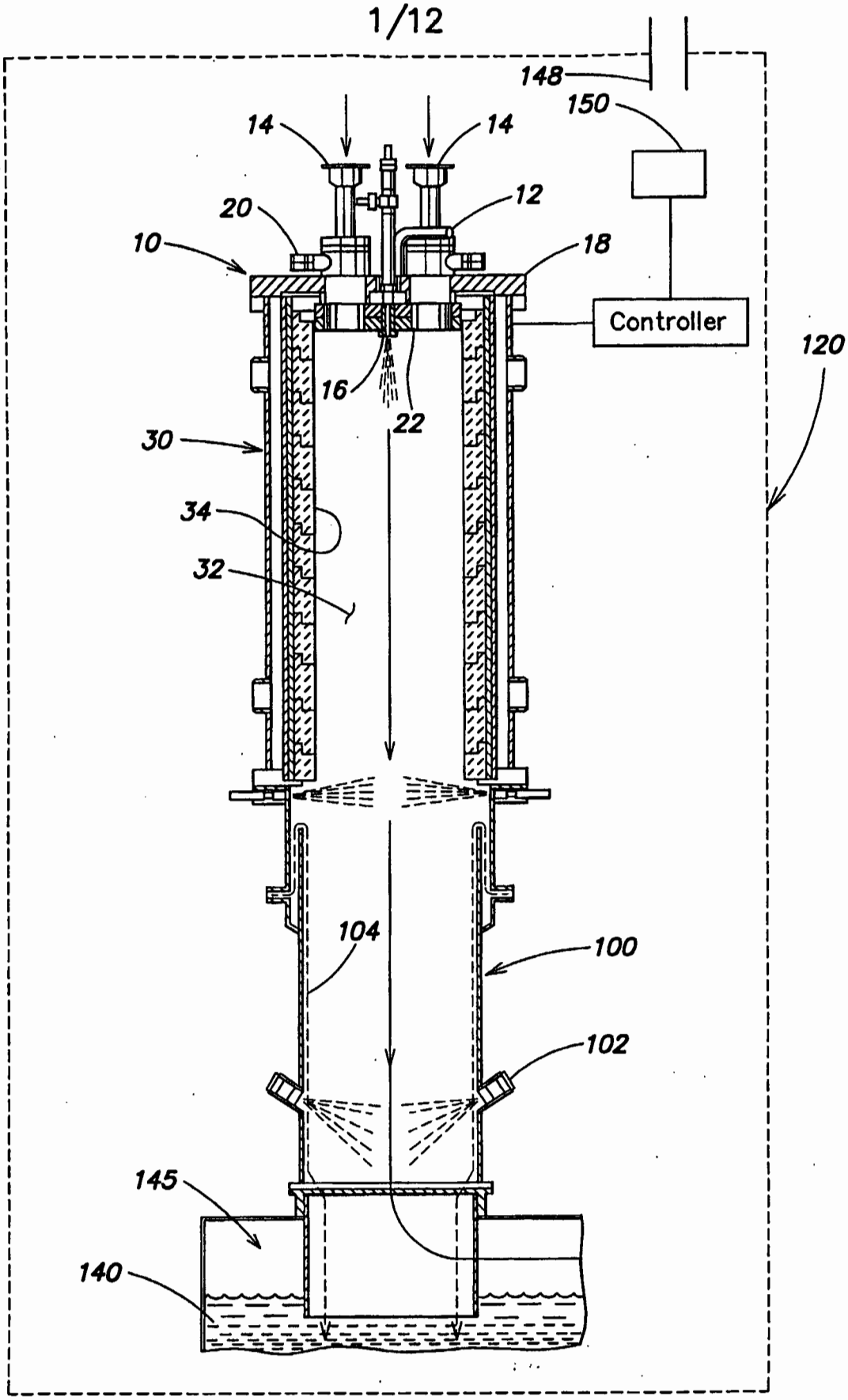

148
150
14
14
12
20
10
18
Controller
120
16
22
30
34
32
104
100
102
145
140

FIG. 1

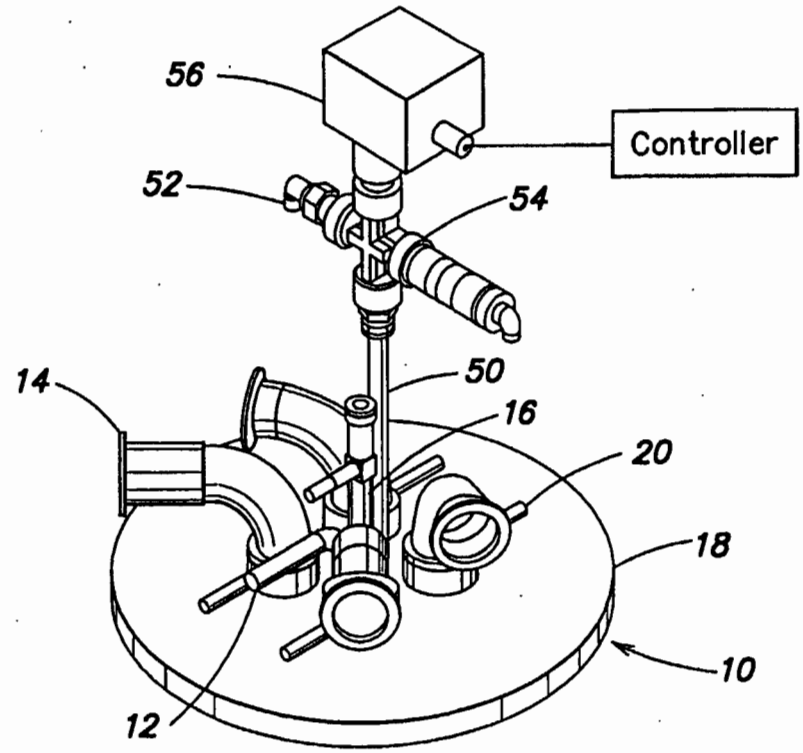

56
Controller
52
54
50
14
16
20
18
10
12

FIG. 2

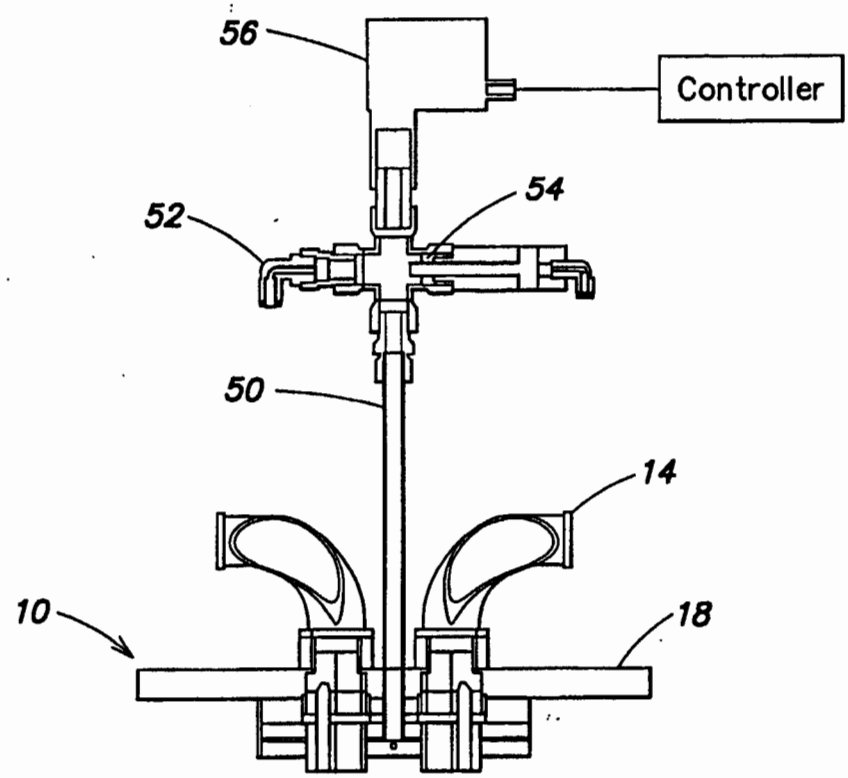

56
Controller
54
52
50
14
10
