

**Sensor Specifications
(America)**

**LAUNCH Tech Co.,Ltd.
[Http://www.launch-tech.com](http://www.launch-tech.com)**

1990-97 FORD

1. 1990

Applicable Vehicle Types:

Ford: All Vehicle Types

1) Water Temperature Sensor, Intake Air Temperature Sensor Resistance And Voltage (Except 2.2l Probe)

| Temperature (°C) | Voltage (V) | Resistance(K ω) |
|------------------|-------------|-------------------------|
| 120 | 0.27 | 1.18 |
| 110 | 0.35 | 1.55 |
| 100 | 0.46 | 2.07 |
| 90 | 0.60 | 2.80 |
| 80 | 0.78 | 3.84 |
| 70 | 1.02 | 5.37 |
| 60 | 1.33 | 7.70 |
| 50 | 1.70 | 10.97 |
| 40 | 2.13 | 16.15 |
| 30 | 2.60 | 24.27 |
| 20 | 3.07 | 37.30 |
| 10 | 3.51 | 58.75 |

2) Vane Type Intake Air Temperature Sensor Resistance Specification (Probe 2.2l)

| Temperature (°C) | Voltage (V) | Ohm(K ω) |
|------------------|-------------|------------------|
| 120 | 0.38 | 0.11 |
| 110 | 0.46 | 0.14 |
| 100 | 0.56 | 0.19 |
| 90 | 0.76 | 0.25 |
| 80 | 0.95 | 0.33 |
| 70 | 1.19 | 0.44 |
| 60 | 1.49 | 0.60 |
| 50 | 1.84 | 0.83 |
| 40 | 2.23 | 1.18 |
| 30 | 2.65 | 1.70 |
| 20 | 3.07 | 2.50 |
| 10 | 3.46 | 3.77 |

3) Water Temperature Sensor, Vane Type Intake Air Temperature Sensor(Vat) Resistance And Voltage Specification (2.2l Probe)

| Temperature (°C) | Voltage (V) | Ohm (Ω) |
|------------------|-------------|------------------|
| -20 | 4.70 | 10-20 |
| 0 | 3.40 | 4-7 |
| 20 | 2.50 | 2-3 |
| 40 | 2.00 | 0.9-1.3 |
| 60 | 1.20 | 0.4-0.7 |
| 80 | 0.70 | 0.2-0.4 |

4) EGR Valve Position Sensor Voltage Specification
(Except 2.2l Probe)

| EGR Valve Throttle Opening(%) | Volt |
|-------------------------------|------|
| 0 | 0.40 |
| 10 | 0.75 |
| 20 | 1.10 |
| 30 | 1.45 |
| 40 | 1.80 |
| 50 | 2.15 |
| 60 | 2.50 |
| 70 | 2.85 |
| 80 | 3.20 |
| 90 | 3.55 |
| 100 | 3.90 |

5) EGR Valve Position Sensor Voltage Specification
(2.2l Probe)

| Manifold Vacuum Limiter (Inch-Hg) | Volt |
|-----------------------------------|-------|
| 0 | 0.867 |
| 1 | 0.893 |
| 2 | 0.923 |
| 3 | 1.434 |
| 4 | 1.84 |
| 5 | 2.09 |
| 6 | 3.86 |
| 7 | 4.93 |
| 8 | 4.93 |

6) Quality Air Flow Sensor Signal Voltage

| Velocity (Mile/Hr.) | Volt |
|---------------------|------|
| Idle | 0.60 |
| 20 | 1.10 |
| 40 | 1.70 |
| 60 | 2.10 |

7) Manifold Absolute Pressure Sensor Frequency Specification

| Atmospheric Pressure (Inch-Hg) | Frequency (Hz) |
|--------------------------------|----------------|
| 17.1 | 122.4 |
| 18.3 | 125.5 |
| 19.5 | 128.7 |
| 20.7 | 131.9 |
| 21.8 | 135.1 |
| 23.0 | 138.3 |
| 24.2 | 141.8 |
| 25.4 | 145.4 |
| 26.6 | 148.9 |
| 27.7 | 152.5 |
| 28.9 | 156.1 |
| 30.1 | 159.6 |
| 31.0 | 162.4 |

8) Manifold Absolute Pressure Sensor Frequency Specification

| Manifold Vacuum Limiter (Inch-Hg) | Frequency (Hz) |
|-----------------------------------|----------------|
| 0 | 159 |
| 3 | 150 |
| 6 | 141 |
| 9 | 133 |
| 12 | 125 |
| 15 | 117 |
| 18 | 109 |
| 21 | 102 |
| 24 | 95 |
| 27 | 88 |
| 30 | 80 |

9) Oxygen Sensor Voltage Specification(2.2l Probe)

| Status | Voltage |
|--------------|------------|
| Acceleration | Raising |
| Deceleration | Depression |
| Idle | 0.2-0.8 |

10) Throttle Position Sensor Voltage Specification

| Sensor Setting Value (KOEO&KOER) | | | Signal Voltage Scope | |
|----------------------------------|-----------------|---------------|----------------------|------|
| Applicable Models | Pivot Angle (°) | Voltage Scope | Min | Max |
| 1.9l PFI | 4-13.0 | 0.80-1.20 | 0.24 | 4.84 |
| 1.9l MA PFI | 3-13.0 | 0.70-1.20 | 0.20 | 4.84 |
| 1.9l TBI | | | | |
| Off | 0-12.0 | 0.49-1.15 | 0.39 | 4.84 |
| Running | 2.5-14.0 | 0.71-1.25 | 0.39 | 4.84 |
| 2.3l OHC PFI | 0-13.5 | 0.59-1.22 | 0.20 | 4.84 |
| 2.3l HSC PFI | 0-13.5 | 0.73-1.22 | 0.20 | 4.84 |
| 3.0l PFI | 0-13.5 | 0.59-1.22 | 0.34 | 4.84 |
| 3.0l SHO MA PFI | 0-4.5 | 0.38-0.82 | 0.23 | 4.84 |
| 3.8l PFI | 3-13.5 | 0.73-1.22 | 0.39 | 4.84 |
| 3.8l MA PFI | 0-13.5 | 0.49-1.22 | 0.39 | 4.84 |
| 5.0l PFI | 3-13.5 | 0.73-1.22 | 0.39 | 4.84 |
| 5.0l MA PFI | 0-13.5 | 0.49-1.22 | 0.39 | 4.84 |

