531	532-7	532-7L 532-7R	532-7N	532-2L	535-2
Takeoff (wet)	875	860	905	--	--	920
Takeoff (dry)	810	--	--	--	--	--
Maximum Continuous	850	--	885	--	--	920
Maximum Transient for starts	930	--	--	--	--	--
Max. Overtemperature (5 sec. limit)	950	--	1000	--	--	--
Oil inlet temperature range, °C	minus 15 to + 120	--	--	--	--	--
Min. start	minus 30	--	--	--	--	--
Min. wet takeoff						
- aircraft static	50	40	50	40	60	--
- aircraft rolling	40	--	50	40	--	--

Maximum permissible temperatures: Turbine gas temperature, (°C)	532-7P	535-7R	551-7	551-7R	552-2, 552-7, 552-7R		
Takeoff (wet)	925	920	940	--	930		
Takeoff (dry)	--	--	910	--	900		
Maximum Continuous	910	920	930	--	920		
Maximum Transient for starts	--	--	--	--	930		
Max. Overtemperature (5 sec. limit)	--	--	--	--	1000		
Oil inlet temperature range, °C	--	--	--	--	--		
Min. start	--	--	--	--	--		
Min. wet takeoff					<u>552-2</u>	<u>552-7</u>	<u>552-7R</u>
- aircraft static	40	50	65	50	60	65	50
- aircraft rolling	40	50	65	50	40	65	50

NOTE 2. Fuel & Oil Pressure Limits:

Fuel supply pressure at engine fuel inlet varies with flow per latest approved issue of RR curve HK 23643.

Oil pressure varies with oil inlet temperature. Normal for 525 series, 13 to 35 psig; for all other models, 12 to 35 psig. 9 psig is minimum in-flight for all models.

NOTE 3. The engine ratings are based on standard conditions with no air bleed or aircraft accessory power extraction, 60°F, 29.92 in. Hg., and PW/PO=.01 at sea level within limiting gas temperatures. On dry air, T.O. power is increased less than .5% and M.C. power by 1.3%. Jet thrust is converted to equivalent shaft hp by dividing the thrust value by a factor of 2.5. The output values are the minimum acceptable and are based on the use of Rolls-Royce exhaust cone RK 21556, RK 25226 or approved equivalent and with 12 thermocouples located in the intermediate turbine guide vanes.

NOTE 4. Water/methanol injection is optional and is utilized through automatically varied flow to provide a constant level of power output for take-off. The w/m fluid should be a 63/37 mixture of water and methyl alcohol for all models, (Rolls-Royce MSRR 9359 latest approved issue). The water used is distilled or contains a maximum of 10 ppm solids, and the methyl alcohol is British D.Eng.RD.2491 or equivalent. The w/m flow varies up to a maximum for the different models as follows:

525 series: 493 gph (U.S.); 529-8X, 529D-8X, 529-8Y, 529D-8Y, 529-8Z, 529D-8Z, 532-2L, 532-7, 532-7N, 532-7P, 660 gph (U.S.); 532-7L, 532-7R, 535-7R: 673 gph (U.S.); 535-2: 696 gph (U.S.); 551-7, 551-7R, 552-2, 552-7, 552-7R: 627 gph (U.S.); Remaining models: 564.5 gph (U.S.)

Refer to appropriate Rolls-Royce Operations Instructions for additional operating limits, characteristics and procedures when using W/M selection (NOTE 14).

NOTE 5. Accessory provisions on engine (oil cooler and air inlet are engine-mounted)

Drive	Rotation (facing drive) (C-clockwise) (CC-counter clockwise)	Speed Ratio to turbine	Continuous Torque* (in. lb.)	Static Torque** (in. lb.)	Maximum Overhang (in. lb.)
Power takeoff (120hp)	CC	.345	1510	6300	101
Propeller Governor					
CU 84 for 525 series 528 series 529-7E, 529D-7E, 529-7H, 529D-7H, 532-2L, 532-7 series, 535 series, 551 series, and 552-7, 552-7R	CC	.192	138	1380	102
CU 88 for 529-8 series and 529D-8 series,					
CU 91 for 531					
CU 99 for 552-2					
Starter (Rotax C5104)	CC	2.0	272	1000	84
Fuel pump (Lucas GB 222/3AU series)	CC	.192	108	780	34
* Continuous torque values are based on takeoff power at sea level.					
** Maximum torque of weak link without permanent set, or the clutch setting for the starter.					

NOTE 6. Approved fuels and fuel additives given in Rolls-Royce Operating Instructions. (See NOTE 14).