18

FIG. 3

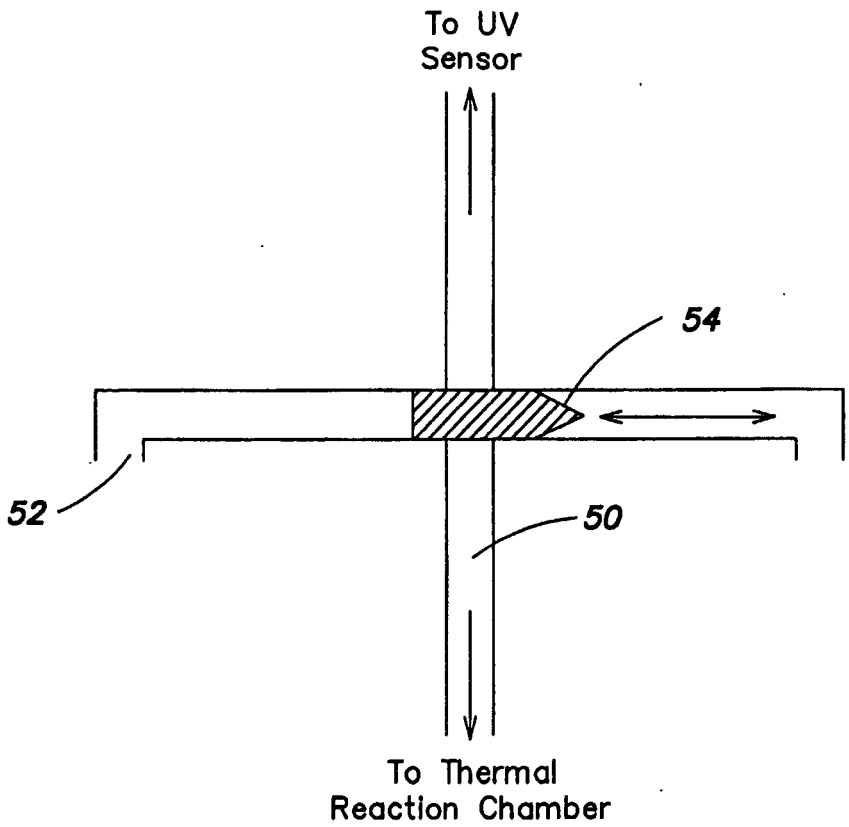

To UV
Sensor
54
52
50
To Thermal
Reaction Chamber

FIG. 4A

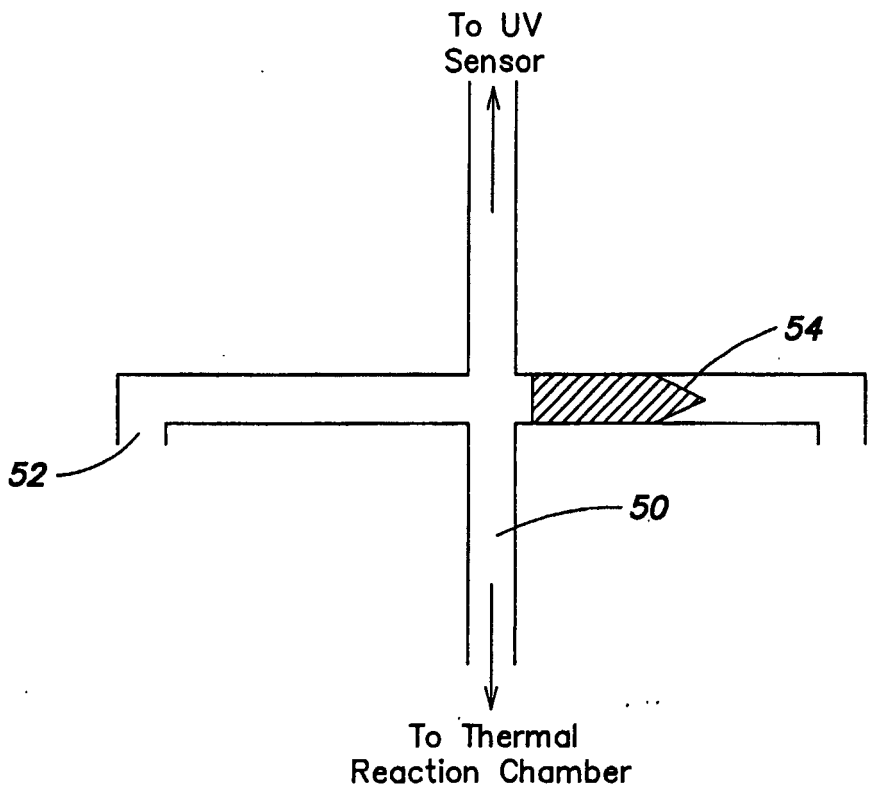

To UV
Sensor
54
52
50
To Thermal
Reaction Chamber

FIG. 4B

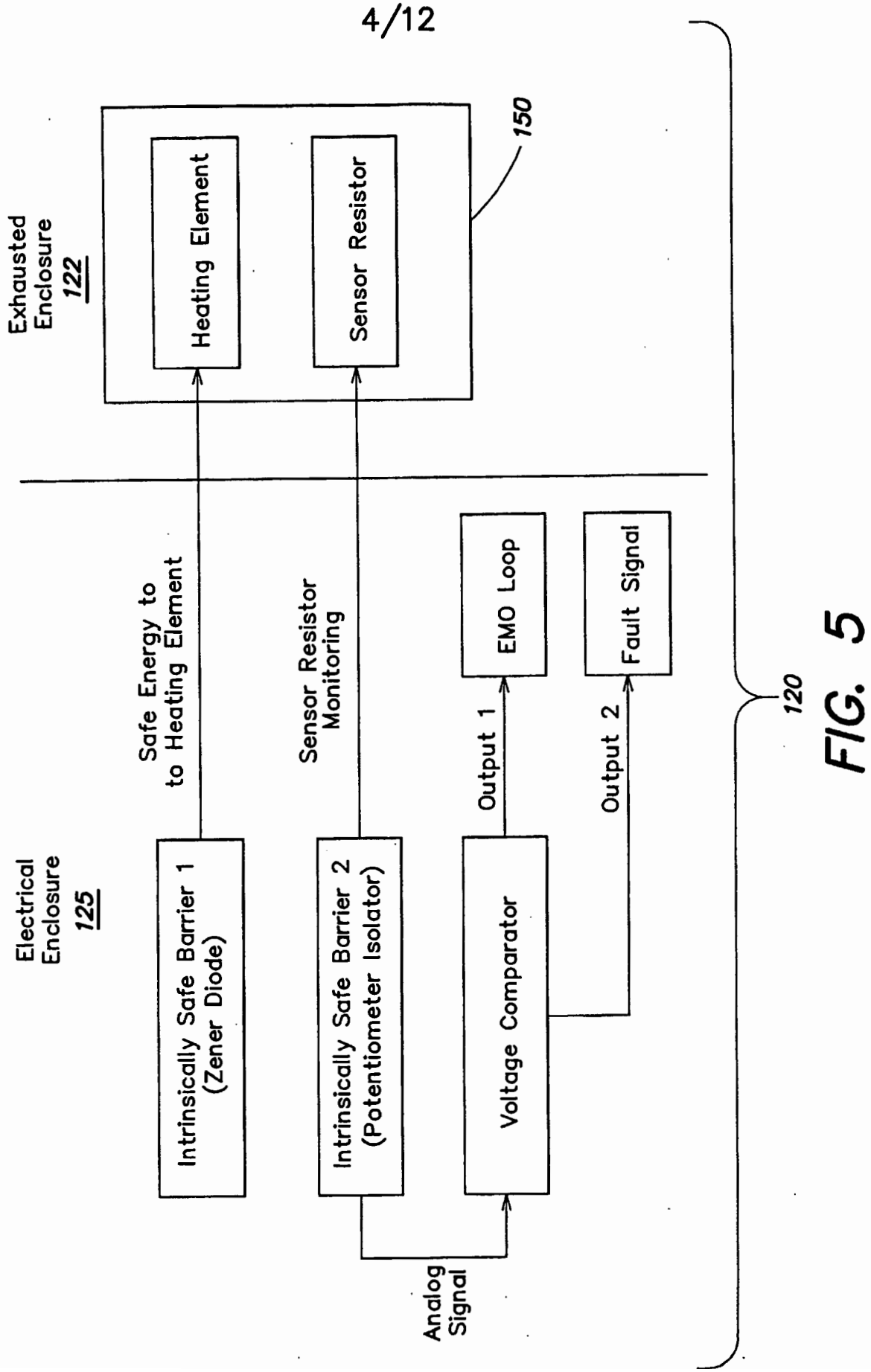

Exhausted Enclosure 122
Heating Element
Sensor Resistor
150
Safe Energy to to Heating Element
Sensor Resistor Monitoring
Output 1
Output 2
EMO Loop
Fault Signal
Electrical Enclosure 125
Intrinsically Safe Barrier 1 (Zener Diode)
Intrinsically Safe Barrier 2 (Potentiometer Isolator)
Voltage Comparator
Analog Signal
120

