



**DT-466E AND
THE INTERNATIONAL 530E
HARD START / NO START &
PERFORMANCE
ENGINE DIAGNOSTICS**

Date
Eng. S/N
Eng. HP

Miles

VIN

Hours

Technician

Unit #

Injector P/N

Engine Family Rating Code

Turbocharger P/N

Ambient Temp.

Coolant Temp.

Complaint

HARD START / NO START DIAGNOSTICS

1. SUFFICIENT CLEAN FUEL

- Free of Water-Icing and clouding
- Correct grade of fuel

Method	Check
Visual	

2. VISUAL INSPECTION

- Inspect for leaks
- Inspect for loose connections, etc.

Fuel	Oil	Coolant	Electrical	Air
Method	Check			
Visual				

3. CHECK ENGINE OIL LEVEL

- Check engine crankcase oil level
- Check for contaminants (fuel, coolant)
- Correct Grade/Viscosity
- Miles/Hours on oil, correct level
- Check oil pressure on dash gauge

Method	Check
Visual	

4. INTAKE/EXHAUST RESTRICTION

REFER TO FIGURE A ON REVERSE SIDE

- Inspect hoses and piping
- Check filter minder
- Inspect exhaust system

Method	Check
Visual	

Perform Test 7 if EST is not available or inoperative

5. EST TOOL – FAULT CODES
REFER TO FIGURE B ON REVERSE SIDE

- Install Electronic Service Tool

Active	
Inactive	

☐ See Electronic Diagnostic Form for codes

6a. EST – ENGINE OFF TESTS

- Select "Engine Off" test from diagnostic test menu

Faults Found	
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☐ Repair fault codes before continuing

6b. EST-INJECTOR "BUZZ TEST"

NOTE: "Engine Off Test" must be performed first, in order to gain access to the Injector "BUZZ TEST"

- Select "Injector Test" from "The Engine Off Tests" menu

Faults Found	
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☐ See Electronic Diagnostic Form for codes

Perform Test 7 if EST is not available or inoperative

7. STI BUTTON – FLASH CODES
REFER TO FIGURE F ON REVERSE SIDE

- Depress and hold "Engine Diagnostics" switch, then turn the ignition switch to the "ON" position.

Faults Found	
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☐ Refer to Electronic Diagnostic form, if fault code(s) set

8. EST TOOL – DATA LIST

- Select and enter the following data as the first 3 lines in a custom data list
- Monitor the data while cranking the engine for 20 seconds minimum

Data	Spec	Actual
Bat. Voltage	7 Volts min.	
Eng. RPM	150 RPM min.	
ICP Pressure	800 PSI min.	

- ☐ If voltage is low, refer to ECM diagnostics
- ☐ If no RPM is noted, recheck fault codes
- ☐ If ICP pressure is low, refer to Test 10

Perform Test 9 if EST is not available or inoperative

9a. ECM VOLTAGE
REFER TO FIGURE C ON REVERSE SIDE

- Check while cranking the engine
- Measure with DVOM
- Breakout box pins 57+ & 40–

Instrument	Spec	Actual
DVOM 57+ & 40–	7 volts minimum	

☐ If voltage is low, refer to ECM diagnostics

9b. ENGINE CRANKING RPM
REFER TO FIGURE C ON REVERSE SIDE

- Minimum 150 RPM engine cranking speed for 20 seconds
- Breakout box pins 34+ & 46– with Fluke 88

Instrument	Spec	Actual
Fluke 88 34+ & 46–	150 RPM minimum	

☐ If no RPM is noted, recheck fault codes

9c. INJECTION CONTROL PRESSURE
REFER TO FIGURE D OR E ON REVERSE SIDE

- Minimum 150 RPM engine cranking speed for 20 seconds
- Measure with breakout box: pins 27+ & 46– or breakout "Tee" signal (green) & ground (black)

Instrument	Spec	Actual
DVOM 27+ & 46–	1 Volt Minimum	

☐ If ICP pressure is low, refer to Test 10

10. LOW ICP PRESSURE TEST

NOTE: Perform this test if ICP Pressure was low in Test 8 or 9C.

