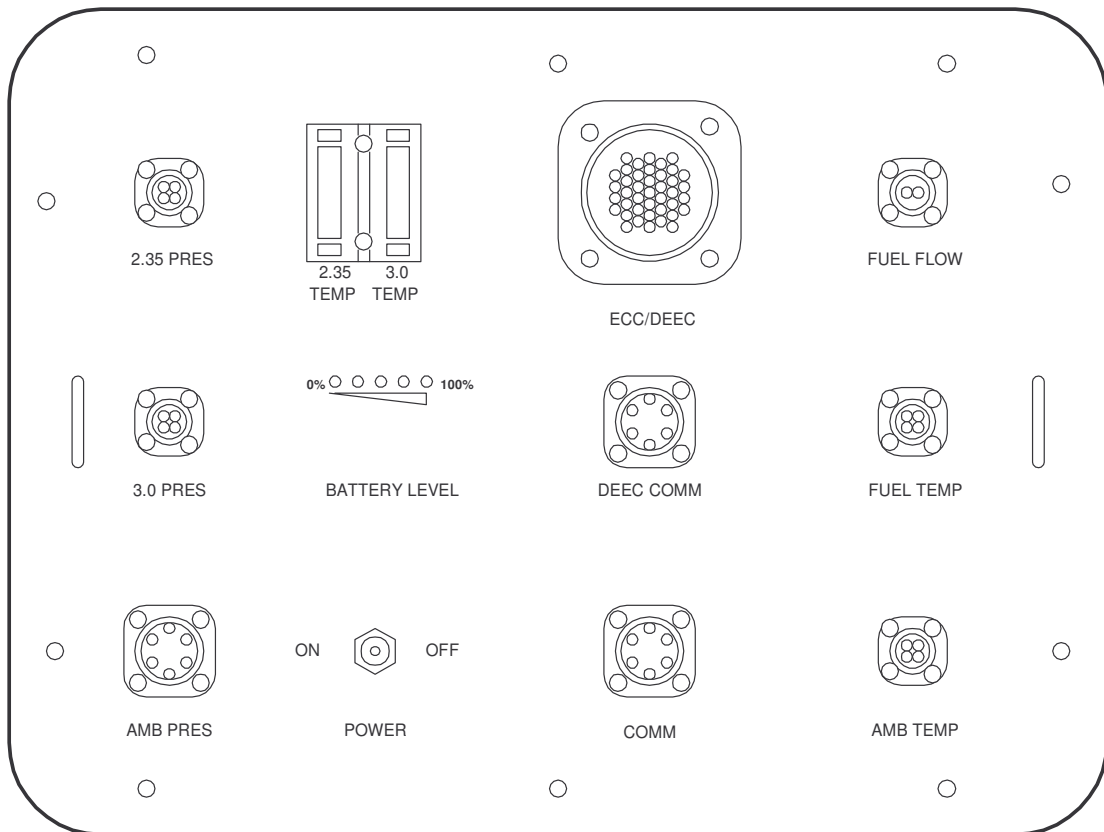

Chapter 2

JEDA Description

This chapter gives you a brief tour of the 1752B JEDA unit. It describes the various input and output ports, their functions, and the standard accessories supplied with the JEDA. Optional accessories are discussed later in the chapter in Section 2.5, Optional Equipment.



2.1 - Input and Output Ports

There are twelve input/output ports on the front and side panel of the JEDA, as shown in the figure above: Three pressure inputs, 2.35 Pressure, 3.0 Pressure and AMB Pressure four temperature inputs, 2.35 Temp, 3.0 Temp, Fuel Temp, and AMB Temp, two communications Input/outputs, DEEC COMM and COMM, a single FUEL FLOW input and a single ECC/DEEC Harness input/output. There is also the POWER switch and BATTERY LEVEL indicator on the faceplate. The BATT CHG input is located on the side of the JEDA case and is protected by a cap.

2.1.1 – 2.35 PRESS (pressure) INPUT

The 2.35 pressure input is provided to allow the connection of an MS type connector of a cable from a pressure transducer for collecting the station 2.35 pressure. A pressure hose is connected at station 2.35 and routed to the 2.35 pressure transducer, which is normally mounted in a rack on the side of the JEDA unit case. The 18-inch cable is then connected to the output of the transducer and routed to the 2.35 PRES input of the JEDA. The transducer, hose, rack and cable are all available from ACES Systems.