FIG. 5

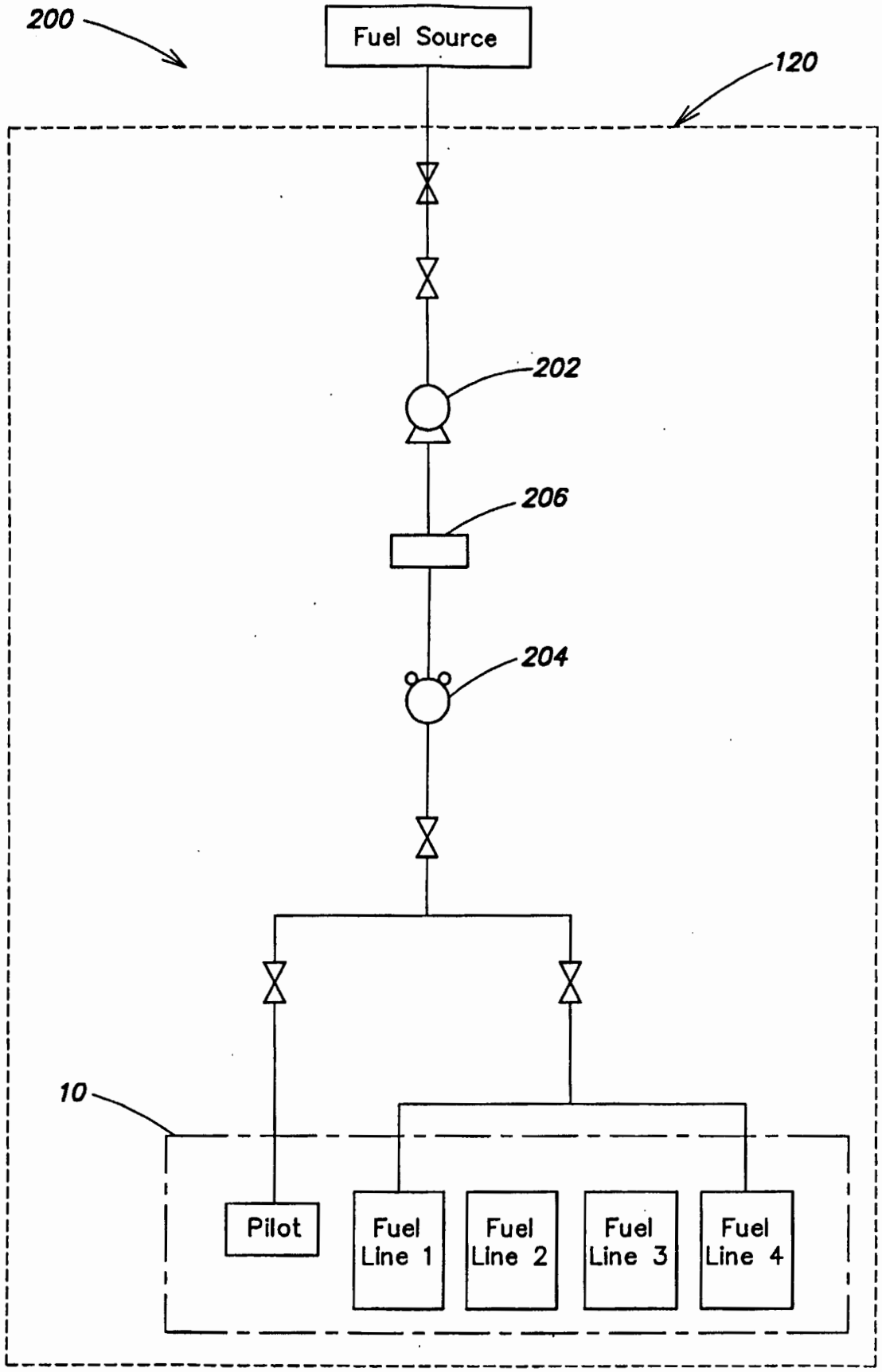

200
Fuel Source
120
202
206
204
10
Pilot
Fuel Line 1
Fuel Line 2
Fuel Line 3
Fuel Line 4

FIG. 6

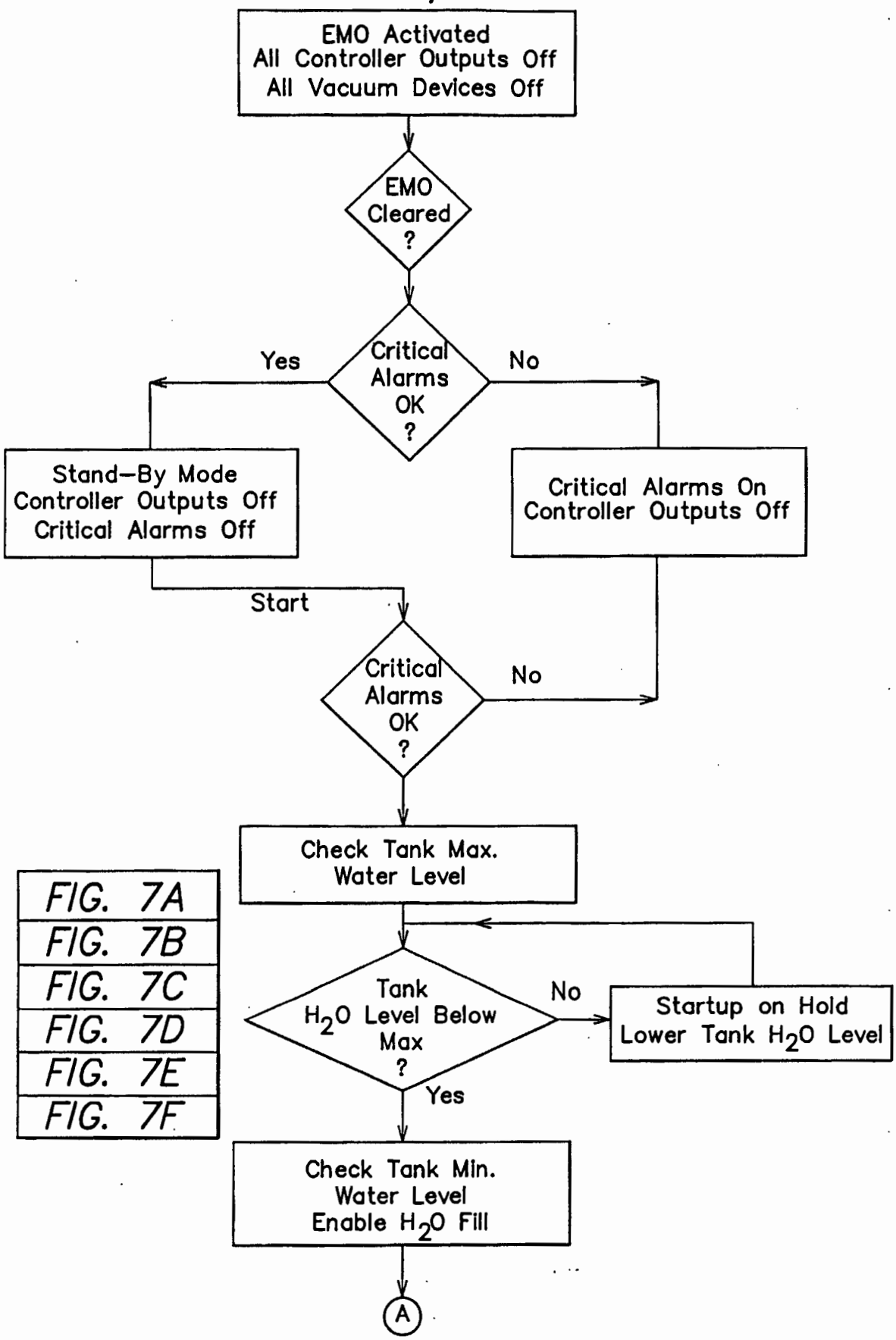


FIG. 7A
FIG. 7B
FIG. 7C
FIG. 7D
FIG. 7E
FIG. 7F

FIG. 7A

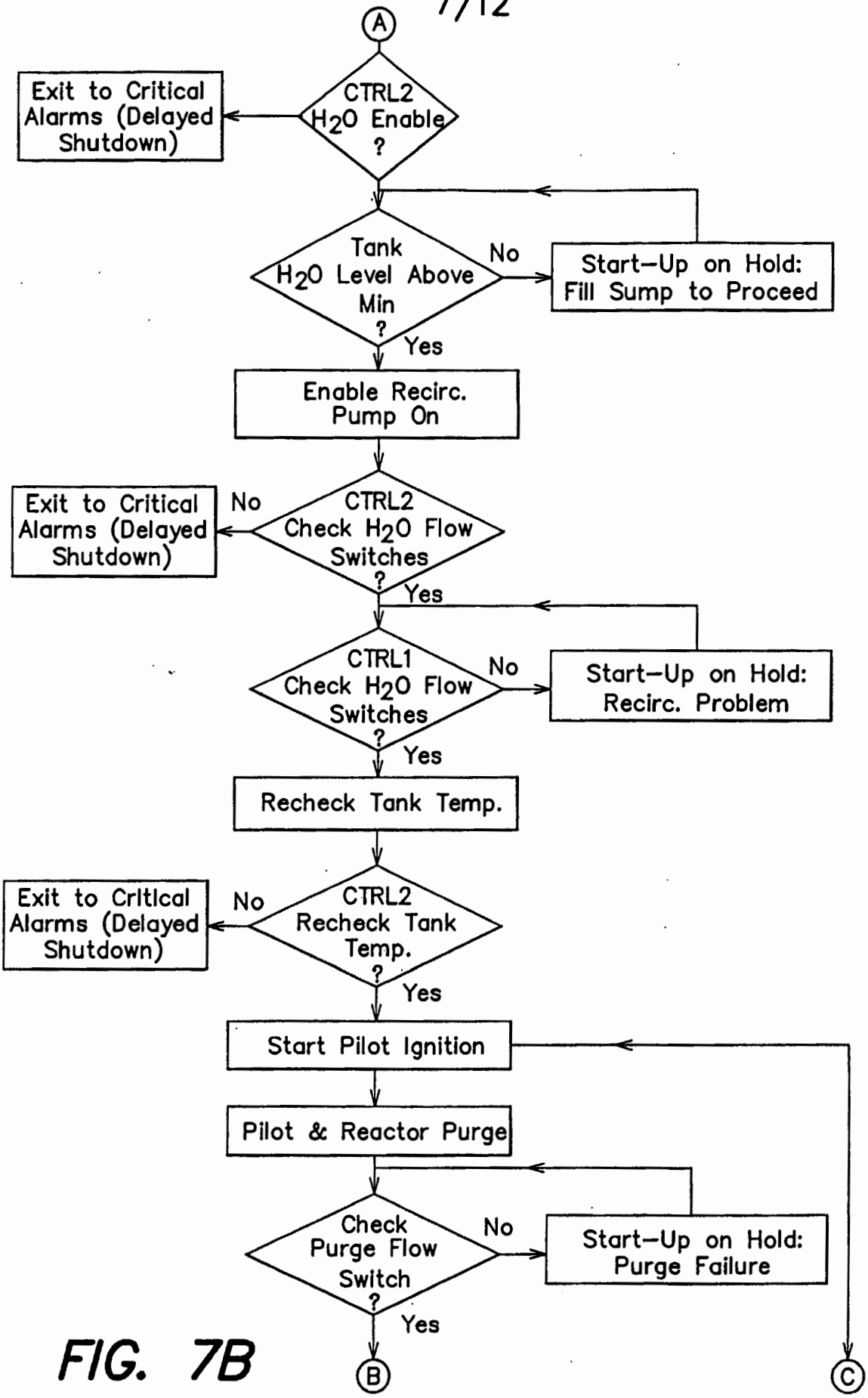

A
CTRL2 H_2O Enable ?
Exit to Critical Alarms (Delayed Shutdown)
Tank H_2O Level Above Min ?
No
Start-Up on Hold: Fill Sump to Proceed
Yes
Enable Recirc. Pump On
CTRL2 Check H_2O Flow Switches ?
No
Exit to Critical Alarms (Delayed Shutdown)
Yes
CTRL1 Check H_2O Flow Switches ?
No
Start-Up on Hold: Recirc. Problem
Yes
Recheck Tank Temp.
CTRL2 Recheck Tank Temp. ?
No
Exit to Critical Alarms (Delayed Shutdown)
Yes
Start Pilot Ignition
Pilot & Reactor Purge
Check Purge Flow Switch ?
No
Start-Up on Hold: Purge Failure
Yes
B
C