NOTE 7. These engines meet FAA requirements for icing protection, for adequate turbine disk integrity, for rotor blade containment, and do not require external armoring.

NOTE 8. Propellers used with this engine must have functioning characteristics which are compatible with the engine and its control system.

NOTE 9. Maximum air bleed for aircraft services is 1.55% of the no-bleed mass flow.

NOTE 10. Maximum overspeed limit is 17000 rpm for 20 seconds. If these limits are exceeded, the engine will require inspection as detailed in the Rolls-Royce Maintenance Manual.

NOTE 11. The maximum allowable horsepower cleared for the engine to cover operation at low ambient air temperature and/or ram conditions is 3000 HP for the 529 series, 532 series, 535 series, 551 and 552 series and is 2075 HP for all other models.

NOTE 12. The above models incorporate the following general characteristics.

Model:

Characteristics:

1A Dart 525	Basic model for use in Viscount 800 Series aircraft. 10' 0" Propeller.	Approved December 2, 1957
B Dart 525F	As 525 with improved turbine blading and higher TCT operating limitations.	Added April 7, 1961 Cancelled December 9, 2002 (See note 15)
C Dart 525D	As 525F but with a modification to the nozzle box affecting interchangeability.	Added February 7, 1962 Cancelled December 9, 2002 (See note 15)
2 Dart 526	Variant for installation in Armstrong Whitworth Argosy aircraft. Take-off and Maximum continuous ratings are higher than 525. 11' 6" Propeller.	Added November 23, 1959 Cancelled December 9, 2002 (See note 15)

NOTE 12. (Continued)

Model:	Characteristics:	
3 Dart 527	Variant for installation in Handley Page Herald aircraft. Ratings as Dart 526. 12' 6" Propeller	Added September 17, 1956 Cancelled December 9, 2002 (See note 15)
4A Dart 528	Variant for installation in Fokker & Fairchild F.27 Friendship aircraft. ISA rating same as Dart 526 but lower takeoff and max. continuous temperature limit as fitted with early standard of turbine blading 11' 6" Propeller.	Added June 22, 1960 Canceled September 9, 1980 (See Note 15)
B 528-7E	As 528 with improved turbine blading and higher TGT operating limitations.	Added June 22, 1960
C 528D-7E	As 528-7E but with nozzle box modification affecting interchangeability.	Added February 7, 1962
D 532-7	AS 528-7E but with various mechanical improvements and with a higher wet rating.	Added June 1, 1965
E 532-7L	As 532-7 but with improved turbine blading and higher rating/operating limitations.	Added January 15, 1968
F 532-7N	As 532-7 but with modified water methanol unit, improved HP turbine blade material and higher T.G.T. limitations, to permit use of w/m up to 15,000 ft.	Added March 24, 1969
G 532-7P	As 532-7 but with improved turbine blading and higher wet takeoff and MC T.G.T. limits	Added March 24, 1969
H 532-2L	As 532-7L but with installation features for Hawker Siddeley, HSA 748 aircraft.	Added April 7, 1972
I 532-7R	As 532-7L but with w/m unit set to provide higher wet takeoff rating.	Added February 19, 1976
J 535-2	As 532-2L but with improved turbine blading, higher T.G.T. limitations, and higher max. continuous rating.	Added May 22, 1980
K 535-7R	As 532-7R but with improved turbine blading, higher T.G.T. limitations, and a higher maximum continuous rating.	Added September 3, 1980
5A Dart 529	Variant for installation in the Grumman Gulfstream aircraft. As Dart 526 but with higher takeoff and maximum continuous rating. 11' 6" Propeller.	Added September 17, 1958 Cancelled September 9, 1980 (See Note 15)
B 529D	As 529 but with nozzle box mod. affecting interchangeability.	Added February 7, 1962 Cancelled Sept 9, 1980 (see Note 15)
C 529-8E	As 529 but with improved turbine bladeing and higher T.G.T. operating limitations.	Added February 7, 1962
D 529D-8E	As 529-8E but with nozzle box mod. affecting interchangeability.	Added February 7, 1962
E 529-8H	As 529-8E but with various mechanical improvements and higher cruise T.C.T. limitations.	Added June 1, 1965
F 529D-8H	As 529-8H but with nozzle box mod. affecting interchangeability.	Added June 1, 1965
G 529-7E	As 529-8E but for installation in Fokker and Fairchild Executive Friendship aircraft. 11' 6" Propeller.	Added February 7, 1962
H 529-7E	As 529-7E with nozzle box mod. affecting interchangeability.	Added February 7, 1962
I 529-7H	As 529-7E but with various mechanical improvements and higher cruise T.G.T. limitations.	Added June 1, 1965