11) Throttle Position Sensor Voltage And Resistance Specification (Probe 2.2l)

| Throttle Opening | Volt | Ohm (Ω) |
|------------------|-------|------------------|
| 1/8 | 0.998 | 0.989 |
| 2/8 | 1.60 | 1.104 |
| 3/8 | 2.37 | 1.278 |
| 4/8 | 2.74 | 1.462 |
| 5/8 | 3.15 | 1.480 |

| | | |
|-----|------|-------|
| 6/8 | 3.43 | 1.459 |
| 7/8 | 3.60 | 1.144 |
| 8/8 | 4.02 | 1.072 |

12) Vane Type Air Flow Sensor Voltage Specification
(Probe 2.2I)

| Vane Throttle Opening | Volt(Change Range 15%) |
|-----------------------|------------------------|
| 1/8 | 3.24 |
| 2/8 | 5.60 |
| 3/8 | 5.62 |
| 4/8 | 5.83 |
| 5/8 | 6.02 |
| 6/8 | 6.57 |
| 7/8 | 7.46 |
| 8/8 | 7.87 |

13) Vane Type Air Flow Sensor Voltage Specification
(Probe 2.2I)

| Air Flux (M ³ /Hr.) | Volt |
|--------------------------------|------|
| 9 | 0.80 |
| 16 | 1.35 |
| 26 | 1.85 |
| 40 | 2.25 |
| 60 | 2.65 |
| 100 | 3.15 |
| 160 | 3.60 |
| 240 | 4.0 |
| 380 | 4.5 |

14) Crankshaft Position Sensor Resistance Value: 210-250 ω

15) Cylinder Identification Sensor Resistance Value: 210-260 ω

16) Heated Oxygen Sensor Voltage Value: 0.2-0.8 V

17) Knock Sensor Resistance Value(Except 2.2I Probe) :
>10 ω

18) Knock Sensor Resistance Value(2.2I Probe) : About 0.03 ω

19) Torque Convertor RPM sensor resistance Value(2.2I Probe) : 210-260 ω

20) Vehicle Speed Sensor Voltage Value: 1.5-6.5v

21) Throttle Position Sensor Voltage Specification
(Except 2.2I Probe)

| Applicable Types | Close | Full Open |
|------------------|----------|-----------|
| 4 Cylinder | 0.9-1.1v | 4.0v |

22) Throttle Position Sensor Voltage Specification(2.2I Probe)

| Red Line (Re.) Voltage | White Line (Throttle Close) Voltage | White Line (Throttle Full Open) Voltage |
|---------------------------|---|---|
| | | |

| | | |
|-----------|-----------|-----------|
| 4.50-4.59 | 0.37-0.54 | 3.58-4.23 |
| 4.60-4.69 | 0.38-0.55 | 3.66-4.32 |
| 4.70-4.79 | 0.39-0.56 | 3.74-4.41 |
| 4.80-4.89 | 0.40-0.57 | 3.82-4.51 |
| 4.90-4.99 | 0.40-0.58 | 3.90-4.60 |
| 5.00-5.09 | 0.41-0.60 | 3.97-4.70 |
| 5.10-5.19 | 0.42-0.61 | 4.05-4.79 |
| 5.20-5.29 | 0.43-0.62 | 4.13-4.88 |
| 5.30-5.39 | 0.44-0.63 | 4.21-4.98 |
| 5.40-5.49 | 0.44-0.64 | 4.29-5.07 |
| 5.50 | 0.44-0.66 | 4.29-5.17 |

2. 1991

Applicable Vehicle Types:

Ford: Crown Victoria, Escort, Mustang, Probe, Taurus, Tempo, Thunderbird

Lincoln: Continental, Mark VII, Town Car

Mercury: Cougar, Grand Marquis, Sable, Topaz, Tracer

1) Water Temperature Sensor Resistance Value Specification

| Temperature (°C) | Ohm (Ω) |
|------------------|-----------|
| 20 | 2200-2700 |
| 40 | 1000-1300 |
| 60 | 500-650 |
| 80 | 250-350 |

2) EGR Valve Position Sensor Voltage Specification

| EGR Valve Throttle Opening (%) | Volt |
|--------------------------------|-----------|
| 0 | 0.40-0.83 |
| 10 | 0.75-1.18 |
| 20 | 1.10-1.52 |
| 30 | 1.45-1.87 |
| 40 | 1.80-2.22 |
| 50 | 2.15-2.57 |
| 60 | 2.50-2.91 |
| 70 | 2.85-3.26 |
| 80 | 3.20-3.61 |
| 90 | 3.55-3.95 |
| 100 | 3.90-4.30 |

3) Oxygen Sensor Voltage Value

| Status | Voltage |
|--------------|------------|
| Acceleration | Raising |
| Deceleration | Depression |
| Idle | 0.2-0.8 |

4) Vane Type Air Flow Sensor Voltage Value

| Vane Throttle Opening | Volt(Change Range 15%) |
|-----------------------|------------------------|
| All Close | 3.90 |
| 1/8 | 3.24 |
| 2/8 | 5.60 |
| 3/8 | 5.62 |
| 4/8 | 5.83 |
| 5/8 | 6.02 |
| 6/8 | 6.57 |
| 7/8 | 7.46 |
| 8/8 | 7.87 |