REFER TO FIGURE G ON REVERSE SIDE

- Remove EOT sensor and check for oil in reservoir and reinstall EOT
- Remove high pressure hose from oil manifold
- Attach adapter and ICP sensor to hose
- Monitor pressure while cranking the engine

Instrument	Spec	Actual
EST	800 PSI min.	
DVOM	1 Volt min.	

- ☐ If pressure is within specifications, check for high pressure oil leakage. Refer to EGES-145 Sec. 2.2
- ☐ If pressure is still low, verify that pump is rotating
- ☐ If pressure is still low, replace IPR and retest

11. FUEL PUMP PRESSURE
REFER TO FIGURE K ON REVERSE SIDE

- Measure at bleeder valve on filter header
- Minimum 150 RPM cranking speed for 30 seconds

Instrument	Spec	Actual
0–160 PSI Gauge	20 PSI minimum	

- ☐ If pressure is low, replace fuel filter, clean fuel strainer and retest.
- ☐ If pressure is still low, perform Transfer Pump Restriction Test 2B (of Performance Diagnostics)

PERFORMANCE DIAGNOSTICS

ALL TESTS SHOULD BE PERFORMED WITH ENGINE AT OPERATING TEMPERATURE

Perform Test 5 if EST is not available or inoperative

1. CHECK ENGINE OIL LEVEL

- Check engine crankcase oil level
- Check for contaminants (fuel, coolant)
- Correct Grade/Viscosity

Method	Check
Visual	

2. SUFFICIENT FUEL/PRESSURE
REFER TO FIGURE K ON REVERSE SIDE

- Drain sample from tank(s)
- Inspect fuel for contamination
- Measure fuel pressure at fuel filter bleeder
- Measure pressure at high idle

Instrument	Spec	Actual
0–160 PSI Gauge	20 PSI minimum @ High idle	

- ☐ If pressure is low, replace fuel filter, clean fuel strainer and retest.
- ☐ If pressure still low, proceed with step 2B.

2b. TRANSFER PUMP RESTRICTION
REFER TO FIGURE L ON REVERSE SIDE

NOTE: Perform this test only if fuel pressure is low.

- Measure at fuel filter inlet @ High idle.

Instrument	Spec	Actual
0–30" Vacuum Gauge	Less than 8" Hg.	

- ☐ If restriction is high, check for blockage between pump and fuel tank
- ☐ If restriction < 8" Hg., refer to EGES-145 Sec. 2.3 for additional diagnostics.

3. EST TOOL – FAULT CODES
REFER TO FIGURE B ON REVERSE SIDE

- Install Electronic Service Tool

Active	
Inactive	

☐ See Electronic Diagnostic Form for codes

4a. EST – ENGINE OFF TESTS

- Select "Engine Off Test" from diagnostic test menu

Faults Found	
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☐ Repair fault codes, before continuing

4b. EST-INJECTOR "BUZZ TEST"

NOTE: "Engine Off Test" must be performed first, in order to gain access to the Injector "BUZZ TEST"

- Select "Injector Test" from "The Engine Off Tests" menu

Faults Found	
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☐ See Electronic Diagnostic Form for codes

5. STI BUTTON – FLASH CODES
REFER TO FIGURE F ON REVERSE SIDE

- Depress and hold "Engine Diagnostics" switch, then turn the ignition switch to the "ON" position.

