DEPARTMENT OF THE ARMY TECHNICAL BULLETIN

ALIGNMENT PROCEDURE FOR
Flexible Engine Diagnostic/Test System
A/E37T-33
(P/N 20090500-1, &-9)

Headquarters, Department of the Army, Washington, DC
14 July 2006

REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS

You can improve this manual. If you find any mistakes, or if you know of a way to improve these procedures, please let us know. Mail your letter or DA Form 2028 (Recommended Changes to Publications and Blank Forms) directly to: Commander, US Army Aviation and Missile Command, AMSAM-MMC-MA-NP, Redstone Arsenal, AL 35898-5000. A reply will be furnished to you. You may also provide DA Form 2028 information to AMCOM via e-mail, fax, or the World Wide Web. Our fax number is DSN 788-6546 or Commercial 256-842-6546. Our e-mail address is 2028@redstone.army.mil. Instructions for sending an electronic 2028 may be found at the back of this manual. For the World Wide Web, use https://amcom2028.redstone.army.mil.

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SECTION I
IDENTIFICATION AND DESCRIPTION

1. **Test Instrument Identification.**
   - **a.** This bulletin provides instructions for the alignment of Flexible Engine Diagnostic/Test System (FEDS), Model A/E37T-33 (P/N 20090500-1 & -9 or Air Force P/N 93D111-1). The 2000 edition of the Operation and Maintenance Instructions and TM 1-4920-443-10 were used as the prime data sources in compiling these instructions. The equipment being A will be referred to as the TI (test instrument) throughout this bulletin.
   - **b. Model Variations.** None.
   - **c. Time and Technique.** The time required for this alignment is approximately 40 hours, using various techniques including the dc and low frequency technique. The alignment interval for the FEDS is 180 days.
2. **Forms, Records, and Reports**
   - **a.** Forms, records, and reports required for alignment personnel at all levels are prescribed by TB 750-25.
   - **b.** Adjustments to be reported are designated by "®" at the end of the sentence in which they appear. When adjustments are listed in a table, "®" follows the designated adjustment. Report only those adjustments made and designated with "®".

Alignment Description. TI parameters and performance specifications which pertain to this alignment are listed in table 1.

Table 1 Alignment Description

TI Characteristics	Performance Specifications	Test Method
AC Ammeter	Range : 0 to 100 amps Tolerance ± 1% FS	Functional Test
AC Voltmeter	Range : 0 to 300 VV AC Tolerance ± 1% FS	Functional Test
DC Ammeter	Range : 0 to 50 amps Tolerance ± 1% FS	Functional Test.
DC Voltmeter	Range : 0 to 50 VV DC Tolerance ± 1% FS	Functional Test
Digital Flow Indicator and Turbine Flowmeter	Ranges: 380 to 5700 PPH (oil) 190 to 2280 PPH (fuel) 95 to 950 PPH (fuel) 7.6 to 494 PPH (fuel) Tolerance: ± 0.35% of indication	Must be calibrated at a qualified lab.
Digital Stop Clocks	Range: 0 to 9999.99 Sec, 0 to 9999.99 Min	Alignment is not required.
Dyno Shroud Position Indicator	Range: 0 to 100% (0-16 V dc) Tolerance ± 0.2%	Precision Voltage Source
Frequency Meter	Range: 55 to 65 Hz Tolerance ± 2%	Functional Test.
Fuel Level Gage	Range: 0 to 100%	Alignment is not required
Limit Control Temperature	Range : 0 to 1300 °F, Tolerance: ± 3 counts	Thermocouple Voltage Source
Pressure Indicator	Range: Various, Tolerance: ± 2 counts	Precision Voltage Source
Pressure Transducers	Range: Various, Tolerance: ± 0.5%	Pressure Alignment Test Sets
Specific Gravity Indicator	Ranges: 0.680 to 0.850 specific gravity Tolerance: ± 1% of range	Tested by comparison with a standard hydrometer.
Speed measurement System	Range: 0 to 120% Analog: ± 0.2% FS Digital: ± 0.2% FS	Apply tachometer generator signals proportional to verified rotation rate.
T53 Inlet Guide Vane (IGV) Position	Range: -10 to 90 degrees Tolerance ± .2 degrees	Precision Voltage Source (same as T700 IGV)
T53/T55/T63 TA Position	Range: 0 to 150 degrees Tolerance ± .5 degrees	Precision Voltage Source (Same as PAS)
T53/T55/T63 Torque Measurement System	Range IN-LBS Tolerance: ± 0.4% FS, Mod: 22793	BF Goodrich box, digital multimeter
T700 DYNO Torque	Range: 0-600 FT-LBS, Tolerance: ± 5 counts	Hanging Weights
T700 Inlet Guide Vane (IGV) Position	Range: -10 to 90 degrees (0-8V8V dc) Tolerance ± .2 degrees	Precision Voltage Source
T700 Load Demand Spindle (LDS) Position	Range: -45 to 105 degrees (0-12V12V dc) Tolerance ± .5 degrees	Precision Voltage Source
T700 Power Available Spindle (PAS) Position	Range: 0 to 150 degrees (0-12V12V dc) Tolerance ± .5 degrees	Precision Voltage Source
T700 Torque Meter	Range : 0-600 FT-LBS, Tolerance: ± 5 FT-LBS	Precision Voltage Source
Temperature Measurement System	Range : 0 to 1300 °F 0 to 2000 °F Tolerance: Analog: ± 0.1% FS Digital: ± 1 count	Thermocouple Calibrator
Variable Filter	Range: 8 to 2500 Hz Tolerance: ± 1%	Apply oscillator signals proportional in amplitude & frequency to the output gain and frequency response.
Vibration Meter	Displacement Range: 0 to 150 mils peak to peak from 5 to 5000 Hz Velocity Range: 0 to 150 in/sec from 5 to 5000 Hz Linearity: ± 2% Frequency Response ± 5%	Apply oscillator signals proportional in amplitude and frequency to meter deflections.
Vibration Transducers	Range: 50 to 150 mV/in/sec (sensitivity)	Must be calibrated at a qualified lab.

SECTION II
EQUIPMENT REQUIREMENTS

3. **Equipment Required.** Table 2 identifies the specific equipment to be used in this alignment procedure. Instruments used in this procedure are contained in the FEDS Calibration Kit, P/N 20090845. Alternate equipment may be used at the discretion of the using laboratory, provided that substitute equipment is of equal or better precision than that contained in the Calibration Kit. All test equipment should bear evidence of current calibration. The accuracies listed in table 1 provide a four-to-one ratio between the standard and TI. Where the four-to-one ratio cannot be met, the true accuracy of the equipment selected is shown in parenthesis. Refer to the commercial operator's manuals supplied with the calibration kit for operating instructions of the equipment.
4. **Accessories Required.** The accessories required for this alignment are common usage accessories, issued as indicated in paragraph 3 above, and are not listed in the alignment procedure.

Table 2 Equipment Required

Part No.	Description	Where Used
3928-1-0-1/USA	Eurotron 2000+ Calibrator	Various Systems
318	Weight Hanger	T700 Torque System
4238P	Vacuum Pump	Pressure System
44-1322-2081-005	Pressure Regulator	Pressure System
50190-0804	BF Goodrich box	T53/55/T63 Torque Measurement System
5SE00491-2	Wire, Type Kx	Temperature System
5SE01412	Torque Arm	T700 Torque System
6076P	Pressure Calibrator 200/500/1000 PSI (±0.05%)	Pressure Systems
6803T	Thermocouple Calibrator, Analogic Digi-Cal II (±0.03%)	Temperature System
7095P	Digital Electro-Pneumatic Calibrator (±0.1%)	Pressure System
7929E	Voltage Source (±0.05%)	Vertical Scale
7975E-B/ 4213E	Digital Multimeter (D.M.M.) (±0.5 to 1.0%)	Various Systems
8142B	Decade Box 0-999.9 ohms (±0.025%)	RTD System
8422E 2700-0001	Source Charge Frequency	Flow, Speed, & Vibration Systems
9100	Weight 50 lbs.	T700 Torque System
NCA-11-FCS/3A	Tachometer Generator Test Set (±0.02%)	Speed System
MIL-C-22491	Nitrogen Cylinder	Pressure System
SSE00491-1	Wire, Type Jx	Temperature System
LTCT 29089-03	Test Set, Flight Line	714 Torque
0368937-0001	CEC Vibe Extender Card	Vibrator System
9778124	Extender Card	T53/T55/T63 Torque Measurement System Limit Control Panel

SECTION III
ALIGNMENT PROCESS

5. Preliminary Instructions

a. The instructions outlined in this section are preparatory to the alignment process. Personnel should become familiar with the entire bulletin before beginning the alignment.

b. Test equipment used in this bulletin is referenced within the text by common name as listed in table 2.

c. Unless otherwise specified, verify the result of each test and, whenever the test requirement is not met, take corrective action before continuing with the alignment. Adjustments required to calibrate the TI are included in this procedure. Additional maintenance information is contained in the manufacturer's manual for the TI.

d. Unless otherwise specified, all controls and control settings refer to the TI.

6. Equipment Setup

WARNING

HIGH VOLTAGE is used or exposed during the performance of this alignment. **DEATH ON CONTACT** may result if personnel fail to observe safety precautions. **REDUCE OUTPUT(S)** to minimum after each step within the performance checks where applicable.

a. If necessary, zero-set meters by turning slotted disk below meter face until meter pointer indicates zero.

b. Remove TI protective covers as required for adjustment.

c. Activate POWER switch and allow at least 15 minutes (unless otherwise noted) for equipment to warm-up and stabilize.

7. Energizing Control Cab

a. Performance Check

(1) Ensure that CB 301 (Cab Main) and CB 302 (60Hz Control Voltage) are activated. At Motor Starter Panel (Cabinet No. 4) perform the following steps:
(2) Depress "60 Hz Pwr" button to activate 60 Hz, 120 V ac power.
(3) Depress #1 button to activate 28 V dc power supply # 1 28 V dc.
(4) Depress #2 button to activate 28 V dc power supply # 2 28 V dc.
(5) At Cabinet No. 4, activate power at Limit Control Panel.
(6) Activate power at Calculating Counter.
(7) Activate power at the Torque Processor System (BF Goodrich and/or Daytronics).
(8) Activate power for AEDATS.
(a) For AEDATS II, activate power at the AEDATS Processor Chassis (Cabinet #2).
(b) For AEDATS IV, activate power at the UPS and Processor Chassis (Cabinet #2).

8. Shutting Down Control Cab

a. Performance Check

(1) Exit AEDATS software and shutdown AEDATS Processor.
(a) For AEDATS II, shutdown power at the AEDATS Processor Chassis (Cabinet #2).
(b) For AEDATS IV, shutdown power at the Processor Chassis, then UPS (Cabinet #2).
(2) Shutdown power at the Torque Processor System (BF Goodrich and/or Daytronics).
(3) At Cabinet No. 4, shutdown power for Limit Control Panel.
(4) Shutdown power at Calculating Counter.
(5) At Motor Starter Panel (Cabinet No. 4) perform the following steps:
(6) Depress #2 button to deactivate 28 V dc power supply # 2 28 V dc.
(7) Depress #1 button to deactivate 28 V dc power supply # 1 28 V dc.
(8) Depress "60 Hz Pwr" button to activate 60 Hz, 120 V ac power.

9. DC Voltmeter (0 to 50 V dc)

a. Performance Check

(1) Ensure that the power is off at the TI Meter Panel Assembly.
(2) Ensure that the DC Voltmeter indication is zero. Adjust the mechanical zero screw as necessary.
(3) Energize Power Supply #1 (CB304) and #2 (CB303) via the circuit breaker panel and set the DC Voltmeter Power Supply Selector Switch to Power Supply #1.
(4) Access Power Supply #1 and #2 in cabinets #6 and #8 respectively. Place the **positive** (+) **lead** of the digital voltmeter to the **positive** (+) 28 V dc **output stud** of Power Supply #1, and place the **negative** (-) **lead** of the digital voltmeter to the **negative (-) DC output** stud of Power Supply #1.
(5) Verify that the Meter Panel Assembly's DC Voltmeter matches the Digital Voltmeter.
(6) Set the DC Voltmeter Power Supply Selector Switch to Power Supply #2. Perform steps 4 and 5 for Power Supply #2.
(7) 714 power supply 24 VDC perform step 4.

10. AC Voltmeter

a. Performance Check

(1) De-energize power to the Meter Panel Assembly via the circuit breaker panel.
(2) Verify that the AC Voltmeter reads **zero**. If not, adjust the meter mechanical zero screw as necessary.
(3) Energize the power to the Meter Panel Assembly.
(4) Set the digital voltmeter to AC volts.
(5) Access the rear of CB301 (Main Circuit Breaker) on the circuit breaker panel.

WARNING

Hazardous voltages are present on all exposed terminals.
Extreme care must be exercised to prevent injury or death.

(6) Measure the voltage between the two phases selected on the voltmeter selector switch on the Meter Panel Assembly. Functional test the voltmeter by comparing measured voltages to voltmeter indication.

11. AC Ammeter

a. Functional test the AC ammeter by noting current indications on each phase.

12. DC Ammeter

a. Functional test the DC ammeter by noting current indication.

13. Frequency Meter

a. Functional test the Frequency Meter by verifying a reading of approximately 60 Hz.

14. Power System Functional Tests

a. Performance Check

(1) Depress the TI 60 Hz Power Switch to ON.

(2) Set the TI AC VOLTMETER 60 Hz selector switch to L1 TO L2. Verify that the TI AC VOLTMETER indication is between 200 and 216 V ac.

(3) Set the TI AC VOLTMETER 60 Hz selector switch to L3 TO L2. Verify that the TI AC Voltmeter indication is between 200 and 216 V ac.

(4) Set the TI AC VOLTMETER 60 Hz selector switch to GND TO L2. Verify that the TI AC Voltmeter indication is between 112 and 128 V ac. Ensure that the TI Frequency Motor 60 Hz indication is 60 Hz.

(5) Set the TI DC VOLTMETER selector switch to 28 V dc Supply No. 1.

(6) Depress the TI 28 V dc No. 1 power switch to ON. Verify that the TI DC voltmeter indication is 28V dc ± 0.5V.

(7) Set the TI DC VOLTMETER selector switch to 28 V dc SUPPLY No. 2.

(8) Depress the TI 28 V dc No. 2 power switch to ON. Verify that the TI DC Voltmeter indication is 28V dc ± 0.5V.

(9) Verify that all TI PRESS-TO-TEST indicators are operational.

15. Vibration Meter System

a. Performance Check

(1) Depress TI CB316 60 Hz INSTRUMENT circuit breaker to ON. Ensure that the system is in the T700 mode (See FEDS operator's manual, Engine Test Configuration). Set tracking filter assembly to OUT and channels 1, 2, and 3 to desired engine. Set channels 4 and 5 to position 1.

(2) Sensitivity Adjustment

(3) This procedure adjusts the sensitivity of the CEC 2047 amplifiers to match the output level of the transducer being used. To make the sensitivity adjustment, proceed as follows:

(4) Set the TI Vibration Meter Amplifier controls on all channels as follows:

Table 15-1 TI Meter Amplifier Controls

FILTER switch to	**CAL**
MODE switch to	**VEL**
RANGE switch to	**150**
XDUCER switch to	**ACCEL**
OUTPUT switch to	**AVG**

(5) Obtain and note the appropriate vibration transducer sensitivity for each channel. Nominal sensitivity values of standard transducers are given in the table 15-2 below. Transducer sensitivity may also be determined by referring to the calibration card supplied with the transducer. This value will be used in step **6** below.

Table 15-2 Vibration Transducer Sensitivity

Manufacturer	P/N	Nominal Sensitivity (mV/in/sec)
CEC	4-106-0001	122
CEC	4-106-0002	122
CEC	4-125-0006	105
CEC	4-118-0002	105
CEC	4-128-0001	60.5
CEC	6222-M20	10
CEC	6233	50

(6) Adjust each channel (CHAN 1, etc.) TI CHAN CAL ADJ control to obtain a TI digital indication equal to the respective channel transducer sensitivity.

(7) Set the TI CHAN 1 FILTER switch to SENS and adjust TI CHAN 1 SENS ADJ control for full scale digital meter indication.

(8) Set the TI CHAN 1 Meter Amplifier controls as follows:

Table 15-3 TI Channel 1 Meter Amplifier Controls

FILTER switch to	**OUT**
MODE switch to	**VEL**
RANGE switch to	**5**
XDUCER switch to	**VEL**
OUTPUT switch to	**AVG**

(9) Repeat steps 4 through 8 for the remaining channels 2, 3, 4 and 5.

16. Digital Bar graph Zero Adjustment

a. Performance Check

(1) Remove 115 V AC supply to CEC 4000-2047 rack. Remove vibration connectors P25 and P91. Reconnect 115V ac supply voltage to CEC rack.

CAUTION

Always remove 115 V ac power from vibration system prior to connecting or disconnecting P25 with J25 (charge amp box). This is done by unplugging the CEC 4000 AC power cord. Failure to remove power may permanently damage the charge amps.

(2) Connect a jumper wire between TI plug P25 pins C and L (Cable from control cab to engine/Charge Amp Box).

(3) Verify that TI Channel 1 Bar graph and digital display indications are zero. Adjust Digital Bar graph Indicator's ZERO control R4 as necessary. **Disconnect** the **jumper wire**.

(4) Repeat steps 2 & 3 for TI Channels 2 through 5 using the connector and pins listed in the table 16-1 below.

Table 16-1 TI Channel Connections

Channel	Plug	Jumper Pins
1	P25	C, L
2	P25	E, B
3	P25	G, M
4	P91	N, G
5	P91	B, M

NOTE

Debug vibration system if 60 Hz noise is present.

(5) After zeroing indicators, go back to step 4 through 8 on performance check 15 and recheck alignment and SENS settings.

(6) Connect the CEC 2700 Precision Signal Source to connector P25, pins C (+) and L (-). Use J2 (pins A and B) of CEC 2700 for AC millivolts signal. Switch CEC 2700 to **AVG** output. Assure that TI power is disabled before connecting or disconnecting P25 with J25.

(7) Set the CEC 2700 to a constant output frequency of 100 Hz while changing the output millivolt level to the values listed below. At each output level, verify that the TI Vibration Meter channel 1 indicator and AEDATS reads within the tolerance limits listed in the table below.

Table 16-2 TI Vibration Meter Indications

Frequency (Hz)	Oscillator Output (AVG)	TI Vibration Meter Limits (in/sec)	CH 1 Reading	CH 2 Reading	CH 3 Reading	CH 4 Reading	CH 5 Reading
100	116.5	0.9 to 1.1					
100	233.0	1.9 to 2.1					
100	350.0	2.9 to 3.1					
100	466.0	3.9 to 4.1					
100	583.0	4.9 to 5.1					

Table 16-3 AEDATS Indications

Frequency (Hz)	Oscillator Output (AVG)	AEDATS Limits (in/sec)	CH 1 Reading	CH 2 Reading	CH 3 Reading	CH 4 Reading	CH 5 Reading
100	116.5	0.9 to 1.1					
100	233.0	1.9 to 2.1					
100	350.0	2.9 to 3.1					
100	466.0	3.9 to 4.1					
100	583.0	4.9 to 5.1					

(8) Repeat steps 8 & 9 for channels 2 through 5, using the plug and pin connections listed in table 16-4 below.

Table 16-4 TI Channel Connections

Channel	Plug	Plug Pins
2	P25	E, B
3	P25	G, M
4	P91	N, G
5	P91	B, M

(9) Remove 115 V AC supply to CEC 4000-2047 rack by unplugging AC power cord. Reinstall connectors P25 and P91. Reconnect 115V ac supply voltage to CEC rack.

17. Digital Vibration Measurement Systems Using Accelerometers

a. Performance Check (Amplifier Response – Velocity Mode)

CAUTION

Do not activate CONTINUITY (CONT) switch. Damage to charge amplifier may result.

(1) Set the TI controls as follows for channels 1, 2, and 3:

Table 17-1 TI Control Settings for Channels 1, 2, and 3.

TI Control	Position
Filter	**CAL**
Mode	**VEL**
Range	**150**
Output	**True RMS**
Xducer	**ACC**
Variable Filter	
Filter	**Out**

(2) Activate TI power and the CEC 2700 power and allow system warm up time of 30 min prior to beginning alignment.

NOTE

CEC 2700 box should be charged with power off for 8 hours prior to use

(3) Adjust the TI CAL ADJ to obtain indications per the table below.

Table 17-2 CAL ADJ settings for TI Channels 1 - 3.

Channel	Indication
Ch 1	**10.0 in/s**
Ch 2	**50.0 in/s**
Ch3	**10.0 in/s**

(4) Set the TI FILTER switch to SENS.
(5) Adjust the TI SENS ADJ to obtain full scale indication of 150 in/s on the TI display.(75 in/s at sites with Endevco system)
(6) Set the TI FILTER switch to OUT.
(7) Set the TI XDUCER switch to VEL.
(8) Set the TI Range switch to 5.
(9) Set the TI OUTPUT switch to TRUE RMS.
(10) Connect CEC 2700 precision signal source J1conector to the TI channel at test trailer plug connection. For each accelerometer channel (T700 Channels 1, 2, & 3), refer to the following table for plug connections. Connect to J1 with red cable (CEC-619566-120), and to T700 engine vibration cable connected to the charge amps.

Table 17-3 Vibration Channel Plug Connections

Channel	T700
1	**P80 (A,B)**
2	**P81 (A,B)**
3	**P82 (A,B)**

Note: The first pin listed is positive. For example, P80 (+,-).
Note: Cable numbering may be different due to Owner installed cables.

(11) Set the precision signal source output to obtain each of the signal values listed in the table below.
(12) On each channel (1, 2, 3), If adjustment is needed, gain access to R120 using extender card PN 0368937-0001 and adjust for 5.00 inch/sec TI indication (full scale).

(13) At each signal set point, verify that the TI indications are within the specified tolerance limits (±.1).

Table 17-4 Amplifier Linearity - Velocity Mode

CH 2				CH 1, 3				
Signal Source		TI Indication (in/sec)		Signal Source		TI Indication (inch/sec)		
(pC RMS)	(Hz)	TI Limits	CH2 Value	(pC RMS)	(Hz)	TI Limits	CH1 Value	CH3 Value
407	100	4.9 to 5.1		81.4	100	4.9 to 5.1		
325.5	100	3.9 to 4.1		65.1	100	3.9 to 4.1		
244.1	100	2.9 to 3.1		48.8	100	2.9 to 3.1		
162.7	100	1.9 to 2.1		32.5	100	1.9 to 2.1		
81.4	100	0.9 to 1.1		16.3	100	0.9 to 1.1		

Table 17-5 AEDATS - Velocity Mode

CH 2				CH 1, 3				
Signal Source		AEDATS Indication (in/sec)		Signal Source		AEDATS Indication (inch/sec)		
(pC RMS)	(Hz)	TI Limits	CH2 Value	(pC RMS)	(Hz)	TI Limits	CH1 Value	CH3 Value
407	100	4.9 to 5.1		81.4	100	4.9 to 5.1		
325.5	100	3.9 to 4.1		65.1	100	3.9 to 4.1		
244.1	100	2.9 to 3.1		48.8	100	2.9 to 3.1		
162.7	100	1.9 to 2.1		32.5	100	1.9 to 2.1		
81.4	100	0.9 to 1.1		16.3	100	0.9 to 1.1		

18. T53/T55/T63/T64 Vibration Check

a. Performance Check

(1) Ensure that the FEDS is in the T53/T55/T63 test mode. (See **FEDS** Manual – Engine Test Configuration). Set tracking filter assembly to OUT and Channels 1, 2, 3 to desired engine. Set channels 4 and 5 to position 1.

(2) Set the TI Meter Amplifier controls on all channels as follows:

Table 18-1 TI Meter Amplifier

FILTER switch to	**CAL**
RANGE switch to	**150**
XDUCER switch to	**ACCEL**
MODE switch to	**ACCEL**
OUTPUT switch to	**AVG**

(3) Adjust each channel (CHAN 1, etc.) CAL ADJ control to obtain a TI digital indication of 105 mV/in/sec.

Table 18-2 Standard Sensitivity Ratings

Model	TI indication
4-118-0002	105
4-128-0001	60.5

(4) Set the TI CHAN 1 FILTER switch to SENS.

(5) Adjust TI CHAN 1 SENS ADJ for full scale digital meter indication (150).

NOTE

Sites with Endevco signal conditioners must be set at 75 for T-700 only

(6) Set the TI CHAN 1 FILTER switch to the desired position, normally OUT.

(7) Set the TI CHAN 1 Meter Amplifier controls as follows:

Table 18-3 TI Channel 1 Meter Amplifier Controls

CHAN 1 XDUCER switch to	**VEL**
CHAN 1 MODE switch to	**VEL**
CHAN 1 RANGE switch to	**5**
CHAN 1 OUTPUT switch to	**AVG**

(8) Repeat steps 2 through 7 for the remaining channels 2, 3, 4, and 5.
(9) Connect jumper wire between pins A and B on the connector labeled VIB1 of cable 20090778-1.
(10) Verify that TI channel 1 bar graph and digital display indications are ZERO. Adjust the Digital Bar graph Indicator's ZERO controls R4 as necessary. Disconnect the jumper wire.
(11) Repeat steps 9 and 10 for TI channels 2 through 5 using the following connections.

Table 18-4 T1 Channels 2 through 5

Channel	Plug	Plug Pins
2	**Cable 20090778, Vib 2**	**A, B**
3	**Cable 20090778, Vib 3**	**A, B**
4	**Cable 1464D297, 40J**	**A, B**
5	**Cable 1464D297, 41J**	**A, B**

Note: Cable 1464D297 is on the V-250 Dynamometer.

(12) Set the TI filter switch to cal and adjust TI **CAL ADJ** control to **105** on the digital display. Repeat for all channels.

Table 18-5 Standard Sensitivity Ratings

Model	TI indication
4-118-0002	**105**
4-128-0001	**60.5**

(13) Set TI FILTER switch to SENS position for all channels and adjust each channel SENS ADJ control for an indication of 150 on each display.
(14) Set TI mode switches to VEL on each channel, range switch to 5.0 and filter switch to OUT.
(15) Connect the CEC 2700 Signal Source J2 connector pins A(+) and B(-) to pins A (+) and B (-) of connector VIB1 on cable 20090778-1. Ensure that CEC2700 signal source is set to AUG.
(16) Maintain the CEC 2700 oscillator at a constant output frequency (100 Hz) while changing the output millivolt level to the values listed below.
(17) At each output level, verify that the TI vibration meter indicator and AEDATS reads within the tolerance limits listed.

Table 18-6 TI Vibration Meter Indications

Frequency (Hz)	Output Level (mV RMS)	Vibration Meter Tolerance Limits (in/sec)	TI Indication (inches/sec)					AEDATS Readings
			CH 1	CH 2	CH 3	CH 4	CH 5	
100	**116.5**	**0.9 to 1.1**						
100	**233.0**	**1.9 to 2.1**						
100	**350.0**	**2.9 to 3.1**						
100	**466.0**	**3.9 to 4.1**						
100	**583.0**	**4.9 to 5.1**						

(18) Repeat steps 17 & 18 for all remaining amplifier channels, 2 to 5, using the following connections:

Table 18-7 T1 Channels 2 through 5

Channel	Plug	Plug Pins
2	**Cable 20090778, Vib 2**	**A, B**
3	**Cable 20090778, Vib 3**	**A, B**
4	**Cable 1464D297, 40J**	**A, B**
5	**Cable 1464D297, 41J**	**A, B**

Note: Cable 1464D297 is on the V-250 Dynamometer.

19. Calculating Counter Test

a. Performance Check (Self Test Procedure)

(1) Set the TI CALCULATING COUNTER controls as follows:

Table 19-1 TI Calculating Counter Controls

All DEC switches to	**6**
All C switches to	**11111**
All AUTO buttons	**depressed**
CHANNEL (1) button	**depressed**
REMOTE button	**depressed**
SAMPLE RATE (FAST) button	**depressed**
All x10 buttons	**released**
TEST button	**depressed**
POWER button	**depressed**

(2) Verify that the TI indicator indication is 011111.

(3) Depress the TI CH1 x10 selector in. Verify that TI reads 111110. Depress the TI CH1 x10 out.

(4) Repeat steps 2 & 3 for the remaining CH1 switch settings of 22222 through 99999, and 00000.

(5) Repeat steps **1** through **4** for the remaining TI indicator **Channels CH2** through **CH4**. Depress the TI indicator **TE**ST selector out.

20. Flow Measurement System

a. Performance Check

(1) Alignment **of Turbine Flowmeters**

(2) **FEDS** flowmeters must be calibrated by a qualified laboratory, following a prescribed calibration schedule of twelve (12) months. Before Aligning the flow system, verify that current calibration sheets are available for each installed flowmeter. If not, replace it with a currently calibrated flowmeter.

(3) Digital Flow Rate Indicator (Calculating Counter) "C" Factor Settings

(a) Flowmeter calibration sheets should list the mean K-factor in pulses/gallon. Use the following formula to determine the Calculating Counter's "C" factor setting in pounds per hour (lb/hr or PPH):

$$\textbf{CH x C} = \frac{\textbf{(3600 x 8.337 x specific gravity)}}{\textbf{Turbine flowmeter K-factor}}$$

where: **3600 = number of seconds in one hour**
8.337 = weight in pounds of one gallon of H^2O at 60 °F
specific gravity = specific gravity of fluid in flowmeter

(b) The calculated value "C" will be entered in the Calculating Counter's CHx C thumb switches, in the five switch positions marked "C".

(c) For each installed flowmeter, calculate the "C" factor, using the specific gravity and K-factor shown on the flowmeter calibration sheet.

(d) Complete the following table using calibration sheet data, and calculated "C" factors.

Table 20-2 Flowmeter Calibration Data with "C" Factors for Calculating Counter

Flowmeter	Flowmeter Serial No.	Flowmeter Cal. Date	Current Cal? (y/n)	Mean K-Factor	Sampling Temp (F)	Specific Gravity	"C" Factor	TI Channel
T700 Fuel								**CH 4**
T53/T55/T64 Fuel								**CH 4**
T53/T63 Oil								**CH 3**

21. Programming Flowmeter Data in AEDATS II/IV

a. Performance Check

(1) Reference the flowmeter calibration sheets. For each flowmeter, choose five alignment runs to correspond with each target frequency shown in the table below. For each run chosen, the Flowmeter Hz value should be as close as possible to the Target Frequency Hz value. Use the five flowmeter data runs to complete the columns labeled "Flowmeter Hz" and "Flowmeter PPH" of the table below. Repeat this step for all three flowmeters listed in the table.

(2) Calculate the average K-factor for each selected set of five runs. Record the average K-factors, the sampling temperatures, and specific gravity values from the flowmeter calibration sheet.

Table 21-1 Flowmeter Alignment Points for AEDATS II/IV

T700 Fuel Flowmeter			T53/55/64 Fuel Flowmeter			T53/T63 Oil Flowmeter		
Target Freq. (Hz)	Flowmeter Hz	Flowmeter PPH	Target Freq. (Hz)	Flowmeter Hz	Flowmeter PPH	Target Freq. (Hz)	Flowmeter Hz	Flowmeter PPH
240			250			300		
480			500			600		
720			750			900		
960			1000			1300		
1200			1250					
Sampling Temp. (°F):			Sampling Temp. (°F):			Sampling Temp. (°F):		
Specific Gravity:			Specific Gravity:			Specific Gravity:		
Average K-Factor:			Average K-Factor:			Average K-Factor:		

NOTE

The following Step (3) must be performed for each of the three flowmeters in the table above.

(3) AEDATS II

(4) Enter Specific Gravity, Temperature, and Average K factor from the flowmeter calibration sheet into AEDATS II. Follow the instructions below.

(a) In **AEDATS** go to **MAIN MENU**. Select "**M**" for **MAINTENANCE UTILITIES**.

(b) Select "**C**" for **CALIBRATION MENU**.

(c) Select "**S**" for **SETTINGS MENU**.

(d) Enter Specific Gravity in selection "**1**" (Fuel Specific Gravity) of Cell Constants screen.

(e) Enter Sampling Temp. in selection "**2**" (Fuel Sample Temperature) of Cell Constants screen.

(f) Enter flowmeter K-factor in selection "**3**", "**4**", or"**5**" of Cell Constants screen as follows:

1 * Enter "3" (Low K-Factor) for the T53/T55/T64 Fuel Flowmeter.

2 * Enter "4" (Mid K-Factor) for the T53/T63 Oil Flowmeter.

3 * Enter "5" (High K-Factor) for the T700 Fuel Flowmeter.

(5) AEDATS IV

Enter Specific Gravity, Temperature, and Average K factor from the flowmeter calibration sheet into AEDATS IV. Follow the instructions in accordance with AEDATS IV, Automated Engine Data Acquisition Test System Manual; H355-7, Test Cell Instrumentation Package (TCIP), Appendix A, Pages A7 – A22.

22. T700 FUEL FLOW METER

a. Performance Check

(1) Ensure that the FEDS is in the T700 mode (Reference FEDS operator's manual).

(2) Set AEDATS to Engine run screen.

(3) At the Fuel Trailer, disconnect the cable from the T700 flowmeter, **MT206**. Connect the CEC2700 oscillator **pins A+** and **B-** from J2 connector to A (+) and B (-) of the cable connector.

(4) Set the oscillator **output** to **500 mV p-p**. Set the frequency to each set point shown in the table below.

(5) At each set point, record the frequency indications from the calculating counter and AEDATS. Verify that those indications are within the tolerances specified in the table.

NOTE

To read frequency on a calculating counter channel, enter 4-10000-0 in the thumb switches. To read frequency with AEDATS 2, refer to the AEDATS (H345-1) Operator's manual, or for AEDATS IV, refer to the AEDATS IV (H355-7) Operator's manual.

Table 22-1 Oscillator Settings for T700 Fuel Flow (Frequency) Alignment

Oscillator (Hz)	Calculating Counter Limits (± 1 Hz)	Calculating Counter Reading (Hz)	AEDATS WF Limits (± 1 Hz)	AEDATS WF Reading (Hz)
240	239-241		239-241	
480	479-481		479-481	
720	719-721		719-721	
960	959-961		959-961	
1200	1199-1201		1199-1201	

(6) Enter the calculated "C" factor in the Calculating Counter CH 4 C thumb switches, in the five switch positions marked "C". Reference paragraph **21** to determine "C" factor.

(7) Verify that AEDATS Alignment was done in paragraph 24. Using the flowmeter data obtained in that paragraph; fill-in the columns labeled "Flowmeter Hz" and "Flowmeter PPH" of the table below.

Table 22-2 Oscillator Settings for T700 Fuel Flow (lb/hr) Alignment

Target Freq. (Hz)	Flowmeter Hz from table 21-1	Flowmeter PPH from table 21-1	Calculating Cntr. Limits (calculated as follows) Flowmeter PPH ±0.5%	Calc. Counter Reading	AEDATS WFi PPH Limits (calculated as follows) Flowmeter PPH ±0.35%	AEDATS WFi Reading
240						
480						
720						
960						
1200						

Note: Calculating Counter Reading = Oscillator Frequency x C, where C is calculated in paragraph 21.

(8) Connect the thermocouple calibrator to the fuel temperature thermocouple connector (**TC208**). Set the output for Type J output at a temperature that corresponds to calibration temperature from the flowmeter calibration sheet.

(9) Set the oscillator output to 500 mV p-p. Set the frequency to each of the set points in the "Flowmeter Hz" column of the table above. Record the fuel flow indications from the calculating counter and AEDATS and verify that those indications are within the specified tolerances.

(10) Reconnect the fuel flowmeter cable and fuel thermocouple.

(11) The turbine flowmeter should be calibrated by a qualified laboratory every twelve (12) months.

23. T53/T55/T64 Fuel Flowmeter

a. Performance Check

(1) Ensure that the FEDS is in the T53/T55 or T64 mode (Reference FEDS operator's manual).

(2) At the Fuel Trailer, disconnect the cable from the T53/T55/T64 Fuel Flowmeter, MT207. Connect the

CEC 2700 oscillator **pins A+** and **B-** from J2 connector to Pins A and B of the cable connector.

(3) Set the oscillator output to 500 mV p-p. Set the frequency to each set point shown in the table below.

(4) At each set point, record the frequency indications from the calculating counter and AEDATS. Verify that those indications are within the tolerances specified in the table.

NOTE

To read frequency on a calculating counter channel, enter 4-10000-0 in the thumb switches. To read frequency with AEDATS 2, refer to the AEDATS (H345-1) Operator's manual, or for AEDATS IV, refer to the AEDATS IV (H355-7) Operator's manual.

Table 23-1 Oscillator Settings for T53/T55/T64 Fuel Flow (Frequency) Alignment

Oscillator (Hz)	Calculating Counter Limits (± 1 Hz)	Calculating Counter Reading (Hz)	AEDATS WF Limits (± 1 Hz)	AEDATS WF Reading (Hz)
250	249-251		249-251	
500	499-501		499-501	
750	749-751		749-751	
1000	999-1001		999-1001	
1250	1249-1251		1249-1251	

(5) Enter the calculated "C" factor in the Calculating Counter CH 4 C thumb switches, in the five switch positions marked "C". Reference paragraph **23** to determine "C" factor.

(6) Verify that AEDATS Alignment was done in paragraph 24. Using the flowmeter data obtained in that paragraph, fill-in the columns labeled "Flowmeter Hz" and "Flowmeter PPH" of the table below.

Table 23-2 Oscillator Settings for T53/T55/T64 Fuel Flow (lb/hr) Alignment

Target Freq. (Hz)	Flowmeter Hz from table 21-1	Flowmeter PPH from table 21-1	Calculating Cntr. Limits (calculated as follows) Flowmeter PPH ±0.5%	Calc. Counter Reading	AEDATS WFi PPH Limits (calculated as follows) Flowmeter PPH ±0.35%	AEDATS WFi Reading
250						
500						
750						
1000						
1250						
Note: Calculating Counter Reading = Oscillator Frequency x C, where C is calculated in paragraph 21.						

(7) Connect the thermocouple calibrator to the fuel temperature thermocouple connector (**TC208**) Pins A (+) and B (-). Set the output for Type J output at a temperature that corresponds to calibration temperature from the flowmeter calibration sheet.

(8) Set the oscillator output to 500 mV p-p. Set the frequency to each of the set points in the "Flowmeter Hz" column of the table above. Record the fuel flow indications from the calculating counter and AEDATS and verify that those indications are within the specified tolerances.

(9) Reconnect the fuel flowmeter cable and fuel thermocouple.

(10) The turbine flowmeter should be calibrated by a qualified laboratory every twelve (12) months.

24. T53/T63 Oil Flowmeter

a. Performance Check

(1) Ensure that the FEDS is in the T53/T63 mode (Reference FEDS operator's manual).

(2) At the Large Engine Test Trailer, disconnect the cable from the T53/T63 Oil Flowmeter. Connect the CEC 2700 oscillator **pins A+** and **B-** from J2 connector to pins A and B of the cable connector.

(3) Set the oscillator output to 500 mV p-p. Set the frequency to each set point shown in the table below.

(4) At each set point, record the frequency indications from the calculating counter and AEDATS. Verify that those indications are within the tolerances specified in the table.

NOTE

To read frequency on a calculating counter channel, enter 4-10000-0 in the thumb switches. To read frequency with AEDATS 2, refer to the AEDATS (H345-1) Operator's manual, or for AEDATS IV, refer to the AEDATS IV (H355-7) Operator's manual.

Table 24-1 Oscillator Settings for T53/T63 Oil Flow (Frequency) Alignment

Oscillator (Hz)	Calculating Counter Limits (± 1 Hz)	Calculating Counter Reading (Hz)	AEDATS Woil Limits (± 1 Hz)	AEDATS Woil Reading (Hz)
300	299-301		299-301	
600	599-601		599-601	
900	899-901		899-901	
1300	1299-1301		1299-1301	

(5) Enter the calculated "C" factor in the Calculating Counter CH 3 C thumb switches, in the five switch positions marked "C". Reference paragraph **23** to determine the "C" factor. The specific gravity of the oil (not fuel) should be used to calculate this "C" factor.

(6) Verify that AEDATS Alignment was done in paragraph **24**. Using the flowmeter data obtained in that paragraph, fill in the columns labeled "Flowmeter Hz" and "Flowmeter PPH" of the table below.

Table 24-2 Oscillator Settings for T53/T63 Oil Flow (lb/hr) Alignment

Target Freq. (Hz)	Flowmeter Hz from table 21-1	Flowmeter PPH from table 21-1	Calculating Counter Limits (calculated as follows) Flowmeter PPH ±0.5%	Calc. Counter Reading	AEDATS WFoil PPH Limits (calculated as follows) Flowmeter PPH ±0.35%	AEDATS WFOil Reading
300						
600						
900						
1300						
Note: Calculating Counter Reading = Oscillator Frequency x C, where C is calculated in paragraph 21.						

(7) Set the oscillator output to 500 mV p-p. Set the frequency to each of the set points in the "Flowmeter Hz" column of the table above. Record the flow indications from the calculating counter and AEDATS and verify that those indications are within the specified tolerances.

(8) Reconnect the oil flowmeter cable.

(9) The turbine flowmeter should be calibrated by a qualified laboratory every twelve (12) months.

25. T63 Fuel Flowmeter

a. Performance Check

(1) Ensure that the FEDS is in the T63 mode with the T63 Flight Harness (20090777-1) connected to the J-box (Reference FEDS operator's manual).

(2) The T63 Fuel Flowmeter produces a non-linear frequency vs. mass-flow (PPH or lb/hr) relationship. A flow linearizer (P/N LN-5-C-V1B6) mounted on the Fuel Skid linearizes this signal.

b. Fuel Flow T63 Flow Linearizer Programming

(1) Must load program on Laptop called "Link Host"

(2) Enter Data from Calibration sheet (Compatible with Windows 98 or older)
(1) Open shortcut to Linear Link.
(2) EDIT: Go to link setup. 0-10 V Out, RF Input and Top flow and Top Freq. From Cal Sheet.
(3) EDIT: Header Fields enter Data from Calibration sheet. (Enter)
(4) VIEW: Mechanical Data(Enter)
(5) EDIT: Data fields enter 20 calibration points. (Enter)
(6) CONNECT INTERFACE CABLE TO LAPTOP AND LINEARIZER
(7) PROGRAM: Establish communications
(8) VIEW: Open K Factor Plot (Enter)
(9) SHOULD SAY table generation successful. (OK)
(10)PROGRAM: Program Link (OK)
(11)Will download Data loaded from Calibration sheet
(12) Enter low **reading on voltage out** _____ (Enter)
(13)Enter High reading on voltage out _____ (Enter)
(14)Verify Analog reading on voltage out _____ (Enter)
(15)Should Say Sending Table
(16)Should read Calibration performed successful.

c. Enter Specific Gravity in AEDATS under initialization (fuel correction factor) for PPH on Calibration sheet.

(1) Enter the **fuel flow correction factor or linearizer conversion factor** into calculating counter CH 4 C switches. Enter this value in the five thumbwheel switches marked "C".

Provide corrections and place formula 78 X 8.337 X SG / 2000 in correct context.

K- Factor = Hz. x Time base / Flow rate

(Note: enter c=01000 into counter to read frequency)

PPH= GPM x 500 x SG. or GPM= $\frac{\text{PPH}}{500 \times \text{S. G.}}$

PPH= Pulses per second (hz). X 3600 x S. G. x 8.347 / pulses per gallon (K Factor)

(2) At the Fuel Trailer, open the cover of the Flow Linearizer (P/N LN – 5-C-V1B6) mounted next to the J-box. Connect the CEC 2700 oscillator from J2 connector A(+) and B(-) to TB 201 terminals 1+ and 2-.

NOTE

Note: The T63 Fuel Flowmeter is an RF carrier type flowmeter.

(3) Set the CEC 2700 oscillator at the following points and record the indication on the calculating counter and AEDATS:

Table 27-1 Oscillator Settings for T63 Fuel Flow (lb/hr) Alignment

Target Freq. (Hz)	Flowmeter Hz from table 21-1	Flowmeter PPH from table 21-1	Calculating Cntr. Limits (calculated as follows) Flowmeter PPH ±0.5%	Calc. Counter Reading	AEDATS WFi PPH Limits (calculated as follows) Flowmeter PPH ±0.35%	AEDATS WF Reading
600						
800						
1000						
1200						
1400						
Note: Calculating Counter Reading = Oscillator Frequency x C, where C is calculated in paragraph 21						

(4) For AEDATS Alignment, see Appendix B - Calibration of Automatic Data Acquisition System (AEDATS).
(5) Disconnect the test equipment and install the cover on the Flow Linearizer.
(6) The turbine flowmeter should be calibrated by a qualified laboratory every twelve (12) months.

26. Specific Gravity Indicator (0.680 to 0.850).

a. Performance Check

(1) Ensure that the manual flow control valves that are in-line with the flowmeters are closed.
(2) Set the **FUEL PUMP** switch to **ON.**
(3) Open the manual hydrometer shutoff valves.
(4) Adjust the control valve to obtain a small amount of fuel circulating through the system.
(5) Open the indicator suction valve.

CAUTION

Do not allow the fuel to raise more than ¼ inch above the indicator overflow tube. Damage to the hydrometer element may result.

(6) Slowly open the indicator inlet valve. Allow fuel to circulate into the hydrometer well and out the overflow tubes.
(7) Collect a fuel sample in the hydrometer jar. Measure and record the fuel specific gravity using the hydrometer from the calibration kit.
(8) Adjust the indicator inlet valve until the fuel level stabilizes and the hydrometer element assumes a free-floating position. Close inlet valve.
(9) Note the two specific gravity indications and record. Verify that the calibrated hydrometer indication is within 0± 0.0017 of the nominal value of the fuel skid hydrometer.
Calibrated Hydrometer SG: _____ **FEDS** Hydrometer SG: _____
(10) Note the two thermometer values and record. Verify that the indicated temperature for the calibrated hydrometer is within 1° F of the thermometer in the fuel well.
Calibrated Thermometer: _____ **FEDS** Thermometer: _____
(11) Allow the fuel to drain completely from the hydrometer well and close the indicator suction valve.
(12) Close the flow control valve.
(13) Set the FUEL PUMP switch to OFF.
(14) Close the manual hydrometer shutoff valve, close the manual valve, and close the fuel tank manual shutoff valve..

27. Temperature Measurement System

a. Performance Check (Digital Temperature Indicator, Type-J (Iron-Const.) Thermocouple Channels)

NOTE

The Limit Control Panel, Temperature and Speed Limit Control (paragraph 35) may be calibrated in conjunction with the digital temperatures indicator.

(1) Connect the thermocouple calibrator to P56, Engine Lube Discharge, of cable 20090787-1, which is connected to the T700 side of the J-box. Use Type Jx thermocouple wire.
(2) Turn on the thermocouple calibrator and allow a 30 minute warm-up period. (Not required if using Eurotron 2000T)
(3) Depress **Channel 1** on the Doric **Type J thermocouple switch**.
(4) Adjust the thermocouple calibrator for Type J, 32 °F temperature output.
(5) Verify that the Temperature Indicator indication is between 31 and 33 °F. Adjust the Temperature Indicator ice point reference potentiometer (R44) as necessary.

NOTE

To gain access to the TI Temperature Indicator alignment controls, remove the two screws from the sides of the front panel and remove the panel. The two potentiometers are visible at the upper left of the display. Potentiometer R44 (Front Panel ZERO) controls the ice point indication and R45 (SPAN) controls the positive (+) full scale indication.

(6) Adjust the thermocouple calibrator controls to a temperature of 1000 °F.
(7) Verify that the temperature indicator reads between 999 to 1001 °F. Adjust the indicator positive (+) full-scale adjustments. Repeat the previous four steps until no further adjustment is necessary.

NOTE

Interaction may occur between the TI temperature indicator ice point and positive (+) full-scale adjustments. Repeat the previous four steps until no further adjustment is necessary.

(8) Adjust the thermocouple calibrator controls to obtain the temperature values listed below. At each temperature setting, verify that the TI indicated temperature is within the tolerance limits.
(9) Do not calibrate AEDATS EODT at this time, as it will be calibrated in the next section.

Table 27-1 TI Temperature Indication

Thermocouple Calibrator (°F)	DORIC and AEDATS Tolerance Limits (± 1)	DORIC Actual Reading	AEDATS EODT Actual Reading
32	31 to 33		
100	99 to 101		
200	199 to 201		
300	299 to 301		

NOTE: AEDATS Alignment/Check for this channel will be completed in the next section.

28. Type-J Thermocouple Alignment – T700 Trailer

a. Performance Check

(1) In this section we will align the Type-J thermocouple channels monitoring the T700 engine tests. These channels are listed in the table below.

Table 28-1 T700 Type-J Thermocouple Channels

Channel Name	Connector Label	Doric Channel	AEDATS II/IV Channel	Temperature Range
Engine Lube Discharge Temp	P56 or Eng Lube Disch Temp	1	BSUMP	0-300 °F
Engine Oil Scav. Temp.	P57 (BSUMP)	2	J02	0-300 °F
Inlet Air Temp	P58	3	T21	0-120 °F
Inlet Air Temp	P59	4	T22	0-120 °F
Inlet Air Temp	P68	5	T23	0-120 °F
Inlet Air Temp	P92	6	T24	0-120 °F
Inlet Air Temp	P101	27	T25	0-120 °F
Inlet Air Temp	P102	28	T26	0-120 °F
Inlet Air Temp	P103	29	T27	0-120 °F
Inlet Air Temp	P104	30	T28	0-120 °F
Dyno Lube Tank Temp	J20 of dyno	7	Tdyn_tnk	0-300 °F
Dyno Lube Out Fwd	J21 of dyno	8	Tdyn_fwd	0-300 °F
Dyno Lube Out Aft	J22 of dyno	9	Tdyn_aft	0-300 °F
TDyno F/A	J20, J23 & J24 of dyno	none	Tdyn_FA	0-300 °F

(2) Access cables 20090787-1 and 20090767-1 on the T700 side of the J-box. These cables contain the thermocouple connectors where the TC calibrator will be installed.

(3) As a preliminary continuity check, install thermocouples at each connector and verify that the indicated temperature for the respective channel is approximately the ambient temperature (this test is optional).

(4) For each temperature channel listed in the following tables, perform steps (a) through (d) below.

(a) Connect the thermocouple (TC) calibrator to the specified connector using J-type TC leads.

(b) Adjust the TC calibrator controls to obtain each specified temperature setting.

(c) Record the indicated temperature at each setting and verify that the recorded temperature is within the given tolerance limits.

(d) Calibrate the corresponding AEDATS channel in accordance with AEDATS II (H345-1) Technical Manual, or AEDATS IV (H355-7) Technical Manual.

NOTE

The Limit Control Panel, Temperature and Speed Limit Control (paragraph #37) may be calibrated in conjunction with the channels marked by "*" in the following table.

Table 28-2 Alignment Points for T700 Type-J Thermocouple Channels

	Channel Name	Connector	DORIC Channel	AEDATS Channel	Calibrator Temp (°F)	DORIC and AEDATS Tolerance Limits (± 1)	DORIC Reading	AEDATS Reading
*	Engine Lube Discharge Temp.	P56 or Eng Lube Disch Temp	1	BSUMP	32	31 to 33		
					100	99 to 101		
					200	199 to 201		
					300	299 to 301		
*	Engine Oil Scav. Temp.	P57	2	J02	32	31 to 33		
					100	99 to 101		
					200	199 to 201		
					300	299 to 301		
	Inlet Air Temp	P58	3	T21	32	31 to 33		
					70	69 to 71		
					100	99 to 101		
					120	119 to 121		
	Inlet Air Temp	P59	4	T22	32	31 to 33		
					70	69 to 71		
					100	99 to 101		
					120	119 to 121		
	Inlet Air Temp	P68	5	T23	32	31 to 33		
					70	69 to 71		
					100	99 to 101		
					120	119 to 121		
	Inlet Air Temp	P92	6	T24	32	31 to 33		
					70	69 to 71		
					100	99 to 101		
					120	119 to 121		
	Inlet Air Temp	P101	27	T25	32	31 to 33		
					70	69 to 71		
					100	99 to 101		
					120	119 to 121		
	Inlet Air Temp	P102	28	T26	32	31 to 33		
					70	69 to 71		
					100	99 to 101		
					120	119 to 121		
	Inlet Air Temp	P103	29	T27	32	31 to 33		
					70	69 to 71		
					100	99 to 101		
					120	119 to 121		
	Inlet Air Temp	P104	30	T28	32	31 to 33		
					70	69 to 71		
					100	99 to 101		
					120	119 to 121		
*	Dyno-lube Inlet Temp.	J20 of Dyno	7	Tdyn_tnk	32	31 to 33		
					100	99 to 101		
					200	199 to 201		
					300	299 to 301		
*	Dyno-lube Fwd Temp.	J21 of Dyno	8	Tdyn_fwd	32	31 to 33		
					100	99 to 101		
					200	199 to 201		
					300	299 to 301		
*	Dyno-lube Aft Temp.	J22 of Dyno	9	Tdyn_aft	32	31 to 33		
					100	99 to 101		
					200	199 to 201		
					300	299 to 301		
*	Dyno-lube Delta Temp.	See note (below) J20,J23, and J24	none	Tdyn_FA	32	31 to 33		
					100	99 to 101		
					200	199 to 201		
					300	299 to 301		

To align Dyno-lube delta temperature, disconnect J24, install thermocouple at J20, and Connect Calibrator at J23. * The Limit Control Panel (paragraph #37) may be calibrated in conjunction with the channels marked by "*"

29. Type-J Thermocouple Alignment - T53/T55/T63/T64 Trailer

a. Performance Check

(1) In this section we will align the Type-J thermocouple channels monitoring the T53/T55/T63/T64 engine tests. These channels are listed in the table below.