5) Vane Type Intake Air Temperature Sensor Voltage Value
(Change Range 15%)

| Temperature (°C) | Voltage (V) |
|------------------|-------------|
| -6 | 3.64 |
| -1 | 3.36 |
| 4 | 3.05 |
| 7 | 2.79 |
| 10 | 2.29 |
| 16 | 2.61 |
| 21 | 2.35 |
| 27 | 2.05 |
| 32 | 1.76 |
| 38 | 1.57 |

6) Water Temperature Sensor, Intake Air Temperature Sensor Resistance And Voltage Specification
(Except 1.8/2.2/5.8l)

| Temperature (°C) | Voltage (V) | Ohm(Kw) |
|------------------|-------------|---------|
| 100 | 0.46 | 2.07 |
| 90 | 0.60 | 2.80 |
| 80 | 0.78 | 3.84 |
| 70 | 1.02 | 5.37 |
| 60 | 1.33 | 7.70 |
| 50 | 1.70 | 10.97 |
| 40 | 2.13 | 16.15 |
| 30 | 2.60 | 24.27 |
| 20 | 3.07 | 37.30 |
| 10 | 3.51 | 58.75 |

7) EGR Valve Position Sensor Voltage Specification
(2.2l Probe& California)

| Manifold Vacuum Limiter (Inch-Hg) | Volt |
|-----------------------------------|-------|
| 0 | 0.867 |
| 1 | 0.893 |
| 2 | 0.923 |
| 3 | 1.434 |
| 4 | 1.84 |
| 5 | 2.09 |
| 6 | 3.86 |
| 7 | 4.93 |

| | |
|---|------|
| 8 | 4.93 |
|---|------|

8) Quality Air Flow Sensor Signal Voltage

| Velocity (Mile/Hr.) | Volt |
|---------------------|------|
| Idle | 0.60 |
| 20 | 1.10 |
| 40 | 1.70 |
| 60 | 2.10 |

9) Manifold Absolute Pressure Sensor Frequency Specification

| Atmospheric Pressure (Inch-Hg) | Frequency (Hz) |
|--------------------------------|----------------|
| 17.1 | 122.4 |
| 18.3 | 125.5 |
| 19.5 | 128.7 |
| 20.7 | 131.9 |
| 21.8 | 135.1 |
| 23.0 | 138.3 |
| 24.2 | 141.8 |
| 25.4 | 145.4 |
| 26.6 | 148.9 |
| 27.7 | 152.5 |
| 28.9 | 156.1 |
| 30.1 | 159.6 |
| 31.0 | 162.4 |

10) Manifold Absolute Pressure Sensor Frequency Specification

| Manifold Vacuum Limiter (Inch-Hg) | Frequency (Hz) |
|-----------------------------------|----------------|
| 0 | 159 |
| 3 | 150 |
| 6 | 141 |
| 9 | 133 |
| 12 | 125 |
| 15 | 117 |
| 18 | 109 |
| 21 | 102 |
| 24 | 95 |
| 27 | 88 |
| 30 | 80 |

11) Throttle Position Sensor Voltage Value Specification

| Throttle Opening | Volt |
|------------------|------|
| 0 | 0.50 |
| 10 | 0.97 |
| 20 | 1.44 |
| 30 | 1.90 |
| 40 | 2.37 |
| 50 | 2.84 |
| 60 | 3.31 |
| 70 | 3.78 |

| | |
|----|------|
| 80 | 4.24 |
|----|------|

12) Manifold Absolute Pressure Sensor Voltage Output Specification

| Altitude (Feet) | Volt |
|-----------------|-----------|
| 0 | 1.55-1.63 |
| 1000 | 1.52-1.60 |
| 2000 | 1.49-1.57 |
| 3000 | 1.46-1.54 |
| 4000 | 1.43-1.51 |
| 5000 | 1.40-1.48 |
| 6000 | 1.37-1.45 |
| 7000 | 1.35-1.43 |

13) Pressure Feedback EGR Sensor Voltage Specification
(Change Range 15%)

| Pressure (PSI) | Volt |
|----------------|------|
| 1.82 | 4.75 |
| 1.36 | 4.38 |
| 0.91 | 4.00 |
| 0.46 | 3.63 |
| 0.0 | 3.25 |
| -2.47 | 1.22 |
| -3.63 | 0.25 |

14) Triangle Pressure Feedback EGR Sensor Voltage Specification (Change Range 15%)

| Pressure (PSI) | Volt |
|----------------|------|
| 4.34 | 4.56 |
| 3.25 | 3.54 |
| 2.17 | 2.51 |
| 1.08 | 1.48 |
| 0.0 | 0.45 |

15) Cylinder Identification Sensor No.2 Resistance Value
(2.2l Turbo) : 210-260 ω

16) Heated Oxygen Sensor Voltage Value Specification

| Status | Voltage |
|--------------|------------|
| Rev Increase | Raising |
| Rev Decrease | Depression |
| Idle | 0.2-0.6 |

17) Knock Sensor Voltage Value(2.2l Turbo) : >0.03 V

18) Manual Joy Stick Position Sensor Voltage And Resistance Specification
(Change Range 15%)

| Position | Volt | Ohm (Ω) |
|----------|------|------------------|
| P | 4.41 | 4160 |
| R | 3.60 | 1440 |
| N | 2.83 | 2733 |
| D | 2.09 | 401 |
| 1 | 0.68 | 81 |