2.1.2 – 3.0 PRESS INPUT

The 3.0 pressure input is provided to allow the connection of an MS type connector of a cable from a pressure transducer for collecting the station 3.0 pressure. A pressure hose is connected at station 3.0 and routed to the 3.0 pressure transducer, which is normally mounted in a rack on the side of the JEDA unit case. An 18-inch cable is then connected to the output of the transducer and routed to the 3.0 PRES input of the JEDA. The transducer, hose, rack and cable are all available from ACES Systems.

2.1.3 – AMB PRES INPUT

The ambient pressure input is provided to allow the connection of an MS type connector of a cable from a pressure transducer for collecting ambient pressure. A pressure hose is not necessary for the ambient pressure transducer, which is normally mounted in a rack on the side of the JEDA unit case but may be physically separated from the JEDA unit by a distance limited only by the length of the cable. An AMB PRESS cable is then connected to the output of the transducer and routed to the AMB PRES input of the JEDA. The transducer, cable and rack are available from ACES Systems.

2.1.4 – 2.35 TEMP INPUT

The 2.35 TEMP input is provided to allow the connection of a bayonet type plug and cable from a station 2.35 thermocouple. The cable and connector assembly is available from ACES Systems.

2.1.5 – 3.0 TEMP INPUT

The 3.0 TEMP input is provided to allow the connection of a bayonet type plug and cable from a station 3.0 thermocouple. The cable and connector assembly is available from ACES Systems.

2.1.6 – FUEL TEMP INPUT

The fuel TEMP input is provided to allow the connection of an MS type, 4 pin connector and cable from a RTD fuel temperature probe. The cable and fuel temp probe are available from ACES Systems. (See Optional Equipment section of this chapter.)

2.1.7 – AMB TEMP INPUT

The AMB TEMP input is provided to allow the connection of an MS type, 4-pin connector. The opposite end of the cable is connected to an RTD ambient air temperature sensor, which is placed in the vicinity of the engine. The cable and ambient temperature sensor are available from ACES Systems.

2.1.8 – DEEC COMM INPUT/OUTPUT

The DEEC COMM input/output is provided for communications **between the JEDA and the N1 DEEC computer** mounted in the aircraft. This cable is how the JEDA sends commands to the DEEC to control the engine during data collection and how it receives information from the DEEC, which is then transferred to the Analyzer for storage. At the time of this writing there were three variants of the DEEC COMM cable, (1). A generic cable which works with most DEEC Models. (2). The Lear 45 DEEC COMM cable which works only with the Lear 45 application and (3). The Falcon 900/IAI SPX which works with either the Falcon 900 or the IAI SPX. The computer end of the cable interfaces with the particular computer or airframe for which it was designed and the opposite end connects to the 6 Pin MS DEEC COMM connector of the JEDA.

NOTE

Take care not to confuse the DEEC COMM and the COMM ports of the JEDA unit. While the connectors are the same, you will not be able to communicate with the JEDA or the Analyzer if the connections are cross connected.

2.1.9 – COMM INPUT/OUTPUT

The input marked simply “COMM” is for connection of the communication cable **between the Analyzer and the JEDA unit**. This cable is approximately 70 feet long and connects to the MS 6 pin COMM connector on the JEDA. The opposite end of this cable terminates with a 25 pin DB connector which is connected to a RS232-to-RS422 converter which in turn connects to the serial port of the analyzer. This cable is how the analyzer sends commands to the JEDA unit during the calibration run.

NOTE

Take care not to confuse the DEEC COMM and the COMM ports of the JEDA unit. While the connectors are the same, you will not be able to communicate with the JEDA or the Analyzer if the connections are cross connected.

2.1.10 – EEC/DEEC INPUT/OUTPUT

The EEC/DEEC connector is provided so that a harness can be connected between the engine, N2 ECC or N2 DEEC computer, and JEDA unit. These cables are used in place of the DEEC COMM cables when the engine is equipped with older EEC or N2 DEEC computers. The DEEC Harness may also be used in conjunction with the DEEC COMM cable on engines equipped with the 8002–60 or 8002–62 N1 DEEC computers. The EEC or DEEC Harness connects in line with the signal transmissions between the engine and the computer. The T5 line is the only signal that may be broken between the engine and computer so that the JEDA unit can simulate overtemperature conditions. The EEC and DEEC harness cables are available from ACES Systems.