NOTE 12. (Continued)**Models:****Characteristics:****(Cont'd)**

J 529D-7H	As 529-7H with nozzle box mod. affecting interchangeability.	Added June 1, 1965
K 529-8X	Variant for installation in Grumman Gulfstream executive aircraft. As 529-8H but with higher wet take-off ratings.	Added October 1, 1965
L 529D-8X	As 529-8X with nozzle box mod. affecting interchangeability.	Added October 1, 1965
M 529-8Y	As 529-8X but with improved turbine blading and higher max continuous TGT limit.	Added June 16, 1981
N 529D-8Y	As 529-8Y but with nozzle box mod affecting interchangeability	Added June 16, 1981
P 529-8Z	As 529-8Y but with improved turbine blading and higher max continuous TGT limit	Added June 16, 1981
Q 529D-8Z	As 529-8Z but with nozzle box mod affecting interchangeably.	Added June 16, 1981
6 Dart 531	Variant for installation in Avro 748 aircraft. Ratings and limitations as Dart 526 but with increased wet TO TCT limit. 12' 0" dia. propeller.	Added February 7, 1962
7 Dart 530	Variant for installation in Viscount aircraft. Upated 525F with increased wet and dry Takeoff and Maximum Continuous power ratings.	Added December 28, 1982 Cancelled December 9, 2002 (see note 15)
8A Dart 551-7	Variant with new impellers and turbines for installation in Fokker F27 aircraft. Updated 535-7R with increased wet and dry takeoff and maximum continuous power ratings and improved specific fuel consumption.	Added January 14, 1985
B Dart 551-7R	As 551-7 but with lower wet power rating.	Added January 14, 1985
9A Dart 552-2	Variant for installation in HSA 748 aircraft. Upated and improved s.f.c. Derivative of Mk536-2.	Added August 30, 1985
B Dart 552-7R	Improved fuel burn derivative of Mk551-7R.	Added August 30, 1985
C Dart 552-7	Improved fuel burn derivative of Mk551-7, mechanically similar to Mk552-7R but with a higher water-methanol power rating.	Added August 30, 1985

NOTE 13. Ratings shown give HP at the propeller shaft conditions per NOTE 3. Corresponding ratings at the turbine shaft with 40 HP gearbox offtake for these models are:

529-8X, 529D-8X, 529-8Y, 529D-8Y, 529-8Z, 529D-8Z	532-7, -7N, -7P	532-2L, -7L, 535-2	532-7R, 535-7R
2239-2030-522-15000	2239-2030-522-15000	2293-2080-532-15000	2336-2120-539-15000

NOTE 14.

ENGINE MARK NO.	AIRCRAFT	MAINTENANCE MANUAL	OPERATING INSTRUCTIONS
525	Vickers Viscount	M-Da7-V	F-Da7-V
528-7E, 528D-7E	Friendship Fairchild and Fokker	M-Da7-F	F-Da7-FaF F-Da7-FoF
529-7E, 529D-7E, 529-7H, 529D-7H	Fairchild Friendship	M-Da7-F	F-Da7-FaF
529-8E, 529D-8E 529-8H, 529D-8H 529-8X, 529D-8X 529-8Y, 529D-8Y 529-8Z, 529D-8Z	Grumman Gulfstream	M-Da7-G	F-Da7-G
531, 532-2L, 535-2, 552-2	H.S.A. 748	M-Da7-Av	F-Da7-Av
532-7, 532-7L, 532-7N	Friendship Fairchild and Fokker	M-Da7-F	F-Da7-FaF F-Da7-FoF
532-7P, 532-7R, 535-7R, 551-7, 551-7R, 552-7, 552-7R	Fokker Friendship	M-Da7-F	F-Da7-FoF
OVERHAUL MANUAL:			
ALL MARK NOS.		0-Da7-AC	

NOTE 15. The 528, 529, and 529D are no longer in service and were deleted from this TCDS on September 9, 1980. The 525D, 525F, 526, 527 and 530 are no longer in service and were deleted from this TCDS on December 9, 2002.

NOTE 16. Life limits, established for critical rotating components, are published in Chapter 5 of the maintenance and overhaul manuals.

NOTE 17. Service Bulletins, structural repair manuals, vendor manuals, aircraft flight manuals, and overhaul and maintenance manuals, which contain a statement that the document is Luftfahrt-Bundesamt approved, are accepted by the FAA and are considered FAA approved. These approvals pertain to the type design only.

---E N D---