19) Transmission Oil Temperature Sensor Voltage And Resistance Specification (Change Range 15%)

| Temperature (°C) | Voltage (V) | Ohm (Ω) |
|------------------|-------------|---------|
| 0 | 3.88 | 96255 |
| 5 | 3.71 | 75201 |
| 10 | 3.53 | 59175 |
| 15 | 3.32 | 46883 |
| 20 | 3.10 | 37387 |
| 25 | 2.86 | 30000 |
| 30 | 2.62 | 24215 |
| 35 | 2.38 | 19657 |
| 40 | 2.15 | 16043 |
| 45 | 1.92 | 13161 |
| 50 | 1.71 | 10050 |
| 55 | 1.51 | 8990 |
| 60 | 1.33 | 7387 |
| 65 | 1.17 | 6265 |
| 70 | 1.03 | 5260 |
| 75 | 0.90 | 4450 |
| 80 | 0.78 | 3775 |
| 85 | 0.69 | 3215 |
| 90 | 0.60 | 2750 |
| 95 | 0.52 | 2361 |

20) Electron Vacuum Adjustment Sensor Resistance Value

| Displacement | Ohm (Ω) |
|--------------|---------|
| 5.8l | 20-45 |

21) Throttle Position Sensor Voltage Specification
(Except 2.2l Probe)

| Applicable Types | Close | Full Open |
|------------------|--------|-----------|
| 1.8l A/T&2.2l | 0.99v | 4.02v |
| 1.9l | 0.34v | 4.84v |
| 2.3l HSC | 0.20 V | 4.84 V |
| 2.3l OHC | 0.34 V | 4.84 V |
| 2.5l | 0.39 V | 4.84 V |

22) Knock Sensor Voltage Value(2.2l Turbo) : > 0.03v

3. 1992

Applicable Vehicle Types:

Ford: Crown Victoria, Escort, Mustang, Probe, Taurus, Tempo, Thunderbird

Lincoln: Continental, Mark Vii, Town Car

Mercury: Cougar, Grand Marquis, Sable, Topaz, Tracer

1) Water Temperature Sensor Resistance Value Specification

| Temperature (°C) | Ohm (Ω) |
|------------------|-----------|
| 20 | 2200-2700 |
| 40 | 1000-1300 |

| | |
|----|---------|
| 60 | 500-650 |
| 80 | 250-350 |

2) EGR Valve Position Sensor Voltage Specification
(Change Range 15%)

| EGR Valve Throttle Opening (%) | Volt |
|--------------------------------|------|
| 0 | 0.40 |
| 10 | 0.75 |
| 20 | 1.10 |
| 30 | 1.45 |
| 40 | 1.80 |
| 50 | 2.15 |
| 60 | 2.50 |
| 70 | 2.85 |
| 80 | 3.20 |
| 90 | 3.55 |
| 100 | 3.90 |

3) Oxygen Sensor Voltage Value Specification

| Status | Voltage |
|--------------|------------|
| Acceleration | Raising |
| Deceleration | Depression |
| Idle | 0.2-0.8 |

4) Vane Type Air Flow Sensor Voltage Value

| Vane Throttle Opening | Volt(Change Range 15%) |
|-----------------------|------------------------|
| All Close | 3.90 |
| 1/8 | 3.24 |
| 2/8 | 5.60 |
| 3/8 | 5.62 |
| 4/8 | 5.83 |
| 5/8 | 6.02 |
| 6/8 | 6.57 |
| 7/8 | 7.46 |
| 8/8 | 7.87 |

5) Vane Type Intake Air Temperature Sensor Voltage Value
(Change Range 15%)

| Temperature (°C) | Voltage (V) |
|------------------|-------------|
| -6 | 3.64 |
| -1 | 3.36 |
| 4 | 3.05 |
| 7 | 2.79 |
| 10 | 2.29 |
| 16 | 2.61 |
| 21 | 2.35 |
| 27 | 2.05 |
| 32 | 1.76 |
| 38 | 1.57 |

6) Water Temperature Sensor, Intake Air Temperature Sensor Resistance And Voltage Specification

(Change Range 15%)

| Temperature (°C) | Voltage (V) | Ohm(K ω) |
|------------------|-------------|------------------|
| 100 | 0.46 | 2.07 |
| 90 | 0.60 | 2.80 |
| 80 | 0.78 | 3.84 |
| 70 | 1.02 | 5.37 |
| 60 | 1.33 | 7.70 |
| 50 | 1.70 | 10.97 |
| 40 | 2.13 | 16.15 |
| 30 | 2.60 | 24.27 |
| 20 | 3.07 | 37.30 |
| 10 | 3.51 | 58.75 |

7) EGR Valve Position Sensor Voltage Specification

| Manifold Vacuum Limiter (Inch-Hg) | Volt |
|--------------------------------------|-------|
| 0 | 0.867 |
| 1 | 0.893 |
| 2 | 0.923 |
| 3 | 1.434 |
| 4 | 1.84 |
| 5 | 2.09 |
| 6 | 3.86 |
| 7 | 4.93 |
| 8 | 4.93 |

8) Quality Air Flow Sensor Signal Voltage

| Velocity (Mile/Hr.) | Volt |
|---------------------|------|
| Idle | 0.60 |
| 20 | 1.10 |
| 40 | 1.70 |
| 60 | 2.10 |

9) Manifold Absolute Pressure Sensor Frequency Specification (Change Range 15%)

| Atmospheric Pressure (Inch-Hg) | Frequency (Hz) |
|-----------------------------------|----------------|
| 17.1 | 122.4 |
| 18.3 | 125.5 |
| 19.5 | 128.7 |
| 20.7 | 131.9 |
| 21.8 | 135.1 |
| 23.0 | 138.3 |
| 24.2 | 141.8 |
| 25.4 | 145.4 |
| 26.6 | 148.9 |
| 27.7 | 152.5 |
| 28.9 | 156.1 |
| 30.1 | 159.6 |
| 31.0 | 162.4 |