Table 29-1

Channel Name	Connector Label	Doric Channel	AEDATS Channel * See NOTE below	Temperature Range
Eng oil inlet temp	P801	11	Toil_in	0-300 °F
Eng oil out temp	P802	12	Toil_out	0-300 °F
Bellmouth Temp #1	P803	13	Tt11	0-120 °F
Bellmouth Temp #2	P804	14	Tt12	0-120 °F
Compressor Disch Temp	P805	15	T31	0-800 °F
Bellmouth Temp #3	P806	16	Twf	0-120 °F
Compressor Disch Temp	P807	17	T32	0-800 °F
P.T. Bearing Scavenge	P808	18	Tptso	0-800 °F
#2 Bearing Scavenge	P809	19	T2bso	0-800 °F
Dyno-lube Inlet	J20	21	Tdyn tnk	0-300 °F
Dyno-lube FWD	J21	22	Tdyn_FWD	0-300 °F
Dyno-lube AFT	J22	23	Tdyn_AFT	0-300 °F
Dyno FWD/AFT Avg	J23	none	Tdyn_FA	0-300 °F

***NOTE: For AEDATS II Channel names, refer to AEDATS (H345-1) Technical Manual, Appendix C and for AEDATS IV Channel names, refer to AEDATS (H355-7) Technical Manual, Chapter 6.**

(2) Access cables 20090768-1 and 20090769-1 on the T53/T55/T63/T64 side of the J-box. These cables contain the connectors where the thermocouple calibrator will be installed.

(3) As a preliminary continuity check, install thermocouples at each connector and verify that the indicated temperature for the respective channel is approximately the ambient temperature (this test is optional).

(4) For each temperature channel listed in the following tables, perform steps (1) through (4) below.

(a) Connect the thermocouple (TC) calibrator to the specified connector using J-type TC leads.

(b) Adjust the calibrator controls to obtain each specified temperature setting.

(c) At each temperature set point, record the indicated temperature and verify that the recorded temperature is within the given tolerance limits.

(d) Calibrate the corresponding AEDATS channel in accordance with AEDATS II (H345-1) Technical Manual, or AEDATS IV (H355-7) Technical Manual.

NOTE

The Limit Control Panel, Temperature and Speed Limit Control (Steps 35, 36, 37, 39, and 40) may be calibrated in conjunction with the channels marked by "*" in the following table.

Table 29-2

Channel Name	Connector	DORIC Channel	AEDATS Channel	Calibrator Temp (°F)	DORIC and AEDATS Tolerance Limits (±1)	DORIC Reading	AEDATS Reading
* Eng oil inlet temp T53/ 63/T64 (Step 35)	P801	11	Toil_in	32	31 to 33		
				100	99 to 101		
				200	199 to 201		
				300	299 to 301		
* Eng oil out temp T53/T63/T64 (Step 36)	P802	12	Toil_out	32	31 to 33		
				100	99 to 101		
				200	199 to 201		
				300	299 to 301		
Bell mouth Temp #1 T53/T55/T63/T64	P803	13	T22	32	31 to 33		
				70	69 to 71		
				100	99 to 101		
				120	119 to 121		
Bell mouth Temp #2 T53/T55/T63/T64	P804	14	Tt12	32	31 to 33		
				70	69 to 71		
				100	99 to 101		
				120	119 to 121		
T64 Bell mouth 3 Combustor Disch. Temp T53/T55 T63/TA12	P805	15	CDT	32	31 to 33		
				200	199 - 201		
				400	399 - 401		
				600	599 – 601		
				800	799 - 801		
T64 Bell mouth 4 Bell mouth Temp #3 T53/T55 T63/TWFFuel Temp Thermo	P806	16	Twf	32	31 to 33		
				70	69 to 71		
				100	99 to 101		
				120	119 to 121		
Combustor Disch Temp T53 T55 TPTS0 T63 TA12	P807	17	T32	32	31 to 33		
				200	199 - 201		
				400	399 - 401		
				600	599 – 601		
				800	799 - 801		
P.T. Bearing Scavenge T53 T55 T2BS0 T63 TRef1	P808	18	Tptso	32	31 to 33		
				200	199 - 201		
				400	399 - 401		
				600	599 – 601		
				800	799 - 801		
#2 Bearing Scavenge T53 T63 TRef2 T64 Oil Tnk T55 Comb. Static	P809	19	T2bso	32	31 to 33		
				200	199 - 201		
				400	399 - 401		
				600	599 – 601		
				800	799 - 801		

Table 29-2 Continued

Parameter Name	Connector	DORIC Channel	AEDATS Channel	Setpoint Temp (°F)	DORIC Tolerance Limits (±2)	DORIC Reading	AEDATS Tolerance Limits (±1)	AEDATS Reading
* Dyno-lube Inlet Temp.	J20 of dyno	21	Tdyn_tnk	32	30 – 34		31 to 33	
				100	98 – 102		99 to 101	
				200	198 – 202		199 to 201	
				300	298 – 302		299 to 301	
* Dyno-lube Fwd Temp.	J21 of dyno	22	Tdyn_fwd	32	30 – 34		31 to 33	
				100	98 – 102		99 to 101	
				200	198 – 202		199 to 201	
				300	298 – 302		299 to 301	
* Dyno-lube Aft Temp.	J22 of dyno	23	Tdyn_aft	32	30 – 34		31 to 33	
				100	98 – 102		99 to 101	
				200	198 – 202		199 to 201	
				300	298 – 302		299 to 301	
* Dyno-lube Temp.FWD/AFT Average	J20,J23, See note(below)	none	Tdyn_FA	32	30 – 34		31 to 33	
				100	98 – 102		99 to 101	
				200	198 – 202		199 to 201	
				300	298 – 302		299 to 301	

* **The Limit Control Panel (paragraph #37) may be calibrated in conjunction with the channels marked by "*".**

NOTE

To align a Dyno-lube delta temperature (above), disconnect J24, install thermocouple at J20, and Connect Calibrator at J23. Record the observed temperature. Then install calibrator at J24 and open J23 (leave thermocouple at J20) and the output should be same as recorded above.

30. Fuel and Oil Tank Temperatures, Type-J (Iron-Const.) Thermocouple Channels

a. Performance Check

(1) Locate the oil tank in the doghouse on the fuel skid. Unplug Thermocouple connector that mates to the probe on top of the oil tank, **TC209**. Connect Thermocouple calibrator to **TC209** connector. Calibrate **Doric – Ch. 25** and AEDATS **OIL (TOILT)** per the table below. Record the calibrated values for each temperature set point.

(2) Locate the fuel temperature thermocouple (TC208) inside the doghouse on the fuel skid. Disconnect thermocouple TC208. Connect Thermocouple calibrator to TC208 signal lines. Calibrate Doric- Ch. 26 and AEDATS fuel (TFUELT) per the table below. Record the calibrated values for each temperature.

(3) Verify that the recorded temperatures from steps (1) and (2) are within the tolerances specified in table 37 below. Record the calibrated temperature indications below.

NOTE

The T64 engine oil-tank thermocouple connector is on the engine test trailer, J207, pin A(+) and pin B(-).

Table 30-1

Calibrator Set point	DORIC Tolerance Limits (±2)	DORIC Ch. 25	DORIC Ch. 26	AEDATS Tolerance Limits (±1)	AEDATS TOILT	AEDATS TFUELT
32	30 – 34			31 – 33		
100	98 – 102			99 – 101		
200	198 – 202			199 – 201		
300	298 – 302			299 – 301		

31. Digital Temperature Indicator, Type-K (Chromel-Alumel) Thermocouple Channels

a. Performance Check (Doric and **AEDATS Alignment** for T700 Trailer)

(1) Using type Kx thermocouple wire, connect thermocouple calibrator to pins 17 (+) and 16 (-) of connector E1 of the T700 Engine Control Cable, P/N 981AS622-1 (or 1003705). This cable runs from the J-box to the T700 engine.

(2) Set thermocouple calibrator to Type K and ensure a 30 minute warm-up time. (Not required if using Eurotron 2000T)

(3) Select Doric Channel 1 on the Type K thermocouple selector switch.

(4) Adjust the thermocouple calibrator for 400 °F.

(5) Verify that the Type R Temperature Indicator is between 398 and 402 °F. Adjust the ice point potentiometer (R44) as necessary.

NOTE

To gain access to the TI Temperature Indicator alignment controls, remove the two screws from the sides of the front panel and remove the panel. The two potentiometers are visible at the upper left of the display. R44 (Front Panel ZERO) potentiometer controls the ice point indication. R45 (SPAN) potentiometer controls the positive (+) full scale indication.

(6) Adjust the thermocouple calibrator for 2000 °F output.

(7) Verify that the TI indicator indication is between 1998 and 2002 °F. Adjust the indicator positive (+) full-scale potentiometer (R45) as necessary.

NOTE

Interaction may occur between the TI temperature indicator ice point and positive (+) full scale adjustment. Repeat steps 4 through 7 until no further adjustment is necessary.

(8) Adjust the thermocouple calibrator to obtain the temperature values listed. At each temperature value, verify that the TI temperature indicator indication and AEDATS are within the tolerance limits listed.

Table 31-1 TI Temperature Indications

Thermocouple Calibrator (°F)	DORIC TI Tolerance Limits (± 2)	DORIC TI Actual Reading	AEDATS TGT Tolerance Limits (± 1)	AEDATS Channel TGT * see note
400	398 to 402		399-401	
800	798 to 802		799-801	
1200	1198 to 1202		1199-1201	
1650	1648 to 1652		1649-1701	
2000	1998 to 2002		1999-2001	

NOTE: For **AEDATS alignment, refer to** AEDATS **II (H345-1) Technical M**anual**, or AEDATS IV (H355-7)**
Technical Manual.

NOTE: For AEDATS II Channel names, refer to AEDATS (H345-1) Technical Manual, Appendix C and for AEDATS IV Channel names, refer to AEDATS (H355-7) Technical Manual. Chapter 6.

32. DORIC and AEDATS Alignment for T53/T55/T63/T64 Trailer

a. Performance Check

(1) Ensure that the system is in the T53 mode (Reference **FEDS operator's manual**). Access cable 20090770-1, which runs from the J-box to the T53 EGT connector.

NOTE

Cable 20090770-1 used for the T53 may be replaced by 20090770-2 for T55, 20090770-3 for T63, or 20090951-1 for T64.

(2) Using type Kx thermocouple wire, connect the thermocouple calibrator to pins A (+) and pin B (-) of the T53/T63/T64 EGT connector, or connect to pins A (-) and pin D (+) of T55 EGT connector

(3) Select channel two of the Doric Thermocouple Type K selector switch.

(4) Input the following temperature signals and record the indications.

Table 32-1 TI Temperature Indications

Thermocouple Calibrator (°F)	DORIC TI Tolerance Limits (±2)	DORIC TI Actual Reading	AEDATS EGT Tolerance Limits (± 1)	AEDATS Channel EGT * see note
400	398 to 402		399-401	
800	798 to 802		799-801	
1200	1198 to 1202		1199-1201	
1600	1598 to 1602		1599-1601	
1800	1798 to 1802		1799-1801	

NOTE: See Calibration of Automatic Data Acquisition H345-1 (AEDATS II), or H355-7 (AEDATS IV) for FEDS Alignment requirements.

NOTE: For AEDATS II Channel names, refer to AEDATS (H345-1) Technical Manual, Appendix C and for AEDATS IV Channel names, refer to AEDATS (H355-7) Technical Manual. Chapter 6.

33. Analog Temperature Indicator Gauges – Type-K (Chromel-Alumel) Thermocouple Channels

a. Performance Check (T700 Analog Indicator Gauge)

(1) Ensure that the T700 Indicator Panel (20090539-1) is installed in Cabinet #3, slope front.

(2) Using type Kx thermocouple wire, connect the thermocouple calibrator to pins 17 (+) and 16 (-) of connector E1 of cable 981AS622-1 (or 1003705). This cable runs from the J-box to the T700 engine.

(3) Set calibrator to Type K and ensure 30 minutes of warm-up time after powering the calibrator. (Not required if using Eurotron 2000T)

(4) Set the calibrator output to 100 °F.

(5) Verify that the TI temperature indicator is between 98 and 102 °F. Adjust the indicator low potentiometers as necessary (R6 for digital, and R12 for analog, low adjustments).

(6) Set the thermocouple calibrator for an output of 1000 °F.

(7) Verify that the TI temperature indicator indication is between 998°F and 1002 °F. Adjust the indicator high potentiometer as necessary (R15 for digital, and R21 for analog, high adjustments).

NOTE

Interaction may occur between the TI temperature indicator low and high adjustments. Repeat steps 4 through 7 until no further adjustment is necessary.

(8) Adjust the calibrator output to obtain the temperature values listed below. Record each temperature indication and verify that these values are within the tolerance limits listed in the table below.

Table 33-1 TI Temperature Indications

Thermocouple Calibrator (°F)	Temperature Indicator Tolerance Limits	Actual TI Reading DIGITAL
400	398 to 402	
800	798 to 802	
1200	1198 to 1202	
1600	1598 to 1602	
1650	1648 to 1652	
2000	1998 to 2002	

34. T53/T55/T63/T64 Analog/Digital Gauge Alignment

a. Performance Check

(1) Ensure that the system is in the T53 mode with the Indicator Panel (20090829-1) installed, or T64 mode with Indicator Panel (20090955-1) installed (Reference **FEDS operator's manual**).

(2) Connect the calibrator to the thermocouple connector of cable 20090770-1, pins A (+) and B (-). For T64, use cable 20090951-1 pins A (+), and B (-).

(3) Repeat steps (3) to (8) of paragraph 33 using the temperatures specified in the table below.

Table 34-1 TI Temperature Indications

Thermocouple Calibrator (°F)	Temperature Indicator Tolerance Limits	Actual TI Reading	
		Digital	Analog
400	398 to 402		
800	798 to 802		
1200	1198 to 1202		
1600	1598 to 1602		
1800	1798 to 1802		

35. Temperature Limit Control - Engine Oil Inlet Temperature (0 to 300 °F)

a. Performance Check

(1) Ensure that plugs 1 through 4 on the Thermocouple Jack Panel (P/N 20090794-1) are in the T700 position. (Cabinet #4) Ensure that the system is in the T700 mode (Reference **FEDS operator's manual**).

(2) Connect the thermocouple calibrator to P56 of cable 20090787-1, using Type Jx thermocouple wire.

(3) Set all TI limit control thumb switches to 0. Depress the TI Limit Control POWER ON switch.

(4) Perform function test by depressing and releasing the TI Limit Control LAMP TEST switch. Verify the following: All green, yellow, and indicator lamps light, audible over temperature warning sounds, and all digital displays indicate 8888.

(5) Depress and release the TI RESET switch to clear the memory circuit. Allow a 3 minute period for the software program to cycle twice.

NOTE

TI Limit Control temperature indications below 90% of the values preset by thumbwheel switches are blanked out. Depress and release the DISPLAY switch, as required, to obtain temperature indications.

(6) Adjust the thermocouple calibrator output for 32 °F.

(7) Verify that the TI Limit Control indication is between 29 °F and 35 °F. Adjust potentiometer R-33 (within Limit Control Panel) as necessary.

(8) Set the TI Limit Control ENGINE OIL INLET TEMPERATURE thumbwheel switches to 300.

(9) Adjust the thermocouple calibrator to each temperature setting listed below. Record the TI reading at each calibrator setting and verify that the readings are within tolerance limits listed below.

Table 35-1 TI Limit Control Indications

Calibrator Setting (°F)	TI Tolerance Limits (±3°F)	Actual TI Reading T700 Mode	Actual TI Reading T53/T55/T63/64 Mode	Limit Control Indicator Lamp	Audible Warning
100	97 to 103			"In Limit" On	
200	197 to 203			"In Limit" On	
270	267 to 273			"90% Alert" On	
300	297 to 303			"100% Warning" On	

NOTE

Limit Control temperature readings below 90% of the values set by thumb switches are blanked out. Depress and release the DISPLAY switch, as required, to obtain temperature indications.

(10) Depress the TI Limit Control POWER OFF switch.
(11) Access the Thermocouple Jack Panel and move plugs 1-4 to T53/T55/T63/64 position. Ensure that the system is in the T53 or T64 mode (Reference **FEDS operator's manual**).
(12) Connect the thermocouple calibrator to connector P801 of cable 20090768-1.
(13) Depress TI Limit Control POWER ON switch.
(14) Set the Engine Oil Inlet Temperature thumb switches on the Limit Control Panel to 300 °F.
(15) Adjust the calibrator to the temperature settings in the table above. Record the TI reading and verify that the TI Limit Control Panel indications are within the tolerance limits. Adjust as necessary.

36. Temperature Limit Control - Engine Oil Delta Temperature

a. Performance Check

(1) T700 Procedure: Connect Temperature Calibrator to **P57**. Connect a thermocouple to **P56**. Adjust thumbwheel switch setting to 150 for Oil Δ Temperature. Input the temperature set point values listed below and note the TI indications.

(2) T53/55/63/64 Procedure: Connect Calibrator to **P802**. Connect a thermocouple at **P801**. Adjust thumbwheel switch setting to 150 for Oil Δ Temperature. Input the temperature set point values listed below and note the TI indications.

Table 36-1 TI Limit Control Indications

Calibrator Setting (math formula) (°F)	Calibrator (°F) (calculated)	TI Tolerance Limits (±3°F)	TI Reading T700 Mode	TI Reading T53/55 T63/64	Limit Control Indicator Lamp	Audible Warning
Setting = ambient + 135					"90% Alert" On	
Setting = ambient + 150					"100% Warning"	
Audible Warning						100% only

37. Dynamometer Lube Inlet Temperature (0 to 200 °F)

a. Performance Check

(1) Ensure that plug 3 of the Thermocouple Jack panel is in the T700 position. Ensure that the system is in the T700 mode (Reference **FEDS operator's manual**).
(2) Connect the thermocouple calibrator to J20 **(+)**, Dyno Tank, using Type Jx thermocouple wire.
(3) Depress the TI Limit Control POWER ON switch.
(4) Adjust the thermocouple calibrator output for 32 °F.
(5) Verify that the TI Limit Control Panel reading is between 29 and 35 °F. Adjust potentiometer R-33 as necessary.
(6) Set the TI Limit Control DYNAMOMETER LUBE INLET TEMPERATURE / THUMBWHEEL switches to 200.
(7) Adjust the calibrator output to the temperatures listed below. At each temperature, verify that the TI readings are within tolerance limits listed in the table below. Adjust TI as necessary.

Table 37-1 TI Limit Control Indications

Thermocouple Calibrator (°F)	Temperature Indicator Tolerance Limits (±3°F)	TI Reading (°F)	Limit Control Indicator Lamp	Audible Warning
100	97 to 103		In Limit	
150	147 to 153		In Limit	
180	177 to 183		90% Alert	
200	197 to 203		100% Warning	

(8) Depress the TI Limit Control POWER OFF switch.
(9) Access the Thermocouple Jack panel and move plug 3 to the T53/T55/T63/64 position. Ensure that the system is in the T53/T55/T63 or T64 mode (Reference **FEDS operator's manual**).
(10) Connect the thermocouple calibrator to connector J20 (+) and Dyno Tank.
(11) Depress TI Limit Control POWER ON switch.
(12) Adjust the thermocouple calibrator output to the temperatures listed in the table above and verify that the TI Limit Control Panel indications are within tolerance limits listed (refer to Table 40-1).
(13) Depress TI Limit Control POWER OFF switch.

38. Dynamometer Lube Delta Temperature

a. Performance Check (T700 Trailer)

(1) Ensure plug 4 of the Thermocouple Jack panel is in the T700 position. Ensure the system is in the T700 mode (Reference **FEDS operator's manual**).
(2) Connect the thermocouple calibrator to connector J23 of the T700 Dynamometer thermocouple cable, using type Jx thermocouple wire.
(3) A DYNAMOMETER LUBE INLET TEMPERATURE indication for ambient temperature will be required. This can be accomplished by connecting J20 to a Type-J thermocouple.
(4) Set the TI Limit Control Dynamometer Lube Delta Temperature thumb switches to 0080.

Table 40-1 TI Limit Control Indications – T700 Trailer

Calibrator Setting (formula) (°F)	Calibrator Setting (°F)	TI Tolerance Limits (Cal. setting ±3°F)	TI Reading (°F)	Indicator Lamp Illuminated	Audible Warning?
Ambient +74				90% Alert	
Ambient +80				100% Warning	
Audible Warning					100% only

(5) Depress the TI Limit Control POWER ON switch.
(6) Observe the TI Limit Control DYNAMOMETER LUBE INLET TEMPERATURE indication for ambient temperature. Determine the temperature value for 80 °F above the indicated ambient temp.
(7) Adjust the thermocouple calibrator output for the temperature determined above (ambient +80). Verify that the TI Limit Control indicator is between 77 and 83 °F, that the "100% WARNING" indicator is lit, and that the audible warning has sounded. Adjust potentiometer R-4 as necessary.
(8) Depress TI Limit Control POWER OFF switch.

39. Dynamometer Lube Delta Temperature.

a. Performance Check (T53/T55/T63/T64 Trailer)

(1) Access the Thermocouple Jack panel and move Plug 4 to the T53/T55/T63 position. Ensure that the system is in the T53 or T64 mode (Reference **FEDS operator's manual**).
(2) Connect the calibrator to J23 of dynamometer thermocouple cable using type Jx thermocouple wire.
(3) A DYNAMOMETER LUBE INLET TEMPERATURE indication for ambient temperature will be required. This is accomplished by installing a J-type thermocouple to the J20 connector
(4) Set the TI Limit Control DYNAMOMETER LUBE TEMPERATURE thumb switches to 0080.
(5) Depress the TI Limit Control POWER ON switch.
(6) Observe the TI Limit Control DYNAMOMETER LUBE INLET TEMPERATURE indication for ambient temperature. Calculate the temperature value for 80 °F above the ambient temperature.
(7) Adjust the thermocouple calibrator output for the temperature determined above (ambient +80). Verify that the TI Limit Control indicator is between 77 and 83 °F, that the TI Limit Control 100% WARNING

indicator is illuminated, and that the audible warning has sounded.

Table 41-1 TI Limit Control Indications - T53/T55/T63/T64 Trailer

Calibrator Setting (formula) (°F)	Calibrator Setting (°F)	TI Tolerance Limits (Cal. setting ±3°F)	TI Reading (°F)	Indicator Lamp Illuminated	Audible Warning?
Ambient +74				90% Alert	
Ambient +80				100% Warning	
Audible Warning					100% only

(8) Depress TI Limit Control POWER OFF switch.

40. Speed Limit Control - Over speed Power Section No. 1

a. Performance Check (T700 Trailer)

(1) Connect the equipment as follows:

Table 42-1 Speed Limit Control

Oscillator Test Set	Engine Harness Plug E1 Pins
A	8
B	9

(2) Ensure that the system is in the T700 mode (Reference **FEDS operator's manual**).

(3) Depress the TI Limit Control POWER ON switch. Depress the TI RESET switch. Allow a 3 minute period for the software program to cycle twice.

(4) Set the TI Limit Control OVERSPEED POWER SECTION NO. 1 thumbwheel switches to 1333.

NOTE

OVERSPEED POWER SECTION NO. 2 is not connected.

(5) Set the tachometer tester controls as follows:

Table 42-2 Tachometer Tester Controls

Level	**500 mV**
SET Hz	**133**
POWER	**ON**

(6) Verify that the TI Limit Control indicator indicates between 130 and 136 Hz.

(7) Adjust the oscillator tester controls to the Hz values listed below. At each value, verify that the TI Limit Control indicator indicates within the tolerance limits listed.

(8) Set thumbwheels to 1333 and verify alarm activates and verify "100 % warning" indicator illuminates.

Table 42-3 TI Limit Control Indications

Speed (%)	Hz	TI Limit Control Tolerance Limits (Hz)	Indicator Lamp Illuminated	Audible Warning?
40	**533**	**530 to 536**	**"In Limits"**	
60	**800**	**797 to 803**	**"In Limits"**	
80	**1066**	**1063 to 1069**	**"In Limits"**	
90	**1200**	**1197 to 1203**	**"90% Alert"**	
100	**1334**	**1331 to 1337**	**"100% Warning"**	

(9) Turn oscillator test set OFF.
(10) Depress and release the TI Limit Control RESET switch.
(11) Depress the TI Limit Control POWER OFF switch.

41. Speed Limit Control - Over speed Power Section No. 1 T53/T55/T63/T64 MODE

a. Performance Check

(1) Ensure that the system is in the T53/T55/T63 mode with the Indicator Panel (20090829-1) installed. (Reference **FEDS operator's manual**).
(2) Turn on power to T53/T55/T63/T64 Performance Monitoring System. Allow system to conduct BIT. If BIT fails refer to system troubleshooting. Send System to depot for repairs, if necessary.
(3) Depress the MODE switch 3 times. The test mode should be in the 3333 Hz position.
(4) Verify that the TI Limit Control indicator reads 3333 ± 3Hz. Verify frequency on back panel (pins 1 and 2) is 3333 ± 3Hz.
(5) Adjust thumbwheel setting to 3333 and verify the 100% alarm activates. Adjust thumbwheel setting to 3700 ±3 and verify the 90% alarm is activated.
(6) Adjust thumbwheel setting to 3800 ±3 and verify that all alarms are off.
(7) If any of steps 3-6 fail, send the Limit control Panel to depot for repair.

42. Hydraulic Pressure Measurement System

a. Performance Check (T700 Mode)

Ensure that the system is in the **T700/T701/T701C** mode. (See Engine Test Configuration). Align AEDATS concurrently with the vertical scale indicators.

(1) MT16: 0-50 PSIG (T700)

Using the pressure calibrator, apply the following pressures to **MT16** and record the results.

Table 42-1 MT16 Alignment

Target Pressure (psig)	Calibrator Pressure (psig)	Vertical Scale Bottom Row #11 Indicator (± 2 PSI)	AEDATS Pdyn_sup (± 1 PSI)
VENT			
10			
20			
30			
40			
50			
RCAL=			

NOTE

AEDATS channel names for all engines is Pdyn_sup.

AEDATS Alignment – MT16 - See Calibration of Automatic Data Acquisition H345-1 (AEDATS II), or H355-7 (AEDATS IV) for FEDS Alignment requirements.

(2) MT17: 0-150 PSIG (T700)

Use pressure calibrator to apply the following pressures to **MT17A**. Vent **MT17B**. Record the results.

Table 42-2 MT17 Alignment

Target Pressure (psig)	Calibrator Pressure (psig)	Vertical Scale Top Row #5 Indicator (± 2 PSI)	AEDATS BSUMP (± 1 PSI)
VENT			

30			
60			
90			
120			
150			
RCAL=			

NOTE

AEDATS channel name is BSUMP for T700 engines only.
AEDATS Alignment – MT17 - See Calibration of Automatic Data Acquisition H345-1 (AEDATS II), or H355-7 (AEDATS IV) for FEDS Alignment requirements.

(3) MT15: 0-100 PSIG (T700)
Using the pressure calibrator, apply the following pressures to **MT15** and record the results.

Table 42-3 MT15 Alignment

Target Pressure (psig)	Calibrator Pressure (psig)	Vertical Scale Top Row #9 Indicator (± 2 PSI)	AEDATS PFI (± 1 PSI)
VENT			
20			
40			
60			
80			
100			
RCAL=			

NOTE

AEDATS channel names for all engines is PFI.
AEDATS Alignment – MT15 - See Calibration of Automatic Data Acquisition H345-1 (AEDATS II), or H355-7 (AEDATS IV) for FEDS Alignment requirements.

43. Hydraulic Pressure Measurement System

a. Performance Check (T53/T55/T63/T64/714A Mode)

Ensure that the **FEDS** is in the **T53/T55/T63/T64/714A** test mode (Reference **FEDS operator's manual**). Calibrate AEDATS concurrently with the vertical scale indicators.

(1) MT3: 0-50 PSIG (T53/T55/T63/64/714A)

Using the pressure calibrator, apply the following pressures to **MT3** and record the results

Table 43-1 MT3 Alignment

Target Pressure (psig)	Calibrator Pressure (psig)	Vertical Scale Top Row #2 Indicator (± 1 PSI)	AEDATS (± 1 PSI) See Note below
VENT			
10			
20			
30			
40			
50			
RCAL=			

NOTE

For AEDATS II Channel names, refer to AEDATS (H345-1) Technical Manual, Appendix C and for AEDATS IV Channel names, refer to AEDATS (H355-7) Technical Manual. Chapter 6.

AEDATS Alignment – MT3 - See Calibration of Automatic Data Acquisition H345-1 (AEDATS II), or H355-7 (AEDATS IV) for FEDS Alignment requirements.

(2) MT4: 0-50 PSIG (T53/T64)

Using the pressure calibrator, apply the following pressures to **MT4** for T53/T64 and record the results.

Table 43-2 MT4 -Alignment

Target Pressure (psig)	Calibrator Pressure (psig)	Vertical Scale Top Row #4 Indicator (±1 PSI)	AEDATS (± 0. 5 PSI) See Note below
VENT			
10			
20			
30			
40			
50			
RCAL=			

NOTE

For AEDATS II Channel names, refer to AEDATS (H345-1) Technical Manual, Appendix C and for AEDATS IV Channel names, refer to AEDATS (H355-7) Technical Manual. Chapter 6.

AEDATS Alignment – MT4 - See Calibration of Automatic Data Acquisition H345-1 (AEDATS II), or H355-7 (AEDATS IV) for FEDS Alignment requirements.

(3) MT5: 0-200 PSIG (T53, T63, T64)

Using the pressure calibrator, apply the following pressures to **MT5** and record the results.

Table 43-3 MT5 Alignment

Target Pressure (psig)	Calibrator Pressure (psig)	Vertical Scale Top Row #7 Indicator (± 2 PSI)	AEDATS (± 1 PSI) See Note below
VENT			
40			
80			
120			
160			
200			
RCAL=			

NOTE

For AEDATS II Channel names, refer to AEDATS (H345-1) Technical Manual, Appendix C and for AEDATS IV Channel names, refer to AEDATS (H355-7) Technical Manual. Chapter 6.

AEDATS Alignment – MT5 - See Calibration of Automatic Data Acquisition H345-1 (AEDATS II), or H355-7 (AEDATS IV) for FEDS Alignment requirements.

(4) MT6: 0-200 PSIG (T53, T55, T63, T700, 714A)

Using the pressure calibrator, apply the following pressures to **MT6** and record the results.

Table 43-4 MT6 Alignment

Target Pressure (psig)	Calibrator Pressure (psig)	Vertical Scale Top Row #5 Indicator (± 2 PSI)	AEDATS (± 1 PSI) See Note below
VENT			
40			
80			
120			
160			
200			
RCAL=			

NOTE

For AEDATS II Channel names, refer to AEDATS (H345-1) Technical Manual, Appendix C and for AEDATS IV Channel names, refer to AEDATS (H355-7) Technical Manual. Chapter 6.

AEDATS Alignment – MT6 - See Calibration of Automatic Data Acquisition H345-1 (AEDATS II), or H355-7 (AEDATS IV) for FEDS Alignment requirements.

(5) MT7: 0-200 PSIG (T53, T55, 714A, T63)

Using the pressure calibrator, apply the following pressures to **MT7** and record the results.

Table 43-5 MT7 Alignment

Target Pressure (psig)	Calibrator Pressure (psig)	Vertical Scale Top Row #6 Indicator (± 2 PSI)	AEDATS (± 1 PSI) See Note below
VENT			
40			
80			
120			
160			
200			
RCAL=			

NOTE

For AEDATS II Channel names, refer to AEDATS (H345-1) Technical Manual, Appendix C and for AEDATS IV Channel names, refer to AEDATS (H355-7) Technical Manual. Chapter 6.

AEDATS Alignment – MT7 - See Calibration of Automatic Data Acquisition H345-1 (AEDATS II), or H355-7 (AEDATS IV) for FEDS Alignment requirements.

(6) MT8: 0-200 PSIG (T53)

Using the pressure calibrator, apply the following pressures to **MT8** for T53 and record the results.

Table 43-6 MT8 – Alignment

Target Pressure (psig)	Calibrator Pressure (psig)	Vertical Scale Top Row #8 Indicator (± 2.0 PSI)	AEDATS PTbp (± 1 PSI) See Note below
VENT			
40			
80			
120			
160			
200			
RCAL=			

NOTE

AEDATS channel name is T53 - PTbp for T53 engines only.

AEDATS Alignment – MT8 - See Calibration of Automatic Data Acquisition H345-1 (AEDATS II), or H355-7 (AEDATS IV) for FEDS Alignment requirements.

(7) MT8: -15 to +5 PSIG (T64)

Using the pressure calibrator, apply the following pressures to **MT8** for T64 and record results.

Table 43-7 MT8 – Alignment

Target Pressure (psig)	Calibrator Pressure (psig)	Vertical Scale Top Row #8 Indicator (± 1.0 PSI)	AEDATS PTsump (± 1 PSI) See Note below
-15			
-10			
-5			
vent			
5			
RCAL=			

NOTE

AEDATS channel name is PTsump for T64 engines only.

AEDATS Alignment – MT8 - See Calibration of Automatic Data Acquisition H345-1 (AEDATS II), or H355-7 (AEDATS IV) for FEDS Alignment requirements.

(8) MT9: 0-100 PSIG (T53, T55, T63, 714A & 64)

Using the pressure calibrator, apply the following pressures to **MT9** for T53 and record the results.

Table 43-8 MT9 – T53 Alignment

Target Pressure (psig)	Calibrator Pressure (psig)	Vertical Scale Top Row #9 Indicator (± 1.0 PSI)	AEDATS (± 1.0 PSI) See Note below
VENT			
20			
40			
60			
80			
100			
RCAL=			

NOTE

For AEDATS II Channel names, refer to AEDATS (H345-1) Technical Manual, Appendix C and for AEDATS IV Channel names, refer to AEDATS (H355-7) Technical Manual. Chapter 6.

AEDATS Alignment – MT9 - See Calibration of Automatic Data Acquisition H345-1 (AEDATS II), or H355-7 (AEDATS IV) for FEDS Alignment requirements.

(9) MT10: 0-1000 PSIG (T53, T55,& 714A)

Using the pressure calibrator, apply the following pressure to **MT10** and record the results.

Table 43-9 MT10 – Alignment

Target Pressure (psig)	Calibrator Pressure (psig)	Vertical Scale Top Row #10 Indicator (± 2.0 PSI)	AEDATS (± 2.0 PSI) See Note below
VENT			
200			
400			
600			
800			
1000			
RCAL=			

NOTE

For AEDATS II Channel names, refer to AEDATS (H345-1) Technical Manual, Appendix C and for AEDATS IV Channel names, refer to AEDATS (H355-7) Technical Manual. Chapter 6.

AEDATS Alignment – MT10 - See Calibration of Automatic Data Acquisition H345-1 (AEDATS II), or H355-7 (AEDATS IV) for FEDS Alignment requirements.

(10)MT10: 0-1500 PSIG (T64)

Using the pressure calibrator, apply the following pressure to **MT10** for T64 and record results.

Table 43-10 MT10 - 0-1500 PSIG - Alignment

Target Pressure (psig)	Calibrator Pressure (psig)	Vertical Scale Top Row #10 Indicator (± 2.0 PSI)	AEDATS PFD (2.0± 1 PSI) See Note below
VENT			
300			
600			
900			
1200			
1500			
RCAL=			

NOTE

For AEDATS II Channel names, refer to AEDATS (H345-1) Technical Manual, Appendix C and for AEDATS IV Channel names, refer to AEDATS (H355-7) Technical Manual. Chapter 6.

AEDATS Alignment – MT10 - See Calibration of Automatic Data Acquisition H345-1 (AEDATS II), or H355-7 (AEDATS IV) for FEDS Alignment requirements.

(11)MT11: 0-1000 PSIG (T53, T55 & 714A)
Using the pressure calibrator, apply the following pressures to **MT11** and record the results.

Table 43-11 MT11 Alignment

Target Pressure (psig)	Calibrator Pressure (psig)	Vertical Scale Top Row #11 Indicator (± 2.0 PSI)	AEDATS (± 2.0 PSI) See Note below
VENT			
200			
400			
600			
800			
1000			
RCAL=			

NOTE

For AEDATS II Channel names, refer to AEDATS (H345-1) Technical Manual, Appendix C and for AEDATS IV Channel names, refer to AEDATS (H355-7) Technical Manual. Chapter 6.

AEDATS Alignment – MT11 - See Calibration of Automatic Data Acquisition H345-1 (AEDATS II), or H355-7 (AEDATS IV) for FEDS Alignment requirements.

(12)MT12: 0-1000 PSIG (T53)
Using the pressure calibrator, apply the following pressures to **MT12** and record the results.

Table 43-12 MT12 Alignment

Target Pressure (psig)	Calibrator Pressure (psig)	Vertical Scale Bottom Row #5 Indicator (± 2.0 PSI)	AEDATS PFP2 (± 2.0 PSI) See Note below
VENT			
200			
400			
600			
800			
1000			
RCAL=			

NOTE

For AEDATS II Channel names, refer to AEDATS (H345-1) Technical Manual, Appendix C and for AEDATS IV Channel names, refer to AEDATS (H355-7) Technical Manual. Chapter 6.

AEDATS Alignment – MT12 - See Calibration of Automatic Data Acquisition H345-1 (AEDATS II), or H355-7 (AEDATS IV) for FEDS Alignment requirements.

(13) MT13: 0-50 PSIG (T53/T55/T63/T64)

Using the pressure calibrator, apply the following pressures to **MT13** and record the results.

Table 43-13 MT13 Alignment

Target Pressure (psig)	Calibrator Pressure (psig)	Vertical Scale Bottom Row #11 Indicator (± 1.0 PSI)	AEDATS Pdyn_sup (± 1.0 PSI) See Note below
VENT			
10			
20			
30			
40			
50			
RCAL=			

NOTE

For AEDATS II Channel names, refer to AEDATS (H345-1) Technical Manual, Appendix C and for AEDATS IV Channel names, refer to AEDATS (H355-7) Technical Manual. Chapter 6.

AEDATS Alignment – MT13 - See Calibration of Automatic Data Acquisition H345-1 (AEDATS II), or H355-7 (AEDATS IV) for FEDS Alignment requirements.

44. Pneumatic Pressure Measurement System (T700 Mode)

a. Performance Check

Ensure that the system is in the **T700** mode (Reference **FEDS operator's manual**).

(1) CDP Transducer - 0-600 In Hg Abs (T700 & T64)

Using the pressure calibrator, apply the following pressures to the CDP transducer located in Cabinet 11.

Table 44-1 CDP Transducer Alignment

Target Absolute Pressure (In Hg)	Calibrator Absolute Pressure (PSIA)	Vertical Scale Bottom Row #7 Indicator (± 0.3 In Hg)	AEDATS CDP ± 0.3 In Hg See Note below
ARO			
150	**73.7**		
300	**147**		
450	**221**		
600	**294.7**		

NOTE

For AEDATS II Channel names, refer to AEDATS (H345-1) Technical Manual, Appendix C and for AEDATS IV Channel names, refer to AEDATS (H355-7) Technical Manual. Chapter 6.

AEDATS Alignment – CDP - See Calibration of Automatic Data Acquisition H345-1 (AEDATS II), or H355-7 (AEDATS IV) for FEDS Alignment requirements.

45. Pneumatic Pressure Measurement System (T53/T55/T63/T64 Mode)

a. Performance Check

Ensure that the **FEDS** is in the **T53/T55/T63/T64** mode (Reference **FEDS operator's manual**).

(1) MT1: 0-100 PSIG (T53/T55 & 714A)

Using the pressure calibrator, apply the following pressures to **MT1** and record the results.

Table 45-1 MT1 Alignment

Pressure (psig)	Calibrator Pressure	Vertical Scale Top Row #1 Indicator (± 1.0)	AEDATS PS4 ± 1.0 PSI See Note below
VENT			
20			
40			
60			
80			
100			
RCAL=			

NOTE

For AEDATS II Channel names, refer to AEDATS (H345-1) Technical Manual, Appendix C and for AEDATS IV Channel names, refer to AEDATS (H355-7) Technical Manual. Chapter 6.

AEDATS Alignment – MT1 - See Calibration of Automatic Data Acquisition H345-1 (AEDATS II), or H355-7 (AEDATS IV) for FEDS Alignment requirements.

(2) MT2: 0-300 PSIG (T55 &714A)

Using the pressure calibrator, apply the following pressures to **MT2** and record the results.

Table 45-2 MT2 Alignment

Pressure (psig)	Calibrator Pressure	Vertical Scale Top Row #2 Indicator (± 2.0)	AEDATS PDO ± 1.0 PSI See Note below
VENT			
60			
120			
180			
240			
300			
RCAL=			

NOTE

For AEDATS II Channel names, refer to AEDATS (H345-1) Technical Manual, Appendix C and for AEDATS IV Channel names, refer to AEDATS (H355-7) Technical Manual. Chapter 6.

AEDATS Alignment – MT2 - See Calibration of Automatic Data Acquisition H345-1 (AEDATS II), or H355-7 (AEDATS IV) for FEDS Alignment requirements.

(3) MT20: 0-50 In H_2O (Applies to T53 Engine only)

NOTE

Steps (4) through 10 are used for analogic gage alignment. Attach calibrator to P1 Air fitting at front of J-Box. Cap P1 Air fitting at rear of J-Box

(a) **P1** Air (Applies to Engine Only)
(b) Connect the low pressure calibrator to the P1 air partpost on the engine side of the J-box. Remove hose from rear J Box marked P1 Air and cap fitting at J Box.
(c) Activate P1 air switch on touch panel of manual panel to open relay in J-Box.
(d) Access the keypad on the P1 air meter of chassis 200090608-1 in Cabinet #11 by flipping down the analogic nameplate.
(e) Apply 50 inches H_2O pressure to the P1 air transducer via the low pressure calibrator.
(f) Enter the setup mode on the meter by pressing the D and X key simultaneously. Press D until P6 is displayed. When the D key is released, the number shown represents the inputted pressure.
(g) Press the > key to lock in the display. It can now be adjusted using the > key to select the digit and the ^ key to scroll the digit value. When the number is set to 50.00, press the E key. The meter will return to normal operation.

(h) Access MT20 in the J-box. Connect the low pressure calibrator directly to the transducer. Apply the following pressures and verify the display on the P1 Air Panel.

Table 45-3 MT20 P1 AIR Alignment

Pressure In (H_2O)	Calibrator Pressure	Digital Indicators (± 2.0)	AEDATS P1Air ±1.0 H2O See Note below
VENT			
10			
20			
30			
40			
50			
RCAL=			

NOTE

For AEDATS II Channel names, refer to AEDATS (H345-1) Technical Manual, Appendix C and for AEDATS IV Channel names, refer to AEDATS (H355-7) Technical Manual. Chapter 6.

AEDATS Alignment – MT20 - See Calibration of Automatic Data Acquisition H345-1 (AEDATS II), or H355-7 (AEDATS IV) for FEDS Alignment requirements.

(4) PT101 – PT104 (T53,T55, T714A &T63 & T64)
(a) **Locate PT104** on the Bell mouth and Barometer Panel in Cabinet 10. Connect the low pressure calibrator directly to the transducer. Apply the following pressures and record the results.

Table 45-4 PT104 Alignment

Pressure (In H2O)	Calibrator Pressure	Vertical Scale Bottom Row #8 Indicator (± 0.25)	AEDATS ± 0.25 In H2O See Note below
VENT			
10			
20			
30			
40			
50			

NOTE

For AEDATS II Channel names, refer to AEDATS (H345-1) Technical Manual, Appendix C and for AEDATS IV Channel names, refer to AEDATS (H355-7) Technical Manual. Chapter 6.

AEDATS Alignment – PT102, PT103, PT104 - See Calibration of Automatic Data Acquisition H345-1 (AEDATS II), or H355-7 (AEDATS IV) for FEDS Alignment requirements.

(b) Locate PT102 on the Bell mouth and Barometer Panel in Cabinet 10. Connect the low pressure calibrator directly to the transducer. Apply the following pressures and record the results.

Table 45-5 PT102 Alignment

Pressure (In H2O)	Calibrator Pressure	Vertical Scale Bottom Row #6 Indicator (± 0.25)	± 0.25 In H2O AEDATS See Note below
VENT			
10			
20			
30			
40			
50			

NOTE

For AEDATS II Channel names, refer to AEDATS (H345-1) Technical Manual, Appendix C and for AEDATS IV Channel names, refer to AEDATS (H355-7) Technical Manual. Chapter 6.

AEDATS Alignment – PT102, PT103, PT104 - See Calibration of Automatic Data Acquisition H345-1 (AEDATS II), or H355-7 (AEDATS IV) for FEDS Alignment requirements.

(c) Locate PT103 on the Bell mouth and Barometer Panel in Cabinet 10. Connect the low pressure calibrator directly to the transducer. Apply the following pressures and record the results.

Table 45-6 PT103 Alignment

Pressure (In H2O)	Calibrator Pressure	Vertical Scale Bottom Row #7 Indicator (± 0.25)	PS12 ± 0.25 In H2O AEDATS See Note below
VENT			
10			
20			
30			
40			
50			

NOTE

For AEDATS II Channel names, refer to AEDATS (H345-1) Technical Manual, Appendix C and for AEDATS IV Channel names, refer to AEDATS (H355-7) Technical Manual. Chapter 6.

AEDATS Alignment – PT102, PT103, PT104 - See Calibration of Automatic Data Acquisition H345-1 (AEDATS II), or H355-7 (AEDATS IV) for FEDS Alignment requirements.

(d) Locate PT101 on the Bell mouth and Barometer Panel in Cabinet 10. Connect the low pressure calibrator directly to the transducer. Apply the following pressures and record the results.

Table 45-7 PT101 Alignment

Pressure (In Hg)	Calibrator Pressure	Vertical Scale Bottom Row #9 Indicator (±0.25)	BARO ± 0.05 (In Hg) AEDATS See Note below
+3			
VENT			
- 3			

NOTE

For AEDATS II Channel names, refer to AEDATS (H345-1) Technical Manual, Appendix C and for AEDATS IV Channel names, refer to AEDATS (H355-7) Technical Manual. Chapter 6.

AEDATS Alignment – PT101 - See Calibration of Automatic Data Acquisition H345-1 (AEDATS II), or H355-7 (AEDATS IV) for FEDS Alignment requirements.

46. BSUMP Scavenge Pressure Indicator

a. Performance Check

(1) Without Engine Mounted

(a) Procure an engine oil transducer (P/N 418-10054).
(b) Alternate connection if engine is not installed with E3 cable.
(c) Jump pins 1 to 7
(d) Jump pins 2 to 6
(e) Jump Pins 3 to 5
(f) Connect the low pressure calibrator directly to the transducer. On touch screen, turn on 400Hz power. Apply the following pressures and record the results.

(2) With Engine Mounted

(a) Procure an engine oil transducer **(P/N 418-10054)** and connect green cable connector.
(b) No jumper's required
(c) Connect the low pressure calibrator directly to the transducer. On touch screen, turn on 400Hz power. Apply the following pressures and record the results

Table 46-1 Scavenge Pressure Indication

Applied pressure PSIG	Indicator Pressure ±10 PSI (Digital)
0	
50	
100	
150	
200	

47. Speed Measurement System

a. Performance Check (T700 Mode)

(1) Power Turbine (NP) Speed Indicator

(a) Ensure that the system is in the T700 mode (Reference FEDS operator's manual).

(b) Set the TI calculating counter controls (Channel 1) as follows:

Table 47-1 TI Calculating Counter Controls

All DEC switches to	**6**
All C switches to	**11111**
All 10^N Period	**0**
All AUTO buttons	**depressed**
All x10 buttons	**released**
CHANNEL (1) button	**depressed**
SAMPLE RATE (FAST) button	**depressed**
TEST button	**depressed**
POWER button	**depressed**

(c) Verify that the calculating counter indicates 011111. Depress the TI CH1 x10 selector IN, and verify that the TI calculating counter indication is 111110. Depress the TI CH1 x10 selector OUT.

(d) Repeat the previous step for the remaining TI CH1 C thumb switch settings of 22222 through 99999 and 00000.

(e) Repeat the previous step and this step for the remaining TI calculating counter channels: CH2, CH3, and **CH4**. Depress the TI calculating counter test selector Out.

(f) Connect the oscillator test set to pins 8 and 9 of E1.

(g) Set the TI calculating counter controls as follows:

Table 47-2 TI Calculating Counter Controls

	T700/T701/T701C	**401/401C**
CH2 DEC	4	4
CH2 C	07502	07179
All 10^N Periods	0	0
CH2 Auto	depressed	depressed
CH2 x10	depressed	depressed
SAMPLE RATE (FAST)	1	1
TEST	released	released

(h) Set the oscillator controls as follows:

Table 47-3 Oscillator Settings

	T700/T701/T701C	**401/401C**
Level	500 mV	500mV
Set Hz	133	139
Power	On	On

AEDATS Alignment – See Calibration of Automatic Data Acquisition H345-1 (AEDATS II), or H355-7 (AEDATS IV) for FEDS Alignment requirements.

(i) Calculating counter, AEDATS and TI indicator should indicate between 9.7 and 10.3. Adjust TI indicator low (zero) potentiometers as necessary (R18 for digital and R20 for analog low adjustments).

(j) Set the oscillator to 1393.4 Hz at 1Vpp

(k) Verify that the calculating counter and TI indicator indicate between 104.2% and 104.8%. Adjust the TI indicator high (Span) potentiometer as necessary (R23 for digital and R29 for analog high adjustments). For T700-GE-401 and T700-GE-401C applications, the indications should be 99.7% to 100.3%.

NOTE

Interaction may occur between TI indicator low and TI indicator high adjustments. Repeat the previous five steps until no further adjustment is necessary.

(l) Set oscillator to the speeds listed below. At each speed, verify that the TI calculating counter and TI indicator indicates within the tolerance limits listed below. Record results.

Table 47-4 TI Calculating Counter vs. TI Indicator

T700-GE-700/-701/-701C Oscillator (Hz)	T700-GE-401/-401C Oscillator (Hz) ±0.3%	TI Calculating Counter (%) ±0.3%	TI Indicator (%) Digital ±0.3%	TI Indicator (%) Analog ±5%	AEDATS (%) RPM4 ± 1 %
533					
800					
1066					
1333					

NOTE

For AEDATS II Channel names, refer to AEDATS (H345-1) Technical Manual, Appendix C and for AEDATS IV Channel names, refer to AEDATS (H355-7) Technical Manual. Chapter 6.

AEDATS Alignment – RPM4 - See Calibration of Automatic Data Acquisition H345-1 (AEDATS II), or H355-7 (AEDATS IV) for FEDS Alignment requirements.

(2) Power Turbine (NG) Speed Indicator

(a) Connect the oscillator test set to pins 20 and 21 of connector E3.