Faults Found	
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☐ Refer to Electronic Diagnostic form if fault code(s) set

6. INTAKE RESTRICTION
REFER TO FIGURE H ON REVERSE SIDE

- Measure at high idle and no load
- Use manometer or magnehelic gauge

Instrument	Spec	Actual
Manometer or Magnehelic Gauge	12.5" H ₂ O	

7a. EST-ENGINE RUNNING TEST

- Select "Engine Running" test from the diagnostic test menu

Faults Found	
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☐ Refer to Electronic Diagnostic form if fault code(s) set

7b. EST TOOL-INJECTOR TEST
(CYLINDER CONTRIBUTION)

NOTE: "Engine RUNNING Test" must be performed first, in order to gain access to the "INJECTOR TEST"

- Select "Injector Test" from "Engine Running" test menu

Faults Found	
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☐ Refer to Electronic Diagnostic form if fault code(s) set

Tests 8, 9 & 10 to be performed at Full load

8. FUEL PRESSURE (FULL LOAD)
REFER TO FIGURE K ON REVERSE SIDE

- Measure fuel pressure at fuel filter bleeder.
- Measure pressure at full load rated speed.

Instrument	Spec	Actual
0–160 PSI Gauge	20 PSI minimum	

- ☐ If pressure is low, replace fuel filter, clean fuel strainer & retest
- ☐ If pressure is still low, perform Test 2B.

9. ICP PRESSURE
REFER TO FIGURE D OR E ON REVERSE SIDE

- Monitor ICP pressure and engine RPM with the EST tool in data list mode
- Or use breakout "TEE" and DVOM

- Refer to EGES-145 for specifications

Data	Spec	Actual
Low Idle	PSI/Volts	
High Idle	PSI/Volts	
Full Load	PSI/Volts	

- ☐ If pressure is low or unstable, disconnect ICP sensor and retest
- ☐ If problem is resolved, refer to ICP diagnostics
- ☐ If pressure is still low or unstable, replace IPR and retest

10. BOOST PRESSURE

REFER TO FIGURE I ON REVERSE SIDE

- Monitor boost pressure and engine RPM with the EST tool in data list mode
- Or use dash tach and 0–30 PSI gauge and "T", if EST tool is not available

- Measure pressure at full load rated speed
- Refer to EGES-145 for specifications

Spec	Actual
PSI @ RPM	

11. CRANKCASE PRESSURE
REFER TO FIGURE J ON REVERSE SIDE

- Measure at road draft tube with orifice tool (ZTSE-4039)
- Measure at High Idle no load RPM

Instrument	Spec	Actual
0 to 60" H ₂ O Magnehelic Gauge	< 6" H ₂ O	

STOP

IF GUIDELINE DATA WAS OBTAINED DURING THE FIRST 11 TESTS, ENGINE OPERATION IS SATISFACTORY. NO FURTHER TESTING IS REQUIRED

12. WASTEGATE ACTUATOR TEST

- Apply regulated air to actuator
- Inspect for leakage
- Inspect actuator for movement

Instrument	Spec	Actual
0 to 60 PSI Gauge	28–32 PSI	

13. EXHAUST RESTRICTION

- Visually inspect exhaust system for damage
- Measure at a point 3 to 6 inches after turbo outlet
- Measure at full load and rated speed

Instrument	Spec	Actual
Manometer or Magnehelic Gauge	0–35" H ₂ O	

14. VALVE CLEARANCE

- Engine off: Hot or Cold

Instrument	Spec	Actual
Feeler Gauge		

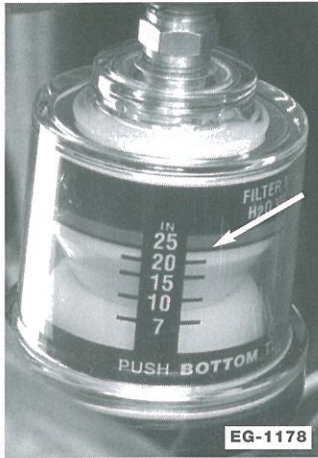
PERFORM TESTS IN SHADED AREAS IF EST TOOL IS NOT AVAILABLE OR ATA CODES ARE NOT TRANSMITTED

Fig. A

**INTAKE RESTRICTION
(FILTER MINDER)**



EG-1179



EG-1178

LOW RESTRICTION

HIGH RESTRICTION

Fig. B

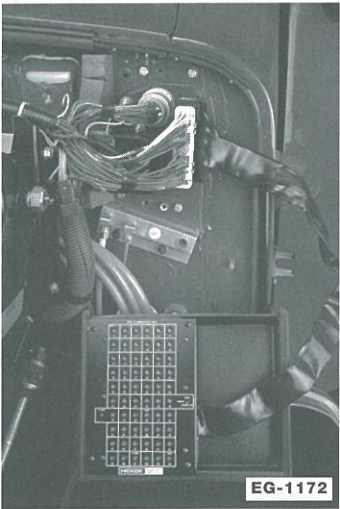
ATA CONNECTOR



EG-1171

Fig. C

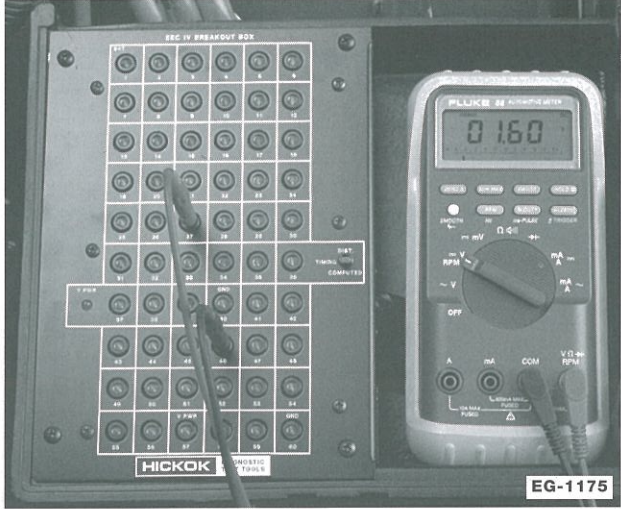
**BREAKOUT BOX
INSTALLATION**



EG-1172

Fig. D

**ICP PRESSURE WITH
BREAKOUT BOX**



EG-1175

Fig. E

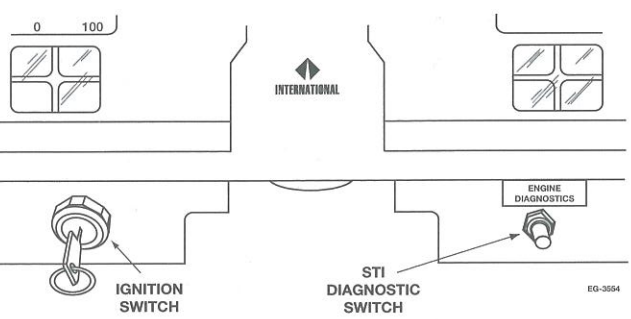
**ICP PRESSURE WITH
BREAKOUT "T"**



EG-5022

Fig. F

SELF TEST INPUT BUTTON LOCATION



SELF TEST INPUT BUTTON LOCATION

EG-3554

Fig. G

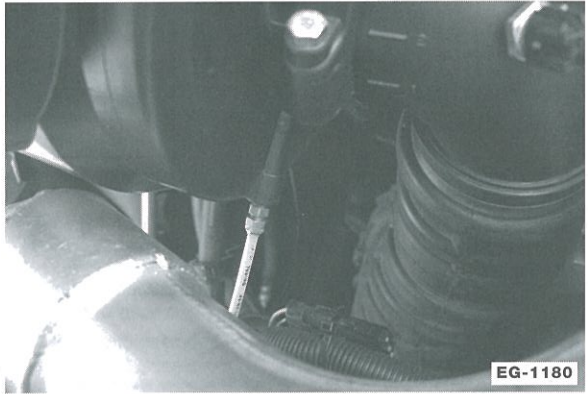
**CHECK ENGINE OIL
(IN RESERVOIR)**



EG-5024

Fig. H

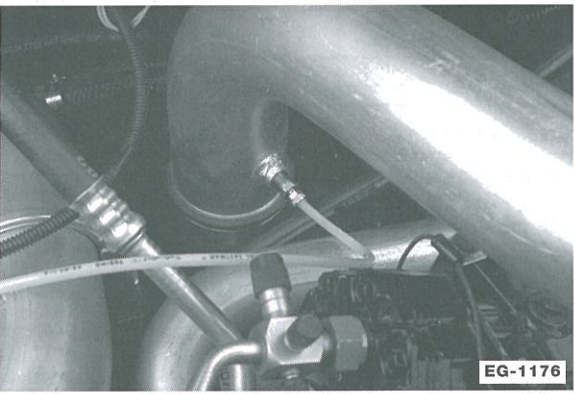
INTAKE RESTRICTION



EG-1180

Fig. I

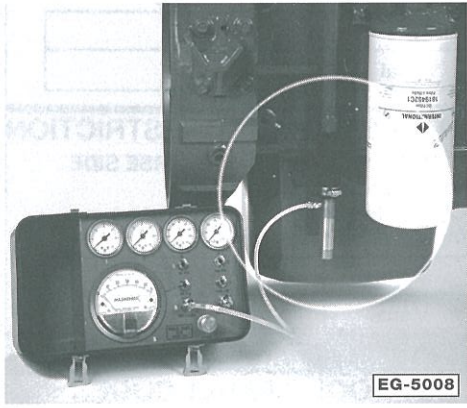
BOOST PRESSURE



EG-1176

Fig. J

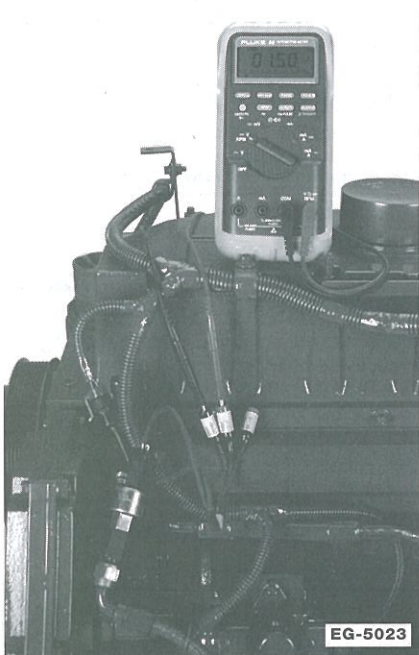
CRANKCASE PRESSURE



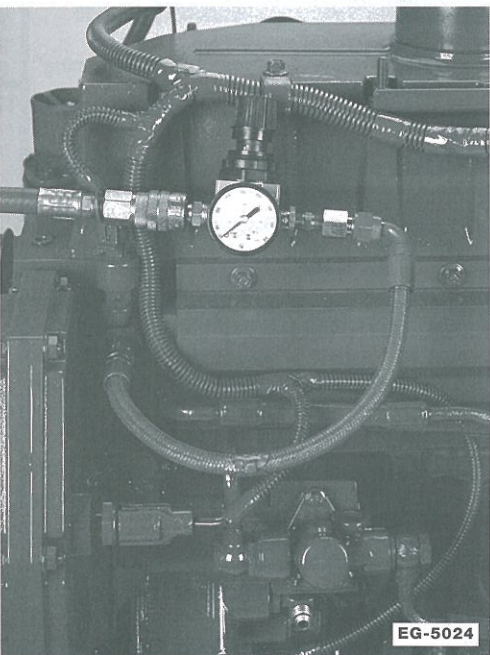
EG-5008

Fig. G

LOW ICP TEST



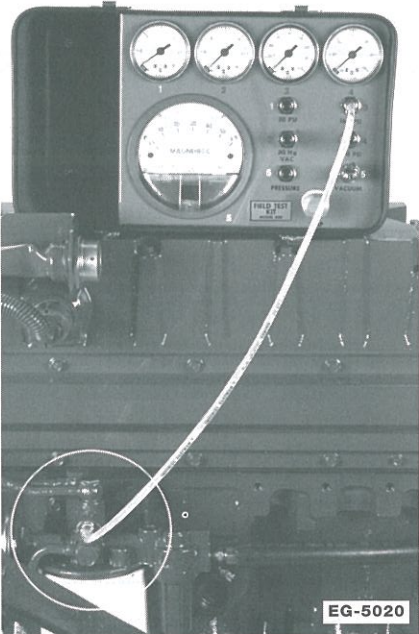
EG-5023



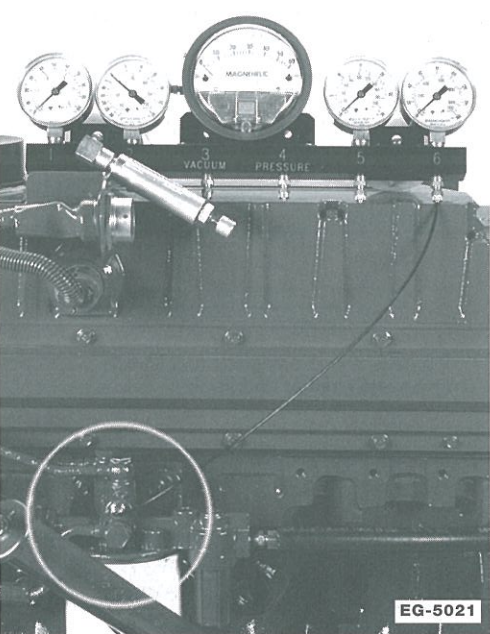
EG-5024

Fig. K

FUEL PUMP PRESSURE



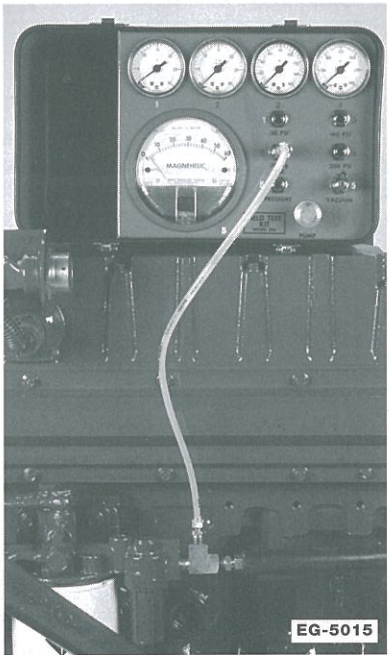
EG-5020



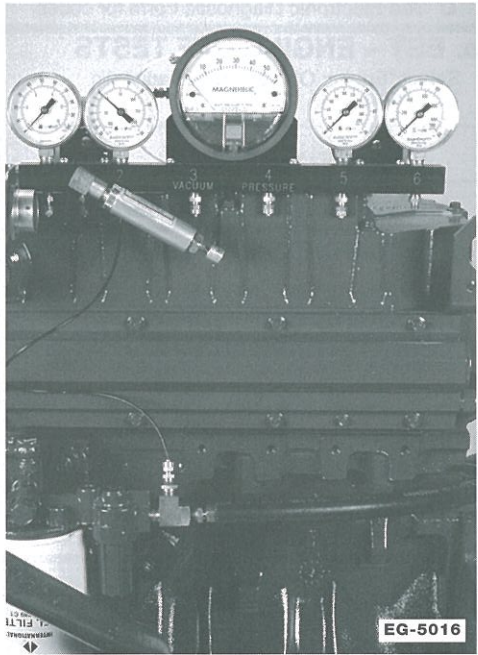
EG-5021

Fig. L

TRANSFER PUMP RESTRICTION



EG-5015



EG-5016