10) Manifold Absolute Pressure Sensor Frequency Specification (Change Range 15%)

| Manifold Vacuum Limiter (Inch-Hg) | Frequency (Hz) |
|--------------------------------------|----------------|
| 0 | 159 |
| 3 | 150 |
| 6 | 141 |
| 9 | 133 |
| 12 | 125 |
| 15 | 117 |
| 18 | 109 |
| 21 | 102 |
| 24 | 95 |
| 27 | 88 |
| 30 | 80 |

11) Throttle Position Sensor Voltage Value Specification
(Except 1.8l&2.2l)

| Throttle Opening | Volt |
|------------------|------|
| 0 | 0.50 |
| 10 | 0.97 |
| 20 | 1.44 |
| 30 | 1.90 |
| 40 | 2.37 |
| 50 | 2.84 |
| 60 | 3.31 |
| 70 | 3.78 |
| 80 | 4.24 |

12) Manifold Absolute Pressure Sensor Voltage Output Specification

| Altitude (Feet) | Volt |
|-----------------|-----------|
| 0 | 1.55-1.63 |
| 1000 | 1.52-1.60 |
| 2000 | 1.49-1.57 |
| 3000 | 1.46-1.54 |
| 4000 | 1.43-1.51 |
| 5000 | 1.40-1.48 |
| 6000 | 1.37-1.45 |
| 7000 | 1.35-1.43 |

13) Pressure Feedback EGR Sensor Voltage Specification
(Change Range 15%)

| Pressure (PSI) | Volt |
|----------------|------|
| 1.82 | 4.75 |
| 1.36 | 4.38 |
| 0.91 | 4.00 |
| 0.46 | 3.63 |
| 0.0 | 3.25 |
| -2.47 | 1.22 |
| -3.63 | 0.25 |

14) Triangle Pressure Feedback EGR Sensor Voltage Specification(Change Range 15%)

| Pressure (PSI) | Vacuum (Inch-Hg) | Volt |
|----------------|------------------|------|
|----------------|------------------|------|

| | | |
|------|------|------|
| 4.34 | 8.83 | 4.56 |
| 3.25 | 6.62 | 3.54 |
| 2.17 | 4.41 | 2.51 |
| 1.08 | 2.21 | 1.48 |
| 0.0 | 0 | 0.45 |

15) Cylinder Identification Sensor No.2 Resistance Value (2.2l Turbo) : 210-260 ω

16) Heated Oxygen Sensor Voltage Value Specification

| | |
|--------------|------------|
| Status | Voltage |
| Acceleration | Raising |
| Deceleration | Depression |
| Idle | 0.2-0.6 |

17) Knock Sensor Voltage Value(2.2l Turbo) : >0.03 V

18) Manual Joy Stick Position Sensor Resistance Specification

| | |
|-------------------|------------------|
| Position | Ohm (Ω) |
| R | 3770-4607 |
| P | 1304-1593 |
| N | 660-807 |
| D(Overspeed Gear) | 361-442 |
| D | 190-232 |
| 1 | 78-95 |

19) Transmission Oil Temperature Sensor Voltage And Resistance Specification (Change Range 15%)

| | | |
|-----------------------------|-------------|------------------|
| Temperature ($^{\circ}$ C) | Voltage (V) | Ohm (Ω) |
| 0 | 3.88 | 96255 |
| 5 | 3.71 | 75201 |
| 10 | 3.53 | 59175 |
| 15 | 3.32 | 46883 |
| 20 | 3.10 | 37387 |
| 25 | 2.86 | 30000 |
| 30 | 2.62 | 24215 |
| 35 | 2.38 | 19657 |
| 40 | 2.15 | 16043 |
| 45 | 1.92 | 13161 |
| 50 | 1.71 | 10050 |
| 55 | 1.51 | 8990 |
| 60 | 1.33 | 7387 |
| 65 | 1.17 | 6265 |
| 70 | 1.03 | 5260 |
| 75 | 0.90 | 4450 |
| 80 | 0.78 | 3775 |
| 85 | 0.69 | 3215 |
| 90 | 0.60 | 2750 |
| 95 | 0.52 | 2361 |

20) Vane Type Intake Air Temperature Sensor Resistance Value(Change Range 15%)

| | |
|-----------------------------|------------------|
| Temperature ($^{\circ}$ C) | Ohm (Ω) |
| -20 | 15000 |
| 0 | 5210 |

| | |
|----|------|
| 20 | 2500 |
| 40 | 1100 |
| 60 | 600 |
| 80 | 300 |

21) Throttle Position Sensor Voltage And Resistance Specification (1.8l A/T&2.2l)

| Throttle Opening | Volt | Ohm (Ω) |
|------------------|-------|------------------|
| 1/8 | 0.998 | 0.989 |
| 2/8 | 1.60 | 1.104 |
| 3/8 | 2.37 | 1.278 |
| 4/8 | 2.74 | 1.462 |
| 5/8 | 3.15 | 1.480 |
| 6/8 | 3.43 | 1.459 |
| 7/8 | 3.60 | 1.144 |
| 8/8 | 4.02 | 1.072 |

22) Knock Sensor Voltage Value(2.2l Turbo) : > 0.03v

4. 1993

Applicable Vehicle Types:

Ford: Crown Victoria, Escort, Mustang, Probe, Taurus, Tempo, Thunderbird

Lincoln: Continental, Mark VIII, Town Car

Mercury: Cougar, Grand Marquis, Sable, Topaz, Tracer

1) Water Temperature Sensor Resistance Value Specification

| Temperature ($^{\circ}\text{C}$) | Ohm (Ω) |
|------------------------------------|------------------|
| 20 | 2200-2700 |
| 40 | 1000-1300 |
| 60 | 500-650 |
| 80 | 250-350 |