(b) Set the TI calculating counter controls (Channel **1**) as follows:

Table 47-5 TI Calculating Counter Controls

CH1 DEC	4
CH1 C	04682
$CH110^N$ Periods	0
CH1 Auto	depressed
CH1 x10	released
Channel 1	depressed
SAMPLE RATE (FAST)	1
TEST button	depressed
POWER button	depressed

(c) Set the oscillator controls as follows:

Table 47-6 Oscillator Settings

Level	500 mV
Set Hz	214
Power	On

AEDATS Alignment – NG - See Calibration of Automatic Data Acquisition H345-1 (AEDATS II), or H355-7 (AEDATS IV) for FEDS Alignment requirements.

(d) Calculating counter, TI calculating counter and TI indicator should indicate between 9.7 and 10.3. Adjust the TI indicator low (zero) potentiometer as necessary (**R18** for digital and **R20** for analog low adjustments).
(e) Set the oscillator to 2136 Hz 1Vpp.
(f) Verify that the TI calculating counter and TI indicator indicate between 99.7% and 100.3%. Adjust the TI indicator high (span) potentiometer as necessary (**R23** for digital and **R29** for analog high adjustments).

NOTE

Interaction may occur between TI indicator low and TI indicator high adjustments. Repeat the previous five steps until no further adjustment is necessary.

(g) Set oscillator to the speeds listed below. At each speed, verify that the TI calculating counter and TI indicator indicates within the tolerance limits listed below. Record results.

Table 47-7 TI Calculating Counter vs. TI Indicator

Oscillator (Hz)	TI Calculating Counter (%) ±0.3%	TI Indicator (%) Digital ±0.3%	TI Indicator (%) Analog ±0.3%	AEDATS (%) RPM2 ± 1%
854				
1282				
1709				
2136				

NOTE

For AEDATS II Channel names, refer to AEDATS (H345-1) Technical Manual, Appendix C and for AEDATS IV Channel names, refer to AEDATS (H355-7) Technical Manual. Chapter 6.

AEDATS Alignment – RPM2 - See Calibration of Automatic Data Acquisition H345-1 (AEDATS II), or H355-7 (AEDATS IV) for FEDS Alignment requirements.

48. Speed Measurement System

a. Performance Check (T53/T55/T63/T64 Mode)

(1) Power Turbine (N2) Speed Indicator

(a) Ensure that the system is in the T53/T55/T63/T64 mode (Reference **FEDS operator's manual**).
(b) Set the TI calculating counter controls (Channel) as follows:

Table 48-1 TI Calculating Counter Controls

All DEC switches to	6
All C switches to	11111
All 10^N Periods	0
All AUTO buttons	depressed
All x10 buttons	released
CHANNEL 1 button	depressed
SAMPLE RATE (FAST)	1
TEST button	released
POWER button	depressed

(c) Verify that the calculating counter indicates 011111. Depress the TI CH1 x10 selector IN, and verify that the TI calculating counter indication is 111110. Depress the TI CH1 x10 selector OUT.
(d) Repeat the previous step for the remaining TI CH1 C thumb switch settings of 22222 through 99999 and 00000.
(e) Repeat the previous step and this step for the remaining TI calculating counter channels; CH2, CH3, CH4. Depress the TI calculating counter test selector OUT.
(f) Connect the tachometer generator test set to pins A and B of engine harness N2 at Tachometer.
(g) Set the TI calculating counter controls (Channel 2) as follows:

Table 48-2 TI Calculating Counter Controls

CH2 DEC	5
CH2 C	14286
All 10^N Period	0
CH2 Auto	depressed
CH2 x10	released
SAMPLE RATE (FAST)	1
TEST	released

(h) Set the tachometer tester controls as follows:

Table 48-3 Tachometer Tester Controls

Motor Direction	Forward
Set RPM	10%
Power	On

AEDATS Alignment – See Calibration of Automatic Data Acquisition H345-1 (AEDATS II), or H355-7 (AEDATS IV) for FEDS Alignment requirements.

(i) Verify that the TI calculating counter and TI indicator indicate between 9.7% and 10.3%. Adjust the TI indicator low (zero) potentiometers as necessary (R18 for digital and R20 for analog low adjustments).
(j) Set the tachometer tester. Set RPM selector to 100%.
(k) Verify that the TI calculating counter and TI indicator indicate between 99.7% and 100.3%. Adjust the TI indicator high (SPAN) potentiometer as necessary (R23 for digital and R29 for analog high adjustments).

NOTE

Interaction may occur between TI indicator low and TI indicator high adjustments. Repeat the previous five steps until no further adjustment is necessary.

NOTE

Ground E on TB 810 terminal # 17 if engine is not mounted (Disconnect E3 cable)

(l) With the tachometer tester, set RPM selector to the remaining speeds listed below. At each tachometer tester speed, verify that the TI calculating counter and TI indicator indicates within the tolerance limits listed below. Record results.

Table 48-4 TI Calculating Counter vs. TI Indicator

Tachometer Tester Speed (%)	TI Calculating Counter ± .3%	TI Indicator Digital ± .3%	TI Indicator (%) Analog ± .3%	AEDATS ±.1 Hz RPM3
40 (28 Hz)			39.9 – 40.1	
60 (42 Hz)			59.9 – 60.1	
80 (56 Hz)			79.9 – 80.1	
100 (70 Hz)			99.9 – 100.1	

NOTE

For AEDATS II Channel names, refer to AEDATS (H345-1) Technical Manual, Appendix C and for AEDATS IV Channel names, refer to AEDATS (H355-7) Technical Manual. Chapter 6.

AEDATS Alignment – RPM3 - See Calibration of Automatic Data Acquisition H345-1 (AEDATS II), or H355-7 (AEDATS IV) for FEDS Alignment requirements.

(m) Set the tachometer tester to 10%, the motor direction switch to STOP, and the power switch to OFF.

49. T53/T55/T63/T64 Gas Generator (N1) Speed Indicator and T64 Gas Generator (Ng) Speed Indicator

a. Performance Check

(1) Connect the tachometer generator test set to pins A and B of engine harness at Tachometer (N1).

(2) Set the TI calculating counter controls (Channel 1) as follows:

Table 49-1 TI Calculating Counter Controls

CH1 DEC	5
CH1 C	14286
CH1 10^N Period	0
CH1 Auto	depressed
CH1 x10	released
channel 1	depressed
SAMPLE RATE (FAST)	1
TEST	released

(3) Repeat steps h through m in paragraph 50

(4) With the tachometer tester, set RPM selector to the remaining speeds listed below. At each tachometer tester speed, verify that the TI calculating counter and TI indicator indicates within the tolerance limits listed below. Record results.

Table 49-2 TI Calculating Counter vs. TI Indicator

Tachometer Tester Speed (%)	TI Calculating Counter ± .3%	TI Indicator Digital ± .3%	TI Indicator (%) Analog ± .3%	AEDATS ±.1 % NG
40 (28 Hz)				
60 (42 Hz)				
80 (56 Hz)				
100 (70 Hz)				

NOTE

For AEDATS II Channel names, refer to AEDATS (H345-1) Technical Manual, Appendix C and for AEDATS IV Channel names, refer to AEDATS (H355-7) Technical Manual. Chapter 6.

AEDATS Alignment – RPM1 - See Calibration of Automatic Data Acquisition H345-1 (AEDATS II), or H355-7 (AEDATS IV) for FEDS Alignment requirements.

50. T64 Power Turbine (Nf) Speed Indicator

a. Performance Check

(1) Turn on POWER to **T53/T55/T63/T64** Performance Monitoring System. Allow system to conduct built-in test (BIT). If BIT fails, refer to system troubleshooting. Send Performance Monitoring System to depot for repair, if necessary.

(2) Depress the MODE switch once. The test mode should indicate a 0 Hz reading.

NOTE

Frequency can be varied on the back of the Limit Control Panel, terminal strip locations 1 and 2. The frequency can also be verified using the speed limit indication on the Limit Control Panel if speed Limit Control Panel has already been calibrated. Reading should be 0±10 Hz.

(3) Set the TI Calculating Counter controls (Channel 2) as follows:

Table 50-1 TI Calculating Counter Controls

CH2 DEC	6
CH2 C	11030
CH2 10^N Period	0
CH2 Auto	depressed
CH2 x10	released
SAMPLE RATE (FAST)	1
TEST	released

(4) TI Calculating Counter should read 0 ±0.3; the AEDATS should indicate 0.0 ±.1% and the Nf analog/digital gage should indicate 0.0 ±0.3% . Adjust the analog/gage indicator low (ZERO) potentiometers (R18 for digital and R20 for analog) as necessary.

(5) Depress the MODE switch once on the Performance Measuring System. The test MODE should be in the 512 Hz test position. Verify frequency on the Limit Control Panel (512 ±10Hz) or on terminal strip (1,2) on the back of the Limit Control Panel if the Limit Control Panel was not previously calibrated.

(6) TI Calculating Counter should indicate 56.5 ±0.3%. The AEDATS should indicate 56.5 ±0.1%. The analog/digital gage should indicate 56.5 ±0.3%. Adjust the analog/digital gage high (SPAN) potentiometer as necessary (R23 for digital and R29 for analog).

(7) If Calculating Counter is out of specification, send it to Depot for repairs.

(8) If necessary for alignment of AEDATS, see Calibration of Automatic Data Acquisition H345-1 (AEDATS II), or H355-7 (AEDATS IV) for FEDS Alignment requirements, using the 0 Hz and 512 Hz modes on the Performance Monitoring Panel to drive the AEDATS.

(9) Disconnect cable p/n 20090761-1 from the torque sensor cable on T64 dynamometer. Using a function generator, input the following frequencies on pins A (+) and B (-) of connector P70). Verify correct speed indications using the AEDATS. Record results.

NOTE

This step is to verify proper operation of the Performance Monitoring System. Set performance Monitoring System to NORMAL.

Table 50-2 TI Speed Indications

Input (Hz @300 mV p-p Rms)	Speed Indication (± .1%)
181.4 (20%)	
272.1 (30%)	
453.5 (50%)	
725.6 (80%)	
907.0 (100%)	

51. Torque, RPM, and Horsepower Indicator System

a. Performance Check (T700)

(1) Apply power to the TI Torque and Horsepower indicator and allow 20 minutes for the Engine/Dynamometer Limit Control Panel modules to warm-up.

(2) Depress the TI Channel Caller channel #0 pushbutton. Ensure the TI Strain Gage Conditioner digital indicator is in the foot-pounds display mode.

(3) Depress both TI Strain Gage Condition Filter Hz pushbuttons (insert 0.2 Hz filter).

(4) Adjust the Balance Coarse or fine control until the digital indicator displays a minimum value.

(5) Verify that the TI Strain Gage Conditioner digital indicator displays 0.0 ±2.0.

(6) At the engine test trailer, install the transducer torque arm and pan (supports the alignment weights) on the torque tube.

(a) Apply upward movement to the torque arm and verify the TI Strain Gage Conditioner returns to zero.

(b) Apply downward movement to the torque arm and verify the TI Strain Gage Conditioner returns to zero.

(c) Adjust the Balance Coarse/Fine control until the digital indicator displays a zero value. Note Old R CAL value:_____. Add 100# weight, display indicator displays 200 ±2.

(7) Add an additional 100 pounds of alignment weight to the transducer torque pan.

CAUTION

Visually inspect the threaded portion of the weight hanger rod for cracks or stripped threads.

(8) Verify that the TI Strain Gage Conditioner digital indicator displays 400 ±2 foot-pounds. If the required weight is not obtained, adjust the TI Strain Gage Conditioner SPAN COARSE and FINE controls until the TI Strain Gage Conditioner digital indicator displays the required weight within ± 2 foot-pounds.
(9) Add an additional 100 pounds of alignment weight to the transducer torque pan for a total alignment weight of 300 pounds.
(10) Verify that the TI Strain Gage Conditioner digital indicator displays 600 ±2 foot-pounds.
(11) Remove the alignment weights from the transducer torque pan.
(12) Verify that the TI Strain Gage Conditioner digital indicator displays the zero value ± 2 foot-pounds. If the required weight is not obtained, repeat steps 5 through 12 until the correct indication is obtained.
(13) Depress the TI Strain Gage Conditioner - CAL (T700) pushbutton and observe the weight displayed on the TI Strain Gage Conditioner digital indicator. Record this weight for future reference. It will be used for subsequent alignment computations and daily checks.Depress the TI CHANNEL CALLER channel #1 pushbutton. Ensure that the TI Strain Gage Conditioner digital indicator is in RPM display mode.
(14) Verify that the TI CHANNEL CALLER digital indicator displays 0 RPM; if not, adjust the RPM ZERO control for a 0 display.
(15) Connect the test oscillator to TI plug E1 (8,9) and adjust the test oscillator frequency as follows:
(16) T700 engine: 1393.3 ±1 Hz (1v p-p)
(17) Adjust the TI Strain Gage Conditioner SPAN COARSE and FINE controls for a digital indicator display as follows:
(18) T700 engine: 20,900 ±10 RPM
(19) Disconnect the test oscillator signal from TI plug E1 and verify that the TI Strain Gage Conditioner digital indicator displays 0 ±10 RPM.
(20) Depress the TI Strain Gage Conditioner CAL pushbutton and observe and record the digital indicator RPM value displayed.
(21) Depress the TI CHANNEL CALLER channel #2 pushbutton. Ensure the TI Strain Gage Conditioner digital indicator is in the horsepower display mode.
(22) Verify that the TI Strain Gage Conditioner digital indicator displays zero horsepower. If this display is not obtained, adjust the TI HP ZERO control for a zero digital indicator display.
(23) Depress the TI Strain Gage Conditioner - CAL (T700) pushbutton and the TI Horsepower module PUSH to CAL pushbutton. Verify that the value displayed on the TI Strain Gage Conditioner digital indicator is the product of the values of the strain gage indication recorded in step 13 and the RPM value recorded in step 19 divided by 5252.
(24) Example: (CAL FT-LBS x (CAL RPM) / 5252 = displayed value).
(25) If the displayed value is not correct, adjust the TI Strain Gage Conditioner HP SPAN COARSE and FINE controls to obtain the value determined mathematically.
(26) Remove the torque arm and pan. Re-zero the indicator with balance controls. Push (-) CAL pushbutton, then reinstall the CAL value with SPAN controls. Release the (-) CAL pushbutton.

52. Engine Torque

a. Performance Check

(1) Connect the voltage source to pins 10 (+) and 11 (-) on E1 harness. With zero voltage input, the reading for engine torque on the vertical scale indicator and QEng should be zero. Adjust zero indicator for zero reading if necessary. Adjust the voltage source for 8 V dc ±0.01 V dc. The vertical scale indicator should read 800 ± 2 FT/LBS. Adjust the span for 800 FT/LBS indication. Repeat 0 V dc and 8 V dc until no further adjustments are necessary. Record results.

Table 52-1 Engine Torque

Voltage Input	Eng Torque Ft Lbs	Vertical Scale Indicator ± 1 ft lbs	Eng Torque In Lbs	AEDATS Qeng ± 6 in lbs
0 V dc	0 ft lbs		0 in lbs	
2 V dc	200 ft lbs		2400 in lbs	
4 V dc	400 ft lbs		4800 in lbs	
6 V dc	600 ft lbs		7200 in lbs	
8 V dc	800 ft lbs		9600 in lbs	
10 V dc	1000 ft lbs		12000 in lbs	

NOTE

For AEDATS II Channel names, refer to AEDATS (H345-1) Technical Manual, Appendix C and for AEDATS IV Channel names, refer to AEDATS (H355-7) Technical Manual. Chapter 6.

AEDATS Alignment – Qeng - See Calibration of Automatic Data Acquisition H345-1 (AEDATS II), or H355-7 (AEDATS IV) for FEDS Alignment requirements.

53. Torque Measurement System

a. Performance Check (T53/T55/T63/T64)

(1) Turn on POWER to **T53/T55/T63/T64** Performance Monitoring System. Allow system to conduct built-in test (BIT). If BIT fails, refer to troubleshooting procedures for system. Send Performance Monitoring System to DEPOT for repairs, if necessary.

(2) Depress the MODE switch twice. The test mode should indicate V= 0.0. Using a multimeter, verify a 0.0 ±20 mV dc reading in cabinet TB609, 1(+) and 2(-). If test fails, refer to troubleshooting procedures for system. Send Performance Monitoring System to DEPOT for repairs, if necessary. Verify a 0.0 ±4 in-lbs torque reading on the AEDATS.

(3) Depress the MODE switch once. The test mode should indicate V= 9.497. Using a multimeter, verify the voltage (9.497 VV dc ± 20 mV dc) in cabinet TB609, 1(+) and 2(-). If test fails, refer to troubleshooting procedures for system. Send Performance Monitoring System to DEPOT for repairs, if necessary. Verify a 18944 (For T55-712 Eng) ±4 in-lbs. Verify a 22793 (For T55-714/T64 engine) ±4 in-lbs torque indication on the AEDATS.

(4) If necessary, for alignment of AEDATS, see Calibration of Automatic Data Acquisition H345-1 (AEDATS II), or H355-7 (AEDATS IV) for FEDS Alignment requirements, using the V = 0 and V = 9.497 test modes to drive the AEDATS.

b. Performance verification HP, RPM and TQ

(1) Turn on POWER to **T53/T55/T63/T64** Performance Monitoring System. Allow system to conduct built-in test (BIT). If BIT fails, refer to troubleshooting procedures for system. Send Performance Monitoring System to DEPOT for repairs, if necessary.

(2) Set mode switch to normal run. The performance monitor should indicate HP, RPM and TQ.

(3) Disconnect connector cable PN 20090761-1 from torque sensor cable

(4) Connect the CEC 2700 oscillator to connector cable PN 20090761-1 pins A and B

(5) Input the following frequencies from table and record the results

Table 53-1 TI HP, RPM and TQ

Input Frequency	**HP**	**RPM**	**TQ**	**CALC. H.P.**
181.4 Hz=**780 rpm**				
272.1 Hz=**1170 rpm**				
453.5 Hz=**1940 rpm**				
725.6 Hz=**3100 rpm**				
907.0 Hz=**3880 rpm**				
HP = TQ x RPM/ 63024 Army **HP = TQ x RPM/ 5252 Air Force**				
NOTE: Army TQ is measured in (in-lb) Air force TQ is measured in (ft-lb)				

c. RTD Temperature Alignment

(1) Turn on POWER to **T53/T55/T63** Performance Monitoring System. Allow system to conduct built-in test (BIT). If BIT fails, refer to troubleshooting procedures for system. Send Performance Monitoring System to DEPOT for repairs, if necessary.

(3) Depress mode switch once, performance monitor should indicate temperatures

(2) Disconnect connector on cable PN 20090761-1 from torque sensor cable

(3) Connect decade resistor to connector on cable PN 20090761-1 pins I and J

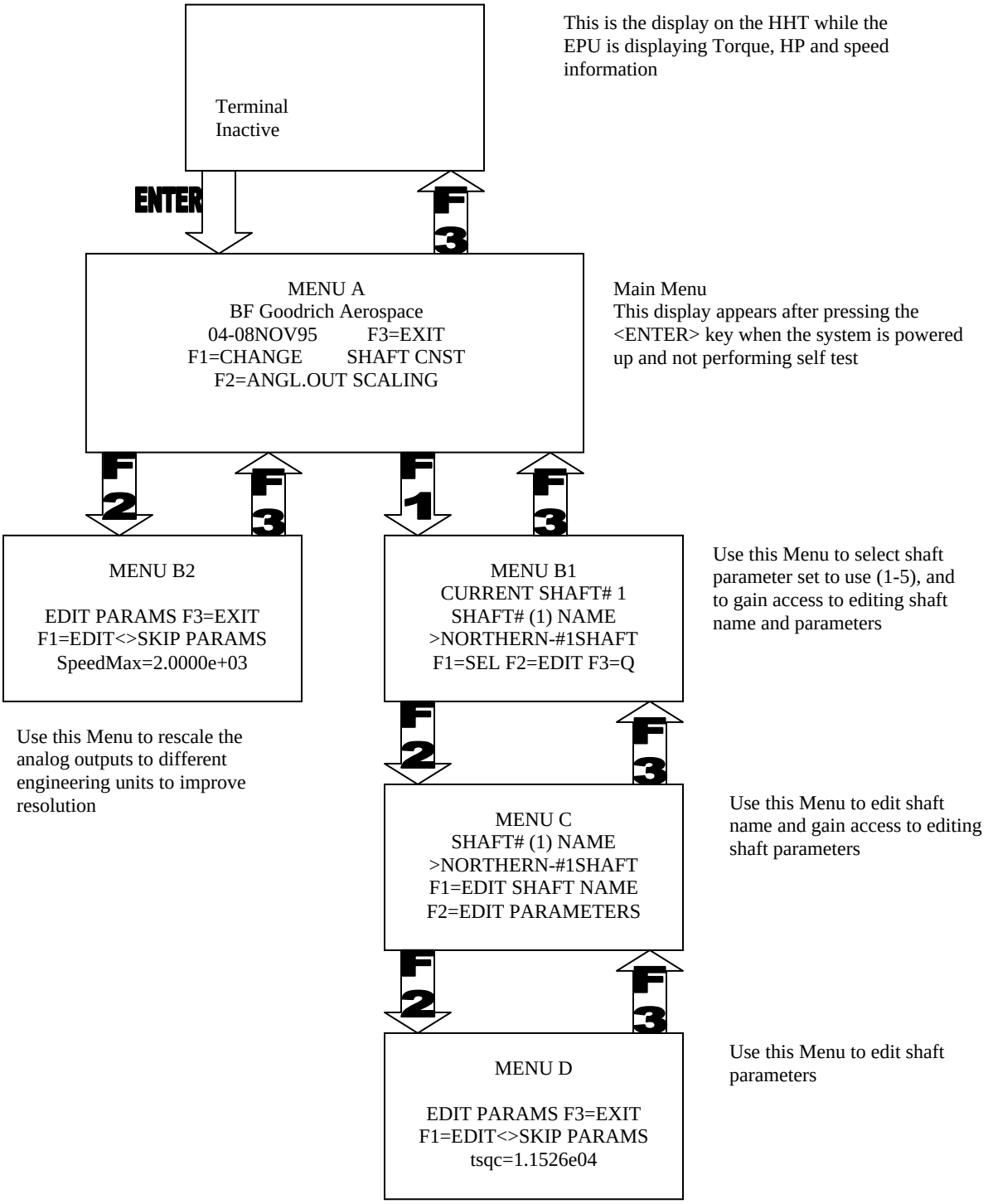
(4) Input the following resistances from table and record the results

Table 53-2 Temperature Alignment

Resistance Ohms	**Temperature deg F**	**Actual Temperature +/- 8 deg F**
100	32	
110	79	
120	126	
130	173	
140	222	

(5) If either steps B or C are out of tolerance, remove the Performance Monitoring System and return to DEPOT for repairs.

d. Hand Held Terminal - The hand held terminal (HHT) allows the user to make alterations to the system alignment constants. This device communicates with the EPU via RS-232, and plugs into the J5 connector on the back of the EPU. The EPU may be removed after necessary data is communicated to the EPU. The HHT has several user configurable parameters. Normally, the user will not have to modify these. The terminal parameters are not to be confused with the parameters that are stored in the EPU that are modified using the HHT. A flow diagram of the editing logic accessible with the HHT is shown in the following figure.



e. Editing Hand Held Terminal Parameters

(1) To enable a built-in test (of the HHT) to be on power up or to set up any other HHT parameter, simultaneously hold the CRTL and SHIFT keys while pressing F1 while the unit is connected to the EPU (powered up).

(2) Once the initial menu appears, the following keys are used to make changes:

(a) F1: Moves forward in the list of values for current parameter.

(b) F2: Move forward in the list of parameters.

(c) F3: Moves backwards in the list of parameters.

(d) F4: Exits edit mode WITHOUT saving to Non-Volatile RAM inside terminal.

(e) F5: Exits edit mode and SAVES any changes to the Non-Volatile RAM.

f. Default Terminal Parameters

(1) In order for the EPU to function properly with the Hand-Held Terminal, the terminal should already be preset to the following parameters and checked by the user.

(2) Parameters with values specified in the “Options” column may be set to any of the specified values shown. All other parameters must be set to what is shown in the “Expected Value” column.

Table 53-3 Defaulted Terminal Parameters

Parameter	Expected Value	Options
BAUD	9600	
DATA BITS	7	
PARITY	ODD	
STOP BIT	1	
DISPLAYPE	DISABLE	
REPEAT	MEDIUM	SLOW-MEDIUM-FAST-NONE
KEY CLICK	ENABLE	ENABLE-DISABLE
KNP FUNC.	DISABLE	
CURSOR	ENABLE	
CURSOR BLINK	ENABLE	ENABLE-DISABLE
XON/OFF	DISABLE	
HANDSHAKE	DISABLE	
ECHO	DUISABLE	
ESCAPE MODE	ANSI	
CR/LF MODE	NEWLINE	
TEST	DISABLE	ENABLE-DISABLE (Built-in-test)
SHIFT LOCK	DISABLE	
SCROLL	81st Char	
VIEW ANGLE	3	MIN, 2-7, MAX (LCD Contrast)
BREAK CMND	DISABLE	

g. Enabling HHT Built-in-Test

(1) The HHT as shipped from the factory does NOT perform a self-test each time it powers up. To enable the HHT BIT function, enter the EDIT menu by the procedure listed in paragraph a. above.

(2) Once in the edit mode, skip to the “TEST” parameter listed in the above paragraph by pressing F2 repeatedly until the word “TEST” appears at the top of the HHT display.

(3) Select “ENABLE” by pressing F1, then SAVE the parameters by pressing F5. Unplug the terminal from the EPU, and plug it back in. The terminal should then execute its built-in test routines. If desired, you may disable the automatic built-in test parameter by following the same procedure and setting as the “TEST” parameter to DIASBLE.

h. Changing Shaft Constants With the HHT

(1) Note that the use of the function keys along the top of the terminal have a different meaning when used to change the EPU parameters as opposed to the HHT internal parameters.

(2) Paragraph 6a above explained editing the parameters of the HHT. There, the user is interacting with the CPU in the HHT. Here, the HHT is transmitting keystrokes directly to the EPU, and likewise displaying any characters transmitted from the EPU.

(3) Typically, F1 and F2 are the primary menu selection keys used for the EPU menus. The center function key, F3, is used to exit most operations. F4 and F5 are used to either move a cursor backward and forward respectively, or to move backward and forward in a parameter list. The F4 and F5 keys are located above the keys “<” and “>”. When space permits on the display of the HHT, the use of the function keys is listed.

(4) The hand held terminal’s function is to enable the user to change the system parameters in the EPU. See the flow diagram which describes the menu structure. Press the ENTER key on the HHT to cause the initial menu (menu-A) to display on the terminal as shown below (the version and date may be different). Unless otherwise specified, the F3 or ESC key (shifted Z) may be used to exit from a menu to return to the previous level or abort an edit operation.

Table 53-3 Menu A

MENU-A:	
	BF Goodrich Aerospace
	O4-08NOV95 F3-EXIT
	F1: CHANGE SHAFT CNST
	F2: ANLG.OUT SCALING

(5) Menu-A is the TOP level menu that is displayed when the ENTER key is pressed on the HHT. The Version (04), Revision (-), and date of release (08NOV95) are displayed on Line#2. F1, F2 and F3 are the three options from this menu. F3 will return the system to normal operation and display the message “TERMINAL INACTIVE” to indicate that the system is not reading any keystrokes from the terminal but the ENTER key which will reopen MENU-A.

(6) Pressing F1 will enter the MENU-B1, while pressing F2 will enter MENU-B2.

Table 53-4 Menu B1

MENU-B1:	
	CURRENT SHAFT #1
	SHAFT #1 (1) NAME
	>NORTHERN #1 SHAFT
	F1= SEL F2=EDIT F3= Q

(7) Line #1, the shaft number indicates what parameter set the system will use to process the signals. Pressing F1 will cause the shaft displayed on the LINE-2 to become the “current shaft”. Pressing F2 from this screen will jump to the next screen to either change the name of the shaft or its parameters (MENU-C). Pressing F3 will exit to the previous menu (menu-A).

Table 53-5 Menu C

MENU-C:	
	SHAFT #1 (1) NAME
	>NORTHERN #1 SHAFT
	F1= EDIT SHAFT NAME
	F2= EDIT PARAMETERS

(8) Line #1 indicates which shaft is being altered. Line #2 is the user given name for this shaft. The user given name is useful to identify this shaft data set with the shaft used. If you wish to change the name of this shaft, press the F1 key. A block cursor should appear over the first character of the name. The F4 and F5 keys move the cursor location where the characters will be entered. Use the backspace or space key to make corrections. When your changes to the name are complete, press the ENTER key. Pressing the ESC (Shifted Z) key will discard changes to the name. Pressing the F2 key will continue to MENU-D, which will allow the user to alter the system parameters.

Table 53-6 Menu D

MENU-D:	
	EDIT PARAMS F3=EXIT
	F1=EDIT SKIP PARAMS
	tqsc = 1.1526e+04

NOTE

Shaft constants are provided from the factory for each shaft and must be entered if a new shaft is installed.

(9) This menu (MENU-D) must be used to input the initial alignment values for a new shaft. The values for “modpc” and “topc” must be input prior to **FEDS** operation. These values are marked on the end of the torque shaft and may be viewed by removing the NAS1225-4W bolt and washer inside the Polygon Hub. These values are also found on the certification accompanying the dynamometer.

Table 53-7 Variable Names

VARIABLE NAME	VALUE	COMMENT	SHAFT ID: Dyno xx, Shaft xxxx
tqsc	28367.86	Torque Full Scale	
tqch	26949.47	Torque Calibrated High	
Tqcm	13474.73	Torque Calibrated Medium	
Tqcl	0000	Torque Calibrated Low	
Modpc	From Shaft	Modulus % (must be entered by user)	
Tcoef	250.0	Temperature coefficient ppm/C	
Topc	From shaft	Torque offset % full scale	
Spsc	25000.0	Speed full scale	
Spch	28572	Speed calibrated high	
Spcl	4395	Speed calibrated low	
a_spdcmp	1.33E-03	Speed compensation factor	
B_spdcmp	-1.33E-06	Speed compensation factor	
C_spdcmp	0	Speed compensation factor	
D_spdcmp	1.33E-03	Speed compensation factor	
E_spdcmp	-1.33E-06	Speed compensation factor	
f_spdcmp	0	Speed compensation factor	
Rpm_br	7000	Speed break frequency (-1 disables)	
Sensors	1	Single (1) or dual sensor (2)	
Channel	0	Primary channel #	
Speed max	20000	Analog output, maximum speed value	
Speed min	-20000	Analog output, minimum speed value	
Torq.max	24000	Analog output, max torque value ft-lb	
Torq.min	-24000	Analog output, min torque value ft-lb	
Temp max	510	Analog output, max temperature	
Temp min	0	Analog output, min temperature	
Power max	10000	Analog output, max power	
Power min	-10000	Analog output, min power	

(10) Pressing the F4/F5 keys will advance from parameter to parameter. No change will occur to any of the parameters until you press the F1 key. To change the parameter currently on the display, press the F1 key. The cursor will appear and can be moved with the F4/F5 keys. Press ENTER when complete. Pressing the ESC key will DISCARD the changes. Press F3 to exit to the previous menu (MENU-C).

i. Changing Analog Output Scaling

(1) The HHT will enable the user to change the span of the analog outputs of the EPU. Press the ENTER key on the terminal to cause the initial menu to display on the terminal as shown below (the version and date may be different). Unless otherwise specified, the F3 or ESC key may be used to exit from a menu to return to the previous level.

Table 53-8 Menu A

MENU-A:	
	BF Goodrich Aerospace
	O4-08NOV95 F3-EXIT
	F1: CHANGE SHAFT CNST
	F2: ANLG.OUT SCALING

(2) Press the F2 key to jump to the analog output scaling menu (MENU – B2)

Table 53-9 Menu B

MENU-B2:	
	EDIT PARAMS F3=EXIT
	F1=EDIT SKIP PARAMS
	SpeedMax = 2.0000e+03

(3) The analog output utilizes a 12-Bit Digital-to-Analog converter, meaning the output span is divided into 4096 equal steps. The voltage outputs are configured as bi-polar. The default analog output scaling is described in section 3.7.4. Computation of the effective engineering unit resolution may be performed as follows:

Effective engineering unit resolution = (1/4096) x (Max Engineering Unit Parameter – Min Engineering Unit Parameter)

Table 53-10 Example

Example:	
	SpeedMax set to 2.000e+03 (20,000 PM)
	SpeedMin set to 0 (0 RPM)

Effective Speed Resolution = (1/4096) X (20000) = 4.9 RPM

Table 53-11

Voltage Output:	
	20000 RPM = 10V
	0 RPM = -10V (i.e. 0V = 10000 RPM)
Voltage Scaling:	
	(1/4096) x 20V = 4.9mV (voltage steps with ±10V output)
	Therefore, scale factor = (4.9mV) / (4.9 RPM) = 1 mV/RPM
Current Output:	
	20000 RPM = 20mA
	0 RPM = 4mA
Current Scaling:	
	(1/4096) x (20 – 4mA) = (1/4096) x 16mA = 3.9µA (current steps)
	Therefore, scale factor = (3.9µA) / (4.9 RPM) = 0.8µA/RPM

(4) Use the F4/F5 keys to skip from parameter to parameter. Press the F1 key to edit the parameter currently on the display. Use the F4/F5 keys to move the cursor. The backspace key does not need to be "shifted". When satisfied with the value, press the ENTER key to store this value. Press ESC if you wish to discard the input; the previous value will be displayed. Press F3 to return to MENU-A.

(5) The analog output parameters correspond to the limits of the analog output. "Speed Max" for instance corresponds with +10V out (maximum analog voltage output). "Speed Min" will correspond to -10V out. The current outputs respond similarly. "Speed Min" will correspond to 4mA, while "Speed Max" will correspond to 20mA.

54. T55 Electric Torque System

a. Performance Check

(1) Connect the T55 Flight Harness, 20090776-1, to connector J655 of the J-box.

(2) Torque meter zeroing procedure (T55 engine must be installed)

(a) Remove engine cable from engine torque meter on engine and install shorting cable.

(b) Turn 400 Hz power on.

(c) Remove analogic gage and adjust zero with potentiometer on rear of gage.

(d) Turn 400 Hz power off.

(e) Remove shorting cable and reconnect engine cable to torque meter on engine.

b. Torque meter Indicator Check

(1) Access the connector that mates to the engine on cable 20090776-1.

(2) Jumper pins "Z" and "a" together, and connect to the negative terminal of the millivolt source.

(3) Ensure that the Torque Power switch on the T55 Indicator panel is off.

(4) Connect pin Y of the engine mating connector of cable 20090776-1 to the positive terminal of the millivolt source.

(5) Set the millivolt source to the following levels and note the response of the Torque meter Indicator on the T55 Indicator panel. Record results.

Table 54-1Torque meter Indications

Millivolt Source	Indication (±5%)
230 ±6mV (50%)	
325 ±6mV (70%)	
430 ±mV (100%)	

55. Engine Oil Inlet Temperature Gage

a. Performance Check (AEDATS II Only)

(1) Ensure that the **FEDS** is in the T700 mode (Reference **FEDS operator's manual**).

(2) Connect the decade resistor to pins 9 and 10 of the E3 connector of cable 981AS623-1.

(3) Adjust the decade resistor to obtain the TI engine oil inlet temperature gage indications listed below. At each indication verify that the decade resistor indicates within the tolerance limits listed. Record results.

NOTE

Turn switch to 712 on signal conditioning chassis.

NOTE

The 0-400 temperature gauge will read approximately 20 degrees high because of resistance in the wiring from the control cab to the engine

Table 55-1 TI Temperature Gage Indications

Decade Resistor (ohms)	TI Temperature Gage Indication (°F)
90.34 to 90.42 Ω (32°F) ±10	
97.27 to 97.35 Ω (68°F) ±10	
104.56 to 104.64 Ω (104°F) ±10	
111.78 to 112.78 Ω (140°F) ±10	
119.86 to 120.86 Ω (176°F) ±10	
128.35 to 129.35 Ω (212°F) ±10	
141.80 to 143.00 Ω (266°F) ±10	
151.31 to 152.51 Ω (302°F) ±10	
176.95 to 178.95 Ω (392 °F) ±10	

NOTE: For use with AEDATS II Configuration only

56. Engine Oil Inlet Temperature Gage

a. Performance Check (AEDATS IV Only)

(1) Ensure that the **FEDS** is in the **T700 mode** (Reference **FEDS operator's manual**).

(2) Connect the decade resistor to pins 9 and 10 of the E3 connector of cable 981AS623-1.

(3) Adjust the decade resistor to obtain the TI engine oil inlet temperature AEDATS indications listed below. At each indication verify that the decade resistor indicates within the tolerance limits listed. Record results.

NOTE

Turn switch to 712 on signal conditioning chassis.

Table 56-1 AEDATS IV Indications

Decade Resistor (ohms)	AEDATS 4 (ORBT) +/- 2 °F
90.34 to 90.42 Ω (32°F)	
97.27 to 97.35 Ω (68°F)	
104.56 to 104.64 Ω (104°F)	
111.78 to 112.78 Ω (140°F)	
119.86 to 120.86 Ω (176°F)	
128.35 to 129.35 Ω (212°F)	
141.80 to 143.00 Ω (266°F)	
151.31 to 152.51 Ω (302°F)	
176.95 to 178.95 Ω (392 °F)	

NOTE: For use with AEDATS IV Configuration only.

AEDATS Alignment – See Calibration of Automatic Data Acquisition H355-7 (AEDATS IV) for FEDS Alignment requirements.

b. Performance Check (AEDATS II Only)

(1) Ensure that the **FEDS** system is in the T53/T55/T63 mode (Reference **FEDS operator's manual**).

(2) Connect the decade resistor to pins N and K of the T55 Flight harness, or N and P of the T53 Flight Harness.

(3) Adjust the decade resistor to obtain the TI engine oil inlet temperature gage indications listed below. At each indication verify that the decade resistor indicates within the tolerance limits listed. Record results.

NOTE

Turn switch to 712 on signal conditioning chassis.

NOTE

The 0-400 temperature gauge will read approximately 20 degrees high because of resistance in the wiring from the control cab to the engine

Table 56-2 TI Temperature Gage Indications

Decade Resistor (ohms)	TI Temperature Gage Indication (°F)
90.34 to 90.42 Ω (32°F) ±10	
97.27 to 97.35 Ω (68°F) ±10	
104.56 to 104.64 Ω (104°F) ±10	
111.78 to 112.78 Ω (140°F) ±10	
119.86 to 120.86 Ω (176°F) ±10	
128.35 to 129.35 Ω (212°F) ±10	
141.80 to 143.00 Ω (266°F) ±10	
151.31 to 152.51 Ω (302°F) ±10	
176.95 to 178.95 Ω (392 °F) ±10	

NOTE: For use with AEDATS II Configuration only

c. Performance Check (AEDATS IV Only)

(1) Ensure that the **FEDS** system is in the **T53/T55/T63** mode (Reference **FEDS operator's manual**).

(2) Connect the decade resistor to pins N and K of the T55 Flight harness, or N and P of the T53 Flight Harness.

(3) Adjust the decade resistor to obtain the TI engine oil inlet temperature ADEATS indications listed below. At each indication verify that the decade resistor indicates within the tolerance limits listed. Record results.

NOTE

Turn switch to 712 on signal conditioning chassis.

Table 56-3 AEDATS IV Indications

Decade Resistor (ohms)	AEDATS 4 (ORBT) +/- 2 °F
90.34 to 90.42 Ω (32°F)	
97.27 to 97.35 Ω (68°F)	
104.56 to 104.64 Ω (104°F)	
111.78 to 112.78 Ω (140°F)	
119.86 to 120.86 Ω (176°F)	
128.35 to 129.35 Ω (212°F)	
141.80 to 143.00 Ω (266°F)	
151.31 to 152.51 Ω (302°F)	
176.95 to 178.95 Ω (392 °F)	

NOTE: For use with AEDATS IV Configuration only.

AEDATS Alignment – See Calibration of Automatic Data Acquisition H355-7 (AEDATS IV) for FEDS Alignment requirements.

57. T700 Fault Light Panel

WARNING

28 V DC may be present between test points referenced. When opening junction boxes, 115 V AC may be present on terminal strips at locations next to test points.

a. T700

(1) Ensure that the system is in the T700 mode (Reference **FEDS operator's manual**). All references to the dyno in the T700 sections are to the small air dyno on the T700 Test Trailer.

b. Engine Fuel Filter Bypass

(1) Locate connector E3 of the Flight Harness, 981AS623-1. Jumper pins 15 and 16. The Engine Fuel Filter Bypass fault indicator should light.

c. T700 Fuel Boost

(4) Locate pressure switch 11PS in the doghouse on the Fuel Skid. It will be "T"-ed off the T700 fuel flowmeter lines.

(5) Disconnect the "T"-ed line and connect the high pressure calibrator to the pressure switch.

(1) Apply pressure to 11PS Pressure Switch. The Fuel Boost indicator on the Fault Light panel should go out for T700 Fuel Boost. At 15 Psig ±1 on the increase.

(2) If the indicator does not activate, calibrate the pressure switch as follows:

(a) Adjust the pressure switch to go out the T700 Fuel Boost Indicator (on the Fault Light Panel) on 15 ±1 psig on increase.

(b) Disconnect the test equipment and re-connect the fuel system. Activate the Fuel Pump and leak check all connectors. De-activate the Fuel Pump.

d. Skid Low Fuel Level

(1) The Skid Low Fuel Level indicator should light when the Fuel Skid tank level drops to 15% or lower. This can be noted when the system is low on fuel.

Note: The above situation can be simulated as follows:

(2) Access the Fuel Skid junction box. Jumper TB206 (12) to TB206 (11). The Skid Low Fuel Level indicator should light. This simulation verifies the entire system except for the Low Level sensor.

e. T700 Fuel Valve

(1) With the system in the T700 mode, the Valve Select indicator should light T700 when the Fuel Pump is activated. De-activate the Fuel Pump.

f. Skid Main Fuel Valve

(1) The Main Valve Closed indicator should be illuminated. Activate the Fuel Pump. The Main Valve Closed indicator should go out. De-activate the Fuel Pump.

g. Chip Detector

(1) Locate connector E3 of the Flight Harness 981AS623-1. Jumper pins 11 and 12. The Chip Detector indicator should light.

h. Skid Fuel Filter Bypass T-700

(1) The Skid Fuel Filter Bypass indication can be simulated by accessing the Fuel Skid J-box and jumping TB207 (1) to TB207 (2). The Skid Fuel Filter Bypass indicator should light.

(2) The Fuel Filter Bypass delta-P pressure switch can be activated by applying actual pressure, if desired. However, this procedure should only be used if the delta-P pressure switch is suspect.

(3) Locate the delta-P pressure switch on the side of the Fuel-Water separator. Disconnect the high and low-pressure input lines.

(4) With the low-pressure line vented to atmosphere, connect the high-pressure calibrator to the high-

pressure side (supply side).

(5) Apply pressure, increasing from Zero, do not exceed 10 psig. The Skid Fuel Filter Bypass indicator should light on increasing pressure in the range of 1 to 10 psig.

(6) Remove all test equipment and re-connect the system. Make sure to perform leak checks.

i. Dynolube Filter delta-P T-700

(1) The Dynolube Filter delta-P switch is factory set by the Air Dynamometer manufacturer. To simulate a Dynolube Filter Bypass condition, jumper pins L and K on connector J73 of cable 981AS615-1. The Lube Filter Bypass indicator in the Air Dyno section of the Fault Light panel should light.

j. Dynolube Tank Low Level T-700

(1) The Low Oil Level indicator will light when the dynolube tank is low on oil. This can be observed when changing the oil on the dynolube system.

(2) The above condition can be simulated by jumping pins M and N of connector J73 of cable 981AS615-1.

k. Dyno Low Oil Pressure Forward T-700

(1) Locate the pressure switch labeled 5PS on the J-box. Disconnect the existing hose, and connect the high-pressure calibrator.

(2) Apply 15 ±2 psig to the pressure switch. The Low Oil Press Fwd 5PS/17PS indicator on the Fault Light panel should be extinguished.

(3) Slowly bleed the pressure off the pressure switch. The Low Oil Press Fwd 5PS/17PS indicator should light at 10.5 ±.5 psig on decreasing pressure.

(4) Disconnect the test equipment and reconnect the hose removed in step 1 above.

l. Dyno Low Oil Pressure Aft T-700

(6) Locate the pressure switch labeled 6PS on the J-box. Disconnect the existing hose, and connect the high-pressure calibrator.

(7) Apply 15 ±2 psig to the pressure switch. The Low Oil Press Fwd 6PS indicator on the Fault Light panel should be extinguished.

(8) Slowly bleed the pressure off the pressure switch. The Low Oil Press Fwd 5PS indicator should light at 10.5 ±.5 psig on decreasing pressure.

(9) Disconnect the test equipment and reconnect the hose removed in step 1 above.

m. Engine Oil Filter delta-P T-700

(1) Locate connector E3 of the Flight Harness, 981AS623-1. Jumper pins 13 and 14, the Lube Filter Bypass indicator in the Engine section of the Fault Light panel should light.

n. Low Fuel Pressure

(1) Locate connector E3 of the Flight Harness, 981AS623-1. Jumper pins 23 and 24, the Low Fuel Press indicator in the Engine section of the Fault Light panel should light.

o. Engine Low Oil Pressure

(1) The Low Oil Press indicator in the Engine section of the Fault Light panel should be illuminated.

(2) Disconnect the hoses connected to pressure switches 3PS (B) on the J-box.

(3) Connect 3PS (B) to the High Pressure calibrator.

(4) Apply a pressure of 30 psig. The Low Oil Press indicator in the Engine section of the Fault Light panel should go out.

(5) Slowly decrease pressure, light should light on decreasing pressure at 25±2.

58. T53/T55/T63/T64 Fault Light Panel

a. T53/T55/T63/T64

(1) Ensure that the system is in the T53/T55/T63/T64 mode (Reference **FEDS operator's manual**). All references to the dyno in T53/T55/T63/T64 sections are to the large air dyno on the T53/T55/T63/T64 Test Trailer.

b. Dyno Supply Low Pressure

(1) Locate pressure switch 19PS on the Engine Test Trailer. Disconnect the existing hose and attach the High Pressure Calibrator. The Dyno Supply indicator should be illuminated (with 0 psig applied).

(2) Apply pressure gradually from zero psig through 15 psig. The Dyno Supply indicator should go out at approximately 10 ±2 psig.

(3) Remove the test equipment and reconnect the hose removed in step 1 above.

c. Main Valve Closed, Valve Select, and Fuel Boost Pressure

(1) Energize the Fuel Pump. The Main Valve Closed indicator should go out, the Valve Select indicator should light ARMY, and the Fuel Boost Pressure should go out for ARMY.

NOTE

Replace ARMY with T64 for T64 test systems.

(2) De-energize the Fuel Pump.

d. Chip Detector

(1) Using any of the following Flight Harnesses:

Table 58-1 Flight Harnesses

20090775 – 1	T53
20090776 – 1	T55
20090777 – 1	T63
20090950 – 1	T64

(2) Touch the chip detector lead to ground. The chip detector indicator should light.

e. Dynolube Filter delta-P

(1) The Lube Filter Bypass indicator in the Air Dyno section of the Fault Light panel should be extinguished. Locate pressure switch 18PS on the Test Trailer and disconnect the existing hose.

(2) Connect the High Pressure Calibrator to pressure switch 18PS. Slowly increase the pressure from zero to 15 psig. At approximately 10 ±1 psig the Lube Filter Bypass indicator should light.

(3) Remove all test equipment and reconnect the hose in step 1 above. Leak check this connection.

f. Dynolube Tank Low Level

(1) The Low Oil Level indicator will light when the dynolube tank is low on oil. This can be observed when changing the oil on the dynolube system.

(2) The above condition can be simulated by jumping pins F and G on connector J103 located on the Auxiliary J-box, 20090707-1.

g. Dyno Low Oil Pressure Forward

(1) The Low Oil Press Fwd 5PS/17PS indicator should be illuminated. Disconnect the hose connected to pressure switch 17PS on the J-box.

(2) Connect the High Pressure Calibrator to pressure switch 17PS on the J-box. Apply a pressure of 15 psig, the Low Oil Press Fwd 5PS/17PS indicator should go out.

(3) Slowly decrease the pressure. At approximately 10.5 ±.5 psig, on decreasing pressure, the Low Oil Press Fwd 5PS/17PS indicator should light.

(4) Disconnect the test equipment and reconnect the hose removed in step 1 above. Leak check this connection.

h. Oil Filter delta-P

(1) Locate differential pressure switch 10PS, which is mounted to the Engine Oil Tank in the doghouse of the Fuel Skid. This pressure switch has a fixed set-point in the 2 to 13 psid range, with a deadband of 1.5 PSI.
(2) Disconnect the lines running to the low and high-pressure ports of the pressure switch.
(3) Leave the low side of the pressure switch vented to atmosphere. Connect the High Pressure Calibrator to the high pressure port of the pressure switch.
(4) The Lube Filter Bypass indicator should be extinguished. Slowly increase the pressure. The Lube Filter Bypass indicator should light in the range of 7 ±1 psig on increasing pressure.
(5) Remove the test equipment. Reconnect the lines removed in step 1 above. Leak check these connections.

NOTE

T64 10PS located at filter, after tank outside of large test trailer

i. Fuel Pressure
(1) Disconnect the hose connected to J-box pressure switch 18PS. The Low Fuel Press indicator should be illuminated.
(2) Connect the High Pressure Calibrator to J-box pressure switch 18 PS. Increase the pressure to 12 psig. The Low Fuel press indicator should be extinguished.
(3) Slowly decrease the pressure. At approximately 8 ±1 psig on decreasing pressure the Low Fuel press indicator should light.
(4) Disconnect the test equipment. Reconnect the hose removed in step a above. Leak check this connection.

j. Low Oil Pressure
(1) Disconnect the hose connected to J-box pressure switch 15 PS. The Low Oil Press indicator should be illuminated.
(2) Connect the High Pressure Calibrator to J-box pressure switch 15 PS. Increase the pressure to 30 psig. The Low Oil Press indicator should be extinguished.
(3) Slowly bleed off the pressure. At approximately 25 ±1 psig, on decreasing pressure, the Low Oil Press indicator should light.
(4) Remove the test equipment. Reconnect the hose removed in step 1 above. Leak check this connection.

k. Dyno Low Oil Pressure Aft
(1) Remove the hose connected to J-box pressure switch 16 PS. The Low Oil Press Aft 6PS/16PS indicator should be illuminated.
(2) Connect the High Pressure Calibrator to J-box pressure switch 16 PS. Increase the pressure to 15 psig. The Low Oil Press Aft 6PS/16PS indicator should be extinguished.
(3) Slowly bleed off the pressure. At approximately 10.5 ±.5 psig, on decreasing pressure, the Low Oil Press Aft 6PS/16PS indicator should light.

l. Low Oil Level - T53/T63/T64
(1) Ensure that either the T53 Flight Harness, 20090775-1, the T63 Flight Harness, 20090777-1, or the T64 Flight Harness is connected to connector J655 of the J-box.
(2) The Low Oil Level indicator should be extinguished. This indicator will illuminate when the oil level in the Engine Oil Tank (on the Fuel Skid) reaches a low level. This can be observed when draining the oil system.
(3) The above situation can be electrically simulated. Access the Fuel Skid J-box, and jumper TB206(5) and TB206(6). The Low Oil Level indicator should light. For T64, TB206(5) and TB206(6) are located on the engine test trailer.

m. Low Oil Level - T55
(1) Ensure that the T55 Flight Harness, 20090776-1, is connected to connector J655 on the J-box.
(2) The Low Oil Level indicator should be extinguished. Locate the engine mating connector of Flight Harness 20090776-1. Short pin A to ground. The Low Oil Level indicator should light.

n. T53/T55/T63 Fuel Boost

(1) Locate pressure switch 2PS in the doghouse on the Fuel Skid. It will be “T”-ed off the T53/T55 fuel flowmeter lines.

(2) Disconnect the “T”-ed line and connect the high pressure calibrator to the pressure switch.

(3) Apply pressure to 2PS Pressure Switch (Fuel Skid) transducer of 15 PSI ±1 on increase. The Fuel Boost indicator on the Fault Light panel should go out for Fuel Boost ARMY.

(4) If the indicator does not activate, calibrate the pressure switch as follows:

(a) Adjust the pressure switch to go out the ARMY Fuel Boost Indicator (on the Fault Light Panel) on 15 ±1 psig on increase.

(b) Disconnect the test equipment and re-connect the fuel system. Activate the Fuel Pump and leak check all connectors. De-activate the Fuel Pump.