2.1.11 – POWER SWITCH

The power switch is a ON/OFF gate protected toggle switch which turns power to the JEDA unit on or off. When the power switch is positioned to ON, you should be able to hear a series of faint clicks as various relays in the JEDA perform a self-check. If the battery is sufficiently charged, you should also see illumination of one or more battery level indicator lights.

2.1.12 – BATTERY LEVEL INDICATOR

The battery level indicator assembly is provided as a quick reference for the state of the battery contained inside the JEDA unit. The assembly contains five lights, three green, 1 amber, and 1 red, to indicate the approximate level of battery power remaining. If the red light is illuminated you should terminate the run and recharge the battery before proceeding. If you are using the EEC or DEEC harness, the battery will be charged from the engine computer as it is being used. The DEEC COMM cable also has the same battery charging capability.

2.1.13 – BATT CHG INPUT

The “BATT CHG” (Battery Charge) port is used in conjunction with the battery charger supplied with the JEDA. Your analyzer will come with either a 110V or 220V charger according to your geographical requirements. See the section of this manual on “CHARGING THE BATTERY” for details of charging.

WARNING

When using the 220V battery charger, do not leave the battery attached (on charge) for a period of more than 24 hours. To do so may result in damage to the battery and/or analyzer.

WARNING

The protective cap on the “BATT CHG” port must remain in place during periods when the charging unit is not connected. The two pins of the charging input are active at all times and may be shorted by unintentional contact with a conductor if the cap is not in place.

2.2 - Additional Standard Equipment

The standard 1752B kit contains the JEDA unit, plus all the necessary items to complete a single-engine calibration run on an N1 DEEC equipped aircraft other than a Lear 45, Falcon 900, Falcon 50 or ASTRA SPX. If your requirements are for older EEC, N2 DEEC, Lear 45, Falcon 900, Falcon 50 or IAI SPX, additional equipment will be required. The individual accessory items in the standard 1752B kit are described below.

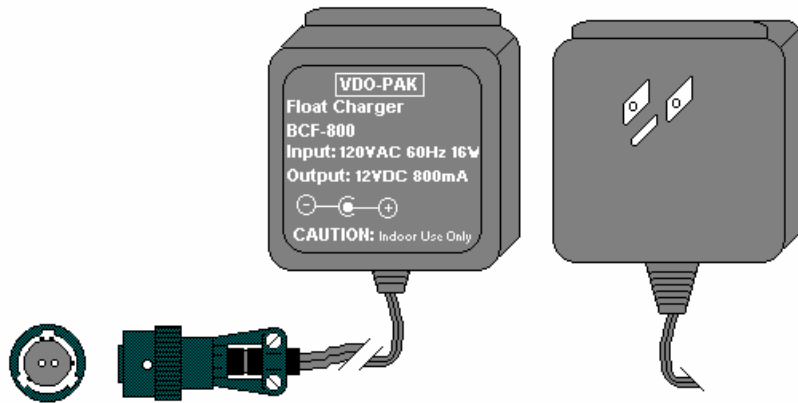
2.2.1 - Battery

The primary power source for the analyzer is its internal battery. It is a camcorder, RB-85 type 12-volt lead acid battery rated at 2.3 Amp hours. This means that a fully charged battery will supply power at the rate of 2.3 Amps for one hour or at the rate of 1 Amp for 2.3 hours. Typically, a fully charged battery will provide power for 4 to 6 hours of continuous operation while powering all available sensors. Power is proportionally increased with the use of fewer sensors and accessories. A minimum of 2 hours charging time is required for a full charge. If using the optional EEC or DEEC harness, the battery will be charged while the JEDA is connected to the powered computer. As with any lead acid battery, age, usage, and environmental conditions may eventually necessitate battery replacement. We do not recommend you change the battery yourself because of the possibility of damage to other components. Contact ACES Systems for details about return and replacement of the internal battery.