2) Engine Cooling Fan Coolant Temperature Sensor Resistance Specification

| Temperature ($^{\circ}\text{C}$) | Ohm (Ω) |
|------------------------------------|------------------|
| 91 | 1700-1840 |
| 97 | 1420-1530 |
| 108 | 1030-1110 |

3) Heated Oxygen Sensor Voltage Value Specification

| Status | Voltage |
|-------------------------------------|---------|
| Acceleration | 0.5-1.0 |
| Rev Decrease | 0-0.5 |
| Idle(cold engine) | 0 |
| Idle(heat engine) | 0-1 |
| Ignition Switch On, Engine Turn Off | 0 |

4) Vane Type Air Flow Sensor Voltage Value

| Vane Throttle Opening | Volt(Change Range 15%) |
|-----------------------|------------------------|
|-----------------------|------------------------|

| | |
|-----------|------|
| All Close | 3.90 |
| 1/8 | 3.24 |
| 2/8 | 5.60 |
| 3/8 | 5.62 |
| 4/8 | 5.83 |
| 5/8 | 6.02 |
| 6/8 | 6.57 |
| 7/8 | 7.46 |
| 8/8 | 7.87 |

5) Barometric Pressure Sensor Voltage Value

| | |
|------------------|------|
| Vacuum (Inch-Hg) | Volt |
| 0 | 3.9 |
| 4 | 3.6 |
| 8 | 3.1 |
| 12 | 2.5 |
| 16 | 2.0 |
| 20 | 1.5 |
| 24 | 0.9 |
| 28 | 0.4 |

6) Water Temperature Sensor, Intake Air Temperature Sensor Resistance And Voltage Specification(Change Range 15%)

| Temperature (°C) | Voltage (V) | Ohm(K ω) |
|------------------|-------------|------------------|
| 100 | 0.46 | 2.07 |
| 90 | 0.60 | 2.80 |
| 80 | 0.78 | 3.84 |
| 70 | 1.02 | 5.37 |
| 60 | 1.33 | 7.70 |
| 50 | 1.70 | 10.97 |
| 40 | 2.13 | 16.15 |
| 30 | 2.60 | 24.27 |
| 20 | 3.07 | 37.30 |
| 10 | 3.51 | 58.75 |

7) Intake Air Temperature Sensor Resistance Value Specification

| Temperature (°C) | Ohm (Ω) |
|------------------|------------------|
| 1.8 &2.5 | |
| 0 | 10000-20000 |
| 20 | 2000-3000 |
| 40 | 900-1300 |
| 2.0 A/T | |
| 0 | 72100-79400 |
| 13 | 54300-58600 |
| 25 | 29700-36300 |
| 43 | 17900-19300 |

8) Quality Air Flow Sensor Voltage

| | |
|--------|------|
| Status | Volt |
|--------|------|

| | |
|--------------------|---------|
| Engine Running | 1.5-5.0 |
| Ignition Switch On | 1.0-1.5 |
| Idle | 0.6 |
| 20 Mile/Hr. | 1.1 |
| 40 Mile/Hr. | 1.7 |
| 60 Mile/Hr. | 2.1 |

9) Manifold Absolute Pressure Sensor Frequency Specification (Change Range 15%)

| Atmospheric Pressure (Inch-Hg) | Frequency (Hz) |
|-----------------------------------|----------------|
| 17.1 | 122.4 |
| 18.3 | 125.5 |
| 19.5 | 128.7 |
| 20.7 | 131.9 |
| 21.8 | 135.1 |
| 23.0 | 138.3 |
| 24.2 | 141.8 |
| 25.4 | 145.4 |
| 26.6 | 148.9 |
| 27.7 | 152.5 |
| 28.9 | 156.1 |
| 30.1 | 159.6 |
| 31.0 | 162.4 |

10) Manifold Absolute Pressure Sensor Frequency Specification (Change Range 15%)

| Manifold Vacuum Limiter (Inch-Hg) | Frequency (Hz) |
|--------------------------------------|----------------|
| 0 | 159 |
| 3 | 150 |
| 6 | 141 |
| 9 | 133 |
| 12 | 125 |
| 15 | 117 |
| 18 | 109 |
| 21 | 102 |
| 24 | 95 |
| 27 | 88 |
| 30 | 80 |

11) Throttle Position Sensor Voltage Value Specification
(Except 1.8l&2.2l)

| Throttle Opening | Volt |
|------------------|------|
| 0 | 0.50 |
| 10 | 0.97 |
| 20 | 1.44 |
| 30 | 1.90 |
| 40 | 2.37 |
| 50 | 2.84 |
| 60 | 3.31 |
| 70 | 3.78 |

| | |
|----|------|
| 80 | 4.24 |
|----|------|

12) Manifold Absolute Pressure Sensor Voltage Output Specification

| Altitude (Feet) | Volt |
|-----------------|-----------|
| 0 | 1.55-1.63 |
| 1000 | 1.52-1.60 |
| 2000 | 1.49-1.57 |
| 3000 | 1.46-1.54 |
| 4000 | 1.43-1.51 |
| 5000 | 1.40-1.48 |
| 6000 | 1.37-1.45 |
| 7000 | 1.35-1.43 |

13) Pressure Feedback EGR Sensor Voltage Specification (Change Range 15%)

| Pressure (PSI) | Vacuum (Inch-Hg) | Volt |
|----------------|------------------|------|
| 1.82 | 3.70 | 4.75 |
| 1.36 | 2.79 | 4.38 |
| 0.91 | 1.85 | 4.00 |
| 0.46 | 0.94 | 3.63 |
| 0.0 | 0 | 3.25 |
| -2.47 | -5.03 | 1.22 |
| -3.63 | -7.40 | 0.25 |