59. T700 Dyno Shroud Position Indicator Alignment

a. Performance Check

Note: AEDATS Alignment – See Calibration of Automatic Data Acquisition H355-7 (AEDATS IV) for FEDS Alignment requirements.

(1) The TI AEDATS II screen will request the channel name. Enter Dyno Shroud, then press the return key.
(2) The TI AEDATS II screen will request the first calibration point. Do not enter a value at this time. (The TI AEDATS II screen will display an input range of 0.0 to 5.0 VDC and an output range of 0.0 to 118.6°. The actual values are 0.0 to 16.0 VDC and 0.0 to 100.0%. Disregard the TI AEDATS II screen values.)
(3) Disconnect TI plug P91.
(4) Connect the Voltage Calibrator to the TI plug P91, pins F (+) and H (-), observing polarity.
(5) Set Voltage Calibrator output controls for 0.00 VDC.
(6) Enter 0 as the first TI AEDATS II Alignment point, then press the return key. After 0 is entered, the TI AEDATS II screen will request a second calibration point. Do not enter a value at this time.
(7) Set the Vertical Scale ZERO control for a TI indication of 0%.
(8) Set the Voltage Calibrator output controls for 16.00 VDC.
(9) Enter 100 as the second TI AEDATS II Alignment point, then press the return key. After 100 is entered, the TI AEDATS II screen will request Satisfactory Y/N? Do not make a selection at this time.
(10) Set the Vertical Scale SPAN control for a TI indication of 100%.
(11) Set the Voltage Calibrator for minimum output.
(12) Set Voltage Calibrator output controls for the values listed.
(13) The TI AEDATS II screen and the Vertical Scale must indicate within the corresponding values listed.
(14) Record results.
(15) After the last test point, enter Y to satisfy the AEDATS II request for Satisfactory Y/N?, then press the return key.

Table 59-1 DynoShrd

Voltage Input (VDC)	AEDATS 4 DynoShrd (±0.5 %)	Vertical Scale Bottom Row #3 Indicator (±1.0 %)
0 (0%)		
4 (25%)		
8 (75%)		
12 (50%)		
16 (100%)		

NOTE

AEDATS channel names for all engines is DynoShrd.

(16) Set Voltage Calibrator for minimum output.
(17) Disconnect the Voltage Calibrator from TI plug P91.
(18) Reconnect the TI plug P91.

60. T700 Load Demand Spindle Position

a. Performance Check

Note: AEDATS Alignment – See Calibration of Automatic Data Acquisition H355-7 (AEDATS IV) for FEDS Alignment requirements.

(1) The TI will request the channel name. Enter **LDS**, then press the return key.
(2) The TI AEDATS II screen will request the first calibration point. Do not enter a value at this time. (The TI AEDATS II screen will display an input range of 0.0 to 12.0 VDC and an output range of -45 to 105.0°).
(3) Disconnect TI plug P51.
(4) Connect the Voltage Calibrator to the TI plug P51, pins A (+) and B (-), observing polarity.
(5) Set Voltage Calibrator output controls for 0.00 VDC.
(6) Enter 0 as the first TI AEDATS II Alignment point, then press the return key. After 0 is entered, the TI AEDATS II screen will request the second calibration point. Do not enter a value at this time.
(7) Set the vertical scale ZERO control for a TI indication of 0 deg.
(8) Set the Voltage Calibrator output controls for 12.00 VDC.
(9) Set the vertical scale SPAN control for a TI indication of 105 deg.
(10) Enter 105 as the second AEDATS II Alignment point, then press the return key. After 105 is entered, the TI AEDATS II screen will request satisfactory Y/N? Do not make a selection at this time.
(11) Set Voltage Calibrator output controls for the values listed.
(12) The TI AEDATS II screen and the Vertical Scale must indicate within the corresponding values listed.
(13) Record results.
(14) After the last test point, enter Y to satisfy the AEDATS II screen request for satisfactory Y/N? then press the return key.

Table 60-1 LDS

Voltage Input (VDC)	AEDATS 4 LDS (±0.5 deg)	Vertical Scale Bottom Row #2 Indicator (±1.0 deg)
0 (-45 deg)		
4 (05 deg)		
8 (55 deg)		
12 (105 deg)		

(15) Set the Voltage Calibrator for minimum output.
(16) Disconnect the Voltage Calibrator from TI plug P51.
(17) Reconnect TI plug P51.

61. T700 Power Available Spindle Position

a. Performance Check

Note: AEDATS Alignment – See Calibration of Automatic Data Acquisition H355-7 (AEDATS IV) for FEDS Alignment requirements.

(1) The TI will request the channel name. Enter **PAS**, then press the return key.
(2) The TI AEDATS II screen will request the first calibration point. Do not enter a value at this time. (The TI AEDATS II screen will display an input range of 0.0 to 12.0 VDC and an output range of 0 to 150.0°).
(3) Disconnect TI plug P50.
(4) Connect the Voltage Calibrator to the TI plug P50, pins A (+) and B (-), observing polarity.
(5) Set Voltage Calibrator output controls for 0.00 VDC.
(6) Enter 0 as the first TI AEDATS II Alignment point, then press the return key. After 0 is entered, the TI. AEDATS II screen will request the second calibration point. Do not enter a value at this time.
(7) Set the vertical scale ZERO control for a TI indication of 0 deg.
(8) Set the Voltage Calibrator output controls for 12.00 VDC.
(9) Set the vertical scale SPAN control for a TI indication of 150 deg.
(10) Enter 150 as the second AEDATS II Alignment point, then press the return key. After 150 is entered, the TI AEDATS II screen will request satisfactory Y/N? Do not make a selection at this time.
(11) Set Voltage Calibrator output controls for the values listed.
(12) The TI AEDATS II screen and the Vertical Scale must indicate within the corresponding values listed.
(13) Record results.
(14) After the last test point, enter Y to satisfy the AEDATS II screen request for satisfactory Y/N? then press the return key.

Table 61-1 PAS

Voltage Input (VDC)	AEDATS 4 PAS (±0.5%)	Vertical Scale Bottom Row #1 Indicator (±1.0 deg)
0 (0 deg)		
4 (50 deg)		
8 (100 deg)		
12 (150 deg)		

(15) Set the Voltage Calibrator for minimum output.
(16) Disconnect the Voltage Calibrator from TI plug P50.
(17) Reconnect TI plug P50.

62. T700 Inlet Guide Vane Position

a. Performance Check

Note: AEDATS Alignment – See Calibration of Automatic Data Acquisition H355-7 (AEDATS IV) for FEDS Alignment requirements.

(1) The TI will request the channel name. Enter **IGV**, then press the return key.
(2) The TI AEDATS II screen will request the first calibration point. Do not enter a value at this time. (The TI AEDATS II screen will display an input range of 0.0 to 8.0 VDC and an output range of 0 to 90%).
(3) Disconnect TI plug P53.
(4) Connect the Voltage Calibrator to the TI plug P53, pins A (+) and B (-), observing polarity.
(5) Set Voltage Calibrator output controls for 0.00 VDC.
(6) Enter 0 as the first TI AEDATS II Alignment point, then press the return key. After 0 is entered, the TI AEDATS II screen will request the second calibration point. Do not enter a value at this time.
(7) Set the vertical scale ZERO control for a TI indication of 0 deg.
(8) Set the Voltage Calibrator output controls for 8.00 VDC.
(9) Set the vertical scale SPAN control for a TI indication of 90%.
(10) Enter 90% as the second AEDATS II Alignment point, then press the return key. After 90% is entered, the TI AEDATS II screen will request satisfactory Y/N? Do not make a selection at this time.
(11) Set Voltage Calibrator output controls for the values listed.
(12) The TI AEDATS II screen and the Vertical Scale must indicate within the corresponding values listed.
(13) Record results.
(14) After the last test point, enter Y to satisfy the AEDATS II screen request for satisfactory Y/N? then press the return key.

Table 62-1 IGV

Voltage Input (VDC)	AEDATS 4 IGV (±0.5%)	Vertical Scale Bottom Row #4 Indicator (±1.0 deg)
0 (10%)		
2 (15%)		
4 (40%)		
6 (65%)		
8 (90%)		

(15) Set the Voltage Calibrator for minimum output.
(16) Disconnect the Voltage Calibrator from TI plug P53.
(17) Reconnect TI plug P53

63. T64 Load Demand Spindle Position

a. Performance Check

Note: AEDATS Alignment – See Calibration of Automatic Data Acquisition H355-7 (AEDATS IV) for FEDS Alignment requirements.

(1) Ensure the TI Load Lever amplifier is installed. Select V) from the TI AEDATS II screen. The TI will request the channel name. Enter Load Lvr, then press the return key.
(2) The TI AEDATS II screen will request the first calibration point. Do not enter a value at this time. (The TI AEDATS II screen will display an input range of 0.0 to 4.0 VDC and an output range of 0.0 to 103.0°. The actual values are 0.0 to 8.0 VDC and 0.0 to 100.0°. Disregard the TI AEDATS II screen values.)
(3) Disconnect TI plug P50.
(4) Connect the Voltage Calibrator to the TI plug P50, pins A (+) and B (-), observing polarity.
(5) Set Voltage Calibrator output controls for 0.00 VDC.
(6) Enter 0 as the first TI AEDATS II Alignment point, then press the return key. After 0 is entered, the TI AEDATS screen will request the second calibration point. Do not enter a value at this time.
(7) Set the vertical scale ZERO control for a TI indication of 0 deg.
(8) Set the Voltage Calibrator output controls for 8.00 VDC.
(9) Set the vertical scale SPAN control for a TI indication of 100 deg.
(10) Enter 100 as the second AEDATS II Alignment point, then press the return key. After 100 is entered, the TI AEDATS II screen will request satisfactory Y/N? Do not make a selection at this time.
(11) Set Voltage Calibrator output controls for the values listed.
(12) The TI AEDATS II screen and the Vertical Scale must indicate within the corresponding values listed.
(13) Record results.
(14) After the last test point, enter Y to satisfy the AEDATS screen request for satisfactory Y/N? then press the return key.

Table 63-1 LDS

Voltage Input (VDC)		AEDATS THROTTLE (±0.5%)	Vertical Scale Bottom Row #1 Indicator (±1.0 deg)
0	(0 deg)		
1.6	(20 deg)		
3.2	(40 deg)		
4.8	(60 deg)		
6.4	(80 deg)		
8.0	(100 deg)		

NOTE

AEDATS channel name is LDS for the T64 engine only.

(15) Set the Voltage Calibrator for minimum output.
(16) Disconnect the Voltage Calibrator from TI plug P50.
(17) Reconnect TI plug P50.

64. T64 Power Lever Spindle Position

a. Performance Check

Note: AEDATS Alignment – See Calibration of Automatic Data Acquisition H355-7 (AEDATS IV) for FEDS Alignment requirements.

(1) The TI AEDATS II screen will request the channel name. Enter Throttle, then press the return key.
(2) The TI AEDATS II screen will request the first calibration point. Do not enter a value at this time. (The TI AEDATS II screen will display an input range of 0.0 to 3.0 VDC and an output range of 0.0 to 116.5°. The actual values are 0.0 to 12.0 VDC and 0.0 to 150.0°. Disregard the TI AEDATS II screen values.)
(3) Disconnect TI plug P51.
(4) Connect the Voltage Calibrator to the TI plug P51, pins A (+) and B (-), observing polarity.
(5) Set Voltage Calibrator output controls for 0.00 VDC.
(6) Enter 0 as the first TI AEDATS II Alignment point, then press the return key. After 0 is entered, the TI AEDATS II screen will request a second calibration point. Do not enter a value at this time.
(7) Set the vertical scale ZERO control for a TI indication of 0 deg.
(8) Set the Voltage Calibrator output controls for 12.00 VDC.
(9) Enter 150 as the second TI AEDATS II Alignment point, then press the return key. After 150 is entered, the TI AEDATS II screen will request Satisfactory Y/N? Do not make a selection at this time.
(10) Set the Vertical Scale SPAN control for a TI indication of 150 deg.
(11) Set the Voltage Calibrator for minimum output.
(12) Set Voltage Calibrator output controls for the values listed.
(13) The TI AEDATS II screen and the Vertical Scale must indicate within the corresponding values listed.
(14) Record results.
(15) After the last test point, enter Y to satisfy the AEDATS II request for Satisfactory Y/N?, then press the return key.

Table 64-1 Throttle

Voltage Input (VDC)	AEDATS 4 LOADLVR (±0.5 deg)	Vertical Scale Bottom Row #2 Indicator (±1.0 deg)
0 (0 deg)		
2.4 (30 deg)		
4.8 (60 deg)		
7.2 (90 deg)		
9.6 (120 deg)		
12 (150 deg)		

NOTE

AEDATS channel name is THROTTLE for the T64 engine only.

(16) Set the Voltage Calibrator for minimum output.
(17) Disconnect the Voltage Calibrator from TI plug P51.
(18) Reconnect TI plug P51.

65. T53/T55/T63 Throttle Angle Position

a. Performance Check

Note: AEDATS Alignment – See Calibration of Automatic Data Acquisition H355-7 (AEDATS IV) for FEDS Alignment requirements.

(1) The TI AEDATS II screen will request the channel name. Enter **TA**, then press the return key.
(2) The TI AEDATS II screen will request the first calibration point. Do not enter a value at this time.. The values are 0.0 to 12.0 VDC and 0.0 to 150.0°.
(3) Disconnect **N1 POS** at engine.
(4) Connect the Voltage Calibrator to the **N1 POS**, pins A (+) and B (-), observing polarity.
(5) Set Voltage Calibrator output controls for 0.00 VDC.
(6) Enter 0 as the first TI AEDATS II Alignment point, then press the return key. After 0 is entered, the TI AEDATS II screen will request a second calibration point. Do not enter a value at this time.

(7) Set the vertical scale ZERO control for a TI indication of 0 deg.
(8) Set the Voltage Calibrator output controls for 12.00 VDC.
(9) Enter 150 as the second TI AEDATS II Alignment point, then press the return key. After 150 is entered, the TI AEDATS II screen will request Satisfactory Y/N? Do not make a selection at this time.
(10) Set the Vertical Scale SPAN control for a TI indication of 150 deg.
(11) Set the Voltage Calibrator for minimum output.
(12) Set Voltage Calibrator output controls for the values listed.
(13) The TI AEDATS II screen and the Vertical Scale must indicate within the corresponding values listed.
(14) Record results.
(15) After the last test point, enter Y to satisfy the AEDATS II request for Satisfactory Y/N?, then press the return key.

Table 65-1 Throttle

Voltage Input (VDC)	AEDATS 4 Throttle (±0.5 %)	Vertical Scale Bottom Row #1 Indicator (±1.0 %)
0 (0 %)		
2.4 (30 %)		
4.8 (60 %)		
7.2 (90 %)		
9.6 (120 %)		
12 (150 %)		

NOTE

For AEDATS II Channel names, refer to AEDATS (H345-1) Technical Manual, Appendix C and for AEDATS IV Channel names, refer to AEDATS (H355-7) Technical Manual. Chapter 6

(16) Set the Voltage Calibrator for minimum output.
(17) Disconnect the Voltage Calibrator from **N1 POS**.
(18) Reconnect **N1 POS**. to engine.

66. T53/T55/T63/ T64 DYNO SHROUD POSITION INDICATOR ALIGNMENT

a. Performance Check

Note: AEDATS Alignment – See Calibration of Automatic Data Acquisition H355-7 (AEDATS IV) for FEDS Alignment requirements.

(1) The TI AEDATS II screen will request the channel name. Enter Dyno Shroud, then press the return key.
(2) The TI AEDATS II screen will request the first calibration point. Do not enter a value at this time. (The TI AEDATS II screen will display an input range of 0.0 to 5.0 VDC and an output range of 0.0 to 118.6°. The actual values are 0.0 to 16.0 VDC and 0.0 to 100.0%. Disregard the TI AEDATS II screen values.)
(3) Disconnect TI plug P91.
(4) Connect the Voltage Calibrator to the TI plug P91, pins F (+) and H (-), observing polarity.
(5) Set Voltage Calibrator output controls for 0.00 VDC.
(6) Enter 0 as the first TI AEDATS II Alignment point, then press the return key. After 0 is entered, the TI AEDATS II screen will request a second calibration point. Do not enter a value at this time.
(7) Set the Vertical Scale ZERO control for a TI indication of 0%.
(8) Set the Voltage Calibrator output controls for 16.00 VDC.
(9) Enter 100 as the second TI AEDATS II Alignment point, then press the return key. After 100 is entered, the TI AEDATS screen will request Satisfactory Y/N? Do not make a selection at this time.
(10) Set the Vertical Scale SPAN control for a TI indication of 100%.
(11) Set the Voltage Calibrator for minimum output.
(12) Set Voltage Calibrator output controls for the values listed.
(13) The TI AEDATS II screen and the Vertical Scale must indicate within the corresponding values listed.
(14) Record results.
(15) After the last test point, enter Y to satisfy the AEDATS II request for Satisfactory Y/N?, then press the return key.

Table 66-1 DynoShrd

Voltage Input (VDC)	AEDATS 4 DynoShrd (±0.5 %)	Vertical Scale Bottom Row #3 Indicator (±1.0 %)
0 (0%)		
4 (25%)		
8 (75%)		
12 (50%)		
16 (100%)		

NOTE

AEDATS channel name is DynoShrd for all engines.

(16) Set Voltage Calibrator for minimum output.
(17) Disconnect the Voltage Calibrator from TI plug P91.
(18) Reconnect the TI plug P91.

67. T53/T64 Inlet Guide Vane Position

a. Performance Check

Note: AEDATS Alignment – See Calibration of Automatic Data Acquisition H355-7 (AEDATS IV) for FEDS Alignment requirements.

(1) The TI AEDATS II screen will request the channel name. Enter VG, then press the return key.
(2) The TI AEDATS II screen will request the first calibration point. Do not enter a value at this time. (The TI AEDATS II screen will display an input range of 0.0 to 1.0 VDC and an output range of 0.0 to 39.0°. The actual values are 0.0 to 8.0 VDC and -10.0 to 90.0°. Disregard the TI AEDATS II screen values.)
(3) Disconnect TI plug P53.
(4) Connect the Voltage Calibrator to the TI plug P53, pins A (+) and B (-), observing polarity.

(5) Set Voltage Calibrator output controls for 0.00 VDC.
(6) Enter -10 as the first TI AEDATS II Alignment point, then press the return key. After -10 is entered, the TI AEDATS II screen will request a second calibration point. Do not enter a value at this time.
(7) Set the Vertical Scale ZERO control for a TI indication of -10 deg.
(8) Set the Voltage Calibrator output controls for 8.00 VDC.
(9) Enter 90 as the second TI AEDATS II Alignment point, then press the return key. After 90 is entered, the TI AEDATS screen will request Satisfactory Y/N? Do not make a selection at this time.
(10) Set the Vertical Scale SPAN control for a TI indication of 90 deg.
(11) Set the Voltage Calibrator for minimum output.
(12) Set Voltage Calibrator output controls for the values listed.
(13) The TI AEDATS II screen and the Vertical Scale must indicate within the corresponding values listed.
(14) Record results.
(15) After the last test point, enter Y to satisfy the AEDATS II request for Satisfactory Y/N? then press the return key.

Table 67-1 IGV

Voltage Input (VDC)		AEDATS 4 VGI (±0.5deg)	Vertical Scale Bottom Row #4 Indicator (±1.0 deg)
0	(-10 deg)		
2	(30 deg)		
4	(40 deg)		
6	(65 deg)		
8	(90 deg)		

NOTE

For AEDATS II Channel names, refer to AEDATS (H345-1) Technical Manual, Appendix C and for AEDATS IV Channel names, refer to AEDATS (H355-7) Technical Manual. Chapter 6

(16) Set Voltage Calibrator for minimum output.
(17) Disconnect the Voltage Calibrator from TI plug P53.
(18) Reconnect the TI plug P53.

68. T53/T55/T63/T64 Test Trailer - Dynolube Gauge (Optional)

(1) Supply Gauge (0-100 PSI)

(a) Locate the Dynolube Supply gauge on the Dynolube Control Panel. Remove the plumbed line on the back of the gauge. Connect the High Pressure Calibrator and set and record the following points:

Table 68-1 Supply Gauge Alignment

Set Point (psig)	Measured Value	Limits
0 (Vent)		-3 to 3 psig
20		17 - 23 psig
40		37 - 43 psig
60		57 - 63 psig
80		77 - 83 psig
100		97 - 102 psig

(b) Remove the test equipment. Reconnect the plumbing removed in step 1 above. Leak check this connection.

(2) Scavenge Gauge (-30” Hg to +15 PSIG)

(a) Locate the Dynolube Scavenge gauge on the Dynolube Control Panel. Remove the plumbed line on the back of the gauge. Connect the Low Pressure Calibrator to a “T” line. Connect the Vacuum pump and the gauge to the remaining ports on the “T” line. Set and record the following points.

Table 68-2 Scavenge Gauge Alignment

Set Point	Measured Value	Limits
0 (Vent)		-0.5 to 0.5”Hg (-.25 to +.25 PSI)
-5”Hg (-2.46PSI)		-4.5 to -5.5”Hg (-2.21 to -2.70 PSI)
-10”Hg (-4.91PSI)		-9.5 to -10.5”Hg (-4.67 to -5.16 PSI)
-15”Hg (-7.37PSI)		-14.5 to 15.5”Hg (-7.12 to -7.61 PSI)

(3) Remove the test equipment. Reconnect the plumbing removed in step 1 above. Leak check this connection.

(4) Large Test Trailer Oil System Gauge (Optional)

(a) Locate the 0-15 PSI gauge on the Oil System Disconnect Panel on the Large Test Trailer. Remove the plumbed line from the back of this gauge.

(b) Connect the High Pressure Calibrator to the gauge, set and record the following points:

Table 68-3. Large Test Trailer Oil System Gauge Alignment

Set Point	Measure Value	Limits
0 (Vent)		-.75 to .75 psig
5 psig		4.25 to 5.75 psig
10 psig		9.25 to 10.75 psig
15 psig		14.25 to 15.75 psig

SECTION IV
Alignment of Automated Data Acquisition System (AEDATS II)

69. AEDATS Alignment Description

a. This section describes how to align the system. Alignment signals of installed systems should be applied as close to user signal sources as practical. Recommended alignment equipment and equipment accuracies are listed in Table A3-2. Equivalent equipment is satisfactory. The alignment menu also allows the alignment team to display and print an alignment table for historical reference. In addition, cell constants (flowmeter K-factors, fuel specific gravity and sample temperature) can be set during the alignment. Fuel specific gravity and sample temperature can also be set during engine test initialization.

NOTE

The manufacturer's procedures for the AEDATS are provided in this section. The AEDATS is referred to by the manufacturer's trade name "AEDATS".

70. AEDATS II Alignment Procedure

a. Performance Check

(1) Power up the system per Power-Up Procedure.

(2) Select Maintenance Utilities from AEDATS Main Menu.

(3) Select Calibration from Maintenance Menu. The following calibration menu will be displayed.

(a) CALIBRATION MENU T55-L-712 03-May-91 00:34:21

1 C) Calibrate a Channel
2 D) Display Calibration
3 P) Print Calibration
4 S) Spec. Gravity, K-factors
5 X) Exit Calibration

(4) Select Calibrate a Channel from Calibration Menu. The following message will be displayed.

(a) Unauthorized Calibration Attempt

(b) Press any key to continue.

(5) Place CAL-RUN switch at front edge of board A6 in CAL position.

(6) Select Calibrate a Channel from Calibration Menu. The following menu will be displayed.

(a) CALIBRATE A CHANNEL T55-L-712 03-May-91 00:36:13

1 E) Eldec
2 F) Frequency
3 M) Millivolt DC
4 S) Synchro/Resolver
5 T) Thermocouple
6 V) Volt DC
7 X) Exit

(7) Select channel type from Calibrate a Channel menu. Display will read as follows.

(a) Calibrate (channel type)

(b) Enter Channel Name, Index, or? _____

(c) (Return to exit)

(8) If necessary, select channel name or index number from Table 3-3 through Table 3-6. If channel name or index number of desired channels is not known, enter ? to display a window containing channel type channels. Use arrow keys to scan through the list. Press Return to select highlighted channel.

(a) Channel Name Channel Reading

(b) Enter the first calibration point: _____

(9) Connect signal source (see setup figure of Table 3-3 through Table 3-6) as close to user signal source as practical. Table 3-3 through Table 3-6 list signal and conditioning control unit (SCCU) connector pins to which channel is connected.

(10) Set signal source to low cal point (see Table 3-3 through Table 3-6).

(11) Enter the first calibration point value on the keyboard.

(12) Press Return to save the calibration. Display will read as follows:

(a) Channel Name Channel Reading

(b) Enter the second calibration point:_____

(c) This point is optional (press return if not required).

NOTE

If a single point (offset) calibration is desired, press Return without entering second calibration point.

(13) Set signal source to high cal point (see Table 3-3 through Table 3-6).

(14) Enter the second calibration point value on the keyboard.

(15) Press Retrn to save the calibration. Display will read as follows:

(a) Satisfactory? (Y/N):____

(16) Make the appropriate response to return to step 9. Repeat steps 9-17 for similar channel types or press Retrn to return to calibrate a Channel menu or step 8 to select a different channel type.

(17) Repeat steps 8-17 until all channels are calibrated.

(18) When calibration is complete, place CAL-RUN switch in RUN position.

(19) Reinstall CIRCUIT BOARD ACCESS cover.

(20) Press Retrn to exit to calibrate a Channel menu and press X to return to Calibration Menu.

(21) It is recommended that a printout of the calibration be obtained at the conclusion of the calibration for the purpose of maintaining a calibration history of the system. Select Print Calibration from Calibration Menu to display the Print Calibration Report Menu. See Print Calibration Report Menu 1 of 2 or Print Calibration Report Menu 2 of 2.

(22) Test Setups These are the setups necessary to calibrate the TCIP channels.

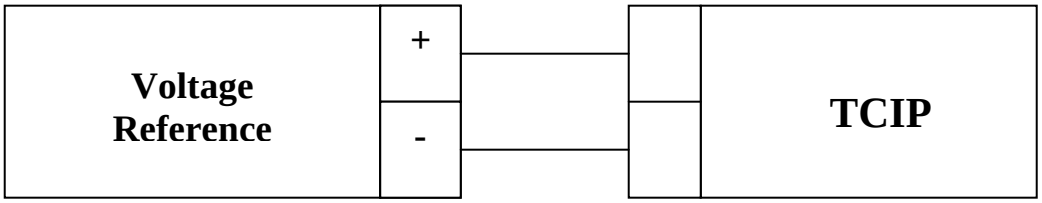
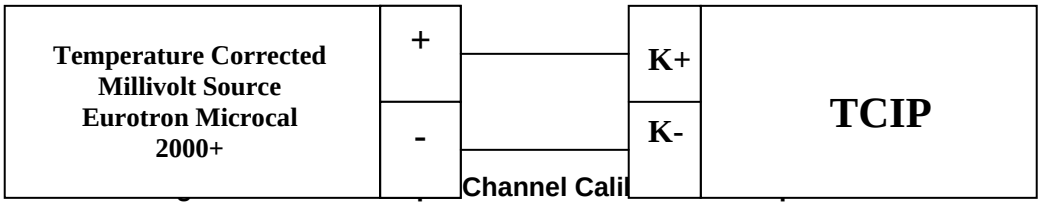


Figure 1. DC Voltage Channel Calibration



Channel Cali

Figure 3. Pressure Channel Calibration Setup

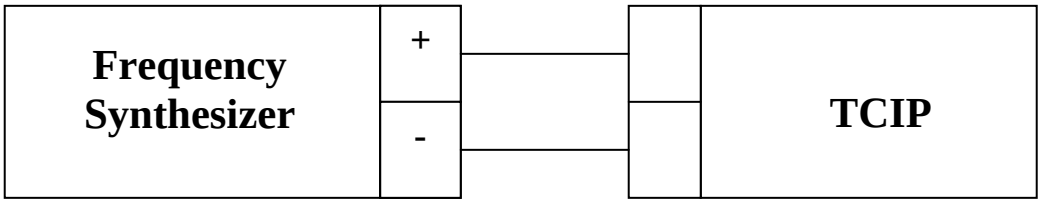


Figure 4. Frequency Channel Calibration Setup

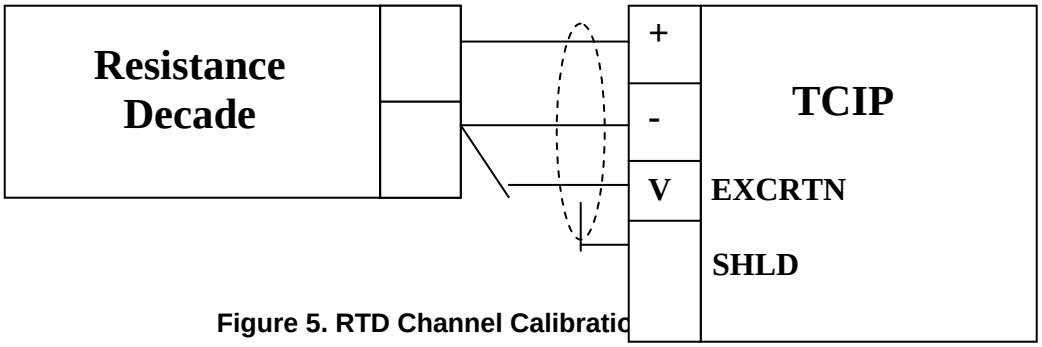


Figure 5. RTD Channel Calibratic

Table 70-1 Alignment Table

Channel Name	Channel Index	Plug Name*	Setup Figure	SCCU CONN** (+,-, Shld)	Cal Point	Desired Reading	Accuracy
Qdyno	3	LL3	1	J7 (G, H, J)	0.000 mv dc 6.035 mv dc	0 in-lb 7500 in-lb	±10 ±10
PTH	17	HL01	2	J10 (A, B)	0.000 V dc 5.000 V dc	0 IPS 5.0 IPS	±.05 ±.05
AGB	18	HL02	2	J10 (C, D)	0.000 V dc 5.000 V dc	0 IPS 5.0 IPS	±.05 ±.05
PTV	19	HL03	2	J10 (E, F)	0.000 V dc 5.000 V dc	0 IPS 5.0 IPS	±.05 ±.05
DF	20	HL04	2	J10 (G, H)	0.000 V dc 5.000 V dc	0 Mils 5.0 Mils	±.05 ±.05
DA	21	HL05	2	J10 (J, K)	0.000 V dc 5.000 V dc	0 Mils 5.0 Mils	±.05 ±.05
Torque/Qdyno	23	HL07	1	J10 (N, P)	0.000 V dc 5.000 V dc		±10 ±10
Dyno_Shrd	24	HL08	1	J10 (R, S)	0.000 V dc 16.000 V dc	0.0% 118.6%	±.10 ±.10
PAS/TA	25	HL09	1	J10 (T, U)	0.000 V dc 12.000 V dc	0.0 deg 116.5 deg	±.10 ±.10
LDS	26	HL10	2	J10 (V, W)	0.000 V dc 12.000 V dc	0.0 deg 103.0 deg	±.10 ±.10

Table 70-1(Cont)Alignment Table

Channel Name	Channel Index	Plug Name*	Setup Figure	SCCU CONN** (+,-, Shld)	Cal Point	Desired Reading	Accuracy
IGV	27	HL11	1	J10 (X, Y)	0.000 V dc 1.000 V dc	0.0 deg 39.0 deg	±.10 ±.10
IGN Amp	29	HL13	2	J10 (b, c)	0.000 V dc 5.000 V dc		±.10 ±.10
IGN Volt	30	HL14	2	J10 (f, g)	0.000 V dc 5.000 V dc		±.10 ±.10
EOST	50	J02	3	J2 (C, D)	0.000 mv dc 29.515 mv dc		±2 ±2
TDyn_Aft	59	J09	3	J2 (T, U)	0.000 mv dc 29.515 mv dc		±2 ±2
TDyn_Fwd	60	J08	3	J2 R, S)	0.000 mv dc 29.515 mv dc		±2 ±2
TDyn_Tnk	61	J07	3	J2 (N, P)	0.000 mv dc 29.515 mv dc		±2 ±2
TDyn_FA	62	J10	3	J2 (V, W)	0.000 mv dc 29.515 mv dc		±2 ±2
Toil_in	65	J17	2	J3 (A, B)	0.000 mv dc 29.515 mv dc	32°F 1000°F	±2 ±2
Toil_out	66	J18	2	J3 (C, D)	0.000 mv dc 29.515 mv dc	32°F 1000°F	±2 ±2

Table 70-1(Cont)Alignment Table

Channel Name	Channel Index	Plug Name*	Setup Figure	SCCU CONN** (+,-, Shld)	Cal Point	Desired Reading	Accuracy
T21	67	J19	3	J3 (E, F)	0.000 mv dc 29.515 mv dc		±2 ±2
T22	68	J20	3	J3 (G, H)	0.000 mv dc 29.515 mv dc		±2 ±2
T23	70	J22	3	J3 (L, M)	0.000 mv dc 29.515 mv dc		±2 ±2
Toil Tnk	73	J25	3	J3 (T, U)	0.000 mv dc 29.515 mv dc		±2 ±2
TFuelT	86	J38	3	J4 (L, M)	0.000 mv dc 29.515 mv dc		±2 ±2

Table 70-2 Alignment Table

Step	Function	Phase (Deg)	Speed	DMM Leads Connectors		Adjustment Location	Meter	Meter Reading
				Low	High			
1	+5 V dc	187.0	6	A3BD C24 -	POW SUP OUT1 +	POW SUP VADJ1	DMM	5.000 ±.05 V dc
2	+15 V dc	187.0	6	A3BD C24 -	POW SUP OUT2 +	POW SUP VADJ2	DMM	15.000 ±.10 V dc
3	-15 V dc	187.0	6	A3BD C24 -	POW SUP OUT3 -	POW SUP VADJ3	DMM	-15.000 ±.10 V dc
4	+5 Vref Gain	187.0	6	A3BD E2	A3BD E1	A3BD R6	DMM	10.000 ±.002 V dc
5	+5 Vref Offset	187.0	6	A3BD C24 -	A3BD E1	A3BD R7	DMM	5.000 ±.002 V dc
6	Center Offset Pot	187.0	6	A3BD C24 -	OFFSET POT Pin 2	OFFSET POT	DMM	0.00 ±.05 V dc
7	Center Gain Pot	195.0	6	A3BD C24 -	GAIN POT Pin 2	GAIN POT	DMM	0.0 ±.1 V dc
8	Speed Meter Offset	195.0	1	- - - -	- - - -	A1BD R31	Speed Meter	00.00 ±.1 KRPM
9	Speed Meter Gain	195.0	C	- - - -	- - - -	A1BD R33	Speed Meter	28.57 ±.1 KRPM
10	Analog Output Offset	187.0	9	J4 Pin 11	J4 Pin 12	A1BD R19	DMM	0.147 ±.003 V dc
11	Analog Output	195.0	9	J4 Pin 11	J4 Pin 12	A1BD R7	DMM	5.137 ±.003 V dc
12	Torque Meter	195.0	9	- - - -	- - - -	A1BD R13	Torque Meter	1541 ±2 Ft.Lbs.

71. Setting Test Cell Constants

a. Performance Check

(1) Select Spec Gravity, K-factors from Calibration Menu. The following cell constants menu is displayed.

(a) Cell Constants

1 Fuel Specific Gravity = 0.0000
2 Fuel Sample Temperature = 0 °F
3 Low K-Factor = 0.00
4 Mid K-Factor = 0.00
5 High K-Factor = 0.00
6 Enter # to change (1-5):_____

(2) To enter fuel specific gravity, select 1 and press **Retrn**. Observe the following display.

(a) Enter Specific Gravity:_____

(3) Make entry and press **Retrn**.

(4) To enter fuel sample temperature, select 2 and press **Retrn**. Observe the following display.

(a) Enter Fuel Sample Temp in °F:_____

(5) Make entry and press **Retrn.**

(6) To enter flowmeter low K-factor, select 3 and press **Retrn**. Observe the following display.

(a) Enter Low K-Factor:_____ (T53, T55)

(7) Make entry and press **Retrn**.

(8) To enter flowmeter mid K-factor, select 4 and press **Retrn**. Observe the following display.

(a) Enter Mid K-Factor:_____ Oil Flow (T53, T63)

(9) Make entry and press **Retrn**.

(10) To enter flowmeter high K-factor, select 5 and press **Retrn**. Observe the following display.

(a) Enter High K-Factor:_____ (T700)

(11) Make entry and press **Retrn** twice to return to Calibration Menu.

72. Date and Time Change

a. Performance Check

(1) Select Maintenance Utilities from Main Menu to display Maintenance Menu.

(2) Select Date and Time Change from the Maintenance Menu and observe the following display.

(a) A) Set Time

(b) B) Set Date

(c) X) Exit

(d) Enter Selection**:**

(3) Select Set Time and observe the following:

(a) Enter time: [hh:mm]:_____

(4) Enter 24-hour time by entering two-digit hours, colon, and two digit minutes.

Example: 13:58

(5) Press Retrn New time will be displayed on CRT and selection menu of step 2 will reappear.

(6) Select Set Date and observe the following:

(a) Enter date: [dd:mm:yy]:_____

(7) Enter date by entering two digit day, colon, two-digit month, colon, and two-digit year.

(a) Example: 27:03:91

(8) Press Retrn New date will be displayed on CRT and selection menu of step 2 will reappear.

(9) Press Retrn to return to Maintenance Menu.

Alignment of Automated Data Acquisition System (AEDATS IV)

73. GENERAL INFORMATION

a. This chapter tells how to calibrate the system. Calibration signals should be applied as close to the signal sources as practical. Recommended calibration equipment and equipment accuracies are listed in Table 75-1. Equivalent equipment is satisfactory. Let the system warm up for 30 minutes prior to conducting a calibration.

NOTE

Prior to calibrating thermocouples, attach all thermocouple leads on to the test stand, and calibrate each channel one at a time. If this is not done, thermocouple channels will appear to drift.

Table 73-1 Calibration Equipment

EQUIPMENT	TYPE/USE	APPLICATION
Eurotron MicroCal 2000+ or equivalent	ANSI Type K thermocouple simulator* Voltage Reference	calibration of tc channels calibration of DC voltage and tc channels
Electro Scientific DB62 or equivalent	Decade Resistance	calibration of RTD channels
Anadex, Inc.FS-600	Frequency Synthesizer	calibration of frequency and flow channels
Keithley Instruments 191 w/option 191	Digital Voltmeter	relay output and transducer excitation tests

b. CALIBRATION PROCEDURES

(1) Using Windows™ Explorer, located under Start/Program/TCIP, double click the TCIP folder.

(2) Start the program by double-clicking the file named Executive.exe. A startup splash screen, displaying the program version and licensing agreement, will be displayed for a moment as follows:

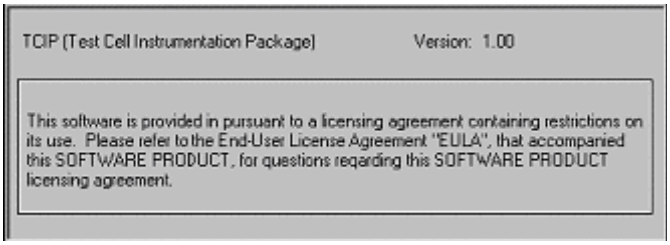


Figure 1. Typical TCIP License Screen

(3) If the calibration of a test cell transducer is due, TCIP will display a Calibration Required screen, similar to Figure 2, until acknowledged by the operator.

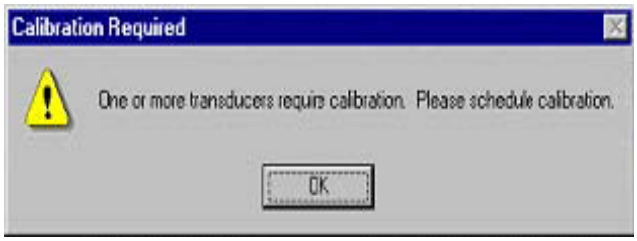


Figure 2. Transducers Require Calibration

(4) Following acknowledgement of the Calibration Required screen, the TCIP Executive window is displayed, Figure 3.

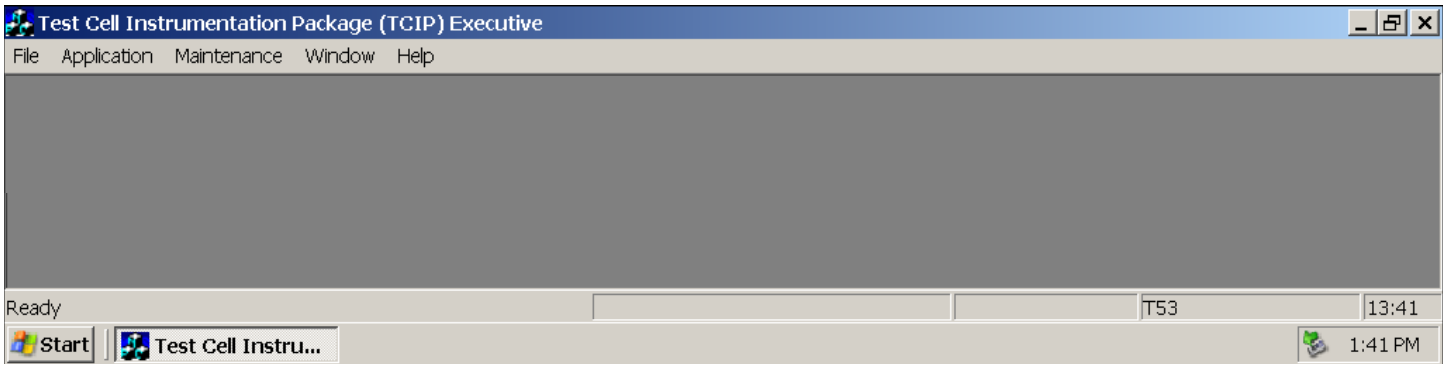


Figure 3. TCIP Executive Screen

(5) From the menu bar at the top of the window, select Maintenance | Calibration | Channel Calibration. The Authorization Required dialog box, Figure 4, will appear.

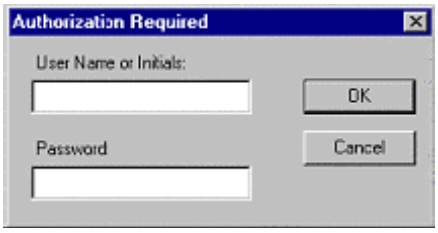


Figure 4. Authorization Required Dialogue Box

(6) Enter an operator name or initials. This entry is required.
(7) Enter the password and click OK. The Select Application screen, similar to Figure 5, will appear.

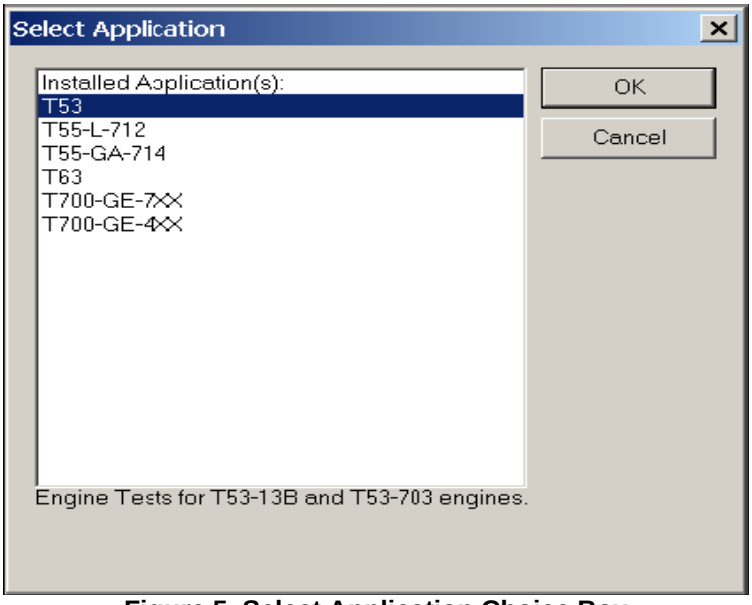


Figure 5. Select Application Choice Box

(8) Click the desired application and OK. Calibration screen, Figure 6, will appear.

c. TWO POINT CALIBRATION A two point calibration requires the application of test signals to a channel using applicable test equipment equivalent to the test equipment in Table 1.
(1) To conduct a two point calibration, make the applicable calibration setups, Section H, of the channel

to be calibrated.

(2) Perform the following Calibration Procedures.

(3) Select the channel to be calibrated and double click. The operator will be prompted to enter the 1st point (low value) as shown in Figure 6.

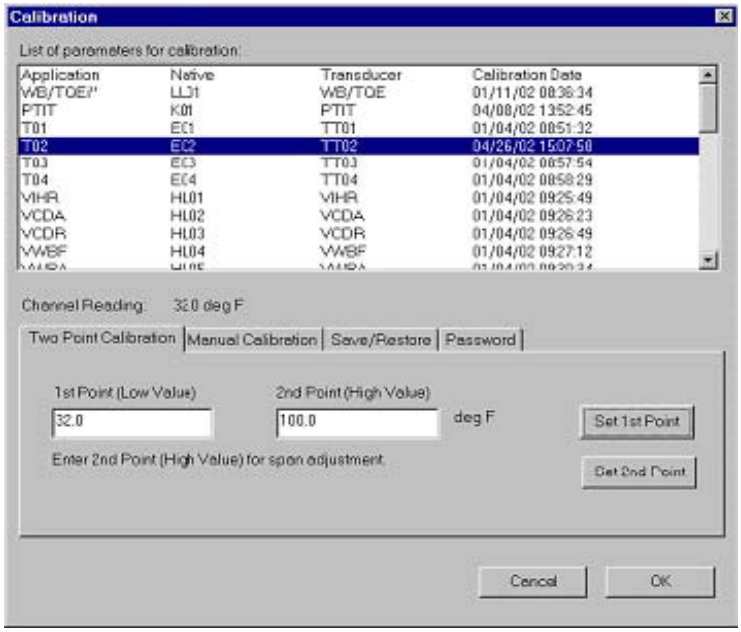


Figure 6. Calibration Set Point Screen

(4) Set the signal source to 1st Point (Low Value) and then click the Set 1st Point button. Refer to Figure 4-15 through Figure 4-19 for Test Set-ups.

(5) Set the signal source to 2nd Point (High Value) and then click the Set 2nd Point button. The Two Point Calibration tab will display "Two point calibration complete on T_nnnnn.", where T_nnnnn is the name of the transducer.

(6) Click OK and the following Confirmation screen will be displayed

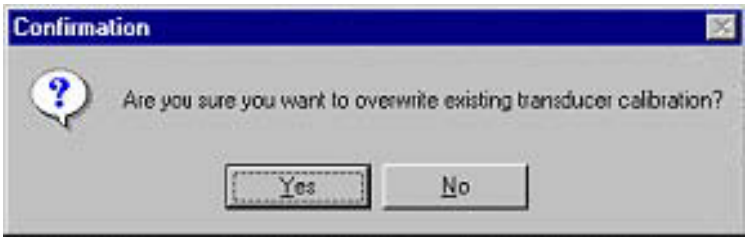


Figure 7. Set-Point Overwrite Confirmation Screen

(7) Click Yes to overwrite the existing transducer calibration and return to the TCIP Executive window. Click No to not overwrite the existing transducer calibration and return to the Calibration screen.

d. MANUAL CALIBRATION

A manual calibration consists of entering known gain and offset values for a channel.

(1) Perform the procedures of Section C.

(2) Select the channel to be calibrated and double click.

(3) Click the Manual Calibration tab.

(4) Enter gain value (slope) and offset value (intercept) as shown in Figure 8.

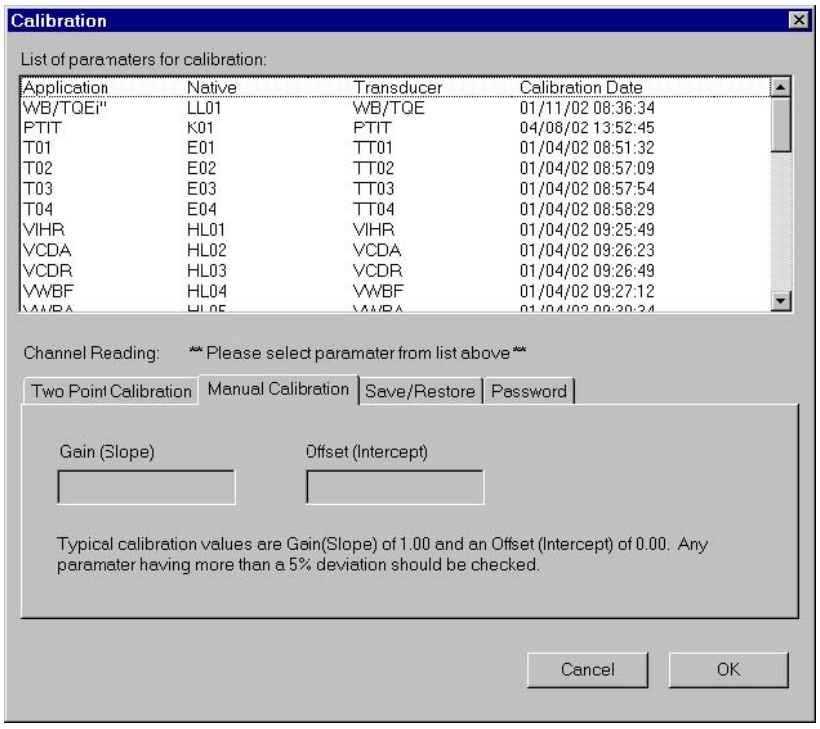


Figure 8. Typical Manual Calibration Screen

(5) Click OK and the following Confirmation screen will be displayed

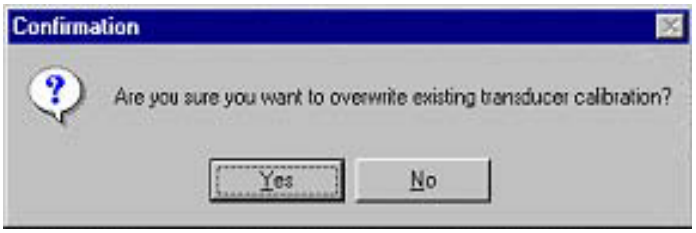


Figure 9. Set point Overwrite Confirmation Box

(6) Click Yes to overwrite the existing transducer calibration and return to the TCIP Executive window. Click No keep the existing transducer calibration and return to the Calibration screen.

e. SAVE/RESTORE CALIBRATION

This function allows you to save or restore a calibration.

(1) Perform the procedures of Section B.
(2) Select the channel to be calibrated and double click.
(3) Click the Manual Calibration tab.
(4) To save a calibration, click the Backup/Restore tab of the calibration screen. The screen will appear similar to Figure 10.

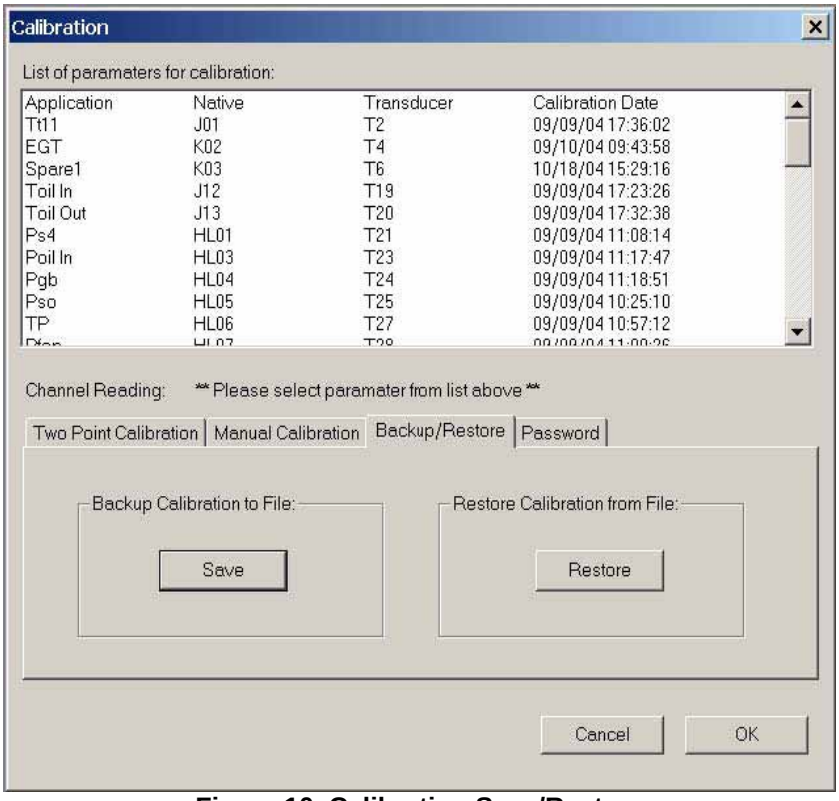


Figure 10. Calibration Save/Restore

(5) Click Save button. The Save As dialog box will appear. Assign a file name to the calibration file. The .cal extension will be entered automatically.