2.2.2 - Battery Charger

The analyzer’s internal battery must be charged periodically. This is accomplished using the battery charger included as standard equipment with your analyzer and shown in the figure below. The 12-Volt DC battery charger is a standard float-type charger commonly used to

charge lead-acid, camcorder-type, batteries. The charger has an input of 120VAC, 60Hz, 16W. The output is 12VDC, 800mA. The charger has a three-prong (grounded) outlet connector built into the charging unit which plugs directly into a wall outlet. On some chargers, a red LED indicator light (not shown in the figure below) built into the charger head indicates when a charge is being supplied. The cord is a standard, 16-gage electrical appliance cord that is 6 feet long. The connector is an MS, two-pin female, quarter turn lock type constructed of aluminum alloy and coated with olive drab chromate for corrosion protection.



2.2.2.1 - Charging the Battery

To charge the battery, do the following.

1. Place the JEDA near an indoor AC electrical outlet where it can remain undisturbed for at least two hours.

WARNING

When using the 220V battery charger, do not leave the battery attached (on charge) for a period of more than 24 hours. To do so may result in damage to the battery and/or Analyzer.

2. Remove the protective cap from the “BATT CHG” port of the JEDA and connect the MS connector of the battery charger.
3. Plug the charging unit into a 120VAC, 60Hz (or 220VAC 50 Hz for the 220V charger) outlet and note that the red LED indicator light on the charger head illuminates, indicating an in-progress charge.

NOTE

The red LED indicator light does not exist on any 220V chargers or certain models of the 110V charger.

4. Leave the JEDA connected to the charger for a minimum of two hours. (The 120V charger may remain connected continuously without harm to the analyzer, battery, or charger.) The red LED indicator light, if so equipped, will blink when charge is complete.

5. When charging is complete, unplug the charger from the AC outlet and disconnect from the JEDA. Replace the protective cap on the JEDA's "BATT CHG" port. Place the charger in a safe place for future use.

NOTE

When the JEDA is connect to the aircraft s engine computers, 28V DC from the computer is used to charge the JEDA battery during operation.

2.2.3 - Carry Case

The JEDA case is constructed of expanded ABS plastic. The case is durable and protects its contents from the elements when closed and latched. Clean the case with a mild soap solution and coat with an ARMOR ALL® type protectant to preserve appearance. (ARMOR ALL is a registered trademark of the Clorox Company.) The case has a limited lifetime warranty from the original manufacturer. The case is airtight when the purge valve is closed (turned clockwise to its limits). If the case is transported between the varying pressure altitudes, such as those, which occur during air travel, the case may be difficult to open due to pressure differential. If there is a pressure differential between the exterior and interior of the case, open the purge valve by turning it counterclockwise. This will allow the pressure to equalize and ease the task of opening the case.

2.2.4 - Owners Manual

The *ACES 1752B JEDA Owners Manual* provides basic information such as an equipment description and routine care for the 1752B JEDA . The guide does not provide information on using the JEDA. Refer to the engine LMM or the ACES engine or airframe specific Appnote for detailed information on the JEDA's operation. Appnotes can be downloaded directly from the ACES web site (www.acesystems.com).

2.2.5 - Software, JEDA Comm for Windows

JEDA Comm is the communications software, which allows you to transfer collected data to a PC for reduction by MEDRA software. When installing JEDA Comm, you should install it under the MEDRA directory. JEDA Comm is an ACES Systems product and is provided free of charge on our web site (www.acesystems.com) should the need arise. JEDA Comm is also supported by ACES Systems product support during the warranty period. MEDRA is a Honeywell software product written, marketed and supported by ACES Systems under a contract agreement with Honeywell Engines. The individual user, on an annual basis, must purchase support for MEDRA from ACES Systems. Purchased support includes telephone support as well as all software upgrades during the support period at no additional charge.

2.2.6- Procedure, TFE731 EMS

EMS is the software, which drives the JEDA Controller, the Analyzer. The EMS Procedure is loaded into the analyzer memory where it resides until removed. The EMS procedure is

necessary to collect data on all N1 DEEC equipped engines. EMS will also acquire data on older N2 DEEC and ECC equipped engines in conjunction with optional equipment. In this respect, the EMS functions as the previously released JEDA Test Controller Procedure, but includes the fuel and time saving aspects of EMS. The EMS software for both the 17XX series and 4040 series analyzers is included with the purchase of the 1752B JEDA. All subsequent upgrades to the software are provided at no additional charge and may be downloaded from the ACES web site at your convenience.