14) Triangle Pressure Feedback EGR Sensor Voltage Specification(Change Range 15%)

| Pressure (PSI) | Vacuum (Inch-Hg) | Volt |
|----------------|------------------|------|
| 4.34 | 8.83 | 4.56 |
| 3.25 | 6.62 | 3.54 |
| 2.17 | 4.41 | 2.51 |
| 1.08 | 2.21 | 1.48 |
| 0.0 | 0 | 0.45 |

15) Activity Fuel Sensor Voltage Output Frequency Specification

| Methanol Percentage | Frequency |
|---------------------|-----------|
| 0 | 30-70 |
| 10 | 40-80 |
| 20 | 50-80 |
| 30 | 60-100 |
| 40 | 70-110 |
| 50 | 80-120 |
| 60 | 90-130 |
| 70 | 100-140 |
| 80 | 110-150 |
| 90 | 120-160 |
| 100 | 130-170 |

16) Manual Joy Stick Position Sensor Resistance Specification

| Position | Ohm (Ω) |
|-------------------|-----------|
| R | 3770-4607 |
| P | 1304-1593 |
| N | 660-807 |
| D(Overspeed Gear) | 361-442 |
| D | 190-232 |

| | |
|---|-------|
| 1 | 78-95 |
|---|-------|

17) EGR Temperature Sensor Resistance Specification

| Temperature (°C) | Ohm (Ω) |
|------------------|---------------|
| 20 | 182000-336000 |
| 30 | 112000-165000 |
| 41 | 41300-47600 |
| 52 | 7500-10500 |

18) EGR Valve Position Sensor Voltage Specification

| Vacuum (Inch-Hg) | Volt |
|------------------|------|
| 0 | 0.8 |
| 6 | 5.0 |

19) Transmission Oil Temperature Sensor Voltage And Resistance Specification (Change Range 15%)

| Temperature (°C) | Voltage(V) | Resistance(Ohm) |
|-------------------------|------------|-----------------|
| Escort&Tracer | | |
| 0 | 4.82 | 52000 |
| 20 | 4.61 | 23000 |
| 40 | 4.26 | 11000 |
| 60 | 3.74 | 5600 |
| 100 | 2.40 | 1710 |
| All Other Vehicle Types | | |
| 0 | 3.88 | 96255 |
| 15 | 3.32 | 46883 |
| 40 | 2.15 | 16043 |
| 70 | 1.03 | 5260 |
| 90 | 0.60 | 2750 |

20) Vane Type Intake Air Temperature Sensor Resistance Value (Change Range 15%)

| Temperature (°C) | Ohm (Ω) |
|------------------|---------|
| -20 | 15000 |
| 0 | 5210 |
| 20 | 2500 |
| 40 | 1100 |
| 60 | 600 |
| 80 | 300 |

21) Throttle Position Sensor Voltage And Resistance Specification(Change Range 15%)

| Throttle Opening | Volt | Ohm (Ω) |
|------------------|-------|---------|
| 1.8I A/T | | |
| 1/8 | 0.998 | 0.989 |
| 2/8 | 1.60 | 1.104 |
| 3/8 | 2.37 | 1.278 |
| 4/8 | 2.74 | 1.462 |
| 5/8 | 3.15 | 1.480 |
| 6/8 | 3.43 | 1.459 |
| 7/8 | 3.60 | 1.144 |
| 8/8 | 4.02 | 1.072 |

| 2.0l A/T&2.5l | | |
|---------------|-----|-----|
| All Close | 0.5 | 0.4 |
| 1/4 | 1.3 | 0.6 |
| 1/2 | 2.2 | 1.6 |
| 3/4 | 2.9 | 2.2 |
| Full Open | 3.7 | 3.0 |

5. 1994

Applicable Vehicle Types:

Ford: Crown Victoria, Escort, Mustang, Probe, Taurus, Tempo, Thunderbird

Lincoln: Continental, Mark VIII, Town Car

Mercury: Cougar, Grand Marquis, Sable, Topaz, Tracer

1) Water Temperature Sensor Resistance Value Specification

| Temperature (°C) | Ohm (Ω) |
|------------------|-----------|
| 20 | 2200-2700 |
| 40 | 1000-1300 |
| 60 | 500-650 |
| 80 | 250-350 |

2) Oxygen Sensor Voltage Value Specification

| Status | Voltage |
|-------------------------------------|---------|
| Acceleration | 0.5-1.0 |
| Rev Decrease | 0-0.5 |
| Idle(cold engine) | 0 |
| Idle(heat engine) | 0-1 |
| Ignition Switch On, Engine Turn Off | 0 |

3) Vane Type Air Flow Sensor Voltage Value

| Vane Throttle Opening | Volt(Change Range 15%) |
|-----------------------|------------------------|
| All Close | 3.90 |
| 1/8 | 3.24 |
| 2/8 | 5.60 |
| 3/8 | 5.62 |
| 4/8 | 5.83 |
| 5/8 | 6.02 |
| 6/8 | 6.57 |
| 7/8 | 7.46 |
| 8/8 | 7.87 |

4) Barometric Pressure Sensor Output Frequency

| Atmospheric Pressure (Inch-Hg) | Frequency (Hz) |
|--------------------------------|----------------|
| 17.1 | 122.4 |
| 18.3 | 125.5 |
| 19.5 | 128.7 |
| 20.7 | 131.9 |
| 21.8 | 135.1 |

| | |
|------|-------|
| 23.0 | 138.3 |
| 24.2 | 141.8 |
| 25.4 | 145.4 |
| 26.6 | 148.9 |
| 27.7 | 152.5 |
| 28.9 | 156.1 |
| 30.1 | 159.6 |
| 31.0 | 162.4 |