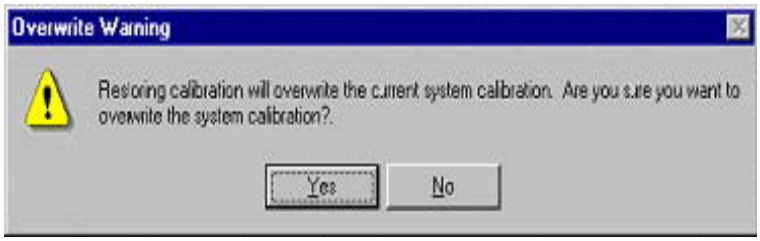


Figure 11. Overwrite Warning

(6) To restore a calibration, click Restore. The Open dialog box will appear. Select the applicable file folder and/or file name and click Open. The Overwrite Warning, Figure 11, will appear.

f. ENTERING NEW PASSWORD

(1) Perform the procedures of Section B.
(2) Select the channel to be calibrated and double click.
(3) Click the Manual Calibration tab.
(4) Click the Password tab of the Calibration screen. The screen will appear similar to Figure 4-12.

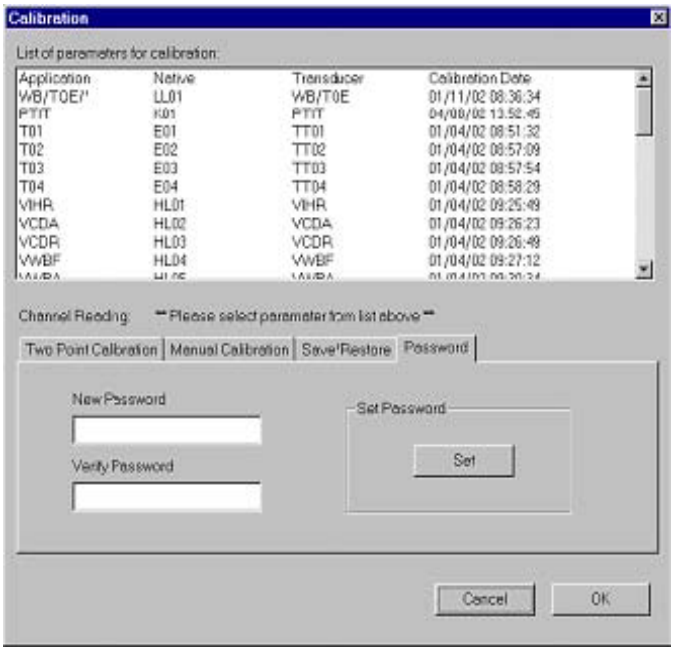


Figure 12. Password Screen

(5) Enter the new password in the New Password box and verify it by entering it again in the Verify Password box.
(6) Click the Set button. The Password Accepted screen will appear similar to Figure 13.
(7) Click OK.

Figure 13. Password Accepted

g. VIEW/PRINT CALIBRATION

(1) From the menu bar at the top of the TCIP executive window, select Maintenance | Calibration | View/Print Calibration. The Cell/System Calibration will appear similar to Figure 14.

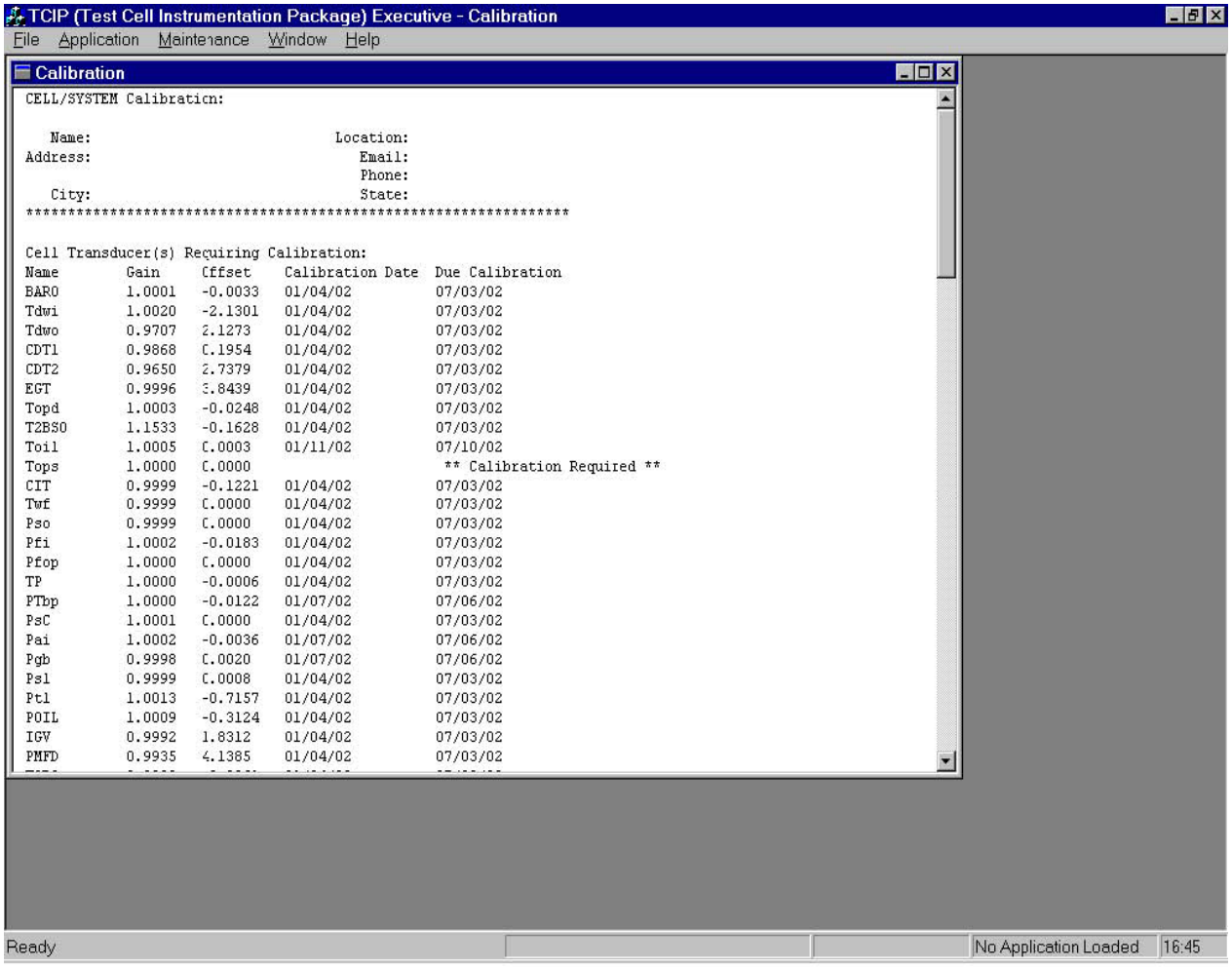


Figure 14. View Calibration

h. TEST SETUP-CHANNELS CALIBRATION

(1) Test Setups These are the setups necessary to calibrate the TCIP channels.

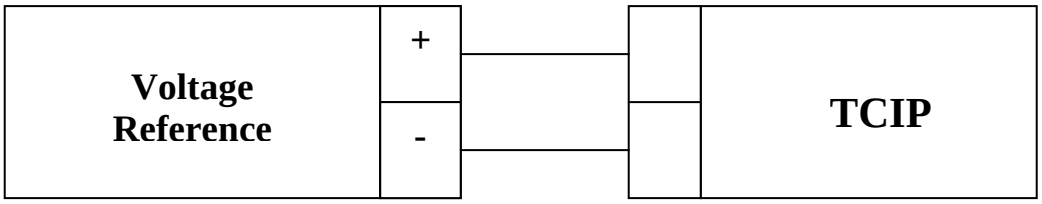
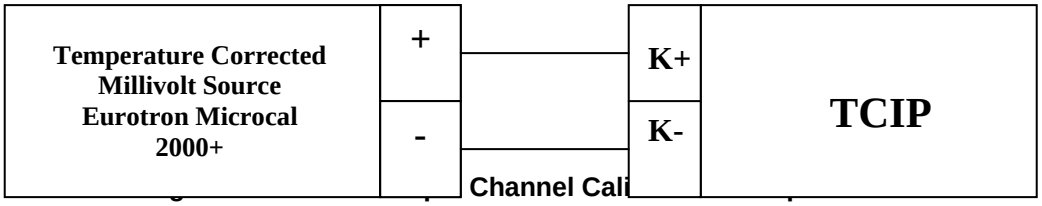


Figure 15. DC Voltage Channel Calibration



Channel Cali

Figure 17. Pressure Channel Calibration Setup

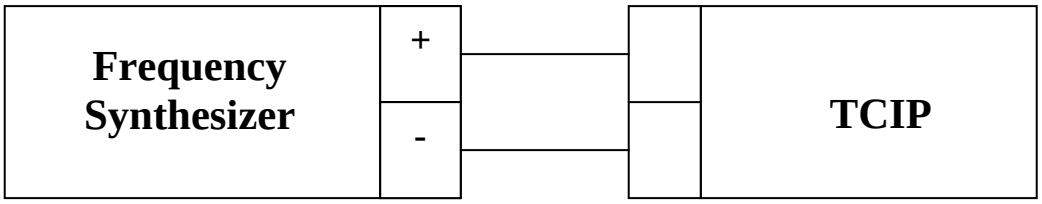


Figure 18. Frequency Channel Calibration Setup

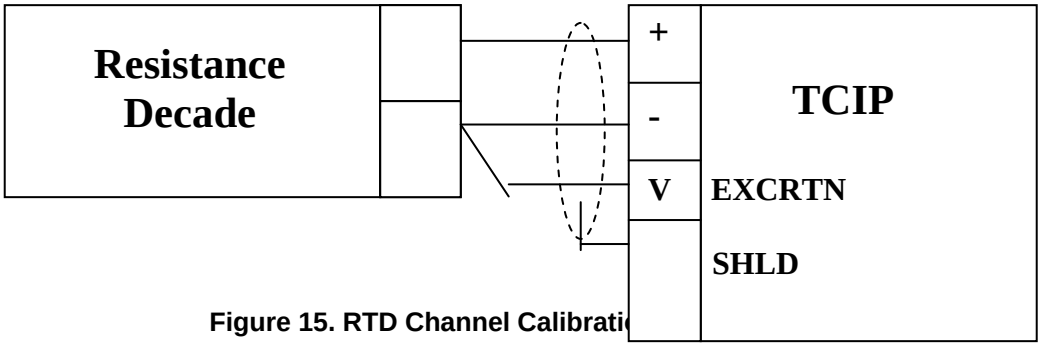


Figure 15. RTD Channel Calibrati

APPENDIX A (AEDATS II)

FEDS ALIGNMENT WORKSHEET
AEDATS II
T700-GE-700/701/701C Engine Applications
T700-GE-401/401C Engine Applications
T53-L-13B/703 Engine Applications
T55-GA-714A Engine Applications
T55-L-712 Engine Applications
T63-A-720 Engine Applications

CERTIFICATION OFFICIAL

NAME _____

DATE _____

LOCATION _____

SERIAL # _____

FEDS ALIGNMENT WORKSHEET
AEDATS II
T700-GE-700/701/701C Engine Applications
T700-GE-401/401C Engine Applications

CERTIFICATION OFFICIAL

NAME _____

DATE _____

LOCATION _____

SERIAL # _____

AEDATS II T700 Alignment Worksheet

NOTE

All pages referenced in this alignment worksheet refer to section III Alignment Process of TB 1-4920-443-35

1. **D.C. Voltmeter (0-50V Dc) (Refer to page 9 Step 10)**
   - **(1)** Turn off power and verify instrument zero (mechanical pointer)
     Instrument zero_____
   - **(2)** Turn on power and verify instrument readings.
   - **(3)** Check power supply #1 and #2 and verify that meter matches digital voltmeter. 28 VDC +/- 0.5.
     - **(a)** #1 meter_____#2 meter _____
     - **(b)** Check power supply #3 and verify 24V dc _____
2. **D.C. Ammeter (Refer to page 9 Step 13)**
   - **a. Function test D.C. ammeter by noting a current indication on switch position PS1 and PS2.**
     - **(a)** D.C. ammeter PS1_____amps PS2_____amps

3. **A.C. Voltmeter (Refer to Page 9 step 11)**
   - **(a)** Turn off 60 Hz power and verify instrument zero (mechanical pointer).
   - **(b)** Instrument zero_____
   - **(2)** Turn on 60 Hz power and verify instrument readings.
     - **(a)** Access rear of CB 301 on circuit panel.

WARNING

High Voltage on exposed terminals

   - **(3)** Measure voltage between phases and functional check by comparing to digital voltmeter indication.
     - **(a)** Phase L1 to L2 meter _____VAC Digital voltmeter _____VAC
     - **(b)** Phase L2 to L3 meter _____VAC Digital voltmeter _____VAC
     - **(c)** Phase L2 to GRD meter _____VAC Digital voltmeter _____VAC

4. **A.C. Ammeter (Refer to Page 9 step 12)**
   - **a. Function test A.C. ammeter by noting current indication.**
     - **(1)** A.C. ammeter L1_____amps L2_____amps L3_____amps

5. **Frequency Meter (Refer to Pages 9 step 14)**
   - **(1)** Function test by noting a reading of approximately 60 Hz.
     - **(a)** Frequency meter _____Hz
   - **(2)** Verify all press to test indicators is operational.

AEDATS II T700 Alignment Worksheet

6. T700 Alignment Worksheet

NOTE

Ensure system is in the T700 mode

(1) Angle Position Measurement System

(a) Dyno shroud Position Indicator (Refer to page 78 step 59)

(b) Input the following voltages into connector P91 pins F+ and H-.

Input Voltage	Percent Reading	AEDATS 2 (**DynoShrd)** +/-.5%	Vertical Scale +/-.1%	Vertical Scale Bottom row 3
0 volts	0%	_____	_____	
4 volts	25%	_____	_____	
8 volts	50%	_____	_____	
12 volts	75%	_____	_____	
16 volts	100%	_____	_____	

(2) Load Demand Spindle Position (Refer to page 78 step 60)

(a) Input the following voltages into connector P51 pins A(+) and B(-). **Connector P51 at Engine (LDS)**

Input Voltage	Degrees	AEDATS 2 (**LDS)** +/- .5 deg	Vertical Scale +/- 1.0 deg	Vertical Scale Bottom row 2
0 volts	-45	_____	_____	
4 volts	05	_____	_____	
8 volts	55	_____	_____	
12 volts	105	_____	_____	

(3) Power Available Spindle Position (Refer to page 80 step 61)

(a) Input the following voltages into connector P50 pins A(+) and B(-). **Connector P50 at Engine (PAS)**

Input Voltage	Degrees	AEDATS 2 (**PAS)** +/- .5 deg	Vertical Scale +/- 1.0 deg	Vertical Scale Bottom row 1
0 volts	0	_____	_____	
4 volts	50	_____	_____	
8 volts	100	_____	_____	
12 volts	150	_____	_____	

(4) Inlet Guide Vane Position (Refer to page 81 step 62)

(a) Input the following voltages into connector P53 pins A(+) and B(-)

(b) .Connector P53 at Engine (IGV)

Input Voltage	Percent Reading	AEDATS 2 (**IGV)** +/-.5 deg	Vertical Scale +/- 1 deg	Vertical Scale Bottom row 4
0 volts	-10%	_____	_____	
2 volts	15%	_____	_____	
4 volts	40%	_____	_____	
6 volts	65%	_____	_____	
8 volts	90%	_____	_____	

AEDATS II T700 Alignment Worksheet

(5) Engine torque alignment (Refer to page 60 step 52)

(a) Input an 8 V dc signal on pins 10 (+) and 11 (-) of the E-1 cable. Set span on the AEDATS and the engine torque gauge at 800 Ft.Lbs. Set each of the following points and record the results.

Input Voltage	Reading Ft Lbs	Vertical Scale +/-1 Ft Lb	Reading In Lbs	AEDATS 2 (**Qeng**) +/- 6 In Lb	Vertical Scale Bottom row 10
0 volts	0	_____	0	_____	
2 volts	200	_____	2400	_____	
4 volts	400	_____	4800	_____	
6 volts	600	_____	7200	_____	
8 volts	800	_____	9600	_____	
10 volts	1000	_____	12000	_____	

(6) Engine oil inlet temperature gauge (Decade Box) (Refer to page 70 step 56)

(a) Connect the decade resistor to pins 9 and 10 of the E-3 cable connector. Adjust the decade resistor to obtain the gauge indications listed below. If modified for 714 switch at signal conditioner set to 712.

NOTE

The 0-400 temperature gauge will read approximately 20 degrees high because of resistance in the wiring from the control cab to the engine.

Avg	Decade Resistor (Ohms)	**Analog Gage** +/-10 °F	Reading
90.4	90.34-90.42	_____	32°F
97.3	97.27-97.35	_____	68°F
104.6	104.56-104.64	_____	104°F
112.3	111.78-112.78	_____	140°F
120.4	119.86-120.86	_____	176°F
128.8	128.35-129.35	_____	212°F
142.4	141.80-143.00	_____	266°F
151.9	151.31-152.51	_____	302°F
177.9	176.95-178.95	_____	392°F

(7) Hydraulic Pressures (Refer to page 38 step 42)

(a) MT-17A 0-150 psid B-sump Delta Pressure

(b) Using the pressure calibrator, apply the following pressures to **MT-17A**, and **Vent 17B** and record the results. **NOTE: Calibrate 3 PS Alarm in conjunction with MT-17A.**

Pressure (psid)	Actual Pressure	AEDATS 2 (**BSUMP**)EODP +/- 1 Psi	Vertical Scale +/- 2 psi	Vertical Scale top row 5
Vent	_____	_____	_____	
30	_____	_____	_____	
60	_____	_____	_____	
90	_____	_____	_____	
120	_____	_____	_____	
150	_____	_____	_____	
R-cal	_____			

AEDATS II T700 Alignment Worksheet

(c) MT-15, 0-100 psig Fuel inlet pressure (Refer to pages 38 step 42)

1 Using the pressure calibrator, apply the following pressures to **MT-15**

Pressure (psid)	Actual Pressure	AEDATS 2 (**PFI**) +/- 1 Psi	Vertical Scale +/- 2 Psi	Vertical Scale Top row 9
Vent	_____	_____	_____	
20	_____	_____	_____	
40	_____	_____	_____	
60	_____	_____	_____	
80	_____	_____	_____	
100	_____	_____	_____	
R-cal	_____			

(d) MT-16, 0-50 psig, Dyno lube inlet pressure (Refer to pages 38 step 42)

1 Using the pressure calibrator, apply the following pressures to **MT-16** (PT408) and record the results. NOTE: **Calibrate 5 PS Alarm in conjunction with MT-16.**

Pressure (psid)	Actual Pressure	AEDATS 2 (**pdyn_Sup**) +/- 1 Psi	Vertical Scale +/- 2 Psi	Vertical Scale bottom row 11
Vent	_____	_____	_____	
10	_____	_____	_____	
20	_____	_____	_____	
30	_____	_____	_____	
40	_____	_____	_____	
50	_____	_____	_____	
R-cal	_____			

(e) Fault light panel (Refer to page 73 step 57)

(f) J BOX

1 T-700 dyno low oil press fwd _____ 5 PS set 10.5 psig on decreasing pressure. (+/-.5)

2 T-700 dyno low oil press aft _____ 6 PS set 10.5 psig on decreasing pressure. (+/-.5)

3 T-700 engine low oil pressure switch _____ 3PS set 25 psig on decreasing pressure. (+/-2)

AEDATS II T700 Alignment Worksheet

(g) Fuel Skid

1 T-700 fuel boost _____11 PS set 15 PSI on increasing pressure (+/- 2)

2 T-700 skid low fuel level _____ TB 206, jumper # 11 & 12

3 T-700 skid fuel filter bypass _____ TB 207 jumper # 1 & 2

4 T-700 fuel valve _____Turn on CB305 and fuel pump switch on.

5 Main fuel valve _____ Turn on CB305 and fuel pump switch.

(h) T700 Test Trailer

1 T-700 dynolube filter bypass _____ J73 connector, jumper pins L & K

2 T-700 dynolube tank low level _____ J73 connector, jumper pins M & N

3 T-700 eng Lube Filter Bypass _____ E-3 connector, jumper pins 13 & 14

4 T-700 Engine fuel filter bypass _____ E-3 connector, jumper pins 15 & 16

5 T-700 chip detector _____ E-3 connector, jumper pins 11 & 12

6 T-700 low fuel pressure _____ E-3 connector, jumper pins 23 & 24

(i) B SUMP Scavenge Pressure Indicator (Refer to page 50 step 46)

1 Procure an engine oil pressure transducer P/N 418-10054 and connect to Green cable connector.

2 Connect E3 cable.

Alternate connection if engine is not installed	
Transducer pin	E-3 cable
1	7
2	6
3	5

Applied Pressure (psig)	**(B Sump Scav)** +/- 1 psi
0	_____
50	_____
100	_____
150	_____
200	_____

AEDATS II T700 Alignment Worksheet

(j) CDP, 0-600 in-hg abs CDP pressure (T700) (Refer to page 46 step 44)

1 Using the pressure calibrator, apply the following pressures to the CDP transducer located in cabinet 11, and record the results.

Pressure (in-hg abs)	Actual Pressure	AEDATS 2 (**CDP**) +/- .3 in hg	Vertical Scale +/- .3 in hg	Vertical Scale bottom row 7 T700
BARO	ABS	_____	_____	
150	73.7	_____	_____	
300	147	_____	_____	
450	221	_____	_____	
600	294.7	_____	_____	
R-cal _____				

(8) Low Temperature Measurement System

NOTE

If adjustment on the Doric is needed, remove the two screws from the side of the front panel and remove the panel. The two potentiometers are visible at the upper left of the display. R44 (Front Panel ZERO) potentiometer control s the 32° reference and R45 (SPAN) potentiometer controls the positive (+) full scale (1000°) Adjust the thermocouple calibrator to 300° and the Doric display should be 300° +/- 1°, if not, repeat adjustment.

(a) Low Temperature Channels (Use shorting connector to obtain ambient temperature)

(b) Channel 1 P-56 Engine Oil Discharge (Refer to page 23 step 27**)**

Input	Calibrator Temp °F	Doric +/- 1°F	AEDATS 2 **(Bsump)** +/- 1°F
32 °F	_____	_____	_____
100 °F	_____	_____	_____
200 °F	_____	_____	_____
300 °F	_____	_____	_____

(9) Temperature and Speed Limit Control Panel (Refer to page 33 step 35)

(a) Engine Discharge Temperature P-56 Thumb wheel setting 300

Input	Calibrator Temp °F	Limit Control Panel +/- 3°F	Indicator lit	
32 °F	_____	_____	In limit	
100 °F	_____	_____	In limit	
200 °F	_____	_____	In limit	
270 °F	_____	_____	90% Alert	_____
300 °F	_____	_____	100% Warning	_____

AEDATS II T700 Alignment Worksheet

(b) Channel 2, P-57 Eng. Oil Scav. Temp. (Refer to page 25 step 28**)**

Input	Calibrator Temp °F	Doric +/- 1°F	AEDATS 2 **(J02)** +/- 1°F
32 °F	_____	_____	_____
100 °F	_____	_____	_____
200 °F	_____	_____	_____
300 °F	_____	_____	_____

(c) Temperature and Speed Limit Control Panel (Refer to page 33 step 35)

1 Engine oil delta temperature P-57 Jumper P-56 Thumb wheel setting 150

Input	Calibrator Temp °F	Limit Control Panel +/- 3°F	Indicator lit	
Ambient +135°F	_____	_____	90% Alert	_____
Ambient +150°F	_____	_____	100% Warning	_____
Audible warning	_____			

(d) Channel 3, P-58 INLET AIR TEMP (Refer to page 25 step 28**)**

Input	Calibrator Temp °F	Doric +/- 1°F	AEDATS 2 **(T21)** +/- 1°F
32 °F	_____	_____	_____
70 °F	_____	_____	_____
100 °F	_____	_____	_____
120 °F	_____	_____	_____

(e) Channel 4, P-59 INLET AIR TEMP (Refer to page 25 step 28**)**

Input	Calibrator Temp °F	Doric +/- 1°F	AEDATS 2 **(T22)** +/- 1°F
32 °F	_____	_____	_____
70 °F	_____	_____	_____
100 °F	_____	_____	_____
120 °F	_____	_____	_____

(f) Channel 5, P-68, INLET AIR TEMP (Refer to page 25 step 28**)**

Input	Calibrator Temp °F	Doric +/- 1°F	AEDATS 2 **(T23)** +/- 1°F
32 °F	_____	_____	_____
70 °F	_____	_____	_____
100 °F	_____	_____	_____
120 °F	_____	_____	_____

AEDATS II T700 Alignment Worksheet

(g) Channel 6, P-92, INLET AIR TEMP **(**Refer to page 25 step 28**)**

Input	Calibrator Temp °F	Doric +/- 1°F	AEDATS 2 **(T24)** +/- 1°F
32 °F	_____	_____	_____
70 °F	_____	_____	_____
100 °F	_____	_____	_____
120 °F	_____	_____	_____

(h) Channel 27, P-101, INLET AIR TEMP **(**Refer to page 25 step 28**)**

Input	Calibrator Temp °F	Doric +/- 1°F	AEDATS 2 **(T25)** +/- 1°F
32 °F	_____	_____	_____
70 °F	_____	_____	_____
100 °F	_____	_____	_____
120 °F	_____	_____	_____

(i) Channel 28, P-102, INLET AIR TEMP **(**Refer to page 25 step 28**)**

Input	Calibrator Temp °F	Doric +/- 1°F	AEDATS 2 **(T26)** +/- 1°F
32 °F	_____	_____	_____
70 °F	_____	_____	_____
100 °F	_____	_____	_____
120 °F	_____	_____	_____

(j) Channel 29, P-103, INLET AIR TEMP **(**Refer to page 25 step 28**)**

Input	Calibrator Temp °F	Doric +/- 1°F	AEDATS 2 **(T27)** +/- 1°F
32 °F	_____	_____	_____
70 °F	_____	_____	_____
100 °F	_____	_____	_____
120 °F	_____	_____	_____

(k) Channel 30, P-104, INLET AIR TEMP **(**Refer to page 25 step 28**)**

Input	Calibrator Temp °F	Doric +/- 1°F	AEDATS 2 **(T28)** +/- 1°F
32 °F	_____	_____	_____
70 °F	_____	_____	_____
100 °F	_____	_____	_____
120 °F	_____	_____	_____

AEDATS II T700 Alignment Worksheet

(l) Channel 7, J20 Dyno Oil Tank (Refer to page 25 step 28**)**

Input	Calibrator Temp °F	Doric +/- 1°F	AEDATS 2 **(Tdyn_tnk)** +/- 1°F
32 °F	_____	_____	_____
100 °F	_____	_____	_____
200 °F	_____	_____	_____
300 °F	_____	_____	_____

(m) Temperature and Speed Limit Control Panel (Refer to page 35 step 37)

1 Dyno-Lube Inlet Temperature, J20 Thumb wheel setting 200

Input	Calibrator Temp °F	Limit Control Panel +/- 3°F	Indicator lit	
32 °F	_____	_____	In limit	
100 °F	_____	_____	In limit	
150 °F	_____	_____	In limit	
180 °F	_____	_____	90% Alert	_____
200 °F	_____	_____	100% Warning	_____

(n) Dyno-lube delta temperature, (Refer to page 35 step 38)

1 Calibrator J23 Jumper J20, Thumb wheel setting 80

2 Disconnect J24

Input	Calibrator Temp °F +/- 3°F	Limit Control Panel +/- 3°F	ADATS 2 **(TDyn_FA)** +/- 1°F	
32 °F	_____		_____	
100 °F	_____		_____	
200 °F	_____		_____	
300 °F	_____		_____	
ambient +74°F	_____	_____	90% Alert	_____
Ambient +80°F	_____	_____	100% Warning	_____
Audible warning	_____			

(o) Channel 8, J**21 Dyno oil Forward (LINE R/S DYNO) (**Refer to page 25 step 28**)**

Input	Calibrator Temp °F	Doric +/- 1°F	AEDATS 2 **(Tdyn_fwd)** +/- 1°F
32 °F	_____	_____	_____
100 °F	_____	_____	_____
200 °F	_____	_____	_____
300 °F	_____	_____	_____

AEDATS II T700 Alignment Worksheet

(p) Channel 9, J**22 Dyno Oil Aft (REAR OF DYNO)** **(**Refer to page 25 step 28**)**

Input	Calibrator Temp °F	Doric +/- 1°F	AEDATS 2 **(Tdyn_aft)** +/- 1°F
32 °F	_____	_____	_____
100 °F	_____	_____	_____
200 °F	_____	_____	_____
300 °F	_____	_____	_____

(10)High temperature system, TGT **(**Refer to page 30 step 31)

(a) THERMOCOUPLE TYPE K

(b) Channel 1, **E1 Cable Pins 17 {+}(yellow) 16 {-}(red)**

Input	Calibrator Temp °F	Doric +/- 2	AEDATS 2 **(TGT)** +/- 1	Analog +/- 2	Digital +/- 2
400°F	_____	_____	_____	_____	_____
800°F	_____	_____	_____	_____	_____
1200°F	_____	_____	_____	_____	_____
1650°F	_____	_____	_____	_____	_____
2000°F	_____	_____	_____	_____	_____

1. **NOTE 1**: Analog gauge adjustments are as follow:
2. **R6** for digital at 100**°F**
3. **R12** for analog at 100**°F**
4. **R15** for digital at 1000**°F**
5. **R21** for analog at 1000**°F**
6. **NOTE 2**: perform the above adjustments if the instrument is out of tolerance.

(11)Vibration system (Vibration Test # 1) (Refer to page 10 step 15)

(a) Set variable filter channel switches to 1, filter selector switch to out.

(b) Set all meters as follows:

1. Filter switch to **CAL**
2. Range switch to **150**
3. Xducer switch to **ACC**
4. Mode switch to **VEL**
5. Output switch to **AVG**

(c) Adjust Cal pot to (105) on digital display on all channels

(d) Set filter switch to sensitivity and adjust Sens pot for an indication of 150 on all channels

(e) Reset:

1. Output switches to AVG
2. Mode switches to **VEL**
3. Range switches to **5.0**
4. Filter switches to **OUT**
5. Xducer switches to **VEL**

(f) Jumper across pins as listed in table 1 below and adjust **R4** for zero (CEC 4000-1010)

(g) After zeroing indicators, go back to step B through E and recheck **CAL** and **SENS** settings

AEDATS II T700 Alignment Worksheet

(h) connect test oscillator to the following connectors:

Table 1 Connections

Plug	Pins	Ground	Channel
P-25	L-C	C	1
P-25	B-E	E	2
P-25	M-G	G	3
P-91	N-G	G	4
P-91	B-M	M	5

(i) First test:

(j) Use J2 (pins A and B) of CEC 2700 for AC millivolts

(a) Channel 1 Connector P25 Pins L (+) C (-)

Frequency	Output(mAvg)	(Vert. Scale) Meter	(Limits)	AEDATS 2 (**PTH)**
	Shorted	_____		_____
100hz	116.5	_____	.9-1.1	_____
100hz	233.0	_____	1.9-2.1	_____
100hz	350.0	_____	2.9-3.1	_____
100hz	466.0	_____	3.9-4.1	_____
100hz	583.0	_____	4.9-5.1	_____

(b) Channel 2 Connector P25 Pins B (+) E (-)

Frequency	Output(mAvg)	(Vert. Scale) Meter	(Limits)	AEDATS 2 (**AGB)**
	Shorted	_____		_____
100hz	116.5	_____	.9-1.1	_____
100hz	233.0	_____	1.9-2.1	_____
100hz	350.0	_____	2.9-3.1	_____
100hz	466.0	_____	3.9-4.1	_____
100hz	583.0	_____	4.9-5.1	_____

(c) Channel 3 Connector P25 Pins M (+) G (-)

Frequency	Output(mAvg)	(Vert. Scale) Meter	(Limits)	AEDATS 2 (**PTV)**
	Shorted	_____		_____
100hz	116.5	_____	.9-1.1	_____
100hz	233.0	_____	1.9-2.1	_____
100hz	350.0	_____	2.9-3.1	_____
100hz	466.0	_____	3.9-4.1	_____
100hz	583.0	_____	4.9-5.1	_____

AEDATS II T700 Alignment Worksheet

(d) Channel 4 Connector P91 Pins N (+) G (-)

Frequency	Output(mAvg)	(Vert. Scale) Meter	(Limits)	AEDATS 2 (**V4)**
	Shorted	_____		_____
100hz	116.5	_____	.9-1.1	_____
100hz	233.0	_____	1.9-2.1	_____
100hz	350.0	_____	2.9-3.1	_____
100hz	466.0	_____	3.9-4.1	_____
100hz	583.0	_____	4.9-5.1	_____

(e) **Channel 5 Connector P91 Pins B (+) M (-)**

Frequency	Output(mAvg)	(Vert. Scale) Meter	(Limits)	AEDATS 2 (**V5)**
	Shorted	_____		_____
100hz	116.5	_____	.9-1.1	_____
100hz	233.0	_____	1.9-2.1	_____
100hz	350.0	_____	2.9-3.1	_____
100hz	466.0	_____	3.9-4.1	_____
100hz	583.0	_____	4.9-5.1	_____

(12)Vibration system (vibration Test # 2)

NOTE

Ensure that the 2700 Calibration box internal switch is in the on position. The Calibration lab may leave the switch in the off position due to calibration procedure

(a) Use J1 with red cable (CEC-619566-120) and T700 engine vibration cable to drive the charge amps.
(b) Connect test box CEC 2700 (J1) to the inputs of the charge amps cables.
(c) Set channels 1, 2, and 3 meters as follows:
1 Filter switch to CAL
2 Range switch to 150
3 Xducer switch to ACC
4 Mode switch to VEL
5 Output switch to AVG
6 Variable filter Out
7 Adjust Cal pot for a reading of 50 on Ch2. and 10 on Ch. 1 and 3.
8 Set filter sw to SENS
9 Adjust SENS pot for a reading of **150**/75 on the digital display of channels 1, 2, and 3.

NOTE

(75 only applies to sites with Endevco system installed)

10 Set XDUCER switch to **VEL**
11 Set OUTPUT sw to **RMS.**
12 Range 5
13 Filter OUT
14 Variable switch to position 1 (T700)

AEDATS II T700 Alignment Worksheet

(d) Channel 1 Connector J26 (V1) (charge amp box)

Frequency	Output (Pcmb/mv)	(Vert. Scale) Meter	(Limits)
100hz	16.3	_____	.9-1.1
100hz	32.5	_____	1.9-2.1
100hz	48.8	_____	2.9-3.1
100hz	65.1	_____	3.9-4.1
100hz	81.4	_____	4.9-5.1

(e) Channel 2 Connector J38 (V2) (charge amp box)

Frequency	Output (Pcmb/mv)	(Vert. Scale) Meter	(Limits)
100hz	81.4	_____	.9-1.1
100hz	163	_____	1.9-2.1
100hz	244	_____	2.9-3.1
100hz	326	_____	3.9-4.1
100hz	407	_____	4.9-5.1

(f) Channel 3 Connector J37 (V3) (charge amp box)

Frequency	Output (Pcmb/mv)	(Vert. Scale) Meter	(Limits)
100hz	16.3	_____	.9-1.1
100hz	32.5	_____	1.9-2.1
100hz	48.8	_____	2.9-3.1
100hz	65.1	_____	3.9-4.1
100hz	81.4	_____	4.9-5.1

(13)Fuel flow measurement CEC 2700 BOX (Refer to page 18 step 22)

(a) Set calculating counter controls as follows: (Channel 4)

1	DEC	6
2	C	01000
3	10n	0
4	Auto	depressed
5	X10	depressed
6	Sample Rate (fast)	1
7	Test	released
8	Power	on

(b) Determine **C** settings for channel 4 Channel 4 **C** = (3600 x 8.337 x specific gravity) divided by the turbine meter K-factor (Average from calibration sheet)

(c) Enter calculated value on channel 4 **C** switches

(d) At the fuel trailer disconnect MT-206 from the flowmeter and connect the test oscillator to pins A (+) and B (-).

(e) Connect the frequency counter to the test oscillator. Or use CEC2700 box.

(NOTE: The frequency counter must have the low pass filter on)

(f) Enter Specific Gravity, K Factor and Temp in AEDATS to read PPH from flowmeter Cal sheet.

(g) Connect Temp source to TC 208 to correspond to flowmeter Cal Temp.

(h) Set the following points with test oscillator:

1 1 Vac input

AEDATS II T700 Alignment Worksheet

NOTE

Oscillator frequency x C = PPH (Enter S/G into AEDATS to read PPH from Cal sheet)
Input the following frequencies into connector MT206 pins A (+) and B (-). Center Flowmeter.

				Note: Cell constant high K Factor (#5)	
Oscillator Hz	Calculating Counter Hz +/- 1	AEDATS 2 **(WF1)** Hz +/- 1	Calibration Sheet Hz	Calculating Counter PPH+/- .5 %	AEDATS 2 **(WF1)** PPH +/- .35 %
240Hz	_____	_____	_____	_____	_____
480Hz	_____	_____	_____	_____	_____
720Hz	_____	_____	_____	_____	_____
960Hz	_____	_____	_____	_____	_____
1200Hz	_____	_____	_____	_____	_____
(Note: frequency x **C** = PPH) (CH 4C= 3600 x 8.337 x SG /K factor)					

(14)Speed Measurement System **(**Refer to page 51 step 47**)** CEC 2700 or Function Generator

(a) Power turbine speed (NP) (N2) speed indicator (T700/T701/T701C)

1 Set calculating counter controls as follows: (Channel 2)
2 DEC **4**
3 C **07502**
4 10n periods **0**
5 Auto **depressed**
6 x10 **depressed**
7 Sample rate to (fast) **1**
8 Test **released**

(b) Power turbine speed (NP) (N2) speed indicator (T401/T401C)

1 Set calculating counter controls as follows: (Channel 2)
2 DEC **4**
3 C **07179**
4 10n periods **0**
5 Auto **depressed**
6 x10 **depressed**
7 Sample rate to (fast) **1**
8 Test **released**

(c) Set the CEC 2700 oscillator controls as follows: **(NP)**
1 Level 500mV to 1.5 V Rms, (voltage is needed to drive amp)

(d) Input the following frequencies into connector E1 pins 8 and 9.

Oscillator Frequency	Calculating counter +/- .3%	AEDATS 2 **(RPM 4)** +/- 1hz	Gauge Analog +/- 5%	Gauge Digital +/- .3%
133hz (10%)	_____	_____	_____	_____
533hz (40%)	_____	_____	_____	_____
800hz (60%)	_____	_____	_____	_____
1200hz (90%)	_____	_____	_____	_____
1333hz (100%)	_____	_____	_____	_____

AEDATS II T700 Alignment Worksheet

(15)Over Speed channels (NP) **(**Refer to page 36 step 40)

(a) Over speed power section #1.

(b) Set the CEC 2700 oscillator controls as follows: **(NP)**

1 Level 500mV to 1.5 V, (voltage is needed to drive amp)

(c) Input the following frequencies into connector E1 pins 8 and 9. Thumbwheel setting 1333

Speed Hz/%	Limit control indicator +/- .3hz
133hz (10%)	_____
533hz (40%)	_____
800hz (60%)	_____
1200hz (90%)	_____
1333hz (100%)	_____

NOTE

Over speed power section #2 is not connected

(d) Set frequency at 90% and 100% of thumbwheel setting to check alarms

1 90% alarm 1200 Hz_____100% alarm 1333 Hz _____audible alarm Y/N_____

(16)Power turbine speed (NG) speed indicator (Refer to page 53 step 47A2)

(a) Set calculating counter controls as follows: (Channel 1)

1	DEC	**4**
2	C	**04682**
3	10n	**0**
4	Auto	**depressed**
5	x10	**released**
6	Sample rate (fast)	**1**
7	Test	**released**

(b) Set the oscillator controls as follows: **(NG)**

1 Level 500mV to 1.5 V, (voltage is needed to drive amp)

(c) Input the following frequencies into connector E3 pins 20 and 21.

Oscillator Frequency	Calculating counter +/- .3%	AEDATS 2 **(RPM 2)** +/- 1hz	Gauge Analog +/- .3%	Gauge Digital +/- .3%
214hz (10%)	_____	_____	_____	_____
854hz (40%)	_____	_____	_____	_____
1282hz (60%)	_____	_____	_____	_____
1709hz (90%)	_____	_____	_____	_____
2136hz (100%)	_____	_____	_____	_____

AEDATS II T700 Alignment Worksheet

(17)Torque, horsepower, and speed indicator **(**Refer to page 58 step 51) **9530A DATRONICS**

(a) Zero indicator and install torque arm and pan, push down and release. Lift up on arm and release. Adjust to zero

1 Note old r-cal value._____ for Ref. Only (check old R Cal)

(b) Install 100 lbs of weight (Torque= 200 ft-lb)

1 Adjust span coarse and fine controls until results are obtained

(c) Add 100 lbs of weight for a total of 200 lbs and verify the indicator reads 400 ft-lb (+/-2 ft-lb)

(d) Add 100 lbs of weight for a total of 300 lbs and verify the Indicator reads 600 ft lbs (+/-2 ft-lb)

Weights	Torque Ft-lb	Datronics indicator +/-2 ft-lb	Torque in-lb	AEDATS 2 (**Qdyno**) +/- 10 in-lb
0	0	_____	0	_____
100 Lbs	200	_____	2400	_____
200 Lbs	400	_____	4800	_____
300 Lbs	600	_____	7200	_____

(e) Torque R-cal_____ holding - R Cal down Datronics Remove torque arm and pan

(f) Re-adjust balance and span pots to read zero and the new r-cal respectively

(g) Adjust AEDATS to Datronics Zero

(18)RPM **(**Refer to page 58 step 51)

(a) Ensure indicator is in rpm mode. Adjust balance and span controls for a zero indication +/- 1 Hz

(b) Input a signal of 1393.3 Hz on pins 8 and 9 of the E-1 cable and adjust balance and span controls for an indication of 20,900 rpm +/- 10 rpm

1 Zero_____, Span_____ Rpm R-cal_____

(19)SHP **(**Refer to page 58 step 51)

(a) Ensure indicator is in **Shp** mode. Set zero. Push **Shp cal** and **- cal** (torque) button and verify the indication is the product of the values of the R-cals noted above, divided by 5252

1 Torque R-cal _____**x** Rpm R-ca l_____**/**5252 = **Shp**_____

(b) If the displayed value is not correct adjust the span controls to obtain the value attained mathematically (displayed value)_____

FEDS ALIGNMENT WORKSHEET
AEDATS II

T53-L-13B/703 Engine Applications
T55-L-712 Engine Applications
T63-A-720 Engine Applications

CERTIFICATION OFFICIAL

NAME _____

DATE _____

LOCATION _____

SERIAL # _____

AEDATS II T53 ALIGNMENT WORKSHEET

1. T53/T55/T63 Alignment Worksheet

NOTE

Ensure system is in the mode for the engine requiring alignment (T53/T55/T63)

a. Angle Position Measurement System

(1) Dyno shroud Position Indicator (Refer to pages 85 step 66) Connector P91 (F+) (H-)
(a) Input the following voltages into Connector P91

Input Voltage	Percent Reading	AEDATS 2 (**DynoShrd)** +/-.5%	Vertical Scale +/-.1%	Vertical Scale Bottom row 3
0 volts	0%	_____	_____	
4 volts	25%	_____	_____	
8 volts	50%	_____	_____	
12 volts	75%	_____	_____	
16 volts	100%	_____	_____	

(2) TA Position (T53/T55/T63) (Refer to page 84 step 65)
(a) Input the following voltages into connector N1 POS pins B (+) and C (-).
(b) Connector N1 POS at Engine

Input Voltage	Degrees	AEDATS 2 (**TA)** +/- .5 deg	Vertical Scale +/- 1.0 deg	Vertical Scale Bottom row 1
0 volts	0	_____	_____	
4 volts	50	_____	_____	
8 volts	100	_____	_____	
12 volts	150	_____	_____	

(3) Inlet Guide Vane Position (T53) (Refer to pages 86 step 67)
(a) Input the following voltages into connector T53 IGV pins A (+) and B (-).
(b) Connector T53 IGV at Engine

Input Voltage	Percent Reading	AEDATS 2 (**IGV)** +/-.5 deg	Vertical Scale +/- 1 deg	Vertical Scale Bottom row 4
0 volts	-10%	_____	_____	
2 volts	15%	_____	_____	
4 volts	40%	_____	_____	
6 volts	65%	_____	_____	
8 volts	90%	_____	_____	

AEDATS II T53 ALIGNMENT WORKSHEET

b. Speed measurement system, (Refer to page 54 step 48) Tach. Gen

(1) Power turbine speed (PT) speed indicator

(a) Set calculating counter controls as follows: (Channel 2)

1	DEC	**5**
2	C	**14286**
3	10n	**0**
4	Auto	**depressed**
5	x10	**released**
6	Sample rate (fast)	**1**
7	Test	**released**

(b) Input the following frequencies into the flight harness or engine harness connector

1 T55 Flight Harness pins D and E
2 T53 Flight Harness pins E and F T53 Engine harness pins A and B
3 T63 Flight Harness pins A and B

NOTE

Ground E onTB810 term. #17, if engine is not mounted (will not read) speeds.

(c) Set the tachometer tester controls to the following:

1 Motor direction-stop,
2 Set rpm-10%,
3 Power on
4 Set the motor direction switch to forward

Tachometer tester	Calculating counter +/- .3%	AEDATS 2 **(RPM 3)** +/- .01hz	Gauge Analog +/- .3%	Gauge Digital +/- .3%
7hz (10%)	_____	_____	_____	_____
28hz (40%)	_____	_____	_____	_____
42hz (60%)	_____	_____	_____	_____
56hz (80%)	_____	_____	_____	_____
70hz (100%)	_____	_____	_____	_____

(2) Gas producer speed indication (GP), (Refer to page 56 step 49)

(a) Set the calculating counter controls as follows: (Channel 1)

1	DEC	**5**
2	C	**14286**
3	10n	**0**
4	Auto	**depressed**
5	x10	**released**
6	Sample rate (fast)	**1**
7	Test	**released**

AEDATS II T53 ALIGNMENT WORKSHEET

(b) Input the following frequencies into the flight harness connector
- **1** T55 Flight Harness pins G and H.
- **2** T53 Flight Harness pins G and H
- **3** T63 Flight Harness pins A and B

(c) Set the tachometer tester controls to the following:
- **1** Motor direction-stop,
- **2** Set rpm-10%,
- **3** Power on
- **4** Set the motor direction switch to forward

Tachometer tester	Calculating counter +/- .3%	AEDATS 2 **(RPM 1)** +/- .01hz	Gauge Analog +/- .3%	Gauge Digital +/- .3%
7hz (10%)	_____	_____	_____	_____
28hz (40%)	_____	_____	_____	_____
42hz (60%)	_____	_____	_____	_____
56hz (80%)	_____	_____	_____	_____
70hz (100%)	_____	_____	_____	_____

(3) Over speed power section #1, T-53 **(**Refer to page 37 step 41**)**

(a) Use the B. F Goodrich EPU to perform this test.

(b) Set the EPU to the second “MODE” display

(c) Cal: V=9.497 I=19.601 J2 CONN=3333 HZ

Thumbwheel settings	indication	Limit control indicator +/- .3Hz		
3800	In limit	_____	90% alarm	_____
3700	90%	_____	100% alarm	_____
3333	100%	_____	Audible alarm	_____
Note: over speed power section #2 is not connected				

(4) Torque measurement system, (Refer to page 61 step 53)

(a) Set the modulus code to match the modulus code of the torque shaft that is installed in the dynamometer.

(b) Set the AEDATS channel 23 (**Torq**) for T-53/T-55/T63 engine

(c) Set the EPU to the first "MODE" display:
- **1** Display should read 512 Hz. 0 volt
- **2** TB 609 1 (+) 2(-) _____ +/-20 mv
- **3** Enter first point in AEDATS 0.

AEDATS II T53 ALIGNMENT WORKSHEET

(d) Set to second mode
- **1** CAL:V=9.497 I=19.601
- **2** Display should read 9.497v
- **3** TB 609 1 (+) 2 (-) _____ +/-20mv
- **4** J2 CONN=3333 HZ
- **5** Enter second point in AEDATS (712) 18994, (714) 22793 Satisfactory? Y/N

(e) Disconnect cable P/N 20090761-1 from torque sensor cable
(f) Input Frequency to Pins A/B (reference Step 53B)
(g) Set Performance Monitor to Normal

Input Frequency	**HP**	**RPM**	**TQ**	**CALC. H.P.**
181.4. Hz.=**780 rpm**	_____	_____	_____	_____
272.1 Hz..=**1170 rpm**	_____	_____	_____	_____
453.5 Hz.=**1940 rpm**	_____	_____	_____	_____
725.6 Hz.=**3100 rpm**	_____	_____	_____	_____
907.0 Hz.=**3880 rpm**	_____	_____	_____	_____
HP = TQ x RPM/ 63024 Army		**HP = TQ x RPM/ 5252 Air Force**		
NOTE: Army TQ is measured in (in-lb) Air force TQ is measured in (ft-lb)				

(5) Verify RTD function of performance Monitor (reference Step 53C)
(a) Connect to cable 20090761-1 pins I and J
(b) Hit mode switch one time to monitor Temperature

Resistance Ohms	**Temperature Deg F**	**Actual Temperature +/- 8 deg F**
100	32	_____
110	79	_____
120	126	_____
130	173	_____
140	222	_____

AEDATS II T53 ALIGNMENT WORKSHEET

(6) Fuel flow measurement CEC 2700 BOX T-53/T55/T63 (Refer to page 19 step 23)

(a) Ensure the system is in the T-53/T55 test mode, with the correct flight harness connected to the J-box.

(b) Set calculating counter controls as follows: (Channel 4)

1	**DEC**	**6**
2	**C**	**01000**
3	**10n**	**0**
4	**Auto**	**depressed**
5	**X10**	**released**
6	**Sample Rate (fast)**	**1**
7	**Test**	**released**

(c) Determine **C** settings for channel 4 Channel 4 **C** = (3600 x 8.337 x specific gravity) divided by the turbine meter K-factor (Average from calibration sheet)

(d) Enter calculated value on channel 4 **C** switches

(e) At the fuel trailer disconnect MT-207 from the flowmeter and connect the test oscillator to pins A (+) and B (-).

(f) Connect the frequency counter to the test oscillator. Or use CEC2700 box.

NOTE

The frequency counter must have the low pass filter on

(g) Enter Specific Gravity, K Factor and Temp in AEDATS to read PPH from flowmeter Cal sheet.

(h) Connect Temp source to TC 208 to correspond to flowmeter Cal Temp.

(i) Set the following points with test oscillator:

1 1 Vac input

(j) Note: oscillator frequency x c = PPH

(k) Enter S/G into AEDATS to read PPH from Cal sheet

(l) Input the following frequencies into connector MT207 pins A (+) and B (-).Lower Flowmeter.

				Note: Cell constant Low K Factor (#3)	
Oscillator Hz	Calculating Counter +/- 1 Hz	AEDATS 2 **(WF)** +/- 1 Hz	Calibration Sheet Hz	Calculating Counter +/- .35 % PPH	AEDATS 2 **(WF)** +/- .35 % PPH
250Hz	_____	_____	_____	_____	_____
500Hz	_____	_____	_____	_____	_____
750Hz	_____	_____	_____	_____	_____
1000Hz	_____	_____	_____	_____	_____
1250Hz	_____	_____	_____	_____	_____
(Note: frequency x **C** = PPH) (CH 4C= 3600 x 8.337 x SG /K factor)					

AEDATS II T53 ALIGNMENT WORKSHEET

(7) Specific gravity indicator (0.680 to 0.850):+/- 0.0017 (reference page 22 step 26)

Feds Hydrometer	_____	Calibrated Hydrometer	_____
Temp Hydrometer	_____	Temp AEDATS 2 (**tfuelt**)	_____

(8) Fuel Flow T63 Flow Linearizer Programming (Refer to page 21 step 25B)

(a) Must load program on Laptop called "LinkHost"

(b) Enter Data from Calibration sheet (Compatible with Windows 98 or older)

1 Open shortcut to Linear Link.
2 **EDIT**: Go to link setup. 0-10 V Out, RF Input and Top flow and Top Freq. From Cal Sheet.
3 **EDIT**: Header Fields enter Data from Calibration sheet. (Enter)
4 **VIEW**: Mechanical Data (Enter)
5 **EDIT**: Data fields enter 20 calibration points. (Enter)
6 **CONNECT INTERFACE CABLE TO LAPTOP AND LINEARIZER**
7 **PROGRAM:** Establish communications
8 **VIEW:** Open K Factor Plot (Enter)
9 **SHOULD SAY** table generation successful. (OK)
10 **PROGRAM:** Program Link (OK)
11 **Will download Data loaded from Calibration sheet**
12 **Enter low reading on voltage out** _____ (Enter)
13 **Enter High reading on voltage out** _____ (Enter)
14 **Verify Analog reading on voltage out** _____ (Enter)
15 **Should Say Sending Table**
16 **Should read Calibration performed successful.**

(9) Fuel flow measurement CEC 2700 BOX T63 (Refer to page 21 step 25C)

(a) Ensure the system is in the **T63** test mode, with the correct flight harness connected to the J-box.

(b) Set calculating counter controls as follows: (Channel 4)

1	**DEC**	**6**
2	**C**	**01000**
3	**10n**	**0**
4	**Auto**	**depressed**
5	**X10**	**released**
6	**Sample Rate (fast)**	**1**
7	**Test**	**released**

(c) Determine **C** settings for channel 4 Channel 4 **C =** (3600 x 8.337 x specific gravity) divided by the turbine meter K-factor (Average from calibration sheet)

(d) Enter calculated value on channel 4 **C** switches

(e) At the Jbox on the fuel skid, Connect the Test Oscillator to TB 201 pins 1+ and 2-. **Do not connect to MT209 at the flowmeter**. The T63 flowmeter is a RF carrier type signal. Frequency will not read through the Linearizer system.

(f) Connect the frequency counter to the test oscillator. Or use CEC2700 box.

NOTE

The frequency counter must have the low pass filter on

(g) Enter Specific Gravity, K Factor and Temp in AEDATS to read PPH from flowmeter Cal sheet.

(h) Enter Specific Gravity in AEDATS under initialization (fuel correction factor) for PPH from Calibration sheet. **(Correction Factor:78 x 8.337 x SG / 2000)**

(i) Connect Temp source to TC 208 to correspond to flowmeter Cal Temp.

(j) Set the following points with test oscillator:

1 1 V ac input

(k) Oscillator frequency x c = PPH

AEDATS II T53 ALIGNMENT WORKSHEET

(l) Input the following frequencies into TB 201 pins 1 (+) and 2 (-).

				Note: Cell constant Low K Factor (#3)
Oscillator Hz	Calculating Counter +/- 1 Hz	AEDATS 2 **(WF1)** +/- 1 Hz	Calibration Sheet Hz	Calculating Counter PPH+/- .35 %
0Hz	_____	_____	_____	_____
600Hz	_____	_____	_____	_____
800Hz	_____	_____	_____	_____
1000Hz	_____	_____	_____	_____
1200Hz	_____	_____	_____	_____
1400Hz	_____	_____	_____	_____
(Note: frequency x **C** = PPH) (CH 4C= 3600 x 8.337 x SG /K factor)				

1 K- Factor = Hz. x Time base / Flow rate
2 PPH= GPM x 500 x SG. Or GPM= PPH/500xS.G.
3 PPH= Pulses per second (Hz). x 3600 x S. G. x 8.347 / pulses per gallon (K Factor)
4 Correction Factor 78 x 8.337 x SG / 2000

(10)Oil flow measurement CEC 2700 BOX T53/T63 (Refer to page 20 step 24)

(a) Ensure the system is in the **T53/T63** test mode, with the correct flight harness connected to the J-box.

(b) Set calculating counter controls as follows: (Channel 3)

1	DEC	**6**
2	C	**01000**
3	10n	**0**
4	Auto	**depressed**
5	X10	**depressed**
6	Sample Rate (fast)	**1**
7	Test	**released**

(c) At the Large Engine Test Trailer, disconnect the cable from the T53/T63 Oil Flowmeter. Connect the CEC 2700 oscillator to pins A and B of the cable connector.

Oscillator (Hz)	Calculating Counter +/-1 Hz	AEDATS 2 **(WF2)** (Hz)
300		
600		
900		
1300		
Note: frequency x C = PPH		

(11)Vibration system, T-53/55/63 (Refer to page 14 step 18)

(a) Set variable filter channel switches to 2, on channels 1, 2 and 3 filter selector switch to out, and power switch to on.

(b) Set all meters as follows:

1	Filter switch to	**CAL**
2	Range switch to	**150**
3	Xducer to	**ACC**
4	Mode switch to	**ACC**
5	Output switch to	**AVG**

(c) Adjust **cal** pot to **105** on digital display on all channels

(d) Set filter switch to sensitivity and adjust **sens** pot for an indication of **150** on all channels

AEDATS II T53 ALIGNMENT WORKSHEET

(e) Reset:

1 Output switches to **AVG**
2 Mode switches to **VEL**
3 Range switches to **5.0**
4 Filter switches to **OUT**
5 Xducer switches to **VEL**

(f) Connect test oscillator to the following connectors:

Plug	Pins	Ground	Channel
Vib 1	A+,B-	B	1
Vib 2	A+,B-	B	2
Vib 3	A+,B-	B	3
P-91	G+,N-	N	4
P-91	B+,M-	M	5
Note: P-91 is located on side of dyno Channel 1			

(g) Channel 1

Frequency	Output(mAvg)	(Vert. Scale) Meter	(Limits)	AEDATS II (**V1)**
	Shorted	_____		_____
100hz	116.5	_____	.9-1.1	_____
100hz	233.0	_____	1.9-2.1	_____
100hz	350.0	_____	2.9-3.1	_____
100hz	466.0	_____	3.9-4.1	_____
100hz	583.0	_____	4.9-5.1	_____

(h) Channel 2

Frequency	Output(mAvg)	(Vert. Scale) Meter	(Limits)	AEDATS II (**V2)**
	Shorted	_____		_____
100hz	116.5	_____	.9-1.1	_____
100hz	233.0	_____	1.9-2.1	_____
100hz	350.0	_____	2.9-3.1	_____
100hz	466.0	_____	3.9-4.1	_____
100hz	583.0	_____	4.9-5.1	_____

(i) Channel 3

Frequency	Output(mAvg)	(Vert. Scale) Meter	(Limits)	AEDATS II (**V3)**
	Shorted	_____		_____
100hz	116.5	_____	.9-1.1	_____
100hz	233.0	_____	1.9-2.1	_____
100hz	350.0	_____	2.9-3.1	_____
100hz	466.0	_____	3.9-4.1	_____
100hz	583.0	_____	4.9-5.1	_____

AEDATS II T53 ALIGNMENT WORKSHEET

(j) Channel 4

Frequency	Output(mAvg)	(Vert. Scale) Meter	(Limits)	AEDATS II (**V4)**
	Shorted	_____		_____
100hz	116.5	_____	.9-1.1	_____
100hz	233.0	_____	1.9-2.1	_____
100hz	350.0	_____	2.9-3.1	_____
100hz	466.0	_____	3.9-4.1	_____
100hz	583.0	_____	4.9-5.1	_____

(k) Channel 5

Frequency	Output(mAvg)	(Vert. Scale) Meter	(Limits)	AEDATS II (**V5)**
	Shorted	_____		_____
100hz	116.5	_____	.9-1.1	_____
100hz	233.0	_____	1.9-2.1	_____
100hz	350.0	_____	2.9-3.1	_____
100hz	466.0	_____	3.9-4.1	_____
100hz	583.0	_____	4.9-5.1	_____

(12)Engine oil inlet temperature gauge T53/T55 (Decade Box) (Refer to page 71 step 56B)

(f) Connect the decade resistor to pins N and P of the flight harness cable connector (T53), or pins K and N of the flight harness cable connector (T55). Adjust the decade resistor to obtain the gauge indications listed below.

NOTE

The 0-400 temperature gauge will read approximately 20 degrees high because of resistance in the wiring from the control cab to the engine.

Avg	Decade Resistor (Ohms)	**Analog Gage** +/-10 °F	Reading
90.4	90.34-90.42	_____	32°F
97.3	97.27-97.35	_____	68°F
104.6	104.56-104.64	_____	104°F
112.3	111.78-112.78	_____	140°F
120.4	119.86-120.86	_____	176°F
128.8	128.35-129.35	_____	212°F
142.4	141.80-143.00	_____	266°F
151.9	151.31-152.51	_____	302°F
177.9	176.95-178.95	_____	392°F

AEDATS II T53 ALIGNMENT WORKSHEET

(13)Hydraulic Pressures T53/T55/T63 (Refer to page 39 step 43) High Pressure Calibrator

(a) MT-10 0-1000 psig fuel manifold Pressure

1 Using the pressure calibrator, apply the following pressures to **MT-10**, and record the results.

				Vertical Scale top row 10
5SE01313-9 Pressure (psig)	Actual Pressure psi	AEDATS 2 (*) +/- 2 psi	6SE00950-7 Vertical Scale +/- 2 psi	AEDATS 2 Channel name (*)
Vent	_____	_____	_____	T53 pmfd T55 pfcd L714 pfpo T64 pfd
200	_____	_____	_____	
400	_____	_____	_____	
600	_____	_____	_____	
800	_____	_____	_____	
1000	_____	_____	_____	
R-cal	_____			

(b) MT-11 0-1000 psig fuel pump #1 Pressure

1 Using the pressure calibrator, apply the following pressures to **MT-11**, and record the results.

				Vertical Scale top row 11
5SE01313-9 Pressure (psig)	Actual Pressure psi	AEDATS 2 (*) +/- 2 psi	6SE00950-7 Vertical Scale +/- 2 psi	AEDATS 2 Channel name (*)
Vent	_____	_____	_____	T53 pfp1 T55 pfp1 L714 pfp1
200	_____	_____	_____	
400	_____	_____	_____	
600	_____	_____	_____	
800	_____	_____	_____	
1000	_____	_____	_____	
R-cal	_____			

(c) MT-12 0-1000 psig fuel pump #2 Pressure

1 Using the pressure calibrator, apply the following pressures to **MT-12**, and record the results.

				Vertical Scale bottom row 5
5SE01313-9 Pressure (psig)	Actual Pressure psi	AEDATS 2 (*) +/- 2 psi	6SE00950-7 Vertical Scale +/- 2 psi	AEDATS 2 Channel name (*)
Vent	_____	_____	_____	T53 pfp2
200	_____	_____	_____	
400	_____	_____	_____	
600	_____	_____	_____	
800	_____	_____	_____	
1000	_____	_____	_____	
R-cal	_____			

AEDATS II T53 ALIGNMENT WORKSHEET

(d) MT2 0-300 psig combustor static diffuser

1 Using the pressure calibrator, apply the following pressures to **MT2**, and record the results.

			Vertical Scale top row 2	
5SE01313-20 Pressure (psig)	Actual Pressure psi	AEDATS 2 (*) +/- 1 psi	6SE00950-5 Vertical Scale +/- 2 psi	AEDATS 2 Channel name (*)
Vent	_____	_____	_____	T55 PDO L714 PT3
100	_____	_____	_____	
150	_____	_____	_____	
200	_____	_____	_____	
250	_____	_____	_____	
300	_____	_____	_____	
R-cal	_____			

(e) MT-5 0-200 psig Oil scavenge Pressure

1 Using the pressure calibrator, apply the following pressures to **MT-5**, and record the results.

			Vertical Scale top row 7	
5SE01313-7 Pressure (psig)	Actual Pressure psi	AEDATS 2 (*) +/- 1 psi	6SE00950-4 Vertical Scale +/- 2 psi	AEDATS 2 Channel name (*)
Vent	_____	_____	_____	T53 pso T63 **Eop_ret**
40	_____	_____	_____	
80	_____	_____	_____	
120	_____	_____	_____	
160	_____	_____	_____	
200	_____	_____	_____	
R-cal	_____			

(f) MT-6 0-200 psig Torque meter Pressure

1 Using the pressure calibrator, apply the following pressures to **MT-6**, and record the results.

			Vertical Scale top row 5	
5SE01313-7 Pressure (psig)	Actual Pressure psi	AEDATS 2 (*) +/- 1 psi	6SE00950-4 Vertical Scale +/- 2 psi	AEDATS 2 Channel name (*)
Vent	_____	_____	_____	T53 TP T55 p2b T63 TorqPSI L714 P2b
40	_____	_____	_____	
80	_____	_____	_____	
120	_____	_____	_____	
160	_____	_____	_____	
200	_____	_____	_____	
R-cal	_____			

AEDATS II T53 ALIGNMENT WORKSHEET

(g) MT-7 0-200 psig Main Oil filter Pressure

1 Using the pressure calibrator, apply the following pressures to **MT-7**, and record the results.

			Vertical Scale top row 6	
5SE01313-7 Pressure (psig)	Actual Pressure psi	AEDATS 2 (*) +/- 1 psi	6SE00950-4 Vertical Scale +/- 2 psi	AEDATS 2 Channel name (*)
Vent	_____	_____	_____	T53 pfop T55 POPD T63 Eop L714 POPD
40	_____	_____	_____	
80	_____	_____	_____	
120	_____	_____	_____	
160	_____	_____	_____	
200	_____	_____	_____	
R-cal	_____		**NOTE: set 15 PS alarm**	

(h) MT-8 0-200 psig Torq boost Pressure (T53 Only)

1 Using the pressure calibrator, apply the following pressures to **MT-8**, and record the results.

			Vertical Scale top row 8	
5SE01313-7 Pressure (psig)	Actual Pressure psi	AEDATS 2 (*) +/- 1 psi	6SE00950-4 Vertical Scale +/- 2 psi	AEDATS 2 Channel name (*)
Vent	_____	_____	_____	T53 Ptbp
40	_____	_____	_____	
80	_____	_____	_____	
120	_____	_____	_____	
160	_____	_____	_____	
200	_____	_____	_____	
R-cal	_____			

(i) MT-1 0-100 psig Combustor static Pressure

1 Using the pressure calibrator, apply the following pressures to **MT-1**, and record the results.

			Vertical Scale top row 1	
5SE01313-5 Pressure (psig)	Actual Pressure psi	AEDATS 2 (*) +/- 1 psi	6SE00950-3 Vertical Scale +/- 2 psi	AEDATS 2 Channel name (*)
Vent	_____	_____	_____	T53 Ps4 T55 Ps3 L714 PS4
20	_____	_____	_____	
40	_____	_____	_____	
60	_____	_____	_____	
80	_____	_____	_____	
100	_____	_____	_____	
R-cal	_____			

AEDATS II T53 ALIGNMENT WORKSHEET

(j) MT-9 0-100 psig Fuel inlet Pressure

1 Using the pressure calibrator, apply the following pressures to **MT-9**, and record the results.

			Vertical Scale top row 9	
5SE01313-5 Pressure (psig)	Actual Pressure psi	AEDATS 2 (*) +/- 1 psi	6SE00950-3 Vertical Scale +/- 2 psi	AEDATS 2 Channel name (*)
Vent	_____	_____	_____	T53 pfi T55 pfi T63 Pfuel L714 PWFI
20	_____	_____	_____	
40	_____	_____	_____	
60	_____	_____	_____	
80	_____	_____	_____	
100	_____	_____	_____	
R-cal	_____			

(k) MT-3 0-50 psig Oil in Pressure

1 Using the pressure calibrator, apply the following pressures to **MT-3**, and record the results.

			Vertical Scale top row 3	
5SE01313-4 Pressure (psig)	Actual Pressure psi	AEDATS 2 (*) +/- 1 psi	6SE00950-2 Vertical Scale +/- 2 psi	AEDATS 2 Channel name (*)
Vent	_____	_____	_____	T53 Poil_in T55 pgb T63 Eop_sup L714 ACCGB
10	_____	_____	_____	
20	_____	_____	_____	
30	_____	_____	_____	
40	_____	_____	_____	
50	_____	_____	_____	
R-cal	_____			

(l) MT-4 0-50 psig Gearbox Pressure

1 Using the pressure calibrator, apply the following pressures to **MT-4**, and record the results.

			Vertical Scale top row 4	
5SE01313-4 Pressure (psig)	Actual Pressure psi	AEDATS 2 (*) +/- 1 psi	6SE00950-2 Vertical Scale +/- 2 psi	AEDATS 2 Channel name (*)
Vent	_____	_____	_____	T53 pgb
10	_____	_____	_____	
20	_____	_____	_____	
30	_____	_____	_____	
40	_____	_____	_____	
50	_____	_____	_____	
R-cal	_____			

AEDATS II T53 ALIGNMENT WORKSHEET

(m) MT-13 0-50 psig Dyno inlet Pressure

1 Using the pressure calibrator, apply the following pressures to **MT-13**, and record the results.

			Vertical Scale bottom row 11	
5SE01313-4 Pressure (psig)	Actual Pressure psi	AEDATS 2 (*) +/- 1 psi	6SE00950-2 Vertical Scale +/- 2 psi	AEDATS 2 Channel name (*)
Vent	_____	_____	_____	T53 Pdyn_sup T55 Pdyn_sup T63 Pdyn_sup L714 Pdyn_sup
10	_____	_____	_____	
20	_____	_____	_____	
30	_____	_____	_____	
40	_____	_____	_____	
50	_____	_____	_____	
R-cal	_____			

(n) MT-20 0-50 in-h2o P1 Air Pressure P1 air panel

1 Access MT-20 in the J-box. Connect the low pressure calibrator directly to the transducer. Apply the following pressures to **MT-20**, and record the results.

5SE01313-19 Pressure (in-h20)	Digital Indicator +/-2 psi	AEDATS 2 (*) +/- 1 psi	AEDATS 2 Channel name (*)
Vent	_____	_____	T53 P1air
10	_____	_____	
20	_____	_____	
30	_____	_____	
40	_____	_____	
50	_____	_____	

AEDATS II T53 ALIGNMENT WORKSHEET

(14)T53/T55/T63 Fault light panel (Refer to page 75 step 58)

(a) J BOX

1	Dyno low oil pressure fwd	_____	17PS Set at 10.5 psig on decreasing pressure **+/-.5**
2	Fuel pressure	_____	18PS Set at 8 psig on decreasing pressure +/-1
3	Low oil pressure Eng	_____	15PS Set at 25 on decreasing pressure +/-1
4	Dyno low oil pressure aft	_____	16PS Set at 10.5 psig on decreasing pressure**+/-.5**
5	Anti Ice Pressure	_____	13PS Set at 4 psig on increase **+/-.5 (**touch screen**)**

(b) T53/T55/T63 Test Trailer

1	Chip detector	_____	Touch chip detector lead to ground
2	Dyno supply low pressure	_____	19PS on trailer set at 10 psig on DEC. press +/-1
3	Dynolube filter delta-p	_____	18PS on trailer set at 10 psig on INC. press +/-1
4	Dynolube tank low level	_____	Jumper pins F & G at J103 aux. J-box
5	T55 low oil level	_____	Jumper pin A to ground T55 flight harness

(c) Fuel Skid

1	Fuel boost pressure	_____	2 PS set 15 psi on increasing pressure +/-1
2	T-53/T63 oil filter delta-p	_____	10PS low side vented pressure high side +/-1 set 7 psi on increasing pressure
3	T-53/T63 low oil level	_____	Jumper pins 5 and 6 0n TB 206
4	Main Fuel valve closed	_____	Turn on CB305 Press fuel pump switch on
5	Fuel valve select	_____	Turn on CB305 and fuel pump switch

(d) PT-101, 0-50 in-hg abs, Barometer (Refer to page 46 step 45)

1 Locate **PT-101** on the bell mouth and barometer panel in cabinet 10. Connect the low pressure calibrator directly to the transducer. Apply following pressures and record the results. (2.036)

2 Do not zero barometer only set span

			Vertical Scale bottom row 9	
5SE01313-22 Pressure (in-hg abs)	Actual Pressure psi	AEDATS 2 (*) +/- .05 psi	6SE00950-28 Vertical Scale +/- 0.25 psi	AEDATS 2 Channel name (*)
+3	_____	_____	_____	T53 Baro T55 Baro T63 Baro L714 Baro
Vent	_____	_____	_____	
-3	_____	_____	_____	
R-cal	_____			

AEDATS II T53 ALIGNMENT WORKSHEET

(e) PT-102, 0-50 in-h2o, B/M Static Pressure #1

1 Locate **PT-102** on the bell mouth and barometer panel in cabinet 10. Connect the low pressure calibrator directly to the transducer. Apply following pressures and record the results.

			Vertical Scale bottom row 6	
5SE01313-19 Pressure (in-h2o)	Actual Pressure psi	AEDATS 2 (*) +/- .25 psi	6SE00950-29 Vertical Scale +/- .25 psi	AEDATS 2 Channel name (*)
0	_____	_____	_____	T53 Ps11 T55 Ps11 T63 Ps11 L714 PSBM1
10	_____	_____	_____	
20	_____	_____	_____	
30	_____	_____	_____	
40	_____	_____	_____	
50	_____	_____	_____	
R-cal	_____			

(f) PT-103, 0-50 in-h2o, B/M Static Pressure #2

1 Locate **PT-103** on the bell mouth and barometer panel in cabinet 10. Connect the low pressure calibrator directly to the transducer. Apply following pressures and record the results.

			Vertical Scale bottom row 7	
5SE01313-19 Pressure (in-h2o)	Actual Pressure psi	AEDATS 2 (*) +/- .25 psi	6SE00950-29 Vertical Scale +/- .25 psi	AEDATS 2 Channel name (*)
0	_____	_____	_____	T53 Ps12 T55 Ps12 T63 Ps12 L714 PSBM2
10	_____	_____	_____	
20	_____	_____	_____	
30	_____	_____	_____	
40	_____	_____	_____	
50	_____	_____	_____	
R-cal	_____			

(g) PT-104, 0-50 in-h2o, B/M Total Pressure

1 Locate **PT-104** on the bell mouth and barometer panel in cabinet 10. Connect the low pressure calibrator directly to the transducer. Apply following pressures and record the results.

			Vertical Scale bottom row 8	
5SE01313-19 Pressure (in-h2o)	Actual Pressure psi	AEDATS 2 (*) +/- .25 psi	6SE00950-29 Vertical Scale +/- .25 psi	AEDATS 2 Channel name (*)
0	_____	_____	_____	T53 Pt1 T55 Pt1 T63 Pt1 L714 PTBM
10	_____	_____	_____	
20	_____	_____	_____	
30	_____	_____	_____	
40	_____	_____	_____	
50	_____	_____	_____	
R-cal	_____			

AEDATS II T53 ALIGNMENT WORKSHEET

(15)Temperature measurement system: (Refer to page 27 step 29) (AN 6520 Temp Calibrator)

(a) Low temperature channels

(b) Channel 11 P-801 Engine Oil inlet Temp

Input	Doric +/- 2°F	AEDATS 2 **(*)** +/- 1°F	AEDATS 2 Channel name (*)
32 °F	_____	_____	T53 Toil_in T63 Toil_in
100 °F	_____	_____	
200 °F	_____	_____	
300 °F	_____	_____	

(c) Temperature and Speed Limit Control Panel (Refer to page 27 step 29)

1 Engine Oil inlet Temperature P-801 Thumb wheel setting 300

Input	Calibrator Temp °F	Limit Control Panel +/- 3°F	Indicator lit	
32 °F	_____	_____	In limit	
100 °F	_____	_____	In limit	
200 °F	_____	_____	In limit	
270 °F	_____	_____	90% Alert	_____
300 °F	_____	_____	100% Warning	_____

(d) Channel 12 P-802 Engine Oil out Temp (Refer to page 27 step 29)

Input	Doric +/- 2°F	AEDATS 2 **(*)** +/- 1°F	AEDATS 2 Channel name (*)
32 °F	_____	_____	T53 Toil_out T63 Toil_out
100 °F	_____	_____	
200 °F	_____	_____	
300 °F	_____	_____	

(e) Temperature and Speed Limit Control Panel (Refer to page 34 step 36)

1 Engine oil delta temperature T-53, P-802, P-801 jumper Thumb wheel setting 150

Input	Calibrator Temp °F	Limit Control Panel +/- 3°F	Indicator lit	
Ambient +135°F	_____	_____	90% Alert	_____
Ambient +150°F	_____	_____	100% Warning	_____
Audible warning	_____	_____		

AEDATS II T53 ALIGNMENT WORKSHEET

(f) Channel 13 P-803 B/M1 (Refer to page 27 step 29)

Input	Doric +/- 2°F	AEDATS 2 **(*)** +/- 1°F	AEDATS 2 Channel name (*)
32 °F	_____	_____	T53 Tt11 T55 Tt11 T63 Tt11 L714 T01
70 °F	_____	_____	
100 °F	_____	_____	
120 °F	_____	_____	

(g) Channel 14 P-804 B/M2 (Refer to page 27 step 29)

Input	Doric +/- 2°F	AEDATS 2 **(*)** +/- 1°F	AEDATS 2 Channel name (*)
32 °F	_____	_____	T53 Tt12 T55 Tt12 T63 Tt12 L714 T02
70 °F	_____	_____	
100 °F	_____	_____	
120 °F	_____	_____	

(h) Channel 15 P-805 Comp discharge(Refer to page 27 step 29)

Input	Doric +/- 2°F	AEDATS 2 **(*)** +/- 1°F	AEDATS 2 Channel name (*)
32 °F	_____	_____	T53 T31 T55 CDT T63 TAI1 L714 T04
200°F	_____	_____	
400 °F	_____	_____	
600 °F	_____	_____	
800 °F	_____	_____	

(i) Channel 16 P-806 B/M3 (Refer to page 27 step 29)

Input	Doric +/- 2°F	AEDATS 2 **(*)** +/- 1°F	AEDATS 2 Channel name (*)
32 °F	_____	_____	T53 Twf T55 Twf T63 Twf L714 T03
70°F	_____	_____	
100 °F	_____	_____	
120 °F	_____	_____	

AEDATS II T53 ALIGNMENT WORKSHEET

(j) Channel 17 P-807 Comp discharge(Refer to page 27 step 29)

Input	Doric +/- 2°F	AEDATS 2 **(*)** +/- 1°F	AEDATS 2 Channel name (*)
32 °F	_____	_____	T53 T32 T55 TPTSO T63 TAI2 L714 TPTSO
200°F	_____	_____	
400 °F	_____	_____	
600 °F	_____	_____	
800 °F	_____	_____	

(k) Channel 18 P-808 P.T. Bearing Scavenge (Refer to page 27 step 29)

Input	Doric +/- 2°F	AEDATS 2 **(*)** +/- 1°F	AEDATS 2 Channel name (*)
32 °F	_____	_____	T53 TPTSO T55 T2BSO T63 TREF1 L714 T2BSO
200°F	_____	_____	
400 °F	_____	_____	
600 °F	_____	_____	
800 °F	_____	_____	

(l) Channel 19 P-809 #2 Bearing Scavenge (Refer to page 27 step 29)

Input	Doric +/- 2°F	AEDATS 2 **(*)** +/- 1°F	AEDATS 2 Channel name (*)
32 °F	_____	_____	T53 T2BSO T55 comb.st. T63 TREF2 L714 T3
200°F	_____	_____	
400 °F	_____	_____	
600 °F	_____	_____	
800 °F	_____	_____	

(m) Channel 25 TC 209 engine oil tank (thermocouple on top of oil tank)
(Refer to page 27 step 29)

Input	Doric +/- 2°F	AEDATS 2 **(*)** +/- 1°F	AEDATS 2 Channel name (*)
32 °F	_____	_____	T53 ToilT T63 ToilT
100°F	_____	_____	
200 °F	_____	_____	
300 °F	_____	_____	

AEDATS II T53 ALIGNMENT WORKSHEET

(n) Channel 26 TC 208 Fuel tank (TC208 Same as Hydrometer Temp)
(Refer to page 39 step 46)

Input	Doric +/- 2°F	AEDATS 2 **(*)** +/- 1°F	AEDATS 2 Channel name (*)
32 °F	_____	_____	T53 TfuelT T55 TfuelT T63 TfuelT
100°F	_____	_____	
200 °F	_____	_____	
300 °F	_____	_____	

(o) Channel 21 J20 Dyno Dyno lube inlet temp (Refer to page 39 step 46)

Input	Doric +/- 2°F	AEDATS 2 **(*)** +/- 1°F	AEDATS 2 Channel name (*)
32 °F	_____	_____	T53 Tdyn_Tnk T55 Tdyn_Tnk L714 Tdyn_Tnk T63 Tdyn_Tnk
100°F	_____	_____	
150 °F	_____	_____	
180 °F	_____	_____	
200°F	_____	_____	
300°F	_____	_____	

(p) Temperature and Speed Limit Control Panel (Refer to page 36 step 42)
1 Dyno-Lube Inlet Temperature, J20 Thumb wheel setting 200

Input	Calibrator Temp °F	Limit Control Panel +/- 3°F	Indicator lit	
32 °F	_____	_____	In limit	
100 °F	_____	_____	In limit	
150 °F	_____	_____	In limit	
180 °F	_____	_____	90% Alert	_____
200 °F	_____	_____	100% Warning	_____

(q) Dyno-lube delta temperature, (Refer to page 36 step 42)
1 Calibrator J23 Jumper J20, Thumb wheel setting 80

Input	Calibrator Temp °F	Limit Control Panel +/- 3°F	AEDATS 2 **(TDyn_FA)** +/- 1°F	
32 °F	_____		_____	
100 °F	_____		_____	
200 °F	_____		_____	
300 °F	_____		_____	_____
ambient +74°F	_____	_____	90% Alert	_____
Ambient +80°F	_____	_____	100% Warning	
Audible warning	_____			

AEDATS II T53 ALIGNMENT WORKSHEET

(r) Channel 22 J21 Dyno rear bottom Dyno lube out fwd (Refer to page 39 step 46)

Input	Doric +/- 2°F	AEDATS 2 **(*)** +/- 1°F	AEDATS 2 Channel name (*)
32 °F	_____	_____	T53 TDyn_Fwd T55 TDyn_Fwd T63 Tdyn_Fwd L714 Tdyn_Fwd
100°F	_____	_____	
200 °F	_____	_____	
300 °F	_____	_____	

(s) Channel 23 J22 Dyno front bottom Dyno lube out aft (Refer to page 39 step 46)

Input	Doric +/- 2°F	AEDATS 2 **(*)** +/- 1°F	AEDATS 2 Channel name (*)
32 °F	_____	_____	T53 TDyn_Aft T55 TDyn_Aft
100°F	_____	_____	
200 °F	_____	_____	
300 °F	_____	_____	

(16)High temperature system, EGT (Refer to page 31 step 32)

(a) THERMOCOUPLE TYPE K Channel 2, **Egt connector on engine harness (T53) Pins A (+) (yellow) B (-) (red), (T55) Pins D (+) (yellow) A (-) (red), (T63) Pins C (+) (yellow) A (-) (red).**

Input	Doric +/- 2	AEDATS 2 (*) +/- 1	Analog +/- 2	Digital +/- 2	AEDATS 2 Channel name (*)
400°F	_____	_____	_____	_____	T53 EGT T55 PTIT T63 GPTOT
800°F	_____	_____	_____	_____	
1200°F	_____	_____	_____	_____	
1600°F	_____	_____	_____	_____	
1800°F	_____	_____	_____	_____	

AEDATS II T53 ALIGNMENT WORKSHEET

(17)T55 Electric Torque System (Note T55 flight harness must be connected)
(Refer to page 68 step 54)

(a) Access connector at engine T55 Flight Harness (20090776-1)
- **1** Ensure that the torque Power Switch on indicator panel is off.
- **2** Jumper pins Z and A together, and connect to – voltage source.
- **3** Connect pin Y to the + terminal of millivolt source.
- **4** Activate Torque Power Switch on indicator panel.

(b) Set the Millivolt source to the following levels:

Input +/- 6 mv	Reading percentage	Analog Gauge +/- 2%
230	50	_____
325	70	_____
430	100	_____

(c) If out of tolerance use shorting cable to set 0
(d) Install shorting cable between T55 flight harness (20090776-1) and engine

DYNO OIL SAMPLE VAROC 35 YES_____ INIT_____ NO_____INIT_____

DYNO OIL SAMPLE VAROC 250 YES_____ INIT_____ NO_____INIT_____

FEDS ALIGNMENT WORKSHEET AEDATS II

T55-GA-714A Engine Applications (FADEC)

CERTIFICATION OFFICIAL

NAME _____

DATE _____

LOCATION _____

SERIAL # _____

AEDATS II T55-GA-714A FADEC ALIGNMENT WORKSHEET

1. T55-GA-714A FADEC ALIGNMENT WORKSHEET

2. Torque System Check Flight line test set. (LTC29089-03)

a. Before checking the torque system, perform the Flight Line Test Set health check, Section 5E of the Flight Line Test Set manual (SE-876-01-1006)**.**

b. Connection of Flight Line Test Set.

(1) Turn off breaker 313)
(2) Torque switch assy. Rear (LTCT31473-01)
(3) Remove J2. (LTCT31482-01) (28 vdc supply)
(4) Connect J2. (LTCT31577-1) & Connect to P2 plug (LTCT31482-01)
(5) Connect J4. (LTCT31577-1) FLTS.
(6) Remove J7. (LTCT31470-01) & Connect J7 (LTCT31578-1)
(7) Connect J2. (LTCT29351-01) FLTS
(8) Connect P14B to J7 on Torque switch assy.
(9) P14A is not connected.
(10) Remove P1 & P2 RDPS (LTCT31471-01)
(11) Connect J3 (LTCT30572-01) FLTS
(12) Connect P1 & P2 RDPS (LTCT30572-01)

c. Turn on breaker 313 and wait 60 minutes for warm up

3. ETQ Calibration Flight line test set (LTC29089-03)

a. (Refer to Honeywell Technical Manual, Pub No SE-876-01-1060, Section 3-1.4)

b. Connect voltage source to P2 E+ F- (LTCT131471-01)

Input Voltage	Ft-lb Reading +/- 1 ft-lb	AEDATS 2 (**ETQ)**
1.000 volts	0	Do not calibrate to 0 ft-lb
2.000 volts	320	_____
4.000 volts	961	_____
6.000 volts	1601	_____
7.245 volts	2000	_____

4. Simulated torque V_{01}

a. FLTS **Set to Aircraft RDPS**

b. Parameter Selector **V-01 1.000 +/- 0.005 V dc**

Parameter	Limits	FLTS Measured Value
V_{PRI}	95 +/- 10 V ac	_____
I_{PRI}	0.460 +/- 0.010 A ac	_____
V_T	17.00 +/- 2.00 V dc	_____
V_C	17.00 +/- 2.00 V dc	_____
V_X	0.0000 +/- 0.0020 V dc	_____
V_{01}	1.000 +/- 0.005 V dc	_____
V_{02}	V_{01} +/- 0.010 V dc	_____
V_{03}	V_{01} +/- 0.010 V dc	_____

AEDATS II T55-GA-714A FADEC ALIGNMENT WORKSHEET

c. Parameter selector V01 5.063 +/- 0.005 V dc

Parameter	Limits	FLTS Measured Value
V_T	17.00 +/- 2.00 V dc	_____
V_C	17.00 +/- 2.00 V dc	_____
V_X	0.4500 +/- 0.0500 V dc	_____

d. Calculate the following voltage ratio:

(1) Voltage Ratio = $V_X / (2V_C+V_X)$ Record _____

(2) The voltage ratio must be between 0.012869 & 0.013064. If not Replace RDPS.

(3) Turn on AC Torque Meter Power and rotate the Simulated Torque Adjust to achieve $\mathbf{V_{01}}$.

Input Voltage **(V_{01})**	Ft-lb Reading +/- 5 ft-lb	AEDATS 2 (**ETQ)**
1.000 volts	0	_____
2.000 volts	320	_____
4.000 volts	961	_____
6.000 volts	1601	_____
7.245 volts	2000	_____

(4) Remove all test cables, and return the test cell to its original configuration.

5. ORBT Calibration

a. Refer to Honeywell Technical Manual, Pub No SE-876-01-1060, Section 3-1.1D

b. Connect Decade Resistor Box to pins **M** & **N** J25 (ENGINE)

c. Calibrate using the following resistance.

Resistance	Temperature °F	AEDATS 2 (**ORBT)** V dc	Voltmeter TB 617 Pins 8 & 9	Limit V dc +/- 0.5
90.38 +/-.72 ohm	32.0°F	_____	_____	0.0
118.63 +/- .90 ohm	168.5°F	_____	_____	5.0
151.91 +/- 1.08 ohm	305.0°F	_____	_____	10.0

d. N2A Calibration Roll Back Activation

(1) Refer to Honeywell Technical Manual, Pub No SE-876-01-1060, Section 3-1.2A

(2) Connect Precision Signal Source (2700 Box) to J17 pins R- S+ (LTCT28918-03)

Oscillator Frequency	Rollback Light
2816 Hz	_____
2942 Hz +/- 3	_____
Rollback trip Hz	_____

AEDATS II T55-GA-714A FADEC ALIGNMENT WORKSHEET

e. Collective Pitch

(1) Refer to Honeywell Technical Manual, Pub No SE-876-01-1060, Section 3-2.1

(2) Remove the FADEC Control Chassis, (LTCT28915-03), from the test cell console without removing any of the cables, and remove the top cover. Start Fadec diagnostic software (laptop)

(a) Connect a DVM, set to AC volts, to the FADEC Control Chassis' TB2-1 (+) and TB2-2 (-) Measure and record the voltage excitation (E_x) supplied by the DECU in Table 3-7.

(b) Connect a DVM, set to AC volts, to the FADEC Control Chassis' TB2-3 (+) and TB2-4(-) Turn the collective pitch dial located on the front panel of the FADEC Control Chassis until a reading of 6.95% of E_x is attained. Record the dial position in Table 3-6 as this value represents 0.0% Collective Pitch.

(c) Turn the collective pitch dial until a reading of 58.16% of E_x is attained. Record dial position in Table 3-7 as this value represents 73.75% Collective Pitch.

(d) Turn the collective pitch dial until a reading of 67.03% of E_x is attained. Record the dial positions in Table 3-7 as these value represent 85.0% Collective Pitch.

NOTE

Do not turn dial below or above dial points.

Collective Pitch %	E_x = _____	Dial Indication	Voltmeter TB 2-3(+) TB 2-4(-)
0.00	6.95% E_x	_____	_____
73.75	58.16% E_x	_____	_____
85.00	67.03% E_x	_____	_____

f. N2 SET

(1) Refer to Honeywell Technical Manual, Pub No SE-876-01-1060, Section 3-2.2

(a) Connect cable (PN LTCT31480-02) to a laptop computer or other test cell PC.

(b) Start the FADEC diagnostic software (PN LTCT29332-02) and display the gauge N2 Set and Collective pitch.

NOTE

The zero and span potentiometers are located on the printed circuit board, which is mounted in a vertical position and secured to the front panel. These potentiometers are positioned on the top of the board.

(c) Rotate the N2 Set dial fully CCW. Adjust the zero potentiometer (R10) for an indication of 97% on the N2 Set gauge.

(d) Rotate the N2 Set dial fully CW. Adjust the Span potentiometer (R11) for an indication of 103% on the N2 Set gauge.

(e) Repeat steps D and E until no further adjustments are required.

g. N2 Calibration Speed

(1) Connect Precision Signal Source (2700 Box) to J18 pins u & v (LTCT28917-03)

Oscillator Frequency	AEDATS 2 (**NPT)**	Analog Gauge +/- 0.2 %	Digital Gage	Calculating Counter (00355)
704 Hz (25%)	_____	_____	_____	_____
1408 Hz (50%)	_____	_____	_____	_____
2112 Hz (75%)	_____	_____	_____	_____
2816 Hz (100%)	_____	_____	_____	_____

AEDATS II T55-GA-714A FADEC ALIGNMENT WORKSHEET

h. N1 Calibration Speed

(1) Connect Precision Signal Source (2700 Box) to J25 pins A & B (LTCT28921-02)

Oscillator Frequency	AEDATS 2 **(NGG)**	Analog Gauge +/- 0.2 %	Digital Gage	Calculating Counter (0357)
700 Hz (25%)	_____	_____	_____	_____
1400 Hz (50%)	_____	_____	_____	_____
2100 Hz (75%)	_____	_____	_____	_____
2800 Hz (100%)	_____	_____	_____	_____

NOTE

Leave 2800 Hz (100%) applied and proceed to T4.5

i. T4.5 Calibration Temp. (K Type)

(1) Refer to Honeywell Technical Manual, Pub No SE-876-01-1060, Section 3-3.3A

(a) Connect Thermocouple calibrator to J19 A+ B- (LTCT28919-03)

Input	Actual	Doric +/- 2 °F	AEDATS **(T4.5)** +/- 1 °F	Analog Gauge +/- 3 °F	Digital Gauge +/- 3 °F
400	_____	_____	_____	_____	_____
800	_____	_____	_____	_____	_____
1200	_____	_____	_____	_____	_____
1600	_____	_____	_____	_____	_____
1650	_____	_____	_____	_____	_____
2000	_____	_____	_____	_____	_____
Rollback Trip 1650 +/- 2 °F _____					

j. ROLLBACK SOLENOID VALVE CHECK

(1) Refer to Honeywell Technical Manual, Pub No SE-876-01-1060, Section 3-1.5

(a) Turn DC power off to the DECU at the FADEC Control Chassis, LTCT28915-03, and remove cable LTCT28914-03 connector P3 from DECU.

(b) Connect a thermocouple calibrator, set for type “K” T/C, to cable assembly LTCT 28919-03, connector J19-A (+Chromyl), and J19-B (-Alumel).

(c) Apply power to the torque switch assembly, LTCT31473-01.

(d) Verify that the Red LED on the front panel is illuminated.
_____ OK

(e) Using a DC voltmeter, verify that there is no voltage at cable assembly LTCT31478-01, connector P1 pins A (+) to B (-). _____ Volts

(f) Set the thermocouple calibrator to 1400.

(g) Using a DC voltmeter, verify that there is no voltage at cable assembly LTCT31478-01, connector P1 pins A (+) to B (-). _____ Volts

(h) Depress the Reset button on the front panel of the Torque Switch Assembly, LTCT31473-01.

(i) Verify that the Red LED on the front panel is not illuminated. _____ OK

(j) Using a DC voltmeter, verify that there is 28VDC at cable assembly LTCT31478-01, connector P1 pins A (+) to B (-). _____ Volts

(k) Increase the thermocouple simulator temperature to 1660.

(l) Verify that the Red LED on the front panel of the Torque Switch Assembly, LTCT31473-01, is illuminated. _____ OK

(m) Using a DC voltmeter, verify that there is no voltage at cable assembly LTCT31478-01, connector P1 pins A (+) to B (-). _____ Volts

(n) Increase the thermocouple simulator temperature to 1700.

AEDATS II T55-GA-714A FADEC ALIGNMENT WORKSHEET

NOTE

NG has to be greater than 50% for software to trigger rollback. Reference Paragraph 3-5.

(2) Verify that the Rollback Valve Indicator on the Touch Screen is activated. _____ OK P- Connect P3 cable.

k. THROTTLE QUADRANT MECHANISM

(1) Refer to Honeywell Technical Manual, Pub No SE-876-01-1060, Section 3-3

NOTE

Setup of the Throttle Quadrant may be easier if removed from the table top

(a) Start the FADEC diagnostic software LTC29332-02 and display the gauge ECL.
(b) Place the lever in the 30° (or ground idle) position
(c) Remove the FADEC Control Chassis, LTCT28915-03, from the test cell console without removing any of the cables, and remove the top cover
(d) Using a multimeter set on AC Volts, measure the voltage from TB2-5 (+) and TB2-6 (-). Verify the voltage is 0.00 ±2.5 mV AC.
(e) If the voltage is not within limits, loosen the clamp on the ECL lever, and rotate the shaft until the voltage is correct, then tighten the clamp on the lever.
(f) Move the ECL lever back and forth while watching the ECL gauge. The angle on the gauge should go from 0°to 60° smoothly, and without generating DECU faults.
(g) If DECU faults are being generated, remove the side cover on the ECL opposite the lever.
(h) Loosen the three cleats that secure the quad switch CAY-561-2. This should be the component closest to the small printed circuit board.
(i) Rotate the quad switch slightly. For reference, the opening and closing of this switch can be monitored with an ohmmeter in the FADEC control chassis, LTC28915-03, TB2-12 and TB2-13. The switch should open slightly above 30° or Ground Idle.
(j) Tighten the cleats. Reset the DECU, and repeat steps F through I as required
(k) Move the ECL lever to the 0° (Cutoff) position. The ECL gauge should read 0°.
(l) If the ECL gauge does not read 0°, remove the side cover on the ECL opposite the lever.
(m) Look at the small printed circuit board inside the ECL so that the resistor is to the left of the two trim potentiometers.
(n) Adjust the lower trim potentiometer until the ECL gauge displays 0°.
(o) Move the ECL lever until the gauge reads 60°. Secure or remove the ECL end stop as required and the 60° point.

APPENDIX B (AEDATS IV)

FEDS ALIGNMENT WORKSHEET
AEDATS IV
T700-GE-700/701/701C Engine Applications
T700-GE-401/401C Engine Applications
T53-L-13B/703 Engine Applications
T55-GA-714A Engine Applications
T55-L-712 Engine Applications
T63-A-720 Engine Applications

CERTIFICATION OFFICIAL

NAME _____

DATE _____

LOCATION _____

SERIAL # _____

FEDS ALIGNMENT WORKSHEET
AEDATS IV

T700-GE-700/701/701C Engine Applications
T700-GE-401/401C Engine Applications

CERTIFICATION OFFICIAL

NAME _____

DATE _____

LOCATION _____

SERIAL # _____

AEDATS IV T700 ALIGNMENT WORKSHEET

NOTE

All pages referenced in this alignment worksheet refer to section III Alignment Process of TB 1-4920-443-35

1. D.C. Voltmeter (0-50V Dc) (Refer to page 8 Step 9)

(1) Turn off power and verify instrument zero (mechanical pointer)
Instrument zero_____

(2) Turn on power and verify instrument readings.

(3) Check power supply #1 and #2 and verify that meter matches digital voltmeter. 28 VDC +/- 0.5.

(a) #1 meter_____#2 meter _____

(b) Check power supply #3 (714) for 24 VDC _____

2. D.C. Ammeter (Refer to page 9 Step 12)

a. Function test D.C. ammeter by noting a current indication on switch position PS1 and PS2.

(a) D.C. ammeter PS1_____amps PS2_____amps

3. A.C. Voltmeter (Refer to Page 9 step 10)

(a) Turn off 60 Hz power and verify instrument zero (mechanical pointer).

(b) Instrument zero_____

(2) Turn on 60 Hz power and verify instrument readings.

(a) Access rear of CB 301 on circuit panel.

CAUTION

High Voltage on exposed terminals

(3) Measure voltage between phases and functional check by comparing to digital voltmeter indication.

(a) Phase L1 to L2 meter _____VAC Digital voltmeter _____VAC

(b) Phase L2 to L3 meter _____VAC Digital voltmeter _____VAC

(c) Phase L2 to GRD meter _____VAC Digital voltmeter _____VAC

4. A.C. Ammeter (Refer to Page 9 step 11)

a. Function test A.C. ammeter by noting current indication.

(1) A.C. ammeter L1_____amps L2_____amps L3_____amps

5. Frequency Meter (Refer to Pages 9 step 13)

(1) Function test by noting a reading of approximately 60 hz.

(a) Frequency meter _____Hz

(2) Verify all press to test indicators are operational.

AEDATS IV T700 ALIGNMENT WORKSHEET

6. AEDATS IV T700 Alignment Worksheet

NOTE

Ensure system is in the T700 mode

(1) Angle Position Measurement System
(a) Dyno shroud Position Indicator (Refer to page 78 step 59)
(b) Input the following voltages into connector P91 pins F+ and H-.

Input Voltage	Percent Reading	AEDATS 4 (**DynoShrd)** +/-.5%	Vertical Scale +/-.1%	Vertical Scale Bottom row 3
0 volts	0%	_____	_____	
4 volts	25%	_____	_____	
8 volts	50%	_____	_____	
12 volts	75%	_____	_____	
16 volts	100%	_____	_____	
Transducer: T76 Hardware Name: HL33				

(2) Load Demand Spindle Position (Refer to page 79 step 60)
(a) Input the following voltages into connector P51 pins A(+) and B(-). **Connector P51 at Engine (LDS)**

Input Voltage	Degrees	AEDATS 4 (**LDS)** +/- .5 deg	Vertical Scale +/- 1.0 deg	Vertical Scale Bottom row 2
0 volts	-45	_____	_____	
4 volts	05	_____	_____	
8 volts	55	_____	_____	
12 volts	105	_____	_____	
Transducer: T82 Hardware Name: HL35				

(3) Power Available Spindle Position (Refer to page 80 step 61)
(a) Input the following voltages into connector P50 pins A(+) and B(-).**Connector P50 at Engine (PAS)**

Input Voltage	Degrees	AEDATS 4 (**PAS)** +/- .5 deg	Vertical Scale +/- 1.0 deg	Vertical Scale Bottom row 1
0 volts	0	_____	_____	
4 volts	50	_____	_____	
8 volts	100	_____	_____	
12 volts	150	_____	_____	
Transducer: T78 Hardware Name: HL34				

AEDATS IV T700 ALIGNMENT WORKSHEET

(4) Inlet Guide Vane Position (Refer to page 81 step 62)
(a) Input the following voltages into connector P53 pins A(+) and B(-)
(b) Connector P53 at Engine (IGV)

Input Voltage	Percent Reading	AEDATS 4 (**IGV**) +/-.5 deg	Vertical Scale +/- 1 deg	Vertical Scale Bottom row 4
0 volts	-10%	_____	_____	
2 volts	15%	_____	_____	
4 volts	40%	_____	_____	
6 volts	65%	_____	_____	
8 volts	90%	_____	_____	
Transducer: T83 Hardware Name: HL36				

(5) Engine torque alignment (Refer to page 60 step 52)
(a) Input an 8 V dc signal on pins 10 (+) and 11 (-) of the E-1 cable. Set span on the AEDATS and the engine torque gauge at 800 Ft.Lbs. Set each of the following points and record the results.

Input Voltage	Reading Ft Lbs	Vertical Scale +/-1 Ft Lb	Reading In Lbs	AEDATS 4 (**Qeng**) +/- 6 In Lb	Vertical Scale Bottom row 10
0 volts	0	_____	0	_____	
2 volts	200	_____	2400	_____	
4 volts	400	_____	4800	_____	
6 volts	600	_____	7200	_____	
8 volts	800	_____	9600	_____	
10 volts	1000	_____	12000	_____	
Transducer: T109 Hardware Name: HL37					

(6) Engine oil inlet temperature gauge (Decade Box) (Refer to page 70 step 56)
(a) Connect the decade resistor to pins 9 and 10 of the E-3 cable connector. Adjust the decade resistor to obtain the indications listed below. If modified for 714 switch at signal conditioner set to 712.

Avg	Decade Resistor (Ohms)	AEDATS 4 **(OBRT)** +/-2 °F	Reading
90.4	90.34-90.42	_____	32°F
97.3	97.27-97.35	_____	68°F
104.6	104.56-104.64	_____	104°F
112.3	111.78-112.78	_____	140°F
120.4	119.86-120.86	_____	176°F
128.8	128.35-129.35	_____	212°F
142.4	141.80-143.00	_____	266°F
151.9	151.31-152.51	_____	302°F
177.9	176.95-178.95	_____	392°F
Transducer: T87 Hardware Name: LL04			

AEDATS IV T700 ALIGNMENT WORKSHEET

(7) Hydraulic Pressures (Refer to pages 38 step 42)

(a) MT-17A 0-150 psid B-sump Delta Pressure (T700 only)

(b) Using the pressure calibrator, apply the following pressures to **MT-17A and Vent 17B.** Record the results. **NOTE: Calibrate 3 PS Alarm in conjunction with MT-17A.**

Pressure (psid)	Actual Pressure	AEDATS 4 (**EODP**) +/- 1 Psi	Vertical Scale +/- 2 psi	Vertical Scale Bottom row 5
Vent	_____	_____	_____	
30	_____	_____	_____	
60	_____	_____	_____	
90	_____	_____	_____	
120	_____	_____	_____	
150	_____	_____	_____	
R-cal	_____			
Transducer: T86 Hardware Name: HL50				

(c) MT-17A 0-150 psid B-sump Delta Pressure (T701/T701C only)

1 Using the pressure calibrator, apply the following pressures to **MT-17A and Vent 17B.** Record the results. **NOTE: Calibrate 3 PS Alarm in conjunction with MT-17A.**

Pressure (psid)	Actual Pressure	AEDATS 4 (**PBSUMP**) +/- 1 Psi	Vertical Scale +/- 2 psi	Vertical Scale Bottom row 5
Vent	_____	_____	_____	
30	_____	_____	_____	
60	_____	_____	_____	
90	_____	_____	_____	
120	_____	_____	_____	
150	_____	_____	_____	
R-cal	_____			
Transducer: T26 Hardware Name: HL06 **T701C PBSUMP; channel T111 HL 06**				

(d) MT-15, 0-100 psig Fuel inlet pressure (Refer to pages 38 step 42)

1 Using the pressure calibrator, apply the following pressures to **MT-15**

Pressure (psid)	Actual Pressure	AEDATS 4 (**PFI**) +/- 1 Psi	Vertical Scale +/- 2 psi	Vertical Scale Top row 9
Vent	_____	_____	_____	
20	_____	_____	_____	
40	_____	_____	_____	
60	_____	_____	_____	
80	_____	_____	_____	
100	_____	_____	_____	
R-cal	_____			
Transducer: T30 Hardware Name: HL09				

AEDATS IV T700 ALIGNMENT WORKSHEET

(e) MT-16, 0-50 psig, Dyno lube inlet pressure (Refer to pages 38 step 42)

1 Using the pressure calibrator, apply the following pressures to **MT-16** (PT408) and record the results. NOTE: **Calibrate 5 PS Alarm in conjunction with MT-16.**

Pressure (psid)	Actual Pressure	AEDATS 4 (**pdyn_Sup**) +/- 1 Psi	Vertical Scale +/- 2 psi	Vertical Scale bottom row 11
Vent	_____	_____	_____	
10	_____	_____	_____	
20	_____	_____	_____	
30	_____	_____	_____	
40	_____	_____	_____	
50	_____	_____	_____	
R-cal	_____			
Transducer: T34 Hardware Name: HL13				

(f) Fault light panel (Refer to page 73 step 57)

(g) J BOX

1 T-700 dyno low oil press fwd _____ 5 PS set 10.5 psig on decreasing pressure. (+/- .5)

2 T-700 dyno low oil press aft _____ 6 PS set 10.5 psig on decreasing pressure. (+/- .5)

3 T-700 engine low oil pressure switch _____ 3PS set 25 psig on decreasing pressure. (+/- 2)

(h) Fuel Skid

1 T-700 fuel boost _____11 PS set 15 PSI on increasing pressure (+/- 2)

2 T-700 skid low fuel level _____ TB 206, jumper # 11 & 12

3 T-700 skid fuel filter bypass _____ TB 207 jumper # 1 & 2

4 T-700 fuel valve _____ Turn on CB305 and fuel pump switch on.

5 Main fuel valve _____ Turn on CB305 and fuel pump switch.

(i) T700 Test Trailer

1 T-700 dynolube filter bypass _____ J73 connector, jumper pins L & K

2 T-700 dynolube tank low level _____ J73 connector, jumper pins M & N

3 T-700 eng Lube Filter Bypass _____ E-3 connector, jumper pins 13 & 14

4 T-700 Engine fuel filter bypass _____ E-3 connector, jumper pins 15 & 16

5 T-700 chip detector _____ E-3 connector, jumper pins 11 & 12

6 T-700 low fuel pressure _____ E-3 connector, jumper pins 23 & 24

AEDATS IV T700 ALIGNMENT WORKSHEET

(j) BSUMP Scavenge Pressure Indicator (Refer to page 50 step 46)

1 Procure an engine oil pressure transducer P/N 418-10054 and connect to Green cable connector.

2 Connect E3 cable.

Alternate connection if engine is not installed	
Transducer pin	E-3 cable
1	7
2	6
3	5

Applied Pressure (psig)	Engine Control Panel **(B Sump Scav)** +/- 1 psi
0	_____
50	_____
100	_____
150	_____
200	_____

(k) **CDP**, 0-600 in-hg abs CDP pressure (T700) (Refer to page 46 step 44)

1 Using the pressure calibrator, apply the following pressures to the CDP transducer located in cabinet 11, and record the results.

Pressure (in-hg abs)	Actual Pressure	AEDATS 4 (**CDP**) +/- .3 in hg	Vertical Scale +/- .3 in hg	Vertical Scale bottom row 7 T700
BARO	ABS	_____	_____	
150	73.7	_____	_____	
300	147	_____	_____	
450	221	_____	_____	
600	294.7	_____	_____	
R-cal _____				
Transducer: T41 Hardware Name: HL22				

AEDATS IV T700 ALIGNMENT WORKSHEET

(8) Low Temperature Measurement System

NOTE

If adjustment on the Doric is needed, remove the two screws from the side of the front panel and remove the panel. The two potentiometers are visible at the upper left of the display. R44 (Front Panel ZERO) potentiometer controls the 32° reference and R45 (SPAN) potentiometer controls the positive (+) full scale (1000°) Adjust the thermocouple calibrator to 300° and the Doric display should be 300° +/- 1°, if not, repeat adjustment.

(a) Low Temperature Channels (Use shorting connector to obtain ambient temperature)

(b) Channel 1 P-56 Engine Oil Discharge (Refer to page 25 step 27 9a)

Input	Calibrator Temp °F	Doric +/- 1°F	AEDATS 4 **(EODT)** +/- 1°F
32 °F	_____	_____	_____
100 °F	_____	_____	_____
200 °F	_____	_____	_____
300 °F	_____	_____	_____
Transducer: T10 Hardware Name: J02			

(9) Temperature and Speed Limit Control Panel (Refer to page 33 step 35+37)
(a) Engine Discharge Temperature P-56 Thumb wheel setting 300

Input	Calibrator Temp °F	Limit Control Panel +/- 3°F	Indicator lit	
32 °F	_____	_____	In limit	
100 °F	_____	_____	In limit	
200 °F	_____	_____	In limit	
270 °F	_____	_____	90% Alert	_____
300 °F	_____	_____	100% Warning	_____

(b) Channel 2, P-57 Eng. Oil Scav. Temp. (Refer to page 25 step 28)

Input	Calibrator Temp °F	Doric +/- 1°F	AEDATS 4 **(BSUMP)** +/- 1°F
32 °F	_____	_____	_____
100 °F	_____	_____	_____
200 °F	_____	_____	_____
300 °F	_____	_____	_____
Transducer: T113 Hardware Name: J03			

AEDATS IV T700 ALIGNMENT WORKSHEET

(c) Temperature and Speed Limit Control Panel (Refer to page 33 step 37)

1 Engine oil delta temperature P-57 Jumper P-56 Thumb wheel setting 150

Input	Calibrator Temp °F	Limit Control Panel +/- 3°F	Indicator lit	
Ambient +135°F	_____	_____	90% Alert	_____
Ambient +150°F	_____	_____	100% Warning	_____
Audible warning	_____	_____		

(d) Channel 3, P-58 INLET AIR TEMP (Refer to page 24 step 28)

Input	Calibrator Temp °F	Doric +/- 1°F	AEDATS 4 **(T21)** +/- 1°F
32 °F	_____	_____	_____
70 °F	_____	_____	_____
100 °F	_____	_____	_____
120 °F	_____	_____	_____
Transducer: T11		**Hardware Name: J04**	

(e) Channel 4, P-59 INLET AIR TEMP (Refer to page 24 step 28)

Input	Calibrator Temp °F	Doric +/- 1°F	AEDATS 4 **(T22)** +/- 1°F
32 °F	_____	_____	_____
70 °F	_____	_____	_____
100 °F	_____	_____	_____
120 °F	_____	_____	_____
Transducer: T12		**Hardware Name: J05**	

(f) Channel 5, P-68, INLET AIR TEMP (Refer to page 24 step 28)

Input	Calibrator Temp °F	Doric +/- 1°F	AEDATS 4 **(T23)** +/- 1°F
32 °F	_____	_____	_____
70 °F	_____	_____	_____
100 °F	_____	_____	_____
120 °F	_____	_____	_____
Transducer: T13		**Hardware Name: J02**	

AEDATS IV T700 ALIGNMENT WORKSHEET

(g) Channel 6, P-92, INLET AIR TEMP (Refer to page 24 step 28)

Input	Calibrator Temp °F	Doric +/- 1°F	AEDATS 4 **(T24)** +/- 1°F
32 °F	_____	_____	_____
70 °F	_____	_____	_____
100 °F	_____	_____	_____
120 °F	_____	_____	_____
Transducer: T14		**Hardware Name: J07**	

(h) Channel 27, P-101, INLET AIR TEMP **(**Refer to page 24 step 28**)**

Input	Calibrator Temp °F	Doric +/- 1°F	AEDATS 4 **(T25)** +/- 1°F
32 °F	_____	_____	_____
70 °F	_____	_____	_____
100 °F	_____	_____	_____
120 °F	_____	_____	_____
Transducer: T67		**Hardware Name: J27**	

(i) Channel 28, P-102, INLET AIR TEMP **(**Refer to page 24 step 28**)**

Input	Calibrator Temp °F	Doric +/- 1°F	AEDATS 4 **(T26)** +/- 1°F
32 °F	_____	_____	_____
70 °F	_____	_____	_____
100 °F	_____	_____	_____
120 °F	_____	_____	_____
Transducer: T68		**Hardware Name: J28**	

(j) Channel 29, P-103, INLET AIR TEMP **(**Refer to page 24 step 28**)**

Input	Calibrator Temp °F	Doric +/- 1°F	AEDATS 4 **(T27)** +/- 1°F
32 °F	_____	_____	_____
70 °F	_____	_____	_____
100 °F	_____	_____	_____
120 °F	_____	_____	_____
Transducer: T69		**Hardware Name: J29**	

AEDATS IV T700 ALIGNMENT WORKSHEET

(k) Channel 30, P-104, INLET AIR TEMP (Refer to page 24 step 28)

Input	Calibrator Temp °F	Doric +/- 1°F	AEDATS 4 **(T28)** +/- 1°F
32 °F	_____	_____	_____
70 °F	_____	_____	_____
100 °F	_____	_____	_____
120 °F	_____	_____	_____
Transducer: T54 Hardware Name: J14			

(l) Channel 7, J20 Dyno Oil Tank (Refer to page 24 step 28)

Input	Calibrator Temp °F	Doric +/- 1°F	AEDATS 4 **(Tdyn_tnk)** +/- 1°F
32 °F	_____	_____	_____
100 °F	_____	_____	_____
200 °F	_____	_____	_____
300 °F	_____	_____	_____
Transducer: T15 Hardware Name: J08			

(m) Temperature and Speed Limit Control Panel (Refer to page 35 step 37)

1 Dyno-Lube Inlet Temperature, J20 Thumb wheel setting 200

Input	Calibrator Temp °F	Limit Control Panel +/- 3°F	Indicator lit	
32 °F	_____	_____	In limit	
100 °F	_____	_____	In limit	
150 °F	_____	_____	In limit	
180 °F	_____	_____	90% Alert	_____
200 °F	_____	_____	100% Warning	_____

AEDATS IV T700 ALIGNMENT WORKSHEET

(n) Dyno-lube delta temperature (Refer to page 35 step 38)

1 Calibrator J23 Jumper J20, Thumb wheel setting 80

2 Disconnect J24

Input	Calibrator Temp °F	Limit Control Panel +/- 3°F	ADATS 4 **(TDyn_FA)** +/- 1°F	
32 °F	_____		_____	
100 °F	_____		_____	
200 °F	_____		_____	
300 °F	_____		_____	
ambient +74°F	_____	_____	90% Alert	_____
Ambient +80°F	_____	_____	100% Warning	_____
Audible warning	_____			
Transducer: T18 Hardware Name: J11				

(o) Channel 8, J21 Dyno oil Forward (LINE R/S DYNO) (Refer to page 24 step 28)

Input	Calibrator Temp °F	Doric +/- 1°F	AEDATS 4 **(Tdyn_fwd)** +/- 1°F
32 °F	_____	_____	_____
100 °F	_____	_____	_____
200 °F	_____	_____	_____
300 °F	_____	_____	_____
Transducer: T16 Hardware Name: J09			

(p) Channel 9, J22 Dyno Oil Aft (REAR OF DYNO) (Refer to page 24 step 28)

Input	Calibrator Temp °F	Doric +/- 1°F	AEDATS 4 **(Tdyn_aft)** +/- 1°F
32 °F	_____	_____	_____
100 °F	_____	_____	_____
200 °F	_____	_____	_____
300 °F	_____	_____	_____
Transducer: T17 Hardware Name: J10			

AEDATS IV T700 ALIGNMENT WORKSHEET

(10)High temperature system, TGT (Refer to page 30 step 31)

(a) THERMOCOUPLE TYPE K

(b) Channel 1, E1 Cable Pins 17 {+}(yellow) 16 {-}(red)

Input	Calibrator Temp °F	Doric +/- 2	AEDATS 4 **(TGT)** +/- 1	Analog +/- 2	Digital +/- 2
400°F	_____	_____	_____	_____	_____
800°F	_____	_____	_____	_____	_____
1200°F	_____	_____	_____	_____	_____
1650°F	_____	_____	_____	_____	_____
2000°F	_____	_____	_____	_____	_____
Transducer: T3 Hardware Name: K01					

1 NOTE 1: Analog gauge adjustments are as follow:
2 R6 for digital at 100°F
3 R12 for analog at 100°F
4 R15 for digital at 1000°F
5 R21 for analog at 1000°F
6 NOTE 2: perform the above adjustments if the instrument is out of tolerance.

(11)Vibration system (Vibration Test # 1) (Refer to page 10 step 15)

(a) Set variable filter channel switches to 1, filter selector switch to out.

(b) Set all meters as follows:

1 Filter switch to **CAL**
2 Range switch to **150**
3 Xducer switch to **ACC**
4 Mode switch to **VEL**
5 Output switch to **AVG**

(c) Adjust Cal pot to (105) on digital display on all channels

(d) Set filter switch to sensitivity and adjust Sens pot for an indication of 150 on all channels

(e) Reset:

1 Output switches to **AVG**
2 Mode switches to **VEL**
3 Range switches to **5.0**
4 Filter switches to **OUT**
5 Xducer switches to **VEL**

(f) Jumper across pins as listed on step J and adjust **R4** for zero (CEC 4000-1010)

(g) After zeroing indicators, go back to step B through E and recheck **CAL** and **SENS** settings

(h) Connect test oscillator to the following connectors:

Plug	Pins	Ground	Channel
P-25	L-C	C	1
P-25	B-E	E	2
P-25	M-G	G	3
P-91	N-G	G	4
P-91	B-M	M	5

AEDATS IV T700 ALIGNMENT WORKSHEET

(i) First test:
(j) Use J2 (pins A and B) of CEC 2700 for AC millivolts

1 Channel 1 Connector P25 Pins L (+) C (-)

Frequency	Output(mAvg)	(Vert. Scale) Meter	(Limits)	AEDATS 4 (**V1)**
	Shorted	_____		_____
100hz	116.5	_____	.9-1.1	_____
100hz	233.0	_____	1.9-2.1	_____
100hz	350.0	_____	2.9-3.1	_____
100hz	466.0	_____	3.9-4.1	_____
100hz	583.0	_____	4.9-5.1	_____
Transducer: T70 Hardware Name: HL26				

2 Channel 2 Connector P25 Pins B (+) E (-)

Frequency	Output(mAvg)	(Vert. Scale) Meter	(Limits)	AEDATS 4 (**V2)**
	Shorted	_____		_____
100hz	116.5	_____	.9-1.1	_____
100hz	233.0	_____	1.9-2.1	_____
100hz	350.0	_____	2.9-3.1	_____
100hz	466.0	_____	3.9-4.1	_____
100hz	583.0	_____	4.9-5.1	_____
Transducer: T71 Hardware Name: HL27				

3 Channel 3 Connector P25 Pins M (+) G (-)

Frequency	Output(mAvg)	(Vert. Scale) Meter	(Limits)	AEDATS 4 (**V3)**
	Shorted	_____		_____
100hz	116.5	_____	.9-1.1	_____
100hz	233.0	_____	1.9-2.1	_____
100hz	350.0	_____	2.9-3.1	_____
100hz	466.0	_____	3.9-4.1	_____
100hz	583.0	_____	4.9-5.1	_____
Transducer: T72 Hardware Name: HL29				

4 Channel 4 Connector P91 Pins N (+) G (-)

Frequency	Output(mAvg)	(Vert. Scale) Meter	(Limits)	AEDATS 4 (**V4)**
	Shorted	_____		_____
100hz	116.5	_____	.9-1.1	_____
100hz	233.0	_____	1.9-2.1	_____
100hz	350.0	_____	2.9-3.1	_____
100hz	466.0	_____	3.9-4.1	_____
100hz	583.0	_____	4.9-5.1	_____
Transducer: T73 Hardware Name: HL29				

AEDATS IV T700 ALIGNMENT WORKSHEET

5 Channel 5 Connector P91 Pins B (+) M (-)

Frequency	Output(mAvg)	(Vert. Scale) Meter	(Limits)	AEDATS 4 (**V5**)
	Shorted	_____		_____
100hz	116.5	_____	.9-1.1	_____
100hz	233.0	_____	1.9-2.1	_____
100hz	350.0	_____	2.9-3.1	_____
100hz	466.0	_____	3.9-4.1	_____
100hz	583.0	_____	4.9-5.1	_____
Transducer: T74 Hardware Name: HL30				

(12)Vibration system (vibration Test # 2)

NOTE

2700 Calibration box has an internal switch, it must be in the ON position. Calibration lab may leave switch in the OFF position

(a) Use J1 with red cable (CEC-619566-120) and T700 engine vibration cable to drive the charge amps.
(b) Connect test box CEC 2700 (J1) to the inputs of the vibration cables.
(c) Set channels 1, 2, and 3 meters as follows:
1 Filter switch to CAL
2 Range switch to 150
3 Xducer switch to ACC
4 Mode switch to VEL
5 Output switch to AVG
6 Variable filter Out
7 Adjust Cal pot for a reading of **50** on Ch2. and **10** on Ch. 1 and 3.
8 Set filter sw to **SENS**
9 Adjust **SENS** pot for a reading of **150/75** on the digital display of channels 1, 2, and 3.

NOTE

(75 only applies to sites with the Endevco system installed)

10 Set XDUCER switch to VEL
11 Set OUTPUT sw to RMS.
12 Range 5
13 Filter OUT

(d) Channel 1 Connector J26 (V1) (charge amp box)

Frequency	Output (Pcmb/mv)	(Vert. Scale) Meter	(Limits)
100hz	16.3	_____	.9-1.1
100hz	32.5	_____	1.9-2.1
100hz	48.8	_____	2.9-3.1
100hz	65.1	_____	3.9-4.1
100hz	81.4	_____	4.9-5.1

AEDATS IV T700 ALIGNMENT WORKSHEET

(e) Channel 2 Connector J38 (V2) (charge amp box)

Frequency	Output (Pcmb/mv)	(Vert. Scale) Meter	(Limits)
100hz	81.4	_____	.9-1.1
100hz	163	_____	1.9-2.1
100hz	244	_____	2.9-3.1
100hz	326	_____	3.9-4.1
100hz	407	_____	4.9-5.1

(f) Channel 3 Connector J37 (V3) (charge amp box)

Frequency	Output (Pcmb/mv)	(Vert. Scale) Meter	(Limits)
100hz	16.3	_____	.9-1.1
100hz	32.5	_____	1.9-2.1
100hz	48.8	_____	2.9-3.1
100hz	65.1	_____	3.9-4.1
100hz	81.4	_____	4.9-5.1

(13)Fuel flow measurement CEC 2700 BOX (Refer to page 18 step 22)

(a) Set calculating counter controls as follows: (Channel 4)

1	**DEC**	**6**
2	**C**	**01000**
3	**10n**	**0**
4	**Auto**	**depressed**
5	**X10**	**depressed**
6	**Sample Rate (fast)**	**1**
7	**Test**	**released**

(b) Determine C settings for channel 4 Channel 4 C = (3600 x 8.337 x specific gravity) divided by the turbine meter K-factor (Average from calibration sheet)

(c) Enter calculated value on channel 4 C switches

(d) At the fuel trailer disconnect MT-206 from the flowmeter and connect the test oscillator to pins A (+) and B (-).

(e) Connect the frequency counter to the test oscillator. Or use CEC2700 box.

(f) (NOTE: The frequency counter must have the low pass filter on)

(g) Enter Specific Gravity, K Factor and Temp in AEDATS to read PPH from flowmeter Cal sheet.

(h) Connect Temp source to TC 208 to correspond to flowmeter Cal Temp.

(i) Set the following points with test oscillator:

1 1 Vac input

(Note: oscillator frequency x c = PPH)

(Enter S/G into AEDATS to read PPH from Cal sheet)

AEDATS IV T700 ALIGNMENT WORKSHEET

(j) Input the following frequencies into connector MT206 pins A (+) and B (-). Center Flowmeter.

					Note: Cell constant high K Factor (#5)
Oscillator Hz	Calculating Counter Hz +/- 1	AEDATS 4 **(WF HZ)** Hz +/- 1	Calibration Sheet Hz	Calculating Counter PPH+/- .5 %	AEDATS 4 **(WF HZ)** PPH +/- .35 %
240Hz	_____	_____	_____	_____	_____
480Hz	_____	_____	_____	_____	_____
720Hz	_____	_____	_____	_____	_____
960Hz	_____	_____	_____	_____	_____
1200Hz	_____	_____	_____	_____	_____
(Note: frequency x **C** = PPH) (CH 4C= 3600 x 8.337 x SG /K factor)					
Transducer: T53 Hardware Name: F05					
No alignment requirement – must verify frequencies.					

(14) Speed Measurement System **(**Refer to page 51 step 47**)** CEC 2700 BLUE BOX or Function Generator

(a) Power turbine speed (NP) (N2) speed indicator (T700/T701/T701C)

1 Set calculating counter controls as follows: (Channel 2)
2 DEC **4**
3 C **07502**
4 10n periods **0**
5 Auto **depressed**
6 x10 **depressed**
7 Sample rate to (fast) **1**
8 Test **released**

(b) Power turbine speed (NP) (N2) speed indicator (T401/T401C)

1 Set calculating counter controls as follows: (Channel 2)
2 DEC **4**
3 C **07179**
4 10n periods **0**
5 Auto **depressed**
6 x10 **depressed**
7 Sample rate to (fast) **1**
8 Test **released**

(c) Set the CEC 2700 oscillator controls as follows: **(NP)**

1 Level 500mV to 1.5 V, (voltage is needed to drive amp)

AEDATS IV T700 ALIGNMENT WORKSHEET

(d) Input the following frequencies into connector E1 pins 8 and 9.

Oscillator Frequency	Calculating counter +/- .3%	AEDATS 4 **(NP)** +/- 1hz	Gauge Analog +/- 5%	Gauge Digital +/- .3%
133hz (10%)	_____	_____	_____	_____
533hz (40%)	_____	_____	_____	_____
800hz (60%)	_____	_____	_____	_____
1200hz (90%)	_____	_____	_____	_____
1333hz (100%)	_____	_____	_____	_____
Transducer: T51 Hardware Name: F04				
No alignment requirement – must verify frequencies.				

(15)Over Speed channels (NP) (Refer to page 51 step 47)

(a) Over speed power section #1.

(b) Set the CEC 2700 oscillator controls as follows: **(NP)**

1 Level 500mV to 1.5 V, (voltage is needed to drive amp)

(c) Input the following frequencies into connector E1 pins 8 and 9. Thumbwheel setting 1333

Speed Hz/%	Limit control indicator +/- .3hz
133hz (10%)	_____
533hz (40%)	_____
800hz (60%)	_____
1200hz (90%)	_____
1333hz (100%)	_____

NOTE

Over speed power section #2 is not connected

(d) Set frequency at 90% and 100% of thumbwheel setting to check alarms

1 90% alarm 1200 Hz_____100% alarm 1333 Hz _____audible alarm Y/N_____

(16)Power turbine speed (NG) speed indicator (Refer to page 51 step 47-2)

(a) Set calculating counter controls as follows: (Channel 1)

1	DEC	**4**
2	C	**04682**
3	10n	**0**
4	Auto	**depressed**
5	x10	**depressed**
6	Sample rate (fast)	**1**
7	Test	**released**

(b) Set the oscillator controls as follows: **(NG)**

1 Level 500mV to 1.5 V, (voltage is needed to drive amp)

AEDATS IV T700 ALIGNMENT WORKSHEET

(c) Input the following frequencies into connector E3 pins 20 and 21.

Oscillator Frequency	Calculating counter +/- .3%	AEDATS 4 **(NG)** +/- 1hz	Gauge Analog +/- .3%	Gauge Digital +/- .3%
214hz (10%)	_____	_____	_____	_____
854hz (40%)	_____	_____	_____	_____
1282hz (60%)	_____	_____	_____	_____
1709hz (90%)	_____	_____	_____	_____
2136hz (100%)	_____	_____	_____	_____
Transducer: T46 Hardware Name: F02				
No alignment requirement – must verify frequencies.				

(17)Torque, horsepower, and speed indicator (Refer to page 58 step 51) 9530A DATRONICS

(a) Zero indicator and install torque arm and pan, push down and release. Lift up on arm and release. Adjust to zero

1 Note old r-cal value._____ for Ref. Only (check old R Cal)

(b) Install 100 lbs of weight (Torque= 200 ft-lb)

(c) Adjust span course and fine controls until results are obtained

(d) Add 100 lbs of weight for a total of 200 lbs and verify the indicator reads 400 ft-lb (+/-2 ft-lb)

(e) Add 100 lbs of weight for a total of 300 lbs and verify the Indicator reads 600 ft lbs (+/-2 ft-lb)

Weights	Torque Ft-lb	Datronics indicator +/-2 ft-lb	Torque in-lb	AEDATS 4 (**Qdyno**) +/- 10 in-lb
0	0	_____	0	_____
100 Lbs	200	_____	2400	_____
200 Lbs	400	_____	4800	_____
300 Lbs	600	_____	7200	_____
Transducer: T1 Hardware Name: LL01				

(f) Torque R-cal_____ holding - R Cal down Datronics Remove torque arm and pan

(g) Re-adjust balance and span pots to read zero and the new r-cal respectively

(h) Adjust AEDATS to Datronics Zero

(18)RPM (Refer to page 58 step 51)

(a) Ensure indicator is in rpm mode. Adjust balance and span controls for a zero indication +/- 1 Hz

(b) Input a signal of 1393.3 Hz on pins 8 and 9 of the E-1 cable and adjust balance and span controls for an indication of 20,900 rpm +/- 10 rpm

1 Zero_____, Span_____ Rpm R-cal_____

(19)SHP (Refer to page 58 step 51)

(a) Ensure indicator is in **Shp** mode. Set zero. Push **Shp cal** and **- cal** (torque) button and verify the indication is the product of the values of the R-cals noted above, divided by 5252

1 Torque R-cal _____**x** Rpm R-ca l_____**/**5252 = **Shp**_____

(b) If the displayed value is not correct adjust the span controls to obtain the value attained mathematically (displayed value)_____

FEDS ALIGNMENT WORKSHEET
AEDATS IV

T53-L-13B/703 Engine Applications
T55-L-712 Engine Applications
T63-A-720 Engine Applications

CERTIFICATION OFFICIAL

NAME _____

DATE _____

LOCATION _____

SERIAL # _____

AEDATS IV T53/T55/T63 ALIGNMENT WORKSHEET

1. AEDATS IV T53/T55/T63 Alignment Worksheet

NOTE

Ensure system is in the mode for the engine requiring alignment (T53/T55/T63)

a. Angle Position Measurement System

(1) Dyno shroud Position Indicator (Refer to pages 85 step 66) Connector P91 (F+) (H-)

(a) Input the following voltages into Connector P91

Input Voltage	Percent Reading	AEDATS 4 (**DynoShrd)** +/-.5%	Vertical Scale +/-.1%	Vertical Scale Bottom row 3
0 volts	0%	_____	_____	
4 volts	25%	_____	_____	
8 volts	50%	_____	_____	
12 volts	75%	_____	_____	
16 volts	100%	_____	_____	
Transducer: T77 Hardware Name: HL34				

(2) TA Position (T53/T55/T63) (Refer to page 84 step 65)

(a) Input the following voltages into connector N1 POS pins A (+) and B (-).

(b) Connector N1 POS at Engine

Input Voltage	Degrees	AEDATS 4 (**TA)** +/- .5 deg	Vertical Scale +/- 1.0 deg	Vertical Scale Bottom row 1
0 volts	0	_____	_____	
4 volts	50	_____	_____	
8 volts	100	_____	_____	
12 volts	150	_____	_____	
T53 - Transducer: T79 Hardware Name: HL34 **T55 - Transducer: T80 Hardware Name: HL35** **T63 - Transducer: T81 Hardware Name: HL35**				

(3) Inlet Guide Vane Position (T53) (Refer to pages 86 step 67)

(a) Input the following voltages into connector T53 IGV pins A (+) and B (-).

(b) Connector T53 IGV at Engine

Input Voltage	Percent Reading	AEDATS 4 (**IGV)** +/-.5 deg	Vertical Scale +/- 1 deg	Vertical Scale Bottom row 4
0 volts	-10%	_____	_____	
2 volts	15%	_____	_____	
4 volts	40%	_____	_____	
6 volts	65%	_____	_____	
8 volts	90%	_____	_____	
Transducer: T84 Hardware Name: HL36				

AEDATS IV T53/T55/T63 ALIGNMENT WORKSHEET

b. Speed measurement system, (Refer to page 54 step 48) Tach. Gen

(1) Power turbine speed (PT) speed indicator

(a) Set calculating counter controls as follows: (Channel 2)

1	DEC	**5**
2	C	**14286**
3	10n	**0**
4	Auto	**depressed**
5	x10	**released**
6	Sample rate (fast)	**1**
7	Test	**released**

(b) Input the following frequencies into the flight harness or engine harness connector

1 T55 Flight Harness pins D and E
2 T53 Flight Harness pins E and F T53 Engine harness pins A and B
3 T63 Flight Harness pins A and B

NOTE

Ground E 0n TB810 term. #17 if engine is not mounted (will not read) speeds.

(c) Set the tachometer tester controls to the following:

1 Motor direction-stop,
2 Set rpm-10%,
3 Power on
4 Set the motor direction switch to forward.

Tachometer tester	Calculating counter +/- .3%	AEDATS 4 **(N2)** +/- .01hz	Gauge Analog +/- .3%	Gauge Digital +/- .3%
7hz (10%)	_____	_____	_____	_____
28hz (40%)	_____	_____	_____	_____
42hz (60%)	_____	_____	_____	_____
56hz (80%)	_____	_____	_____	_____
70hz (100%)	_____	_____	_____	_____

T53 - Transducer: T48 Hardware Name: F03
T55 - Transducer: T49 Hardware Name: F03
T63 - Transducer: T50 Hardware Name: F03

No alignment requirement – must verify frequencies.

AEDATS IV T53/T55/T63 ALIGNMENT WORKSHEET

(2) Gas producer speed indication (GP), (Refer to page 54 step 48)

(a) Set the calculating counter controls as follows: (Channel 1)

1	DEC	**5**
2	C	**14286**
3	10n	**0**
4	Auto	**depressed**
5	x10	**released**
6	Sample rate (fast)	**1**
7	Test	**released**

(b) Input the following frequencies into the flight harness connector

1 T55 Flight Harness pins G and H.
2 T53 Flight Harness pins G and H
3 T63 Flight Harness pins A and B

(c) Set the tachometer tester controls to the following:

1 Motor direction-stop,
2 Set rpm-10%,
3 Power on
4 Set the motor direction switch to forward

Tachometer tester	Calculating counter +/- .3%	AEDATS 4 **(N1)** +/- .01hz	Gauge Analog +/- .3%	Gauge Digital +/- .3%
7hz (10%)	_____	_____	_____	_____
28hz (40%)	_____	_____	_____	_____
42hz (60%)	_____	_____	_____	_____
56hz (80%)	_____	_____	_____	_____
70hz (100%)	_____	_____	_____	_____

T53 - Transducer: T43 Hardware Name: F01
T55 - Transducer: T44 Hardware Name: F01
T63 - Transducer: T45 Hardware Name: F01

No alignment requirement – must verify frequencies.

(3) Over speed power section #1, T53/T55/T63 (Refer to page 37 step 41)

(a) Use the B. F Goodrich EPU to perform this test.
(b) Set the EPU to the second “MODE” display
(c) Cal: V=9.497 I=19.601 J2 CONN=3333 HZ

Thumbwheel settings	indication	Limit control indicator +/- .3Hz		
3800	In limit	_____	90% alarm	_____
3700	90%	_____	100% alarm	_____
3333	100%	_____	Audible alarm	_____

Note: over speed power section #2 is not connected

AEDATS IV T53/T55/T63 ALIGNMENT WORKSHEET

(4) Torque measurement system, (Refer to page 60 step 53)

(a) Set the modulus code to match the modulus code of the torque shaft that is installed in the dynamometer.

(b) Set the AEDATS channel 23 (**Torq**) for T-53/T-55/T63 engine

(c) Set the EPU to the first "MODE" display:

1 Display should read 512 Hz. 0 volt

2 TB 609 1 (+) 2(-) _____ +/-20 mv

(d) Set to second mode

1 CAL:V=9.497 I=19.601

2 Display should read 9.497v

3 TB 609 1 (+) 2 (-) _____ +/-20mv

4 J2 CONN=3333 HZ

	AEDATS 4 **(*)** +/- 4 in-Lbs	AEDATS 4 Channel Name (*)
Enter first point in AEDATS at **0**	_____	T53 Dyno
Enter second mode in AEDATS at **18994** (712)	_____	T55 QDyno
Enter second mode in AEDATS at **22793** (714)	_____	T63 QDyno
Satisfactory? (Y/N) _____		
T53 - Transducer: T75 Hardware Name: HL33 **T55 - Transducer: T75 Hardware Name: HL32** **T63 - Transducer: T75 Hardware Name: HL31**		

(e) Disconnect cable P/N 20090761-1 from torque sensor cable

(f) Input Frequency to Pins A/B (reference 53B)

(g) Set Performance Monitor to Normal

Input Frequency	**HP**	**RPM**	**TQ**	**CALC. H.P.**
181.4. Hz.**=780 rpm**	_____	_____	_____	_____
272.1 Hz..**=1170 rpm**	_____	_____	_____	_____
453.5 Hz.**=1940 rpm**	_____	_____	_____	_____
725.6 Hz.**=3100 rpm**	_____	_____	_____	_____
907.0 Hz.**=3880 rpm**	_____	_____	_____	_____
HP = TQ x RPM/ 63024 Army		**HP = TQ x RPM/ 5252 Air Force**		
NOTE: Army TQ is measured in (in-lb) Air force TQ is measured in (ft-lb)				

(5) Verify RTD function of performance Monitor (reference 53C)

(a) Connect to cable 20090761-1 pins I and J

(b) Hit mode switch one time to monitor Temperature

Resistance Ohms	**Temperature deg F**	**Actual Temperature +/- 8 deg F**
100	32	_____
110	79	_____
120	126	_____
130	173	_____
140	222	_____

AEDATS IV T53/T55/T63 ALIGNMENT WORKSHEET

(6) Fuel flow measurement CEC 2700 BOX T53/T55 (Refer to page 19 step 23)

(a) Ensure the system is in the T-53/T55 test mode, with the correct flight harness connected to the J-box.

(b) Set calculating counter controls as follows: (Channel 4)

1	**DEC**	**6**
2	**C**	**01000**
3	**10n**	**0**
4	**Auto**	**depressed**
5	**X10**	**released**
6	**Sample Rate (fast)**	**1**
7	**Test**	**released**

(c) Determine **C** settings for channel 4 Channel 4 **C** = (3600 x 8.337 x specific gravity) divided by the turbine meter K-factor (Average from calibration sheet)

(d) Enter calculated value on channel 4 **C** switches

(e) At the fuel trailer disconnect MT-207 from the flowmeter and connect the test oscillator to pins A (+) and B (-).

(f) Connect the frequency counter to the test oscillator. Or use CEC2700 box.

NOTE

The frequency counter must have the low pass filter on

(g) Enter Specific Gravity, K Factor and Temp in AEDATS to read PPH from flowmeter Cal sheet.

(h) Connect Temp source to TC 208 to correspond to flowmeter Cal Temp.

(i) Set the following points with test oscillator:

1 1 Vac input

(j) Note: oscillator frequency x c = PPH

(k) Enter S/G into AEDATS to read PPH from Cal sheet

(l) Input the following frequencies into connector MT207 pins A (+) and B (-).Lower Flowmeter.

				Note: Cell constant Low K Factor (#3)	
Oscillator Hz	Calculating Counter +/- 1 Hz	AEDATS 4 **(WF HZ)** +/- 1 Hz	Calibration Sheet Hz	Calculating Counter +/- .35 % PPH	AEDATS 4 **(WF HZ)** +/- .35 % PPH
250Hz	_____	_____	_____	_____	_____
500Hz	_____	_____	_____	_____	_____
750Hz	_____	_____	_____	_____	_____
1000Hz	_____	_____	_____	_____	_____
1250Hz	_____	_____	_____	_____	_____
(Note: frequency x **C** = PPH) (CH 4C= 3600 x 8.337 x SG /K factor)					
Transducer: T53 Hardware Name: F05 **No alignment requirement – must verify frequencies.**					

(7) Specific gravity indicator (0.680 to 0.850): +/- 0.0017 (reference page 22 step 26)

Feds Hydrometer	_____	Calibrated Hydrometer	_____
Temp Hydrometer	_____	Temp AEDATS 2/4 (**tfuelt**)	_____

AEDATS IV T53/T55/T63 ALIGNMENT WORKSHEET

(8) Fuel Flow T63 Flow Linearizer Programming (Refer to page 22 step 28)

(a) Must load program on Laptop called "LinkHost"

(b) Enter Data from Calibration sheet (Compatible with Windows 98 or older)

1 Open shortcut to Linear Link.
2 EDIT: Go to link setup. 0-10 V Out, RF Input and Top flow and Top Freq. From Cal Sheet.
3 EDIT: Header Fields enter Data from Calibration sheet. (Enter)
4 VIEW: Mechanical Data (Enter)
5 EDIT: Data fields enter 20 calibration points. (Enter)
6 CONNECT INTERFACE CABLE TO LAPTOP AND LINEARIZER
7 PROGRAM: Establish communications
8 VIEW: Open K Factor Plot (Enter)
9 SHOULD SAY table generation successful. (OK)
10 PROGRAM: Program Link (OK)
11 Will download Data loaded from Calibration sheet
12 Enter low reading on voltage out _____ (Enter)
13 Enter High reading on voltage out _____ (Enter)
14 Verify Analog reading on voltage out_____ (Enter)
15 Should Say Sending Table
16 Should read Calibration performed successful.

(9) Fuel flow measurement CEC 2700 BOX T63 (Refer to page 22 step 25)

(a) Ensure the system is in the T63 test mode, with the correct flight harness connected to the J-box.

(b) Set calculating counter controls as follows: (Channel 4)

1	DEC	**6**
2	C	**01000**
3	10n	**0**
4	Auto	**depresse**d
5	X10	**released**
6	Sample Rate (fast)	**1**
7	Test	**released**

(c) Determine **C** settings for channel 4 Channel 4 **C** = (3600 x 8.337 x specific gravity) divided by the turbine meter K-factor (Average from calibration sheet)

(d) Enter calculated value on channel 4 **C** switches

(e) At the Jbox on the fuel skid, Connect the Test Oscillator to TB 201 pins 1+ and 2-. **Do not connect to MT209 at the flowmeter**. The T63 flowmeter is a RF carrier type signal. Frequency will not read through the Linearizer system.

(f) Connect the frequency counter to the test oscillator. Or use CEC2700 box.
(NOTE: The frequency counter must have the low pass filter on)

(g) Enter Specific Gravity, K Factor and Temp in ADATS to read PPH from flowmeter Cal sheet.

(h) Enter Specific Gravity in ADATS under initialization (fuel correction factor) for PPH from Calibration sheet. **(Correction Factor:78 x 8.337 x SG / 2000)**

(i) Connect Temp source to TC 208 to correspond to flowmeter Cal Temp.

(j) Set the following points with test oscillator:

1 1 V ac input

(k) oscillator frequency x c = PPH

(l) Enter S/G into ADATS to read PPH from Cal sheet

AEDATS IV T53/T55/T63 ALIGNMENT WORKSHEET

(m) Input the following frequencies into TB 201 pins 1 (+) and 2 (-).

				Note: Cell constant Low K Factor (#3)
Oscillator Hz	Calculating Counter +/- 1 Hz	AEDATS 4 **(Fuel Flow)** +/- 1 Hz	Calibration Sheet Hz	Calculating Counter PPH+/- .35 %
0Hz	_____	_____	_____	_____
600Hz	_____	_____	_____	_____
800Hz	_____	_____	_____	_____
1000Hz	_____	_____	_____	_____
1200Hz	_____	_____	_____	_____
1400Hz	_____	_____	_____	_____
(Note: frequency x **C** = PPH) (CH 4C= 3600 x 8.337 x SG /K factor)				
Transducer: T53 Hardware Name: F05 **No alignment requirement – must verify frequencies.**				

1 K- Factor = Hz. x Time base / Flow rate
2 PPH= GPM x 500 x SG. Or GPM= PPH/500xS.G.
3 PPH= Pulses per second (Hz). x 3600 x S. G. x 8.347 / pulses per gallon (K Factor)
4 Correction Factor 78 x 8.337 x SG / 2000

(10)Oil flow measurement CEC 2700 BOX T53/T63 (Refer to page 20 step 24)

(a) Ensure the system is in the T53/T63 test mode, with the correct flight harness connected to the J-box.

(b) Set calculating counter controls as follows: (Channel 3)

1	DEC	**6**
2	C	**01000**
3	10n	**0**
4	Auto	**depressed**
5	X10	**released**
6	Sample Rate (fast)	**1**
7	Test	**released**

(c) At the Large Engine Test Trailer, disconnect the cable from the T53/T63 Oil Flowmeter. Connect the CEC 2700 oscillator to pins A and B of the cable connector.

Oscillator (Hz)	Calculating Counter +/-1 Hz	AEDATS 4 **(*)** (Hz)	AEDATS 4 Channel Name (*)
300			T53 WOIL HZ
600			T63 OILFLOW
900			
1300			
Note: frequency x C = PPH			
T53 - Transducer: T53 Hardware Name: F06 **T63 - Transducer: T53 Hardware Name: F06** **No alignment requirement – must verify frequencies.**			

AEDATS IV T53/T55/T63 ALIGNMENT WORKSHEET

(11) Vibration system, T-53/55/63 (Refer to page 14 step 21)

(a) Set variable filter channel switches to 1, filter selector switch to out, and power switch to on.

(b) Set all meters as follows:

1 Filter switch to **CAL**
2 Range switch to **150**
3 Xducer to **ACC**
4 Mode switch to **ACC**
5 Output switch to **AVG**

(c) Adjust **cal** pot to **105** on digital display on all channels

(d) Set filter switch to sensitivity and adjust **sens** pot for an indication of **150** on all channels

(e) Reset:

1 Output switches to **AVG**
2 Mode switches to **VEL**
3 Range switches to **5.0**
4 Filter switches to **OUT**
5 Xducer switches to **VEL**

(f) Connect test oscillator to the following connectors:

Plug	Pins	Ground	Channel
Vib 1	A+,B-	B	1
Vib 2	A+,B-	B	2
Vib 3	A+,B-	B	3
P-91	G+,N-	N	4
P-91	B+,M-	M	5
Note: P-91 is located on side of dyno Channel 1			

(g) Channel 1

Frequency	Output(mAvg)	(Vert. Scale) Meter	(Limits)	AEDATS 4 (**V1**)
	Shorted	_____		_____
100hz	116.5	_____	.9-1.1	_____
100hz	233.0	_____	1.9-2.1	_____
100hz	350.0	_____	2.9-3.1	_____
100hz	466.0	_____	3.9-4.1	_____
100hz	583.0	_____	4.9-5.1	_____
Transducer: T70 Hardware Name: HL27				

(h) Channel 2

Frequency	Output(mAvg)	(Vert. Scale) Meter	(Limits)	AEDATS 4 (**V2**)
	Shorted	_____		_____
100hz	116.5	_____	.9-1.1	_____
100hz	233.0	_____	1.9-2.1	_____
100hz	350.0	_____	2.9-3.1	_____
100hz	466.0	_____	3.9-4.1	_____
100hz	583.0	_____	4.9-5.1	_____
Transducer: T71 Hardware Name: HL28				

AEDATS IV T53/T55/T63 ALIGNMENT WORKSHEET

(i) Channel 3

Frequency	Output(mAvg)	(Vert. Scale) Meter	(Limits)	AEDATS 4 (**V3)**
	Shorted	_____		_____
100hz	116.5	_____	.9-1.1	_____
100hz	233.0	_____	1.9-2.1	_____
100hz	350.0	_____	2.9-3.1	_____
100hz	466.0	_____	3.9-4.1	_____
100hz	583.0	_____	4.9-5.1	_____
Transducer: T72 Hardware Name: HL29				

(a) Channel 4

Frequency	Output(mAvg)	(Vert. Scale) Meter	(Limits)	AEDATS 4 (**V4)**
	Shorted	_____		_____
100hz	116.5	_____	.9-1.1	_____
100hz	233.0	_____	1.9-2.1	_____
100hz	350.0	_____	2.9-3.1	_____
100hz	466.0	_____	3.9-4.1	_____
100hz	583.0	_____	4.9-5.1	_____
Transducer: T73 Hardware Name: HL30				

(b) Channel 5

Frequency	Output(mAvg)	(Vert. Scale) Meter	(Limits)	AEDATS 4 (**V5)**
	Shorted	_____		_____
100hz	116.5	_____	.9-1.1	_____
100hz	233.0	_____	1.9-2.1	_____
100hz	350.0	_____	2.9-3.1	_____
100hz	466.0	_____	3.9-4.1	_____
100hz	583.0	_____	4.9-5.1	_____
Transducer: T74 Hardware Name: HL31				

AEDATS IV T53/T55/T63 ALIGNMENT WORKSHEET

(12)Engine oil inlet temperature gauge T53/T55 (Decade Box) (Refer to page 70 step 56)

(a) Connect the decade resistor to pins N and P of the flight harness cable connector (T53), or pins K and N of the flight harness cable connector (T55). Adjust the decade resistor to obtain the gauge indications listed below.

Avg	Decade Resistor (Ohms)	**AEDATS 4 (ORBT)** +/-2 °F	Reading
90.4	90.34-90.42	_____	32°F
97.3	97.27-97.35	_____	68°F
104.6	104.56-104.64	_____	104°F
112.3	111.78-112.78	_____	140°F
120.4	119.86-120.86	_____	176°F
128.8	128.35-129.35	_____	212°F
142.4	141.80-143.00	_____	266°F
151.9	151.31-152.51	_____	302°F
177.9	176.95-178.95	_____	392°F
Transducer: T87 Hardware Name: LL04			

(13)Hydraulic Pressures T53/T55/T63 (Refer to page 39 step 43) High Pressure Calibrator

(a) MT-10 0-1000 psig fuel manifold Pressure (T53/T55/L714 Only)

1 Using the pressure calibrator, apply the following pressures to **MT-10**, and record the results.

			Vertical Scale top row 10	
5SE01313-9 Pressure (psig)	Actual Pressure psi	AEDATS 4 (*) +/- 2 psi	6SE00950-7 Vertical Scale +/- 2 psi	AEDATS 4 Channel name (*)
Vent	_____	_____	_____	T53 pmfd T55 pfcd L714 pfpo
200	_____	_____	_____	
400	_____	_____	_____	
600	_____	_____	_____	
800	_____	_____	_____	
1000	_____	_____	_____	
R-cal	_____			
Transducer: T31 Hardware Name: HL10				

AEDATS IV T53/T55/T63 ALIGNMENT WORKSHEET

(b) MT-11 0-1000 psig fuel pump #1 Pressure

1 Using the pressure calibrator, apply the following pressures to **MT-11**, and record the results.

				Vertical Scale top row 11
5SE01313-9 Pressure (psig)	Actual Pressure psi	AEDATS 4 (*) +/- 2 psi	6SE00950-7 Vertical Scale +/- 2 psi	AEDATS 4 Channel name (*)
Vent	_____	_____	_____	T53 pfp1 T55 pfp1 L714 pfp1
200	_____	_____	_____	
400	_____	_____	_____	
600	_____	_____	_____	
800	_____	_____	_____	
1000	_____	_____	_____	
R-cal	_____			
Transducer: T32 Hardware Name: HL11				

(c) MT-12 0-1000 psig fuel pump #2 Pressure (T53 only)

1 Using the pressure calibrator, apply the following pressures to **MT-12**, and record the results.

				Vertical Scale bottom row 5
5SE01313-9 Pressure (psig)	Actual Pressure psi	AEDATS 4 (*) +/- 2 psi	6SE00950-7 Vertical Scale +/- 2 psi	AEDATS 4 Channel name (*)
Vent	_____	_____	_____	T53 pfp2
200	_____	_____	_____	
400	_____	_____	_____	
600	_____	_____	_____	
800	_____	_____	_____	
1000	_____	_____	_____	
R-cal	_____			
T53 - Transducer: T33 Hardware Name: HL12				

(d) MT2 0-300 psig combustor static diffuser

1 Using the pressure calibrator, apply the following pressures to **MT2**, and record the results.

				Vertical Scale top row 2
5SE01313-20 Pressure (psig)	Actual Pressure psi	AEDATS 4 (*) +/- 1 psi	6SE00950-5 Vertical Scale +/- 2 psi	AEDATS 4 Channel name (*)
Vent	_____	_____	_____	T55 PDO L714 PT3
100	_____	_____	_____	
150	_____	_____	_____	
200	_____	_____	_____	
250	_____	_____	_____	
300	_____	_____	_____	
R-cal	_____			
Transducer: T22 Hardware Name: HL02				

AEDATS IV T53/T55/T63 ALIGNMENT WORKSHEET

(e) MT-5 0-200 psig oil scavenge pressure

1 Using the pressure calibrator, apply the following pressures to **MT-5**, and record the results.

				Vertical Scale top row 7
5SE01313-7 Pressure (psig)	Actual Pressure psi	AEDATS 4 (*) +/- 1 psi	6SE00950-4 Vertical Scale +/- 2 psi	AEDATS 4 Channel name (*) T53 pso T63 Eop_ret
Vent	_____	_____	_____	
40	_____	_____	_____	
80	_____	_____	_____	
120	_____	_____	_____	
160	_____	_____	_____	
200	_____	_____	_____	
R-cal	_____			
Transducer: T25 Hardware Name: HL05				

(f) MT-6 0-200 psig Torque meter Pressure

1 Using the pressure calibrator, apply the following pressures to **MT-6**, and record the results.

				Vertical Scale top row 5
5SE01313-7 Pressure (psig)	Actual Pressure psi	AEDATS 4 (*) +/- 1 psi	6SE00950-4 Vertical Scale +/- 2 psi	AEDATS 4 Channel name (*) T53 TP T55 p2b T63 TorqPSI L714 P2b
Vent	_____	_____	_____	
40	_____	_____	_____	
80	_____	_____	_____	
120	_____	_____	_____	
160	_____	_____	_____	
200	_____	_____	_____	
R-cal	_____			
Transducer: T27 Hardware Name: HL06				

(g) MT-7 0-200 psig Main Oil filter Pressure

1 Using the pressure calibrator, apply the following pressures to **MT-7**, and record the results.

				Vertical Scale top row 6
5SE01313-7 Pressure (psig)	Actual Pressure psi	AEDATS 4 (*) +/- 1 psi	6SE00950-4 Vertical Scale +/- 2 psi	AEDATS 4 Channel name (*) T53 pfop T55 POPD T63 Eop L714 POPD
Vent	_____	_____	_____	
40	_____	_____	_____	
80	_____	_____	_____	
120	_____	_____	_____	
160	_____	_____	_____	
200	_____	_____	_____	
R-cal	_____		**NOTE: set 15 PS alarm**	
Transducer: T28 Hardware Name: HL07				

AEDATS IV T53/T55/T63 ALIGNMENT WORKSHEET

(h) MT-8 0-200 psig Torq boost Pressure (T53 Only)

1 Using the pressure calibrator, apply the following pressures to **MT-8**, and record the results.

			Vertical Scale top row 8	
5SE01313-7 Pressure (psig)	Actual Pressure psi	AEDATS 4 (*) +/- 1 psi	6SE00950-4 Vertical Scale +/- 2 psi	AEDATS4 Channel name (*)
Vent	_____	_____	_____	T53 Ptbp
40	_____	_____	_____	
80	_____	_____	_____	
120	_____	_____	_____	
160	_____	_____	_____	
200	_____	_____	_____	
R-cal	_____			
Transducer: T29 Hardware Name: HL08				

(i) MT-1 0-100 psig Combustor static Pressure

1 Using the pressure calibrator, apply the following pressures to **MT-1**, and record the results.

			Vertical Scale top row 1	
5SE01313-5 Pressure (psig)	Actual Pressure psi	AEDATS 4 (*) +/- 1 psi	6SE00950-3 Vertical Scale +/- 2 psi	AEDATS 4 Channel name (*)
Vent	_____	_____	_____	T53 Ps4 T55 Ps3 L714 PS4
20	_____	_____	_____	
40	_____	_____	_____	
60	_____	_____	_____	
80	_____	_____	_____	
100	_____	_____	_____	
R-cal	_____			
Transducer: T21 Hardware Name: HL01				

(j) MT-9 0-100 psig Fuel inlet Pressure

1 Using the pressure calibrator, apply the following pressures to **MT-9**, and record the results.

			Vertical Scale top row 9	
5SE01313-5 Pressure (psig)	Actual Pressure psi	AEDATS 4 (*) +/- 1 psi	6SE00950-3 Vertical Scale +/- 2 psi	AEDATS 4 Channel name (*)
Vent	_____	_____	_____	T53 pfi T55 pfi T63 Pfuel L714 PWFI
20	_____	_____	_____	
40	_____	_____	_____	
60	_____	_____	_____	
80	_____	_____	_____	
100	_____	_____	_____	
R-cal	_____			
Transducer: T30 Hardware Name: HL09				

AEDATS IV T53/T55/T63 ALIGNMENT WORKSHEET

(k) MT-3 0-50 psig Oil in Pressure

1 Using the pressure calibrator, apply the following pressures to **MT-3**, and record the results.

			Vertical Scale top row 3	
5SE01313-4 Pressure (psig)	Actual Pressure psi	AEDATS 4 (*) +/- 1 psi	6SE00950-2 Vertical Scale +/- 2 psi	AEDATS 4 Channel name (*)
Vent	_____	_____	_____	T53 Poil_in T55 pgb T63 Sup_Eop L714 ACCGB
10	_____	_____	_____	
20	_____	_____	_____	
30	_____	_____	_____	
40	_____	_____	_____	
50	_____	_____	_____	
R-cal	_____			
Transducer: T23 Hardware Name: HL03				

(l) MT-4 0-50 psig Gearbox Pressure

1 Using the pressure calibrator, apply the following pressures to **MT-4**, and record the results.

			Vertical Scale top row 4	
5SE01313-4 Pressure (psig)	Actual Pressure psi	AEDATS 4 (*) +/- 1 psi	6SE00950-2 Vertical Scale +/- 2 psi	AEDATS 4 Channel name (*)
Vent	_____	_____	_____	T53 pgb
10	_____	_____	_____	
20	_____	_____	_____	
30	_____	_____	_____	
40	_____	_____	_____	
50	_____	_____	_____	
R-cal	_____			
Transducer: T24 Hardware Name: HL04				

(m) MT-13 0-50 psig Dyno inlet Pressure

1 Using the pressure calibrator, apply the following pressures to **MT-4**, and record the results.

			Vertical Scale bottom row 11	
5SE01313-4 Pressure (psig)	Actual Pressure psi	AEDATS 4 (*) +/- 1 psi	6SE00950-2 Vertical Scale +/- 2 psi	AEDATS 4 Channel name (*)
Vent	_____	_____	_____	T53 Pdyn_sup T55 Pdyn_sup T63 Pdyn_sup L714 Pdyn_sup
10	_____	_____	_____	
20	_____	_____	_____	
30	_____	_____	_____	
40	_____	_____	_____	
50	_____	_____	_____	
R-cal	_____			
Transducer: T34 Hardware Name: HL13				

AEDATS IV T53/T55/T63 ALIGNMENT WORKSHEET

(n) MT-20 0-50 in-h2o P1 Air Pressure P1 air panel

1 Access MT-20 in the J-box. Connect the low pressure calibrator directly to the transducer. Apply the following pressures to **MT-20**, and record the results.

5SE01313-19 Pressure (in-h20)	Digital Indicator +/- 2 psi	AEDATS 4 (*) +/- 1 psi	AEDATS 4 Channel name (*)
Vent	_____	_____	T53 P1air
10	_____	_____	
20	_____	_____	
30	_____	_____	
40	_____	_____	
50	_____	_____	
Transducer: T36 Hardware Name: HL17			

(14)T53/T55/T63 Fault light panel (Refer to page 75 step 58)

(a) J BOX

1 Dyno low oil pressure fwd _____17PS Set at 10.5 psig on decreasing pressure +/-.5

2 Fuel pressure _____18PS Set at 8 psig on decreasing pressure +/-1

3 Low oil pressure Eng T53 _____15PS Set at 25 on decreasing pressure +/-1

4 Dyno low oil pressure aft _____16PS Set at 10.5 psig on decreasing pressure+/-.5

5 Anti Ice Pressure _____13PS Set at 4 psig on increase +/-.5

(b) T53/T55/T63 Test Trailer

1 Chip detector _____Touch chip detector lead to ground

2 Dyno supply low pressure _____19PS on trailer set at 10 psig on DEC. press +/-1

3 Dynolube filter delta-p _____18PS on trailer set at 10 psig on INC. press +/-1

4 Dynolube tank low level _____Jumper pins F & G at J103 aux. J-box

5 T55 low oil level _____Jumper pin A to ground T55 flight harness

(c) Fuel Skid

1 Fuel boost pressure _____ 2 PS set 15 psi on increasing pressure +/-1

2 T-53/T63 oil filter delta-p _____ 10PS low side vented pressure high side +/-1 set 7 psi on increasing pressure

3 T-53/T63 low oil level _____Jumper pins 5 and 6 on TB 206

4 Main Fuel valve closed _____Turn on CB305 Press fuel pump switch on

5 Fuel valve select _____Turn on CB305 and fuel pump switch

AEDATS IV T53/T55/T63 ALIGNMENT WORKSHEET

(d) PT-101, 0-50 in-hg abs, Barometer (Refer to page 50 step 45-4D)

1 Locate PT-101 on the bell mouth and barometer panel in cabinet 10. Connect the low pressure calibrator directly to the transducer. Apply following pressures and record the results. (2.036)

2 Do not zero barometer only set span

			Vertical Scale bottom row 9	
5SE01313-22 Pressure (in-hg abs)	Actual Pressure psi	AEDATS 4 (*) +/- .05 psi	6SE00950-28 Vertical Scale +/- 0.25 psi	AEDATS 4 Channel name (*)
+3	_____	_____	_____	T53 Baro T55 Baro T63 Baro L714 Baro
Vent	_____	_____	_____	
-3	_____	_____	_____	
R-cal _____				
Transducer: T40 Hardware Name: HL21				

(e) PT-102, 0-50 in-h2o, B/M Static Pressure #1

1 Locate **PT-102** on the bell mouth and barometer panel in cabinet 10. Connect the low pressure calibrator directly to the transducer. Apply following pressures and record the results.

			Vertical Scale bottom row 6	
5SE01313-19 Pressure (in-h2o)	Actual Pressure psi	AEDATS 4 (*) +/- .25 psi	6SE00950-29 Vertical Scale +/- .25 psi	AEDATS 4 Channel name (*)
0	_____	_____	_____	T53 Ps11 T55 Ps11 T63 Ps11 L714 PSBM1
10	_____	_____	_____	
20	_____	_____	_____	
30	_____	_____	_____	
40	_____	_____	_____	
50	_____	_____	_____	
R-cal _____				
Transducer: T37 Hardware Name: HL18				

AEDATS IV T53/T55/T63 ALIGNMENT WORKSHEET

(f) PT-103, 0-50 in-h2o, B/M Static Pressure #2

1 Locate **PT-103** on the bell mouth and barometer panel in cabinet 10. Connect the low pressure calibrator directly to the transducer. Apply following pressures and record the results.

			Vertical Scale bottom row 7	
5SE01313-19 Pressure (in-h2o)	Actual Pressure psi	AEDATS 4 (*) +/- .25 psi	6SE00950-29 Vertical Scale +/- .25 psi	AEDATS 4 Channel name (*)
0	_____	_____	_____	T53 Ps12 T55 Ps12 T63 Ps12 L714 PSBM2
10	_____	_____	_____	
20	_____	_____	_____	
30	_____	_____	_____	
40	_____	_____	_____	
50	_____	_____	_____	
R-cal	_____			
Transducer: T38 Hardware Name: HL19				

(c) PT-104, 0-50 in-h2o, B/M Total Pressure

(a) Locate **PT-104** on the bell mouth and barometer panel in cabinet 10. Connect the low pressure calibrator directly to the transducer. Apply following pressures and record the results.

			Vertical Scale bottom row 8	
5SE01313-19 Pressure (in-h2o)	Actual Pressure psi	AEDATS 4 (*) +/- .25 psi	6SE00950-29 Vertical Scale +/- .25 psi	AEDATS 4 Channel name (*)
0	_____	_____	_____	T53 Pt1 T55 Pt1 T63 Pt1 L714 PTBM
10	_____	_____	_____	
20	_____	_____	_____	
30	_____	_____	_____	
40	_____	_____	_____	
50	_____	_____	_____	
R-cal	_____			
Transducer: T39 Hardware Name: HL20				

AEDATS IV T53/T55/T63 ALIGNMENT WORKSHEET

(15)Temperature measurement system: (Refer to page 27 step 29) (AN 6520 Temp Calibrator)

(a) Low temperature channels

(b) Channel 11 P-801 Engine Oil inlet Temp

Input	Doric +/- 2°F	AEDATS 4 **(*)** +/- 1°F	AEDATS 4 Channel name (*)
32 °F	_____	_____	T53 Toilin T63 Toilin
100 °F	_____	_____	
200 °F	_____	_____	
300 °F	_____	_____	
Transducer: T19 Hardware Name: J12			

(c) Temperature and Speed Limit Control Panel (Refer to page 33 step 35)

1 Engine Oil inlet Temperature P-801 Thumb wheel setting 300

Input	Calibrator Temp °F	Limit Control Panel +/- 3°F	Indicator lit	
32 °F	_____	_____	In limit	
100 °F	_____	_____	In limit	
200 °F	_____	_____	In limit	
270 °F	_____	_____	90% Alert	_____
300 °F	_____	_____	100% Warning	_____

(d) Channel 12 P-802 Engine Oil out Temp (Refer to page 27 step 29)

Input	Doric +/- 2°F	AEDATS 4 **(*)** +/- 1°F	AEDATS 4 Channel name (*)
32 °F	_____	_____	T53 Toil_out T63 Toil_out
100 °F	_____	_____	
200 °F	_____	_____	
300 °F	_____	_____	
Transducer: J20 Hardware Name: J13			

(e) Temperature and Speed Limit Control Panel (Refer to page 34 step 36)

1 Engine oil delta temperature T-53, P-802, P-801 jumper Thumb wheel setting 150

Input	Calibrator Temp °F	Limit Control Panel +/- 3°F	Indicator lit	
Ambient +135°F	_____	_____	90% Alert	_____
Ambient +150°F	_____	_____	100% Warning	_____
Audible warning	_____			

AEDATS IV T53/T55/T63 ALIGNMENT WORKSHEET

(f) Channel 13 P-803 B/M1(Refer to page 39 step 46)

Input	Doric +/- 2°F	AEDATS 4 **(*)** +/- 1°F	AEDATS 4 Channel name (*)
32 °F	_____	_____	T53 Tt11 T55 Tt11 T63 Tt11 L714 T01
70 °F	_____	_____	
100 °F	_____	_____	
120 °F	_____	_____	
Transducer: T2 Hardware Name: J01			

(g) Channel 14 P-804 B/M2 (Refer to page 30 step 30)

Input	Doric +/- 2°F	AEDATS 4 **(*)** +/- 1°F	AEDATS 4 Channel name (*)
32 °F	_____	_____	T53 Tt12 T55 Tt12 T63 Tt12 L714 T02
70 °F	_____	_____	
100 °F	_____	_____	
120 °F	_____	_____	
Transducer: T55 Hardware Name: J15			

(h) Channel 15 P-805 Comp discharge(Refer to page 30 step 30)

Input	Doric +/- 2°F	AEDATS 4 **(*)** +/- 1°F	AEDATS 4 Channel name (*)
32 °F	_____	_____	T53 T31 T55 CDT T63 TAI1 L714 T04
200°F	_____	_____	
400 °F	_____	_____	
600 °F	_____	_____	
800 °F	_____	_____	
Transducer: T56 Hardware Name: J16			

(i) Channel 16 P-806 B/M3 (Refer to page 30 step 30)

Input	Doric +/- 2°F	AEDATS 4 **(*)** +/- 1°F	AEDATS 4 Channel name (*)
32 °F	_____	_____	T53 TT13 T55 Twf T63 Twf L714 T03
70°F	_____	_____	
100 °F	_____	_____	
120 °F	_____	_____	
Transducer: T57 Hardware Name: J17			

AEDATS IV T53/T55/T63 ALIGNMENT WORKSHEET

(j) Channel 17 P-807 Comp discharge(Refer to page 30 step 30)

Input	Doric +/- 2°F	AEDATS 4 **(*)** +/- 1°F	AEDATS 4 Channel name (*)
32 °F	_____	_____	T53 T32 T55 TPTSO T63 TAI2 L714 TPTSO
200°F	_____	_____	
400 °F	_____	_____	
600 °F	_____	_____	
800 °F	_____	_____	
Transducer: T58 Hardware Name: J18			

(k) Channel 18 P-808 P.T. Bearing Scavenge (Refer to page 30 step 30)

Input	Doric +/- 2°F	AEDATS 4 **(*)** +/- 1°F	AEDATS 4 Channel name (*)
32 °F	_____	_____	T53 TPTSO T55 T2BSO T63 TREF1 L714 T2BSO
200°F	_____	_____	
400 °F	_____	_____	
600 °F	_____	_____	
800 °F	_____	_____	
Transducer: T59 Hardware Name: J19			

(l) Channel 19 P-809 #2 Bearing Scavenge (Refer to page 30 step 30)

Input	Doric +/- 2°F	AEDATS 4 **(*)** +/- 1°F	AEDATS 4 Channel name (*)
32 °F	_____	_____	T53 T2BSO T63 TREF2 L714 T3
200°F	_____	_____	
400 °F	_____	_____	
600 °F	_____	_____	
800 °F	_____	_____	
Transducer: T60 Hardware Name: J20			

(m) Channel 25 TC 209 engine oil tank (thermocouple on top of oil tank)
(Refer to page 30 step 30)

Input	Doric +/- 2°F	AEDATS 4 **(*)** +/- 1°F	AEDATS 4 Channel name (*)
32 °F	_____	_____	T53 ToilT T63 ToilT
100°F	_____	_____	
200 °F	_____	_____	
300 °F	_____	_____	
Transducer: T65 Hardware Name: J25			

AEDATS IV T53/T55/T63 ALIGNMENT WORKSHEET

(n) Channel 26 TC 208 Fuel tank (TC208 Same as Hydrometer Temp)
(Refer to page 30 step 30)

Input	Doric +/- 2°F	AEDATS 4 **(*)** +/- 1°F	AEDATS 4 Channel name (*)
32 °F	_____	_____	T53 TfuelT T55 TfuelT T63 TfuelT
100°F	_____	_____	
200 °F	_____	_____	
300 °F	_____	_____	
Transducer: T66 Hardware Name: J26			

(o) Channel 21 J20 Dyno Dyno lube inlet temp (Refer to page 30 step 30)

Input	Doric +/- 2°F	AEDATS 4 **(*)** +/- 1°F	AEDATS 4 Channel name (*)
32 °F	_____	_____	T53 Tdyn_Tnk T55 Tdyn_Tnk L714 Tdyn_Tnk T63 Tdyn_Tnk
100°F	_____	_____	
150 °F	_____	_____	
175 °F	_____	_____	
200°F	_____	_____	
300°F	_____	_____	
Transducer: T61 Hardware Name: J21			

(p) Temperature and Speed Limit Control Panel (Refer to page 37 step 41)
1 Dyno-Lube Inlet Temperature, J20 Thumb wheel setting 200

Input	Calibrator Temp °F +/- 3°F	Limit Control Panel +/- 3°F	Indicator lit	
32 °F	_____	_____	In limit	
100 °F	_____	_____	In limit	
150 °F	_____	_____	In limit	
180 °F	_____	_____	90% Alert	_____
200 °F	_____	_____	100% Warning	_____

(q) Dyno-lube delta temperature, (Refer to page 37 step 41)
1 Calibrator J23 Jumper J20, Thumb wheel setting 80

Input	Calibrator Temp °F +/- 3°F	Limit Control Panel +/- 3°F	AEDATS 4 **(TDyn_FA)** +/- 1°F	
32 °F	_____		_____	
100 °F	_____		_____	
200 °F	_____		_____	
300 °F	_____		_____	
ambient +74°F	_____	_____	90% Alert	_____
Ambient +80°F	_____	_____	100% Warning	_____
Audible warning	_____			
Transducer: T64 Hardware Name: J24				

AEDATS IV T53/T55/T63 ALIGNMENT WORKSHEET

(r) Channel 22 J21 Dyno rear bottom Dyno lube out fwd (Refer to page 39 step 46)

Input	Doric +/- 2°F	AEDATS 4 **(*)** +/- 1°F	AEDATS 4 Channel name (*)
32 °F	_____	_____	T53 TDyn_Fwd T55 TDyn_Fwd T63 Tdyn_Fwd L714 Tdyn_Fwd
100°F	_____	_____	
200 °F	_____	_____	
300 °F	_____	_____	
Transducer: T62 Hardware Name: J22			

(s) Channel 23 J22 Dyno front bottom Dyno lube out aft (Refer to page 39 step 46)

Input	Doric +/- 2°F	AEDATS 4 **(*)** +/- 1°F	AEDATS 4 Channel name (*)
32 °F	_____	_____	T53 TDyn_Aft T55 TDyn_Aft T63 TDyn_Aft L714 TDyn_Aft
100°F	_____	_____	
200 °F	_____	_____	
300 °F	_____	_____	
Transducer: T63 Hardware Name: J23			

(16)High temperature system, EGT (Refer to page 31 step 32)

(a) THERMOCOUPLE TYPE KChannel 2, Egt connector on engine harness (T53) Pins A (+) (yellow) B (-) (red), (T55) Pins D (+) (yellow) A (-) (red), (T63) Pins C (+) (yellow) A (-) (red).

Input	Doric +/- 2	AEDATS 4 (*) +/- 1	Analog +/- 2	Digital +/- 2	AEDATS 4 Channel name (*)
400°F	_____	_____	_____	_____	T53 EGT T55 PTIT T63 GPTOT
800°F	_____	_____	_____	_____	
1200°F	_____	_____	_____	_____	
1600°F	_____	_____	_____	_____	
1800°F	_____	_____	_____	_____	
Transducer: T4 Hardware Name: K02					

AEDATS IV T53/T55/T63 ALIGNMENT WORKSHEET

(17)T55 Electric Torque System (Note: T55 flight harness must be connected)
(Refer to page 68 step 54)

(a) Access connector at engine T55 Flight Harness (20090776-1)
- **1** Ensure that the torque Power Switch on indicator panel is off.
- **2** Jumper pins Z and A together, and connect to – voltage source.
- **3** Connect pin Y to the + terminal of millivolt source.
- **4** Activate Torque Power Switch on indicator panel.

(b) Set the Millivolt source to the following levels:

Input +/- 6 mv	Reading percentage	AEDATS 4 (QEng) +/- 2%
230	50	_____
325	70	_____
430	100	_____
Transducer: T93 Hardware Name: LL06		

(c) If out of tolerance use shorting cable to set 0

(d) Install shorting cable between T55 flight harness (20090776-1) and engine

DYNO OIL SAMPLE VAROC 35 YES_____ INIT_____ NO_____INIT_____

DYNO OIL SAMPLE VAROC 250 YES_____ INIT_____ NO_____INIT_____

AEDATS IV

FEDS ALIGNMENT WORKSHEET
T64-GE-100 Engine Applications

CERTIFICATION OFFICIAL

NAME _____

DATE _____

LOCATION _____

SERIAL # _____

AEDATS IV T64 ALIGNMENT WORKSHEET

1. AEDATS IV T64 Alignment Worksheet

NOTE

Ensure system is in the mode for the engine requiring alignment (T64)

a. Angle Position Measurement System

(1) Dyno shroud Position Indicator (Refer to pages 85 step 66) Connector P91 (F+) (H-)

(a) Input the following voltages into Connector P91

Input Voltage	Percent Reading	AEDATS 4 (**DynoShrd**) +/-.5%	Vertical Scale +/-.1%	Vertical Scale Bottom row 3
0 volts	0%	_____	_____	
4 volts	25%	_____	_____	
8 volts	50%	_____	_____	
12 volts	75%	_____	_____	
16 volts	100%	_____	_____	
Transducer: T77 Hardware Name: HL34				

(2) Power Lever Spindle Position (T64) (Refer to pages 83 step 64)

(a) Input the following voltages into connector P51 pins A (+) and B (-).

(b) Connector P51 at Engine (LOADLVR)

Input voltage	Degrees	AEDATS 4 **(THROTTLE)** +/- .5 deg	Vertical Scale +/- 1.0 deg	Vertical Scale Bottom Row 2
0 volts	0	_____	_____	
2.4volts	30	_____	_____	
4.8volts	60	_____	_____	
7.2 volts	90	_____	_____	
9.6 volts	120	_____	_____	
12 volts	150	_____	_____	
Transducer: T81 Hardware Name: HL35				

(3) Load Demand Spindle Position (T64) (Refer to pages 82 step 63)

(a) Ensure the T1 Load Lever amplifier is installed

(b) Input the following voltages into connector P50 pins A (+) and B (-).

(c) Connector P50 at Engine (LDS)

Input Voltage	Degrees	AEDATS 4 (**THROTTLE)** +/- .5 %	Vertical Scale +/- 1.0 deg	Vertical Scale Bottom row 1
0 volts	0	_____	_____	
1.6 volts	20	_____	_____	
3.2 volts	40	_____	_____	
4.8 volts	60	_____	_____	
6.4 volts	80	_____	_____	
8.0 volts	100	_____	_____	
Transducer: T82 Hardware Name: HL36				

AEDATS IV T64 ALIGNMENT WORKSHEET

(4) Inlet Guide Vane Position (T64) (Refer to pages 81 step 62)
(a) Input the following voltages into connector T53 IGV pins A (+) and B (-).
(b) Connector T53 IGV at Engine

Input Voltage	Percent Reading	AEDATS 4 (**VGI**) +/-.5 deg	Vertical Scale +/- 1 deg	Vertical Scale Bottom row 4
0 volts	-10%	_____	_____	
2 volts	15%	_____	_____	
4 volts	40%	_____	_____	
6 volts	65%	_____	_____	
8 volts	90%	_____	_____	
Transducer: T84 Hardware Name: HL37				

b. Speed measurement system (Refer to page 54 step 50) **Tach. Gen**

(1) Power turbine speed (PT) speed indicator
(a) Set calculating counter controls as follows: (Channel 2)

1	DEC	**6**
2	C	**11030**
3	10n	**0**
4	Auto	**depressed**
5	x10	**released**
6	Sample rate (fast)	**1**
7	Test	**released**

(b) Input the following frequencies into the flight harness or engine harness connector
1 T64 Flight Harness Connector P70, pins (1+) and 2(-).

NOTE

Ground E on TB810 term. #17 if engine is not mounted (will not read) speeds.

(c) Set the tachometer tester controls to the following:
1 Motor direction-stop,
2 Set rpm-10%,
3 Power on
4 Set the motor direction switch to forward

Tachometer tester	Calculating counter +/- .3%	AEDATS 4 **(NF)** +/- 0.1%	Gauge Analog +/- .3%	Gauge Digital +/- .3%
7hz (10%)	_____	_____	_____	_____
28hz (40%)	_____	_____	_____	_____
42hz (60%)	_____	_____	_____	_____
56hz (80%)	_____	_____	_____	_____
70hz (100%)	_____	_____	_____	_____
Transducer: T52 Hardware Name: F04				
No alignment requirement – must verify frequencies.				

AEDATS IV T64 ALIGNMENT WORKSHEET

(2) Gas producer speed indication (NG) (Refer to page 54 step 48)

(a) Set the calculating counter controls as follows: (Channel 1)

1	DEC	**5**
2	C	**14286**
3	10n	**0**
4	Auto	**depressed**
5	x10	**released**
6	Sample rate (fast)	**1**
7	Test	**released**

(b) Input the following frequencies into the flight harness connector

1 T64 Flight Harness Connector P89, Pins (A+) and (B-).

(c) Set the tachometer tester controls to the following:

1 Motor direction-stop,
2 Set rpm-10%,
3 Power on
4 Set the motor direction switch to forward

Tachometer tester	Calculating counter +/- .3%	AEDATS 4 **(NG)** +/- 0.1%	Gauge Analog +/- .3%	Gauge Digital +/- .3%
7hz (10%)	_____	_____	_____	_____
28hz (40%)	_____	_____	_____	_____
42hz (60%)	_____	_____	_____	_____
56hz (80%)	_____	_____	_____	_____
70hz (100%)	_____	_____	_____	_____
Transducer: T45 Hardware Name: F01				
No alignment requirement – must verify frequencies.				

(3) Over speed power section #1 T64 (Refer to page 37 step 41)

(a) Use the B. F Goodrich EPU to perform this test.
(b) Set the EPU to the second “MODE” display
(c) Cal: V=9.497 I=19.601 J2 CONN=3333 HZ

Thumbwheel settings	indication	Limit control indicator +/- 3 Hz		
3800	In limit	_____	90% alarm	_____
3700	90%	_____	100% alarm	_____
3333	100%	_____	Audible alarm	_____
Note: over speed power section #2 is not connected				

(4) Torque measurement system, (Refer to page 60 step 53)

(a) Set the modulus code to match the modulus code of the torque shaft that is installed in the dynamometer.
(b) Set the AEDATS channel 23 (QDyno) for T-64 engine
(c) Set the EPU to the first "MODE" display:

1 Display should read 512 Hz. 0 volt
2 TB 609 1 (+) 2(-) _____ +/-20 mv

AEDATS IV T64 ALIGNMENT WORKSHEET

(d) Set to second mode
- **1** CAL:V=9.497 I=19.601
- **2** Display should read 9.497v
- **3** TB 609 1 (+) 2 (-) _____ +/-20mv
- **4** J2 CONN=3333 HZ

	AEDATS 4 **(QDyno)** +/- 4 in-Lbs
Enter first point in AEDATS at **0**	_____
Enter second mode in AEDATS at **22793** (T64)	_____
Satisfactory? (Y/N) _____	
Transducer: T75 Hardware Name: HL33	

(e) Disconnect cable **P/N 20090761-1** from torque sensor cable
(f) Input Frequency to Pins A/B (reference 53B)
(g) Set Performance Monitor to **Normal**

Input Frequency	**HP**	**RPM**	**TQ**	**CALC. H.P.**
181.4. Hz.=**780 rpm**	_____	_____	_____	_____
272.1 Hz..=**1170 rpm**	_____	_____	_____	_____
453.5 Hz.=**1940 rpm**	_____	_____	_____	_____
725.6 Hz.=**3100 rpm**	_____	_____	_____	_____
907.0 Hz.=**3880 rpm**	_____	_____	_____	_____
HP = TQ x RPM/ 63024 Army		**HP = TQ x RPM/ 5252 Air Force**		
NOTE: Army TQ is measured in (in-lb) Air force TQ is measured in (ft-lb)				

(5) Verify RTD function of performance Monitor (reference 53C)
(a) Connect to cable 20090761-1 pins I and J
(b) Hit mode switch one time to monitor Temperature

Resistance Ohms	**Temperature deg F**	**Actual Temperature +/- 8 deg F**
100	32	_____
110	79	_____
120	126	_____
130	173	_____
140	222	_____

AEDATS IV T64 ALIGNMENT WORKSHEET

(6) Fuel flow measurement CEC 2700 BOX T-64 (Refer to page 19 step 23)

(a) Ensure the system is in the T-64 test mode, with the correct flight harness connected to the J-box.

(b) Set calculating counter controls as follows: (Channel 4)

1	DEC	**6**
2	C	**01000**
3	10n	**0**
4	Auto	**depressed**
5	X10	**released**
6	Sample Rate (fast)	**1**
7	Test	**released**

(c) Determine C settings for channel 4 Channel 4 C = (3600 x 8.337 x specific gravity) divided by the turbine meter K-factor (Average from calibration sheet)

(d) Enter calculated value on channel 4 C switches

(e) At the fuel trailer disconnect MT-207 from the flowmeter and connect the test oscillator to pins A (+) and B (-).

(f) Connect the frequency counter to the test oscillator. Or use CEC2700 box.

NOTE

The frequency counter must have the low pass filter on

(g) Enter Specific Gravity, K Factor and Temp in AEDATS to read PPH from flowmeter Cal sheet.

(h) Connect Temp source to TC 208 to correspond to flowmeter Cal Temp.

(i) Set the following points with test oscillator:

1 1 Vac input

(j) Note: oscillator frequency x c = PPH

(k) Enter S/G into AEDATS to read PPH from Cal sheet

(l) Input the following frequencies into connector MT207 pins A (+) and B (-).Lower Flowmeter.

					Note: Cell constant Low K Factor (#3)
Oscillator Hz	Calculating Counter +/- 1 Hz	AEDATS 4 **(WF HZ)** +/- 1 Hz	Calibration Sheet Hz	Calculating Counter +/- .35 % PPH	AEDATS 4 **(WF HZ)** +/- .35 % PPH
250Hz	_____	_____	_____	_____	_____
500Hz	_____	_____	_____	_____	_____
750Hz	_____	_____	_____	_____	_____
1000Hz	_____	_____	_____	_____	_____
1250Hz	_____	_____	_____	_____	_____
(Note: frequency x **C** = PPH) (CH 4C= 3600 x 8.337 x SG /K factor)					
Transducer: T53 Hardware Name: F05					
No alignment requirement – must verify frequencies.					

AEDATS IV T64 ALIGNMENT WORKSHEET

(7) Specific gravity indicator (0.680 to 0.850): +/- 0.0017 (reference page 22 step 26)

Feds Hydrometer	_____	Calibrated Hydrometer	_____
Temp Hydrometer	_____	Temp AEDATS 2/4 (**tfuelt**)	_____

(8) Vibration system, T-64 (Refer to page 14 step 18)

(a) Set variable filter channel switches to 1, filter selector switch to out, and power switch to on.

(b) Set all meters as follows:

1 Filter switch to **CAL**
2 Range switch to **150**
3 Xducer to **ACC**
4 Mode switch to **ACC**
5 Output switch to **AVG**

(c) Adjust **cal** pot to **105** on digital display on all channels

(d) Set filter switch to sensitivity and adjust **sens** pot for an indication of **150** on all channels

(e) Reset:

1 Output switches to **AVG**
2 Mode switches to **VEL**
3 Range switches to **5.0**
4 Filter switches to **OUT**
5 Xducer switches to **VEL**

(f) Jumper across pins and adjust **R4** for zero (CEC 4000-1010)

(g) Connect test oscillator to the following connectors:

Plug	Pins	Ground	Channel
Vib 1	A+,B-	B	1
Vib 2	A+,B-	B	2
Vib 3	A+,B-	B	3
P-91	G+,N-	N	4
P-91	B+,M-	M	5
Note: P-91 is located on side of dyno Channel 1			

(h) Channel 1

Frequency	Output(mAvg)	(Vert. Scale) Meter	(Limits)	AEDATS 4 (**V1**)
	Shorted	_____		_____
100hz	116.5	_____	.9-1.1	_____
100hz	233.0	_____	1.9-2.1	_____
100hz	350.0	_____	2.9-3.1	_____
100hz	466.0	_____	3.9-4.1	_____
100hz	583.0	_____	4.9-5.1	_____
Transducer: T70 Hardware Name: HL27				

AEDATS IV T64 ALIGNMENT WORKSHEET

(i) Channel 2

Frequency	Output(mAvg)	(Vert. Scale) Meter	(Limits)	AEDATS 4 (**V2)**
	Shorted	_____		_____
100hz	116.5	_____	.9-1.1	_____
100hz	233.0	_____	1.9-2.1	_____
100hz	350.0	_____	2.9-3.1	_____
100hz	466.0	_____	3.9-4.1	_____
100hz	583.0	_____	4.9-5.1	_____
Transducer: T71 Hardware Name: HL28				

(j) Channel 3

Frequency	Output(mAvg)	(Vert. Scale) Meter	(Limits)	AEDATS 4 (**V3)**
	Shorted	_____		_____
100hz	116.5	_____	.9-1.1	_____
100hz	233.0	_____	1.9-2.1	_____
100hz	350.0	_____	2.9-3.1	_____
100hz	466.0	_____	3.9-4.1	_____
100hz	583.0	_____	4.9-5.1	_____
Transducer: T72 Hardware Name: HL29				

(k) Channel 4

Frequency	Output(mAvg)	(Vert. Scale) Meter	(Limits)	AEDATS 4 (**V4)**
	Shorted	_____		_____
100hz	116.5	_____	.9-1.1	_____
100hz	233.0	_____	1.9-2.1	_____
100hz	350.0	_____	2.9-3.1	_____
100hz	466.0	_____	3.9-4.1	_____
100hz	583.0	_____	4.9-5.1	_____
Transducer: T73 Hardware Name: HL30				

(l) Channel 5

Frequency	Output(mAvg)	(Vert. Scale) Meter	(Limits)	AEDATS 4 (**V5)**
	Shorted	_____		_____
100hz	116.5	_____	.9-1.1	_____
100hz	233.0	_____	1.9-2.1	_____
100hz	350.0	_____	2.9-3.1	_____
100hz	466.0	_____	3.9-4.1	_____
100hz	583.0	_____	4.9-5.1	_____
Transducer: T74 Hardware Name: HL31				

AEDATS IV T64 ALIGNMENT WORKSHEET

(9) Hydraulic Pressures (T64) (Refer to page 44 step 43) High Pressure Calibrator

(a) MT-10 0-1500 psig fuel manifold Pressure

1 Using the pressure calibrator, apply the following pressures to **MT-10**, and record the results.

			Vertical Scale top row 10
5SE01313-9 Pressure (psig)	Actual Pressure psi	AEDATS 4 (**PFD**) +/- 2 psi	6SE00950-8 Vertical Scale +/- 2 psi
Vent	_____	_____	_____
300	_____	_____	_____
600	_____	_____	_____
900	_____	_____	_____
1200	_____	_____	_____
1500	_____	_____	_____
R-cal	_____		
Transducer: T31 Hardware Name: HL10			

(b) MT-5 0-200 psig Engine Lube Discharge

1 Using the pressure calibrator, apply the following pressures to MT-5, and record the results.
NOTE: Calibrate 15 PS Alarm in conjunction with MT-5.

			Vertical Scale top row 7
5SE01313-7 Pressure (psig)	Actual Pressure psi	AEDATS 4 (PELD) +/- 1 psi	6SE00950-4 Vertical Scale +/- 2 psi
Vent	_____	_____	_____
40	_____	_____	_____
80	_____	_____	_____
120	_____	_____	_____
160	_____	_____	_____
200	_____	_____	_____
R-cal	_____		
Transducer: T25 Hardware Name: HL05			

(c) MT-8 -15 to -5 psig PT Sump Pressure

1 Using the Low pressure calibrator, apply the following pressures to MT-8, and record the results.

			Vertical Scale top row 8
5SE01313-7 Pressure (psig)	Actual Pressure psi	AEDATS 4 (PSUMP PT) +/- 1 psi	6SE00950-10 Vertical Scale +/- 2 psi
-15	_____	_____	_____
-10	_____	_____	_____
-5	_____	_____	_____
Vent	_____	_____	_____
+5	_____	_____	_____
R-cal	_____		
Transducer: T29 Hardware Name: HL08			

AEDATS IV T64 ALIGNMENT WORKSHEET

(d) MT-9 0-100 psig Fuel inlet Pressure

1 Using the pressure calibrator, apply the following pressures to MT-9, and record the results.

			Vertical Scale top row 9
5SE01313-5 Pressure (psig)	Actual Pressure psi	AEDATS 4 (**PFI**) +/- 1 psi	6SE00950-3 Vertical Scale +/- 2 psi
Vent	_____	_____	_____
20	_____	_____	_____
40	_____	_____	_____
60	_____	_____	_____
80	_____	_____	_____
100	_____	_____	_____
R-cal	_____		
Transducer: T30 Hardware Name: HL09			

(e) MT-3 0-50 psig Engine Lube Scavage

1 Using the pressure calibrator, apply the following pressures to MT-3, and record the results.

			Vertical Scale top row 3
5SE01313-4 Pressure (psig)	Actual Pressure psi	AEDATS 4 **(PELS)** +/- 1 psi	6SE00950-2 Vertical Scale +/- 2 psi
Vent	_____	_____	_____
10	_____	_____	_____
20	_____	_____	_____
30	_____	_____	_____
40	_____	_____	_____
50	_____	_____	_____
R-cal	_____		
Transducer: T23 Hardware Name: HL03			

(f) MT-4 0-50 psig Front Frame Sump

1 Using the pressure calibrator, apply the following pressures to MT-4, and record the results.

			Vertical Scale top row 4
5SE01313-4 Pressure (psig)	Actual Pressure psi	AEDATS 4 **(PSUMP FF)** +/- 1 psi	6SE00950-2 Vertical Scale +/- 2 psi
Vent	_____	_____	_____
10	_____	_____	_____
20	_____	_____	_____
30	_____	_____	_____
40	_____	_____	_____
50	_____	_____	_____
R-cal	_____		
Transducer: T24 Hardware Name: HL04			

AEDATS IV T64 ALIGNMENT WORKSHEET

(g) MT-13 0-50 psig Dyno Inlet Pressure

1 Using the pressure calibrator, apply the following pressures to MT-4, and record the results.

			Vertical Scale bottom row 11
5SE01313-4 Pressure (psig)	Actual Pressure psi	AEDATS 4 (Pdyn_sup) +/- 1 psi	6SE00950-2 Vertical Scale +/- 2 psi
Vent	_____	_____	_____
10	_____	_____	_____
20	_____	_____	_____
30	_____	_____	_____
40	_____	_____	_____
50	_____	_____	_____
R-cal	_____		
Transducer: T34 Hardware Name: HL13			

(10) T-64 Fault light panel (Refer to page 75 step 58)

(a) J BOX

1 Dyno low oil pressure fwd _____17PS Set at 10.5 psig on decreasing pressure +/-.5

2 Fuel pressure _____18PS Set at 8 psig on decreasing pressure +/-1

3 Low oil pressure Eng T53 _____15PS Set at 25 on decreasing pressure +/-1

4 Dyno low oil pressure aft _____16PS Set at 10.5 psig on decreasing pressure+/-.5

(b) T64 Test Trailer

1 Chip detector _____Touch chip detector lead to ground

2 Dyno supply low pressure _____19PS on trailer set at 10 psig on DEC. press +/-1

3 Dynolube filter delta-p _____18PS on trailer set at 10 psig on INC. press +/-1

4 Dynolube tank low level _____Jumper pins F & G at J103 aux. J-box

5 T64 oil Filter delta-P _____10PS Low side Vented High side 8 psi +/-1

6 T64 Low Oil Level Engine _____Jumper pin at float switch at tank

(c) Fuel Skid

1 Fuel boost pressure _____ 2 PS set 15 psi on increasing pressure +/-1

2 Main Fuel valve closed _____Turn on CB305 Press fuel pump switch on

3 Fuel valve select _____Turn on CB305 and fuel pump switch

AEDATS IV T64 ALIGNMENT WORKSHEET

(d) CDP, 0-600 in-hg abs CDP pressure (T64) (Refer to page 46 step 44)

1 Using the pressure calibrator, apply the following pressures to the CDP transducer located in cabinet 11, and record the results.

			Vertical Scale bottom row 7
Pressure (in-hg abs)	Actual Pressure	AEDATS 4 (**CDP**) +/- .3 in hg	Vertical Scale +/- .3 in hg
BARO	ABS	_____	_____
150	73.7	_____	_____
300	147	_____	_____
450	221	_____	_____
600	294.7	_____	_____
R-cal	_____		
Transducer: T41 Hardware Name: HL22			

(e) PT-101, 0-50 in-hg abs, Barometer (Refer to page 46 step 45)

(b) Locate **PT-101** on the bell mouth and barometer panel in cabinet 10. Connect the low pressure calibrator directly to the transducer. Apply following pressures and record the results. (2.036)

(c) Do not zero barometer only set span.

			Vertical Scale bottom row 9
5SE01313-22 Pressure (in-hg abs)	Actual Pressure psi	AEDATS 4 (Baro) +/- .05 psi	6SE00950-28 Vertical Scale +/- 0.25 psi
+3	_____	_____	_____
Vent	_____	_____	_____
-3	_____	_____	_____
R-cal	_____		
Transducer: T40 Hardware Name: HL21			

(f) PT-102, 0-50 in-h2o, B/M Static Pressure #1

(d) Locate **PT-102** on the bell mouth and barometer panel in cabinet 10. Connect the low pressure calibrator directly to the transducer. Apply following pressures and record the results.

			Vertical Scale bottom row 6
5SE01313-19 Pressure (in-h2o)	Actual Pressure psi	AEDATS 4 (PS1) +/- .25 psi	6SE00950-29 Vertical Scale +/- .25 psi
0	_____	_____	_____
10	_____	_____	_____
20	_____	_____	_____
30	_____	_____	_____
40	_____	_____	_____
50	_____	_____	_____
R-cal	_____		
Transducer: T37 Hardware Name: HL18			

AEDATS IV T64 ALIGNMENT WORKSHEET

(g) PT-103, 0-50 in-h2o, B/M Static Pressure #2

(e) Locate **PT-103** on the bell mouth and barometer panel in cabinet 10. Connect the low pressure calibrator directly to the transducer. Apply following pressures and record the results.

			Vertical Scale bottom row 7
5SE01313-19 Pressure (in-h2o)	Actual Pressure psi	AEDATS 4 (PS2) +/- .25 psi	6SE00950-29 Vertical Scale +/- .25 psi
0	_____	_____	_____
10	_____	_____	_____
20	_____	_____	_____
30	_____	_____	_____
40	_____	_____	_____
50	_____	_____	_____
R-cal	_____		
Transducer: T38 Hardware Name: HL19			

(h) PT-104, 0-50 in-h2o, B/M Total Pressure

(f) Locate **PT-104** on the bell mouth and barometer panel in cabinet 10. Connect the low pressure calibrator directly to the transducer. Apply following pressures and record the results.

			Vertical Scale bottom row 8
5SE01313-19 Pressure (in-h2o)	Actual Pressure psi	AEDATS 4 (PT1) +/- .25 psi	6SE00950-29 Vertical Scale +/- .25 psi
0	_____	_____	_____
10	_____	_____	_____
20	_____	_____	_____
30	_____	_____	_____
40	_____	_____	_____
50	_____	_____	_____
R-cal	_____		
Transducer: T39 Hardware Name: HL20			

(11) Temperature measurement system: (Refer to page 27 step 29) (AN 6520 Temp Calibrator)

(a) Low temperature channels

(b) Channel 11 P-801 Engine Oil inlet Temp (Spare)

Input	Doric +/- 2°F	AEDATS 4 **(**Toil_in **)** +/- 1°F
32 °F	_____	_____
100 °F	_____	_____
200 °F	_____	_____
300 °F	_____	_____
Transducer: T19 Hardware Name: J12		

AEDATS IV T64 ALIGNMENT WORKSHEET

(c) Temperature and Speed Limit Control Panel (Refer to page 33 step 35)
1 Engine Oil inlet Temperature P-801 Thumb wheel setting 300

Input	Calibrator Temp °F	Limit Control Panel +/- 3°F	Indicator lit	
32 °F	_____	_____	In limit	
100 °F	_____	_____	In limit	
200 °F	_____	_____	In limit	
270 °F	_____	_____	90% Alert	_____
300 °F	_____	_____	100% Warning	_____

(d) Channel 12 P-802 Engine Oil out Temp (Refer to page 39 step 46)

Input	Doric +/- 2°F	AEDATS 4 **(**Toil_out**)** +/- 1°F
32 °F	_____	_____
100 °F	_____	_____
200 °F	_____	_____
300 °F	_____	_____
Transducer: T20 Hardware Name: HL13		

(e) Temperature and Speed Limit Control Panel (Refer to page 34 step 36)
1 Engine oil delta temperature T-53, P-802, P-801 jumper Thumb wheel setting 150

Input	Calibrator Temp °F	Limit Control Panel +/- 3°F	Indicator lit	
Ambient +135°F	_____	_____	90% Alert	_____
Ambient +150°F	_____	_____	100% Warning	_____
Audible warning	_____			

(f) Channel 13 P-803 B/M1 (Spare) (Refer to page 32 step 34)

Input	Doric +/- 2°F	AEDATS 4 **(**T21**)** +/- 1°F
32 °F	_____	_____
70 °F	_____	_____
100 °F	_____	_____
120 °F	_____	_____
Transducer: T2 Hardware Name: J01		

AEDATS IV T64 ALIGNMENT WORKSHEET

(g) Channel 14 P-804 B/M2 (Refer to page 32 step 34)

Input	Doric +/- 2°F	AEDATS 4 **(**T22**)** +/- 1°F
32 °F	_____	_____
70 °F	_____	_____
100 °F	_____	_____
120 °F	_____	_____
Transducer: T55 Hardware Name: J15		

(h) Channel 15 P-805 Comp discharge (Refer to page 32 step 34)

Input	Doric +/- 2°F	AEDATS 4 **(CDT)** +/- 1°F
32 °F	_____	_____
200°F	_____	_____
400 °F	_____	_____
600 °F	_____	_____
800 °F	_____	_____
Transducer: T56 Hardware Name: J16		

(i) Channel 16 P-806 B/M3 (Refer to page 32 step 34)

Input	Doric +/- 2°F	AEDATS 4 **(**T23**)** +/- 1°F
32 °F	_____	_____
70°F	_____	_____
100 °F	_____	_____
120 °F	_____	_____
Transducer: T57 Hardware Name: J17		

(j) Channel 19 P-809 #2 Bearing Scavenge (Refer to page 32 step 34)

Input	Doric +/- 2°F	AEDATS 4 **(**Toil tnk**)** +/- 1°F
32 °F	_____	_____
200°F	_____	_____
400 °F	_____	_____
600 °F	_____	_____
800 °F	_____	_____
Transducer: T60 Hardware Name: J20		

AEDATS IV T64 ALIGNMENT WORKSHEET

(k) Channel 26 TC 209 Fuel tank (TC208 Same as Hydrometer Temp)
(Refer to page 32 step 34)

Input	Doric +/- 2°F	AEDATS 4 **(**TfuelT **)** +/- 1°F
32 °F	_____	_____
100°F	_____	_____
200 °F	_____	_____
300 °F	_____	_____
Transducer: T66 Hardware Name: J26		

(l) Channel 21 J20 Dyno Dyno lube inlet temp (Refer to page 32 step 34)

Input	Doric +/- 2°F	AEDATS 4 **(**Tdyn_Tnk**)** +/- 1°F
32 °F	_____	_____
100°F	_____	_____
150 °F	_____	_____
175 °F	_____	_____
200°F	_____	_____
300°F	_____	_____
Transducer: T61 Hardware Name: J21		

(m) Temperature and Speed Limit Control Panel (Refer to page 35 step 38)
1 Dyno-Lube Inlet Temperature, J20 Thumb wheel setting 200

Input	Calibrator Temp °F +/- 3°F	Limit Control Panel +/- 3°F	Indicator lit	
32 °F	_____	_____	In limit	
100 °F	_____	_____	In limit	
150 °F	_____	_____	In limit	
180 °F	_____	_____	90% Alert	_____
200 °F	_____	_____	100% Warning	_____

AEDATS IV T64 ALIGNMENT WORKSHEET

(n) Dyno-lube delta temperature (Refer to page 35 step 38)
1 Calibrator J23 Jumper J20, Thumb wheel setting 80

Input	Calibrator Temp °F +/- 3°F	Limit Control Panel +/- 3°F	AEDATS 4 **(TDyn_FA)** +/- 1°F	
32 °F	_____		_____	
100 °F	_____		_____	
200 °F	_____		_____	
300 °F	_____		_____	
ambient +74°F	_____	_____	90% Alert	_____
Ambient +80°F	_____	_____	100% Warning	_____
Audible warning	_____			
Transducer: T64 Hardware Name: J24				

(o) Channel 22 J21 Dyno rear bottom Dyno lube out fwd (Refer to page 32 step 34)

Input	Doric +/- 2°F	AEDATS 4 **(**Tdyn_Fwd **)** +/- 1°F
32 °F	_____	_____
100°F	_____	_____
200 °F	_____	_____
300 °F	_____	_____
Transducer: T62 Hardware Name: J22		

(p) Channel 23 J22 Dyno front bottom Dyno lube out aft (Refer to page 32 step 34)

Input	Doric +/- 2°F	AEDATS 4 **(**TDyn_Aft**)** +/- 1°F
32 °F	_____	_____
100°F	_____	_____
200 °F	_____	_____
300 °F	_____	_____
Transducer: T63 Hardware Name: J23		

AEDATS IV T64 ALIGNMENT WORKSHEET

(12)High temperature system, EGT (Refer to page 31 step 32)

(a) THERMOCOUPLE TYPE K Channel 2, Egt connector on engine P55 A+ (yellow), B- (red).

Input	Doric +/- 2	AEDATS 4 (T5) +/- 1	Analog +/- 2	Digital +/- 2
400°F	_____	_____	_____	_____
800°F	_____	_____	_____	_____
1200°F	_____	_____	_____	_____
1600°F	_____	_____	_____	_____
1800°F	_____	_____	_____	_____
Transducer: T4 Hardware Name: K04				

DYNO OIL SAMPLE VAROC 35 YES_____ INIT_____ NO_____INIT_____

DYNO OIL SAMPLE VAROC 250 YES_____ INIT_____ NO_____INIT_____

By Order of the Secretary of the Army:

PETER J. SCHOOMAKER
General, United States Army
Chief of Staff

Official:

JOYCE E. MORROW
Administrative Assistant to the
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From: "Whomever" <whomever@wherever.army.mil>
To: 2028@redstone.army.mil

Subject: DA Form 2028

1. ***From:*** Joe Smith
2. *Unit:* home
3. ***Address:*** 4300 Park
4. ***City:*** Hometown
5. ***St:*** MO
6. ***Zip:*** 77777
7. ***Date Sent:*** 19−OCT−93
8. ***Pub no:*** 55−2840−229−23
9. ***Pub Title:*** TM
10. ***Publication Date:*** 04−JUL−85
11. *Change Number:* 7
12. *Submitter Rank:* MSG
13. ***Submitter FName:*** Joe
14. *Submitter MName:* T
15. ***Submitter LName:*** Smith
16. ***Submitter Phone:*** 123−123−1234
17. ***Problem:*** **1**
18. *Page:* 2
19. *Paragraph:* 3
20. *Line:* 4
21. *NSN:* 5
22. *Reference:* 6
23. *Figure:* 7
24. *Table:* 8
25. *Item:* 9
26. *Total:* 123
27. ***Text:***

This is the text for the problem below line 27.