2.2.7 - Cable, N1 DEEC Comm, 10 Ft.

This N1 DEEC cable is how the JEDA communicates with the standard N1 DEEC. This is the only communications link necessary between the standard N1 DEEC computer and the 1752B JEDA unit. The word “standard” refers to all variants of the N1 DEEC except those on the Lear 45, Falcon 900B, Falcon 20B, Falcon 900EX, IAI SPX, and Hawker 800XP. For DEEC communications on those airframes, see OPTIONAL EQUIPMENT below. The N1 DEEC Comm cable has a 6 pin MS male connector at one end and a 22 pin female connector on the opposite end. The 6 pin MS connector end attaches to the DEEC COMM port of the JEDA unit and the 22 pin MS connector end connects directly to the N1 DEEC Computer. The part number of this cable, 10-320-0267, is attached to the cable near the connector ends.

2.2.8 - Cable, Communications, 1752B JEDA-to-1700

This cable is the communications connection between the JEDA unit and the 1700 or 1725 analyzer controlling it. The 1752B JEDA is normally located in the rear avionics compartment where the engine computers are located while the analyzer is normally located in the cockpit or cabin where the operator is using it. The cable is long enough to accommodate any airframe application where the JEDA might be used. One end of the cable is a common DB25M connector and the opposite end is a 6 pin MS male connector. The MS connector end connects to the COMM port of the JEDA unit while the DB25M end is connected to the RS232-to-RS422 converter. The converter is then connected to the 25 pin comm port of the 1700 Analyzer Plus or to a 25-to-9pin adapter for connection to the 1725 Trim TEC Analyzer. The part number of this cable, 10-320-0258, is attached to the cable near the connector ends.

2.2.9 - Converter, RS232-to-RS422

This converter is a small, in line attachment to the JEDA-to-1700 communications cable above. It is attached to the DB25M end of that cable and converts the RS232 signal to RS422 avoiding loss of signal due to the extended length of the communications cable. The part number of the converter, 75-210-0058, is affixed to the converter label.

2.2.10 - Cable, Ambient Temp, JEDA

This cable connects the RTD ambient temperature probe to the JEDA unit. The cable connects to the JEDA at the AMB TEMP input at one end and to the RTD AMB TEMP probe at the other. The cable is long enough to allow the temp probe to be located in the

vicinity of the engine inlet. The part number of this cable, 10-320-0262, is attached to the cable near the connector ends.

WARNING

The Ambient Temperature sensor and cable must be secured with ties or tape to prevent possible ingestion into the engine.

2.2.11 - Assembly, Sensor, RTD Ambient Temp

The ambient sensor assembly, or probe as it is sometimes referred to, collects the ambient temperature while other data is being collected by the JEDA from the engine computer. The ambient temperature at the time of data collection is stored in the same data file and transferred to the PC and MEDRA for performance calculations. The AMB TEMP SENSOR should never be placed in direct sunlight while in use.

WARNING

The Ambient Temperature sensor and cable should be secured with ties or tape to prevent possible ingestion into the engine.

2.3- Optional Equipment

Because the Model 1752B JEDA is so diverse in its capability, many accessories such as pressure transducers, temperature and engine or airframe specific DEEC COMM cables are available when required by the application.

For various engine and airframe applications, contact ACES Systems directly at the number or web address listed at the front of this manual to inquire about available accessories for your particular needs.

Certain engine and airframe applications use common accessories, so ACES Systems has assembled a standard kit, described above, which is included with the purchase of the Model 1752B JEDA. Optional items are listed below.

2.3.1 - Cable, DEEC Comm, Lear 45

The Lear 45 N1 DEEC cable is how the JEDA communicates with the Lear 45 N1 DEEC. This is the only communications link necessary between the Lear 45 N1 DEEC computer and the 1752B JEDA unit. This cable is only used with the Lear 45 application. It cannot be used for the standard N1 DEEC, Falcon 900, or IAI SPX. The Lear 45 N1 DEEC Comm cable has a 6 pin MS male connector at one end and a **22 pin female** connector on the opposite end. The 6 pin MS connector end attaches to the DEEC COMM port of the JEDA unit and the **22 pin** MS connector end connects to the N1 DEEC Computer connection of the Lear 45. The part number of this cable, 10-320-0273, is attached to the cable near the connector ends.

2.3.2 - Cable, DEEC Comm, Falcon 900EX (serial numbers up to 88) / IAI SPX

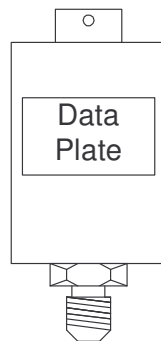
The Falcon 900EX (serial numbers up to 88) / IAI SPX N1 DEEC cable is how the JEDA communicates with the Falcon 900EX and IAI SPX N1 DEEC. This is the only communications link necessary between the Falcon 900EX (serial numbers up to 88) or IAI SPX N1 DEEC computer and the 1752B JEDA unit. The Falcon 900EX (serial numbers up to 88) / IAI SPX N1 DEEC cable is only used with those airframes. It cannot be used for the standard N1 DEEC or the Lear 45. The N1 Falcon 900EX / IAI SPX DEEC Comm cable has a 6 pin MS male connector at one end and a **22 pin female** connector on the opposite end. The 6 pin MS connector end attaches to the DEEC COMM port of the JEDA unit and the **22 pin** MS connector end connects to the N1 DEEC Computer connection of the Falcon 900EX or IAI SPX. The part number of this cable, 10-320-0275, is attached to the cable near the connector ends.

2.3.3 - Cable, Pressure Transducer, AMB

The Ambient Pressure Transducer Cable connects the optional ambient pressure transducer to the 1752B JEDA. The cable has a MS 6 pin female connector at one end and an MS 6 pin male connector at the opposite end. The Cable is extended length to allow freedom of placement for the transducer. The six pin female end connects to the electrical output connector of the ambient pressure transducer and the six pin male end connects to the AMB PRESS input of the JEDA unit. The part number of this cable, 10-320-0262, is attached to the cable near the connector ends. You should not modify the cable in any way as this may affect the accuracy of the measured ambient pressure.

2.3.4 - Transducer, AMB Pressure

The optional ambient pressure transducer senses and transmits the ambient pressure conditions at its locations to the JEDA unit. Although optional, the sensor does offer a more accurate option than setting the aircraft altimeter to 2992 in Hg and reading the approximate pressure. The part number of the transducer, 10-320-0355, is stamped on the data plate of the transducer.



2.3.5 - Cable, Pressure Transducer, 2.35 / 3.0

The 2.35 / 3.0 Pressure Transducer Cable connects both the optional 2.35 and 3.0 pressure transducers to the 1752B JEDA. The cable has a MS 6 pin female connector at one end and an MS 4 pin male connector at the opposite end. The Cable is a fixed length of 12 inches to avoid signal loss. The six pin female end connects to the electrical output connector of either the 2.35 or 3.0 pressure transducer and the 4 pin MS male end connects to the 2.35 PRES input or 3.0 PRES input of the JEDA unit. The part number of this cable, 10-320-0241, is attached to the cable near the connector ends. One cable is required for each transducer being used for the 2.35 or 3.0 pressure readings. You should not modify the cable in any way as this may affect the accuracy of the measured pressures.

2.3.6 - Transducer, 2.35 Pressure

The optional 2.35 pressure transducer senses and transmits station 2.35 pressure conditions during calibration runs. Although optional, the sensor does offer a more accurate option than entering the approximate pressure reading from a analog gage if you wish to collect this pressure. The part number of the transducer, 10-320-0356, is stamped on the data plate of the transducer.

2.3.7 - Transducer, 3.0 Pressure

The optional 3.0 pressure transducer senses and transmits station 3.0 pressure conditions during calibration runs. Although optional, the sensor does offer a more accurate option than entering the approximate pressure reading from a analog gage if you wish to collect this pressure. The part number of the transducer, 10-320-0357, is stamped on the data plate of the transducer.

2.3.8 – Hose, Pressure, 2.35/3.0 Transducer

The transducer pressure hoses connect the engine station 2.35 and 3.0 pressures to the transducer. They are available in two lengths, 12 ft. Part Number 10-100-0349, and 25 ft. Part Number 10-100-0366.

2.3.9 – Adapter, DB25F-to-DB9F

The DB25F-to-DB9F adapter is used to interface the RS232-to-RS422 converter (see above) to the 9 pin male serial comm connector of the 1725 Trim TEC Analyzer. This adapter is only required when you are using the 1725 Analyzer with the 1752B. This adapter may be purchased locally in any electronic retail store if you require, but do not have one. You may also order it directly from ACES System. The part number is 75-800-0016.

2.3.10 – Cable, 2.35 Temp

The 2.35 temp cable connects to a thermocouple at station 2.35 and delivers the measured temperature to the JEDA unit. The temperature is then recorded with the calibration run data and transferred to MEDRA. The part number for the 2.35 temp cable is 10-320-0242.

2.3.11 – Cable, 3.0 Temp

The 3.0 temp cable connects to a thermocouple at station 3.0 and delivers the measured temperature to the JEDA unit. The temperature is then recorded with the calibration run data and transferred to MEDRA. The part number for the 3.0 temp cable is 10-320-0243.

2.3.12– Meter, Fuel Flow, Turbine

The fuel flow turbine is installed in line between two straightening tubes to accurately measure the fuel flow being delivered to the engine. It is connected to the JEDA via the Fuel Flow Cable listed below. The part number for the Turbine Fuel Flow Meter is 54-200-0001.

Note

The Fuel Flow Meter is no longer being produced by the original manufacturer and is not available at the time of this writing.

2.3.13– Cable, Fuel Flow

The fuel flow cable has two MS 2 pin connectors, one at each end. The cable is used to connect the Turbine Fuel Flow Meter to the JEDA unit at the Fuel Flow connector. The cable is a four wire (two of which are unused) shielded, Teflon coated, petroleum resistant cable. The part number for the cable, 10-320-0231, is attached to each end near the MS connectors.

2.3.14– Probe, RTD Fuel Temp

The RTD Fuel Temperature Probe is used to collect the fuel temperature. It is inserted into the fuel stream upstream from the Fuel Flow Meter into one of the wrenching flats of an AN8 union. It is connected to the JEDA unit by the Fuel Temp cable. The part number for the fuel Temp Probe is 10-100-0121



2.3.15 – Cable, Fuel Temp

The fuel temp cable connects the Fuel Temp Probe (seen above) to the JEDA unit. The cable is a four wire, shielded, Teflon coated, petroleum resistant cable. The part number for the cable, 10-320-0233, is attached to each end near the MS connectors.

2.3.16– Harness, DEEC

The DEEC Harness is designed to collect calibration run information from the N2 DEEC computer equipped engines. The longer end (10-ft.) of the harness connects to the JEDA at the ECC/DEEC connector. The wiring harness from the computer to the engine is disconnected and female end of the shorter section of the DEEC Harness is connected to the computer. The wiring harness previously disconnected from the compute then connects to the male connector end of the short section of the DEEC Harness. The part number for the DEEC Harness is 10-320-0239.

WARNING

The DEEC Harness should not be connected to the aircraft independent of the JEDA. To do so will open the T5 circuit and cause overtemps on engine start.

NOTE

The –60 and –62 N1 DEEC computers installed on Falcon 900B / 20B and the Hawker 800XP respectively, currently do not have a DEEC COMM cable defined. It is believed that these airframes will require the use of both the N1 DEEC COMM cable as well as the DEEC Harness (see above) in order to collect data for a calibration run.

2.3.17– Harness, EEC

The EEC Harness is designed to collect calibration run information from the N2 EEC computer equipped engines. The longer end (10-ft.) of the harness connects to the JEDA at the ECC/DEEC connector. The wiring harness from the computer to the engine is disconnected and female end of the shorter section of the EEC Harness is connected to the computer. The wiring harness previously disconnected from the compute then connects to the male connector end of the short section of the DEEC Harness. The part number for the DEEC Harness is 10-320-0238.

WARNING

The DEEC Harness should not be connected to the aircraft independent of the JEDA. To do so will open the T5 circuit and cause possible overtemps and/or torching on engine start.