FIG. 7B

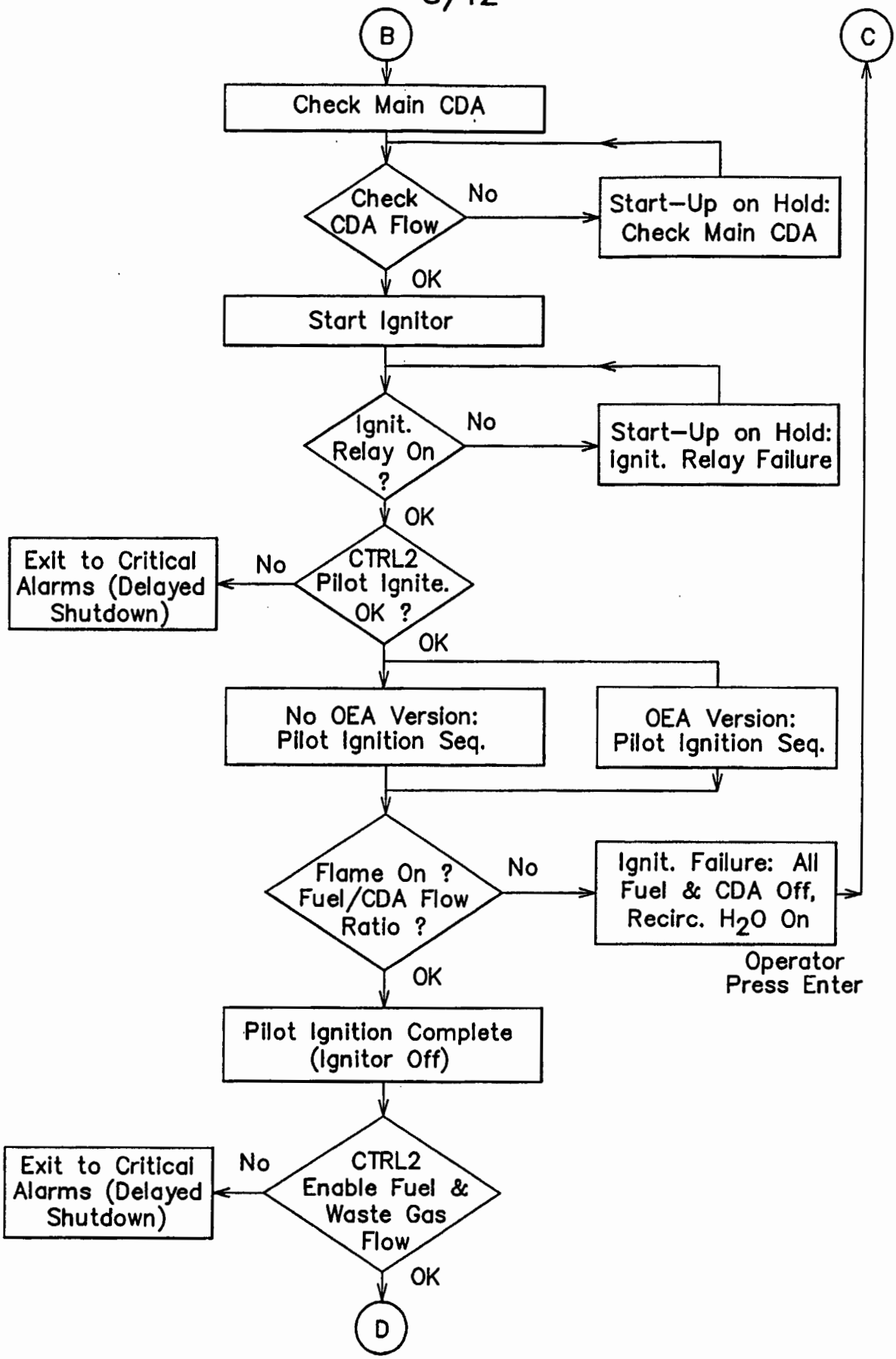

B
C
Check Main CDA
Check CDA Flow
No
Start–Up on Hold: Check Main CDA
OK
Start Ignitor
Ignit. Relay On ?
No
Start–Up on Hold: Ignit. Relay Failure
OK
Exit to Critical Alarms (Delayed Shutdown)
No
CTRL2 Pilot Ignite. OK ?
OK
No OEA Version: Pilot Ignition Seq.
OEA Version: Pilot Ignition Seq.
Flame On ? Fuel/CDA Flow Ratio ?
No
Ignit. Failure: All Fuel & CDA Off, Recirc. H_2O On
Operator Press Enter
OK
Pilot Ignition Complete (Ignitor Off)
Exit to Critical Alarms (Delayed Shutdown)
No
CTRL2 Enable Fuel & Waste Gas Flow
OK
D

FIG. 7C

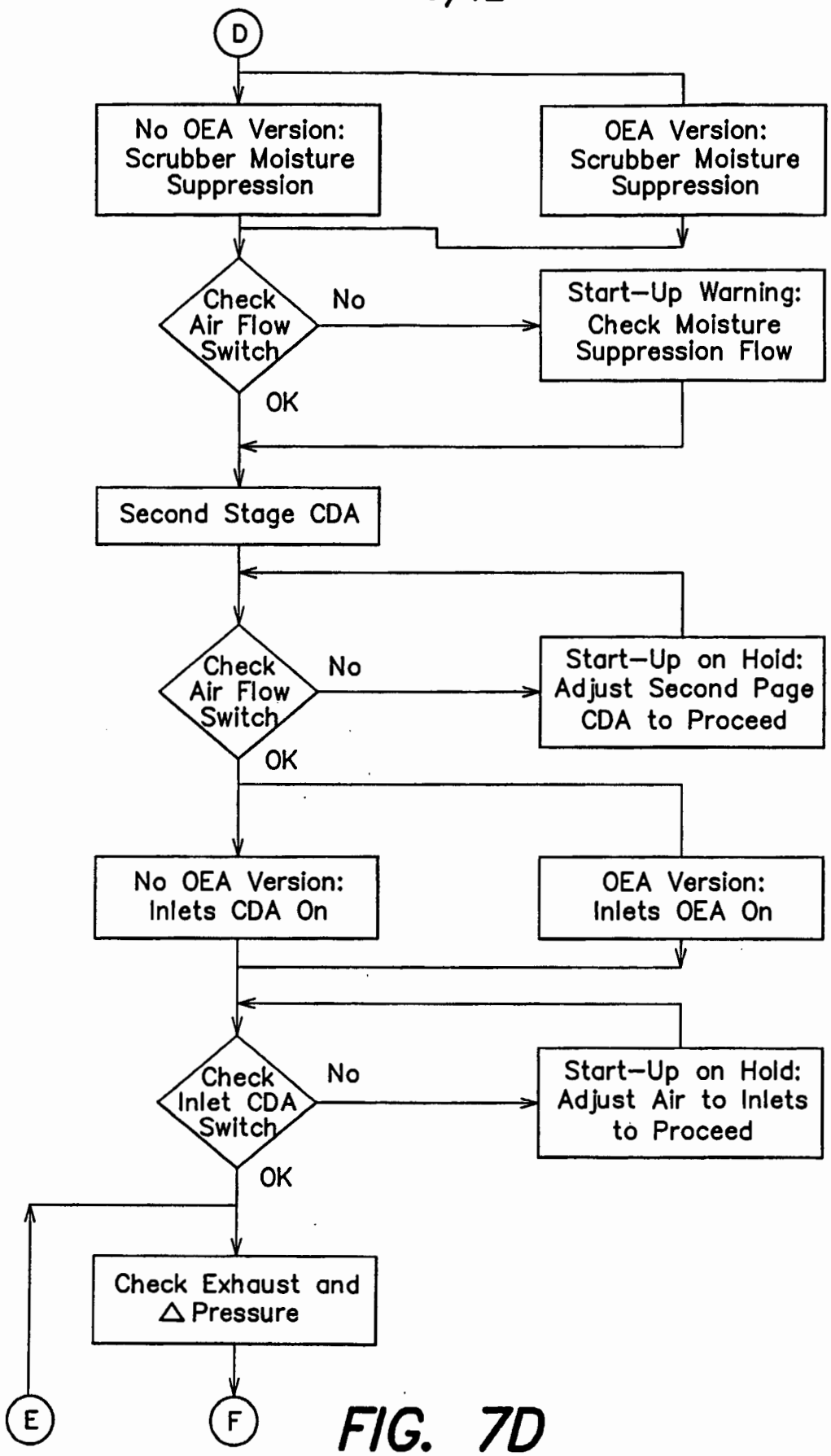

D
No OEA Version: Scrubber Moisture Suppression
OEA Version: Scrubber Moisture Suppression
Check Air Flow Switch
No
Start-Up Warning: Check Moisture Suppression Flow
OK
Second Stage CDA
Check Air Flow Switch
No
Start-Up on Hold: Adjust Second Page CDA to Proceed
OK
No OEA Version: Inlets CDA On
OEA Version: Inlets OEA On
Check Inlet CDA Switch
No
Start-Up on Hold: Adjust Air to Inlets to Proceed
OK
Check Exhaust and △ Pressure
E
F

FIG. 7D

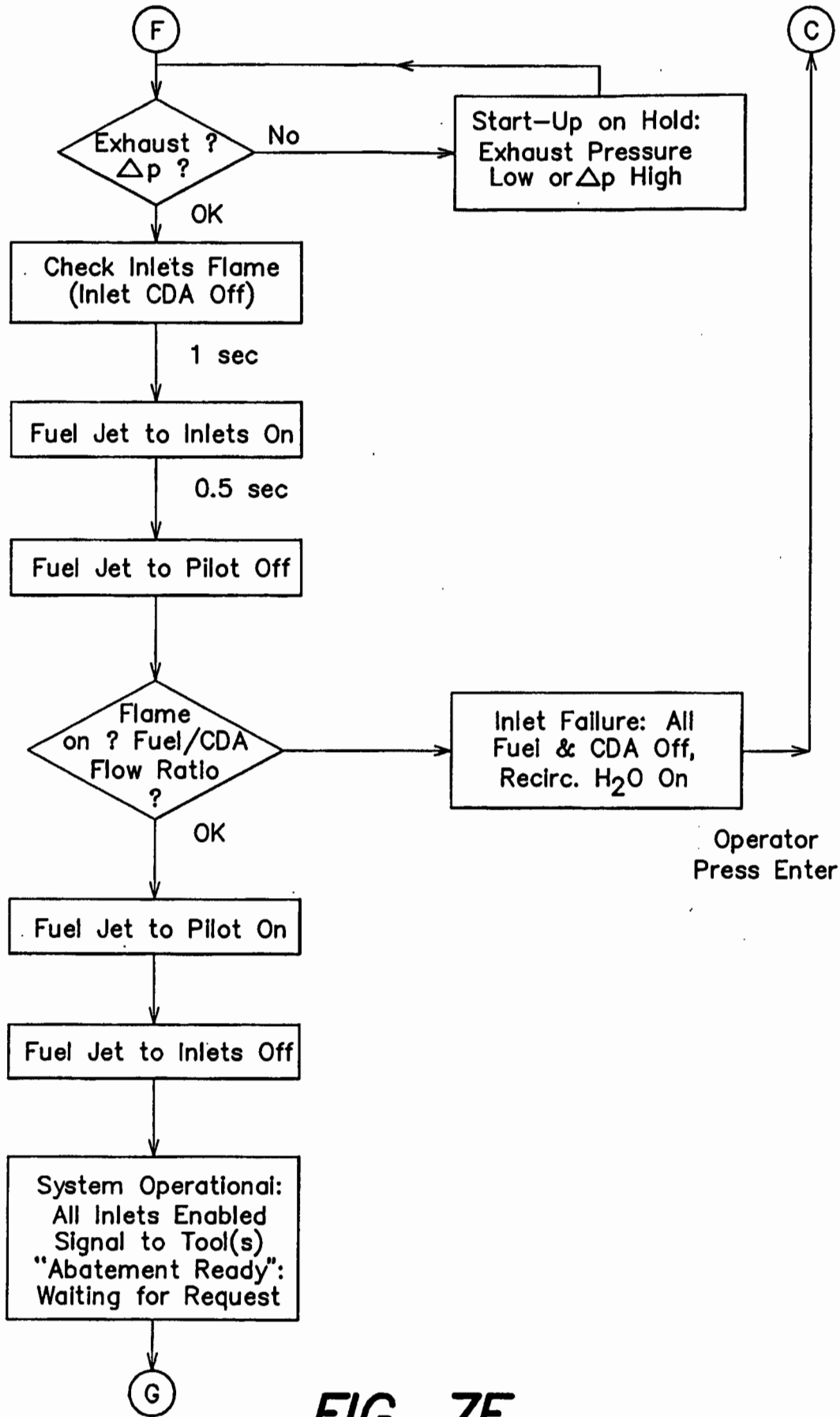

F
C
Exhaust ? Δp ?
No
Start–Up on Hold: Exhaust Pressure Low or Δp High
OK
Check Inlets Flame (Inlet CDA Off)
1 sec
Fuel Jet to Inlets On
0.5 sec
Fuel Jet to Pilot Off
Flame on ? Fuel/CDA Flow Ratio ?
Inlet Failure: All Fuel & CDA Off, Recirc. H_2O On
OK
Operator Press Enter
Fuel Jet to Pilot On
Fuel Jet to Inlets Off
System Operational: All Inlets Enabled Signal to Tool(s) "Abatement Ready": Waiting for Request
G

FIG. 7E

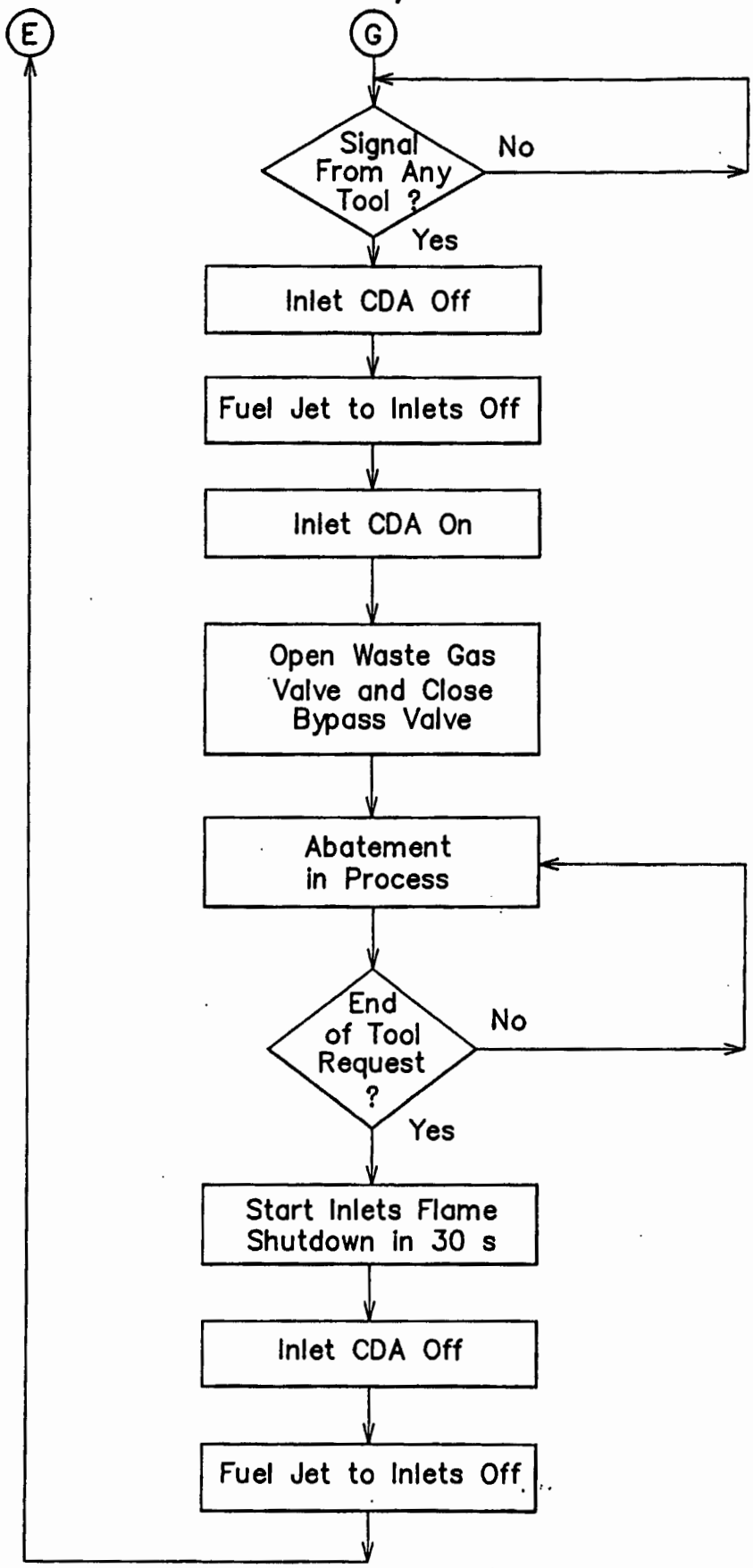

E
G
Signal From Any Tool ?
No
Yes
Inlet CDA Off
Fuel Jet to Inlets Off
Inlet CDA On
Open Waste Gas Valve and Close Bypass Valve
Abatement in Process
End of Tool Request ?
No
Yes
Start Inlets Flame Shutdown in 30 s
Inlet CDA Off
Fuel Jet to Inlets Off

FIG. 7F

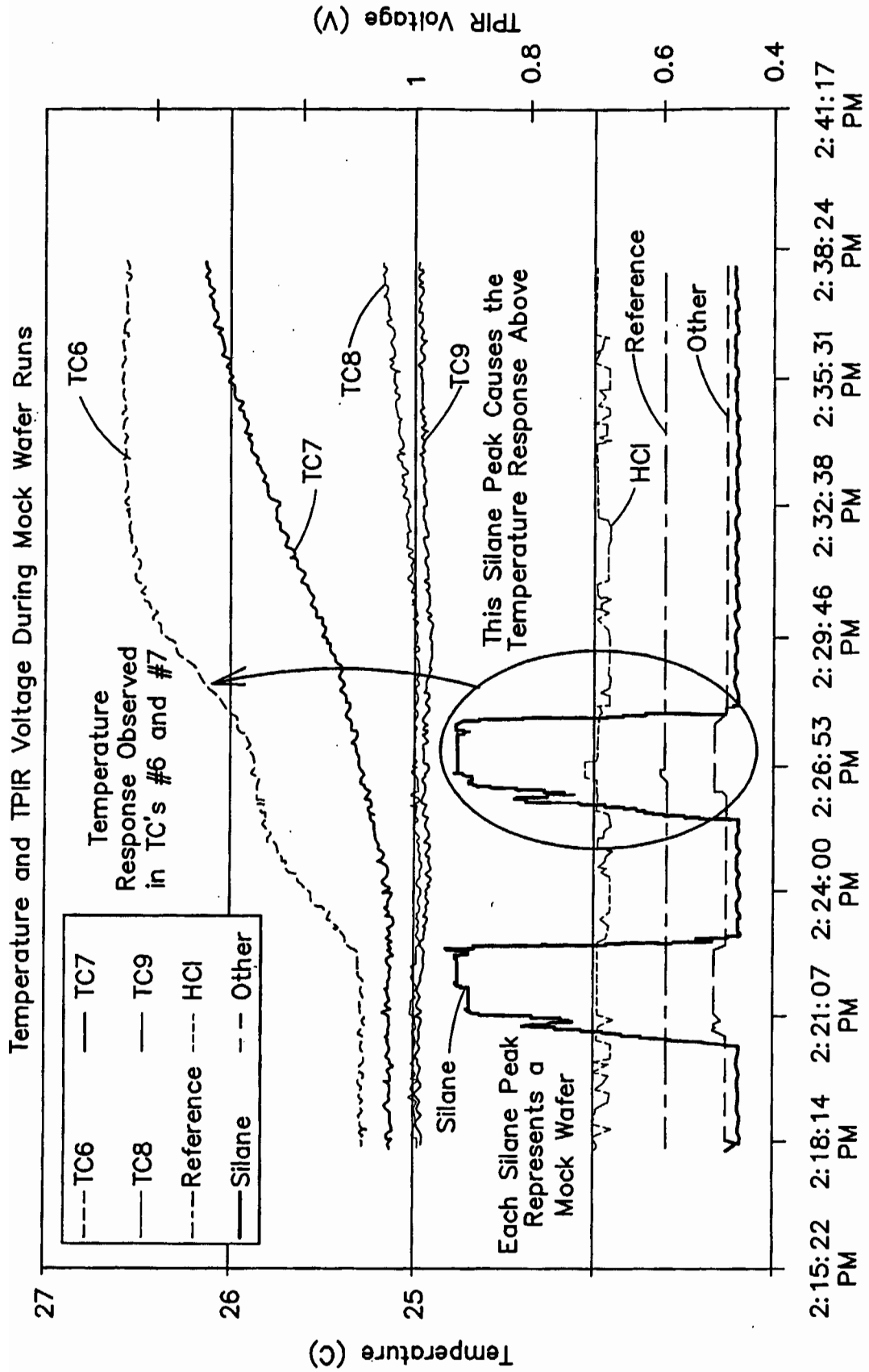

Temperature and TPIR Voltage During Mock Wafer Runs
Temperature (C)
TPIR Voltage (V)
27
26
25
1
0.8
0.6
0.4
2:15:22 PM
2:18:14 PM
2:21:07 PM
2:24:00 PM
2:26:53 PM
2:29:46 PM
2:32:38 PM
2:35:31 PM
2:38:24 PM
2:41:17 PM
TC6
TC7
TC8
TC9
Reference
HCl
Silane
Other
Temperature Response Observed in TC's #6 and #7
This Silane Peak Causes the Temperature Response Above
Each Silane Peak Represents a Mock Wafer

FIG. 8