5) Water Temperature Sensor, Intake Air Temperature Sensor Resistance And Voltage Specification(Change Range 15%)

| Temperature (°C) | Voltage (V) | Ohm(K ω) |
|------------------|-------------|------------------|
| 100 | 0.46 | 2.07 |
| 90 | 0.60 | 2.80 |
| 80 | 0.78 | 3.84 |
| 70 | 1.02 | 5.37 |
| 60 | 1.33 | 7.70 |
| 50 | 1.70 | 10.97 |
| 40 | 2.13 | 16.15 |
| 30 | 2.60 | 24.27 |
| 20 | 3.07 | 37.30 |
| 10 | 3.51 | 58.75 |

6) Quality Air Flow Sensor Voltage

| Status | Volt |
|-------------|------|
| Idle | 0.6 |
| 20 Mile/Hr. | 1.1 |
| 40 Mile/Hr. | 1.7 |
| 60 Mile/Hr. | 2.1 |

7) Throttle Position Sensor Voltage Value Specification

| Throttle Opening | Volt |
|------------------|------|
| 0 | 0.50 |
| 13 | 1.21 |
| 26 | 1.82 |
| 39 | 2.43 |
| 52 | 3.03 |
| 65 | 3.65 |
| 78 | 4.26 |

8) Pressure Feedback EGR&Pressure Difference Feedback Sensor Voltage Specification(Change Range 15%)

| Pressure (PSI) | Vacuum (Inch-Hg) | Volt |
|----------------|------------------|------|
| 4.34 | 8.83 | 4.56 |
| 3.25 | 6.62 | 3.54 |
| 2.17 | 4.41 | 2.51 |
| 1.08 | 2.21 | 1.48 |
| 0.0 | 0 | 0.45 |

9) Activity Fuel Sensor Output Frequency Specification

| Methanol Percentage | Frequency |
|---------------------|-----------|
| 0 | 30-70 |
| 10 | 40-80 |
| 20 | 50-80 |
| 30 | 60-100 |
| 40 | 70-110 |
| 50 | 80-120 |
| 60 | 90-130 |
| 70 | 100-140 |
| 80 | 110-150 |
| 90 | 120-160 |
| 100 | 130-170 |

10) Manual Joy Stick Position Sensor Resistance Specification

| Position | Ohm (Ω) |
|-------------------|------------------|
| R | 3770-4607 |
| P | 1304-1593 |
| N | 660-807 |
| D(Overspeed Gear) | 361-442 |
| D | 190-232 |
| 1 | 78-95 |

11) EGR Temperature Sensor Resistance Specification

| Temperature ($^{\circ}\text{C}$) | Ohm (Ω) |
|------------------------------------|------------------|
| 20 | 182000-336000 |
| 30 | 112000-165000 |
| 41 | 41300-47600 |
| 52 | 7500-10500 |

12) EGR Valve Position Sensor Voltage Specification

| Vacuum (Inch-Hg) | Volt |
|------------------|------|
| 0 | 0.8 |
| 6 | 5.0 |

13) Transmission Oil Temperature Sensor Voltage And Resistance Specification(Change Range 15%)

| Temperature ($^{\circ}\text{C}$) | Voltage (Volt) | Resistance (Ohm) |
|------------------------------------|----------------|------------------|
| Escort&Tracer | | |
| 0 | 4.82 | 52000 |
| 20 | 4.61 | 23000 |
| 40 | 4.26 | 11000 |
| 60 | 3.74 | 5600 |
| 100 | 2.40 | 1710 |
| All Other Vehicle Types | | |
| 0 | 3.88 | 96255 |
| 15 | 3.32 | 46883 |
| 40 | 2.15 | 16043 |
| 70 | 1.03 | 5260 |
| 90 | 0.60 | 2750 |

14) Throttle Position Sensor Voltage And Resistance Specification(Change Range 15%)

| Throttle Opening | Volt | Ohm (Ω) |
|------------------|-------|------------------|
| 1.8l A/T | | |
| 1/8 | 0.998 | 0.989 |
| 2/8 | 1.60 | 1.104 |
| 3/8 | 2.37 | 1.278 |
| 4/8 | 2.74 | 1.462 |
| 5/8 | 3.15 | 1.480 |
| 6/8 | 3.43 | 1.459 |
| 7/8 | 3.60 | 1.144 |
| 8/8 | 4.02 | 1.072 |
| 2.0l A/T&2.5l | | |
| All Close | 0.5 | 0.4 |
| 1/4 | 1.3 | 0.6 |
| 1/2 | 2.2 | 1.6 |
| 3/4 | 2.9 | 2.2 |
| Full Open | 3.7 | 3.0 |

15) Intake Air Temperature Sensor Resistance Value Specification

| Temperature ($^{\circ}\text{C}$) | Ohm (Ω) |
|------------------------------------|------------------|
| 0 | 4000-7000 |
| 20 | 2000-3000 |
| 40 | 900-1300 |
| 60 | 400-700 |

16) Quality Air Flow Sensor Voltage : 0.36-1.50 V

17) Vehicle Speed Sensor Resistance Value: 190-250 ω

18) Throttle Position Sensor Resistance And Voltage Value(1.8l,2.0l&2.5l)

| Throttle Opening | Volt | Ohm (Ω) |
|------------------|------|------------------|
| All Close | 0.5 | 400 |
| 1/4 | 1.3 | 600 |
| 1/2 | 2.2 | 1600 |
| 3/4 | 2.9 | 2200 |
| Full Open | 3.7 | 3000 |

19) Throttle Position Sensor Resistance And Voltage Value
(Except 1.8l,2.0l&2.5l)

| Throttle Opening | Volt(Change Range 15%) |
|------------------|------------------------|
| 0 | 0.50 |
| 10 | 0.97 |
| 20 | 1.44 |
| 30 | 1.90 |
| 40 | 2.37 |
| 50 | 2.84 |
| 60 | 3.31 |
| 70 | 3.78 |
| 80 | 4.24 |

6. 1995

Applicable Vehicle Types: