

THE TOOL COMPANY

FORD FAULT CODE READER

■ STOCK Nos.68082
68080

■ PART Nos.FCR-FORD-3PIN
FCR-FORD-5PIN

• INSTRUCTIONS •

IMPORTANT: PLEASE READ THESE INSTRUCTIONS CAREFULLY TO ENSURE THE SAFE AND EFFECTIVE USE OF THIS TOOL.



GENERAL INFORMATION

This manual has been compiled by Draper Tools and is an integrated part of the product with which it is enclosed and should be kept with it for future references.

This manual describes the purpose for which the product has been designed and contains all the necessary information to ensure its correct and safe use. We recommend that this manual is read before any operation or, before performing any kind of adjustment to the product and prior to any maintenance tasks. By following all the general safety instructions contained in this manual, it will ensure both product and operator safety, together with longer life of the tool itself.

All photographs and drawings in this manual are supplied by Draper Tools to help illustrate the operation of the product.

Whilst every effort has been made to ensure accuracy of information contained in this manual, the Draper Tools policy of continuous improvement determines the right to make modifications without prior warning.



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THE TOOL COMPANY

GUARANTEE

Draper Tools have been carefully tested and inspected before shipment and are guaranteed to be free from defective materials and workmanship for a period of 12 months from the date of purchase except where tools are hired out when the guarantee period is ninety days from the date of purchase.

Should the machine develop any fault, please return the complete tool to your nearest authorized warranty repair agent or contact Draper Tools Limited, Chandler's Ford, Eastleigh, Hampshire, SO53 1YF, England. Telephone: (023) 8026 6355.

If upon inspection it is found that the fault occurring is due to defective materials or workmanship, repairs will be carried out free of charge. This guarantee does not apply to normal wear and tear, nor does it cover any damage caused by misuse, careless or unsafe handling, alterations, accident, or repairs attempted or made by any personnel other than the authorised Draper warranty repair agent.

This guarantee applies in lieu of any other guarantee expressed or implied and variations of its terms are not authorised.

Your Draper guarantee is not effective unless you can produce upon request a dated receipt or invoice to verify your proof of purchase within the 12 month period.

Please note that this guarantee is an additional benefit and does not affect your statutory rights.

Draper Tools Limited.



SPECIFICATION

The Draper Tools policy of continuous improvement determines the right to change specification without notice.

Stock No. 68082 68080
 Part No..... FCR-FORD-3PIN FCR-FORD-5PIN
 Vehicle Ford (petrol engines) Ford (petrol engines)

SUITABLE FOR:

Stock No.68082: FIESTA, ESCORT, ORION, SIERRA, SAPPHIRE, GRANADA, SCORPIO.
 Catalyst/Non Catalyst 1984/86-95 1.3 HCS CFI, 1.1/1.3/1.4/1.6/1.8 CVH EFI. 1.6/1.6
 Turbo CVH EFI (exc. 1.6 CVH EFI & Turbo KE Jetronic) 2.0 DOHC & OHC EFI Catalyst, 2.4
 V6/2.9 V6 & 24V Catalyst. TRANSIT 2.0 OHC CFI 1986>, 2.0 OHC 1992>, 2.9 V6 1992>
 ESCORT, ORION, MONDEO. 1.6/1.8/2.0 Zeta engines <1995

Stock No.68080: (FUEL INJECTION EEC IV E.C.U.) COSWORTH 2.0 (WEBER/MARELLI)
 1986-1990 4X4 1990-1992 ESCORT, ORION 1.6 CVH (KE Jetronic) 1986-1990. SIERRA,
 SAPPHIRE 2.0 OHC Non Catalyst, 2.8 V6 1986 2.9 V6 Non Catalyst. GRANADA, SCORPIO
 2.0 OHC & 2.4 V6 Non Catalyst. 2.8 V6 1986, 2.9 V6 EFI Non Catalyst. TRANSIT 2.0 OHC
 CFI/EFI, 2.9 V6 EFI Non Catalyst.



SAFETY WARNING

Please read the following instructions carefully, failure to do so could lead to personal injury or damage to the vehicle.

1. Avoid a dangerous environment. Do not expose the fault code reader to rain, ensure the work area is well lit. Always store the code reader in its case when it is not in use.
2. When using this code reader on a vehicle it may involve carrying out tests with the engine running and the following points should be followed to avoid injury.
 - a) Wear proper clothing - do not wear loose clothing, neckties (rings, wrist watches) which could catch in moving parts. Non slip footwear is recommended. Wear a protective hair covering to contain long hair. Roll long sleeves above the elbow.
 - b) Do not over-reach - keep proper footing and balance at all times.
3. Never leave the code reader unattended when switched ON in a testing mode or when the code reader is carrying out test procedures. Always switch the code reader and vehicle's ignition off.
4. Always switch the engine off before leaving the vehicle.
5. Ensure the code reader is secure before starting any testing.
6. Check that all cables are kept clear of hot/moving parts.
7. Only run the engine in a well-ventilated non confined area. Do not inhale exhaust gases, as they are dangerous and can be fatal.
8. If working on a vehicle that requires jacking up, ensure the vehicle is well supported with suitable axle stands on a level surface and that the wheels are chocked.
9. When starting the vehicle ensure it is in neutral with the handbrake applied. Automatics, ensure the gearbox is in neutral/park and the parking brake is applied.

OPERATION AND USE

INTRODUCTION:

The Engine Control Unit (ECU) fitted to the majority of Ford vehicles are Ford EEC IV type.

NOTE: Ford IV from 1988 is equipped KAM (Keep Alive Memory).

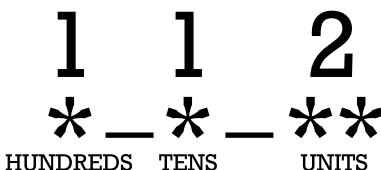
The Ford SD connector is located in the engine bay near the bulkhead/battery. Depending on the vehicle the self diagnosis connector will be a 3 pin plug or a 5 pin plug.

UNDERSTANDING A FAULT CODE:

The two digit fault code will be represented by two series of one second flashes, separated by a short pause. The first series indicate the tens and the second indicates the units. For example;

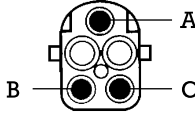


The three digit fault code will be represented by three series of one second flashes, separated by a short pause. The first series indicate the hundreds, the second indicates the tens and so on; For example.



OPERATION AND USE

The 3 pin and 5 pin connector will be located in the engine bay near the bulkhead/battery, on some vehicles it may be located near the front N/S/F wing.



A - Red
B - Yellow
C - Blue

With the fault code reader in the 'O' position connect the lead to the 3/5 pin connector. Switch the ignition 'ON' but do not start the engine. Switch the fault code reader into the '-' position and wait approx. 10 seconds for the fault codes to begin transmitting. Each fault code is transmitted twice. After the initial codes, the faults stored in the KAM will be displayed.

NOTE: Soft faults are past faults recorded in the last 10-40 driving cycles, but are not current at time of test.

Hard faults are stored in the KAM and are currently occurring during testing.

DRIVING CYCLE: The engine starting when <49°C and run until >65°C is reached.

When the KAM codes have been displayed the mode for checking for loose connections in the ECU comes into effect. During this mode, moving the connectors and wiring will illuminate the LED, if any poor/bad connections are detected. This will also log a fault in the KAM.

NOTE: If the fault code reader is switched 'OFF' during this test procedure the KAM codes will be erased.

When testing is complete switch 'OFF' the vehicles ignition, followed by the fault code reader.

READING FAULT CODES:

There are three test procedures;

Ignition on, engine off.

Ignition on, engine on.

Service mode.

Depending on the model/ECU the SD (Self Diagnosis) connector will be either a 3 pin or a 5 pin plug and the fault code either a 2 digit or 3 digit flash code.

2 DIGIT FAULT CODES:

IGNITION 'ON', ENGINE 'OFF'.

NOTE: Before carrying out these tests, disconnect the white octane and idle adjust wires from earth (for the location of this plug refer to the vehicle manufacturer's handbook or Haynes manual). Failure to remove this connection will cause, fault 53 and 54 to be falsely introduced into the memory.

Connect the FCR lead to the vehicle's SD connector.



OPERATION AND USE

IGNITION 'ON', ENGINE 'ON':

Start, and run the engine until the working temperature is achieved. Switch 'off' the ignition. Connect the fault code reader to the SD connector. Switch the fault code reader to the '-' position. Start the engine and after 10 seconds the test will begin.

A code will be transmitted to indicate the start of the engine test. The engine RPM will briefly rise to 2500rpm and return to idle. The code 1 will be transmitted to prompt the user to fully press the throttle and release, if the values measured during this engine pulse do not match the stored values, a fault code will be stored. A fault can also be stored if a signal is missing or if the operation was not carried out successfully. If no faults are present, code 11 will be transmitted followed by code 6 (depending on the vehicle, if the test was initiated with code 5, then code 7 will be transmitted instead of code 6).

After the engine test is the service mode (depending on model). During this period (2-10 minutes approx.) the ignition timing and idle speed are deregulated. For vehicles with a distributor adjustments can be made. For later vehicles where adjustment is not possible the values can be compared with the published vehicle data (refer to vehicle manufacturer's handbook or Haynes manual).

After termination of this test, code 7 will be transmitted and the ECU will regain full control of ignition timing and idle speed etc.

For a continuous display of fault codes, run the engine up to temperature and ensure the air conditioning is switched off. Switch 'off' the ignition and with the fault code reader in the 'O' position connect to the SD connector. Start the engine and switch the fault code reader to the '-' position. The reader will continuously transmit the codes. If no codes are stored, then code 11 will be repeated.

ERASING THE FAULT CODES:

Follow the test sequence for the ignition 'on', engine 'off' procedure, until fault code 1 is transmitted. When this occurs, switch the fault code reader to the 'O' position. This will clear all stored faults in the KAM.

When all testing has been completed, switch 'off' the ignition and the fault code reader and disconnect it. Ensure the octane and idle connection are re-connected correctly.

3 DIGIT FAULT CODES:

IGNITION 'ON', ENGINE 'OFF':

Connect the fault code reader to the SD connector with the ignition off and the fault code reader in the 'O' position.

Switch the ignition 'on' but do not start the engine.

Switch the fault code reader to the '-' position and after a brief period the reader will begin to transmit. Some devices may be operated automatically during this period (this is normal).

The first series of codes to be transmitted are the current faults. These will be repeated. The digit 1 will be transmitted to separate the next batch of codes. These codes are from the KAM and are not present during testing. The codes from the KAM are also repeated.

All faults that are present should be repaired before carrying out the ignition 'on', engine 'on', except for the KAM fault codes. The only exception is if the KAM code is ignition coil related. These must be repaired prior to the next test.

SOLENOID TEST:

This will test all the solenoids and actuators with the exception of the fuel pump relay and injectors.

OPERATION AND USE

To initiate the test after completion of the ignition 'on', engine 'off' test, fully press and release the accelerator pedal. This will signal the ECU to power up the solenoids/actuators, during this period the power supply to the various items can be measured accordingly. When the measurements are complete, pressing the accelerator pedal once more will cancel this operation.

ECU WIRING CONNECTION TEST:

With the ignition 'off' and the fault code reader in the 'O' position connect the fault code reader to the SD connector. Switch ignition 'on', but do not start the engine. Switch the fault code reader to the '-' position, back to the 'O' position then finish in the '-' position. Now by moving the wiring, faulty connections can be detected, as the LED will illuminate and remain lit until the connection is improved. The fault will also be logged into the KAM, for later retrieval. When the test is complete, switch 'off' the vehicle ignition, followed by the fault code reader.

IGNITION 'ON', ENGINE 'ON':

Run the engine until up to working temperature. Ensure the air conditioning, if fitted, is switched 'off'. Switch 'off' the ignition. Connect the fault code reader and switch it into the '-' position. Start the engine and observe the LED. When the fault codes begin to be transmitted, the first code will indicate the engine type, ie. 4 cylinder engine - 2 digits, 6 cylinder engine - 3 digits.

After this has been transmitted, carry out the following actions, as applicable.

Power steering; Turn the steering wheel half a turn, and return back to centre.

Brake pedal switch; Operate brake pedal fully.

Throttle; Operate the accelerator pedal briefly so that the engine idle is raised above 3000rpm (approx. 40 seconds) and then return to idle.

Any fault codes detected during these operations will be transmitted now. After the fault codes, will be a single code to indicate the following action;

Operate the accelerator pedal fully and release.

If no fault codes are detected the code 111 will be transmitted and repeated. After completion of these test sequences either continue on to the cylinder balance test and service mode, or finish by switching 'off' the ignition, switching the fault code reader to the 'O' position and disconnecting.

CYLINDER BALANCE TEST:

After completion of the ignition 'on', engine 'on' test, (for vehicles with sequential fuel injection) operate the accelerator pedal briefly so that the engine idle is raised above 3000rpm for 2 minutes, and then return to idle. During this period the ECU will revert to service mode and test the cylinder balance.

If all cylinders are balanced then code 9 will be transmitted. Should one cylinder be at fault then code 1 to 8 will be transmitted indicating a particular cylinder.

SERVICE MODE:

When the ECM enters service mode the idle speed will be deregulated for 2 to 10 minutes, and the ECU value can be compared with the vehicle manufacturer's handbook or Haynes manual.

After completion of service mode the idle speed will resume to normal operation.



OPERATION AND USE

ERASE FAULT CODES:

During the test procedure for the ignition 'on', engine 'off', when the fault codes are being transmitted switch the fault code reader to the 'O' position. This will erase all faults stored in the KAM.



FAULT CODE TABLE

2 DIGIT FAULT CODES (PART A):

FAULT CODE READING	CODE DESCRIPTION
1	Command code. Loose connection test/open throttle momentarily
2	Separator code
5	Start of engine running test
6	Start of service mode
7	End of service mode
11	No fault
12	Vane air flow meter 1
13	Coolant Temperature Sensor (CTS) or CTS circuit
14	Air Temperature Sensor (ATS) or Vane Air Temperature Sensor (VAT)
15	Throttle Pot Sensor (TPS) or TPS circuit
16	Airflow Sensor (AFS) or AFS circuit #2
17	Manifold Absolute Pressure (MAP) sensor or MAP sensor circuit
18	Low battery voltage
19	Keep Alive Memory (KAM) failure
21	Irregular ignition signal
22	Airflow Sensor (AFS) or AFS circuit #1, voltage too high
23	Coolant Temperature Sensor (CTS) or CTS circuit, voltage too high
24	Air Temperature Sensor (ATS) or Vane Air Temperature Sensor (VAT)
25	Throttle Pot Sensor (TPS), or TPS circuit, voltage too high
26	Airflow Sensor (AFS) #2, voltage too high
27	Manifold Absolute Pressure (MAP) sensor or MAP sensor circuit, value too high
28	2.0 DOHC 16V only: Oxygen Sensor (OS) 1 or OS circuit rich mixture or failed sensor
29	2.0 DOHC 16V only: Oxygen Sensor (OS) 2 or OS circuit rich mixture or failed sensor
31	ECM or ECM circuit RAM/ROM failure
32	Airflow Sensor (AFS) or AFS circuit #1, voltage too low
33	Coolant Temperature Sensor (CTS) or CTS circuit, voltage too low
34	Air Temperature Sensor (ATS) or Vain Air Temperature (VAT) sensor
35	Throttle Pot Sensor (TPS), or TPS circuit voltage low
36	Airflow Sensor (AFS) or AFS circuit #2, voltage too low
37	Manifold Absolute Pressure (MAP) sensor, or MAP circuit value too low
38	2.0 DOHC 16V only: Oxygen Sensor 1 (cylinders 1 & 4), lean mixture or failed sensor
39	2.0 DOHC 16V only: Oxygen Sensor 2 (cylinders 2 & 3), lean mixture or failed sensor
41	Airflow Sensor (AFS) or AFS circuit #1, no change whilst conducting self-test procedure
42	AFS #2 /MAP sensor, no change whilst conducting self-test procedure
43	Throttle Pot Sensor (TPS), or TPS circuit no TPS change during throttle depression whilst conducting self-test procedure

FAULT CODE TABLE

FAULT CODE READING	CODE DESCRIPTION
44	After code 10 in self-test procedure, throttle was opened too late or not at all
45	Vehicle Speed Sensor (VSS) or VSS circuit
46	Idle Speed Control Valve (ISCV), maximum rpm not reached
47	Idle Speed Control Valve (ISCV), minimum rpm not reached
48	CFI engine: Idle tracking switch in throttle plate control motor (DC-ISC) EFI engine: Idle Speed Control (ISC) valve
49	Exhaust Gas Recirculation (EGR) valve
51	Air Conditioning (A/C) switched on
52	Automatic transmission in "D"
53	Octane Adjust 1 grounded (OA1)
54	Octane Adjust 2 grounded (OA2)
55	Idle speed adjust grounded
56	Knock Sensor (KS)
57	Throttle moved too early during self-test
58	Phasing of profile ignition pick up and spark advance word
59	CO adjustment potentiometer of CO circuit
61	Loss of power in cylinder 1
62	Loss of power in cylinder 2
63	Loss of power in cylinder 3
64	Loss of power in cylinder 4
65	Loss of power in cylinder 5. DOHC only: Brake On/Off (BOO) switch
66	Loss of power in cylinder 6. DOHC only: Kickdown switch (KIDS)
67	Fuel Temperature Sensor (FTS) or FTS circuit
68	Turbo Boost Pressure Solenoid Valve (BPSV)
69	Turbo Boost Pressure Solenoid Valve (BPSV)
71	Vacuum Controlled Air Valve (VAV) Pulse Air Solenoid (PUA)
72	1.6 CVH Turbo only: Wastegate Control Solenoid (WCS). EFI engine: Electronic Vacuum Regulator (EVR)
73	Carbon filter solenoid valve
74	Fuel pump: 3/4 shift solenoid
75	Clutch converter lock-up solenoid
76	Brake on activated
77	Kickdown activated
78	Power Steering Pressure Switch (PSPS) not activated during self-test procedure
81	Electronic Vacuum Regulator (EVS)
82	Electronic Pressure Transducer (EPT), voltage below minimum
83	Electronic Pressure Transducer (EPT), voltage too high
84	Electronic Pressure Transducer (EPT), voltage too low
91	2.0 DOHC 16V only: Oxygen Sensors (OS) or OS circuit, plugs connection interchanged

2 DIGIT FAULT CODES (PART B):

FAULT CODE READING	CODE DESCRIPTION
1	Command code (dynamic test)
2	Separator code
3	Module identification code for 6 cylinder engine
5	Start of engine running test

FAULT CODE TABLE

FAULT CODE READING	CODE DESCRIPTION
6	Start of service mode
7	End of service mode
11	System pass
12	Idle speed control valve
13	Idle Speed Control Valve (ISCV)
14	Ignition pick-up signal or circuit
15	KAM/ROM module failure
16	Engine speed too low
17	1.8 CVH LFI only: Idle Speed Stepper Motor (ISSM), idle contacts
18	Ignition module operation
19	Module power supply
20	4 cylinder identification mode
21	Coolant Temperature Sensor (CTS)
22	Manifold Absolute Pressure (MAP) sensor
23	Throttle Pot Sensor (TPS)
24	Air Temperature Sensor (ATS)
25	Knock sensor
26	Idle speed stepper motor
27	Cruise control (CNIL) delayed
28	Cruise control (CNIL) too advanced
29	Vehicle Speed Sensor (VSS)
31	Electronic Pressure Transducer (EPT), voltage too low
32	Electronic Pressure Transducer (EPT), outside specification
33	No Exhaust Gas Recirculation (EGR)
34	Electronic Pressure Transducer (EPT), outside specification
35	Electronic Pressure Transducer (EPT), voltage too high
36	No increase in rpm
37	Decrease in rpm
38	1.8 CVH CPI: Idle speed stepper motor
39	Automatic transmission Lock-Up Clutch Solenoid (LUS)
41	Heated exhaust gas oxygen sensor 1 (cylinder 1-3), lean mixture
42	Heated exhaust gas oxygen sensor 1 (cylinders 1-3) rich mixture
43	Idle speed stepper motor
44	TPS, no change when idle speed DC motor extends
45	Idle Tracking Switch (ITS)
46	Thermactor, no air in self-test
47	Cruise control switch circuit
48	Cruise control switch sticking
49	Cruise control signal
51	Coolant temperature sensor, voltage too high
52	Power steering pressure switch not activated during self-test
53	Throttle Pot Sensor (TPS), voltage too high
54	Air temperature sensor, voltage too high
55	Key power circuit low
56	VAF circuit above max. voltage
57	Octane Adjust (OA) grounded
58	Service injection delayed

FAULT CODE TABLE

FAULT CODE READING	CODE DESCRIPTION
59	Idle adjust grounded
61	Coolant temperature sensor, voltage too low
62	Shift solenoid for 4th/3rd gear closed
63	Throttle pot sensor, voltage too low
64	Air temperature sensor, voltage too low
65	Key power circuit low
66	VAF sensor, input voltage low
67	A/C switched on or automatic transmission in "D"
68	Idle speed stepper motor
71	Idle speed stepper motor
72	Manifold Absolute Pressure (MAP) sensor
73	Throttle Pot Sensor (TPS), no TPS change while depressing throttle during self-test
74	Brake light switch, open-circuit
75	Brake light switch, short-circuit
76	Insufficient VAF change during dynamic response test
77	Blip throttle not operate or operated too late
81	Manifold Absolute Pressure (MAP) sensor (Transit V6)
82	Secondary air feed valve circuit
83	Heavy duty fan switch
84	Electronic vacuum regulator in exhaust gas recirculation system
85	Carbon filter solenoid
87	Electrical fuel pump
88	Electronic cooling fan
89	Torque converter Lock-Up Clutch Solenoid (LUS)
91	Heated exhaust gas oxygen sensor 2 (cylinders 4 to 6), lean mixture
92	Heated exhaust gas oxygen sensor 2 (cylinders 4 to 6), rich mixture
93	Idle speed stepper motor
95/96/98	Indication of malfunction for MAP, TPS, ACT, ECT sensors
99	Throttle Pot Sensor (TPS)

2 DIGIT FAULT CODES (PART C):

FAULT CODE READING	CODE DESCRIPTION
1	Maximum ignition retardation reached
2	Engine Coolant Temperature (ECT) sensor
3	Air Change Temperature (ACT) sensor
4	Knock sensor
5	MAP sensor
12	Vane air flow sensor
13	Engine Coolant Temperature (ECT) sensor
14	Vane air flow sensor
15	Throttle position sensor
22	Vane air flow sensor
22	Disregard
31	Module fault
32	Module fault



FAULT CODE TABLE

2 DIGIT FAULT CODES (PART D):

FAULT CODE READING	CODE DESCRIPTION
11	Engine speed/TDC sensor
12	Phase sensor
13	Pip/spout signal
21	Air charge temperature sensor (short circuit)
22	Air charge temperature sensor (open circuit)
23	Coolant temperature sensor (short circuit)
31	Coolant temperature sensor (open circuit) 4x4 only oxygen sensor
32	MAP sensor (short circuit)
33	MAP sensor (open circuit) 4x4 only throttle position sensor
43	Module fault
44	Module fault

3 DIGIT FAULT CODES (PART A):

FAULT CODE READING	CODE DESCRIPTION
1	Separator/command code, briefly press accelerator pedal fully
2	Command code, press brake pedal fully
3	Command code, press brake pedal fully

3 DIGIT FAULT CODES (PART B):

FAULT CODE READING	CODE DESCRIPTION
1 to 8	Cylinder number with low power, cylinder balance test
9	Pass, cylinder balance test
111	All systems ok
112/113/114	Air temperature sensor: Low voltage, high voltage and outside range
116/117/118	Coolant temperature sensor: Outside range, low voltage and high voltage
121 to 125	Throttle pot sensor: Outside range, low voltage, high voltage, above and below spec.
126	MAP voltage above specification
128	MAP sensor/vacuum hose fault
129	MAP sensor, no MAF change during throttle depression
136/137	Oxygen sensor: Too high or lean mixture
139/144	Oxygen sensor: Too high or lean mixture
157/158/159	Mass Airflow (MAF) sensor: Low voltage, high voltage and outside range
167	Throttle Position Sensor (TPS), no change in TPS while depressing throttle during self-test
171	Oxygen sensor (right)
172	Oxygen sensor (right) too lean
173	Oxygen sensor (right) too rich
174	Oxygen sensor (right) slow response
175	Oxygen sensor (left)
176	Oxygen sensor (left) too lean
177	Oxygen sensor (left) too rich
178	Oxygen sensor (left) slow response
179	Fuel system: mixture too lean
181	Fuel system: mixture too rich

FAULT CODE TABLE

FAULT CODE READING	CODE DESCRIPTION
182	Idle mixture too lean
183	Idle mixture too rich
184/185	Mass Airflow (MAF) sensor: Above specification, below specification
186	Injector opening time: Too long
186	Injector opening time: Too short
188	Oxygen sensor: voltage too low
189	Oxygen sensor: voltage too high
191	Idle mixture too lean
192	Idle mixture too rich
193	Flexible fuel sensor circuit
194	Oxygen sensor
195	Oxygen sensor
211	Profile ignition pick-up signal
212	Tachometer circuit
213	Spark advance word circuit
214	Cylinder identification sensor
215	Electronic Distributorless Ignition System (EDIS) coil #1
216	Electronic Distributorless Ignition System (EDIS) coil #2
217	Electronic Distributorless Ignition System (EDIS) coil #3
218/220/222	Tachometer circuit
219	Spark timing default
221	Spark timing error
225	Knock sensor
226	EDIS module
227	Crank angle sensor/engine speed sensor
228	Electronic Distributorless Ignition System (EDIS) coil #1
229	Electronic Distributorless Ignition System (EDIS) coil #2
231	Electronic Distributorless Ignition System (EDIS) coil #3
232	Primary circuit of ignition coil
233	EDIS module
234 to 237	Ignition coil or circuit
238	EDIS module or circuit
239	Profile ignition pick-up signal under cranking
241	ECM: incorrect self-test data
243	Coil failure
244	Cylinder identification fault when power balance requested
311 to 316	Pulse air system: faulty
326	Electronic pressure transducer/delta pressure feedback electronic system
327	Electronic Pressure Transducer (EPT) Delta Pressure Feedback Electronic System (DPFE)
328	Electronic vacuum regulator
332	EGR valve not opening
334	Electronic vacuum regulator
335	EPT/DPFE
336	Exhaust pressure too high
337	EPT/DPFE
338	Cooling temperature sensor
339	Cooling temperature sensor

FAULT CODE TABLE

FAULT CODE READING	CODE DESCRIPTION
341	Octane adjuster
411	Engine speed during self-test: Too low
412	Engine speed during self-test: Too high
413 to 416	Idle speed control valve
452	Vehicle Speed Sensor (VSS)
453	Servo leaking down
454	Servo leaking up
455	Insufficient RPM increase
456	Insufficient RPM decrease
457/458/459	Speed control fault
511	ROM fault
512	KAM fault
513	EMC reference voltage
519/521	Power steering pressure switch: Not activated during self-test
522	Neutral/drive switch
525	Vehicle in gear or A/C on
528	Clutch switch error
536	Brake on/off switch: Not activated during self-test
538	Operating error during self-test
539	Air Conditioning (A/C) switched on during self-test
542/543	Fuel pump circuit failure
551	Idle Speed Control (ISC) Circuit: Failure
552	Pulse air circuit: Failure
554	Fuel pressure regulator control circuit: Failure
556	Fuel pump circuit
557	Fuel pump circuit: low speed
558	Electronic vacuum regulator circuit
563	High speed electric-drive fan relay/circuit
564	Electronic-drive fan relay/circuit: Failure
565	Carbon filter solenoid valve
566	3rd/4th gear solenoid A/T
573	Electronic-drive fan relay/circuit: Failure
574	High speed electronic-drive fan relay/circuit
575	Fuel pump circuit/inertia switch circuit
576	Kick-down switch
577	Kick-down switch: not activated during self-test
583	Power to fuel pump fault
612	4/3 Switch: Failed open-circuit
613	4/3 Circuit: Failed open-circuit
614	3/2 Circuit: Failed short-circuit
615	3/2 Circuit: Failed short-circuit
621	Shift solenoid 1 circuit: Failed
622	Shift solenoid 2 circuit: Failed
624/625	EPC solenoid circuit: Failed
628	Lock-up solenoid, A/T: Failed
629	Torque converter lock-up clutch solenoid
634	Neutral/drive switch circuit: Failed

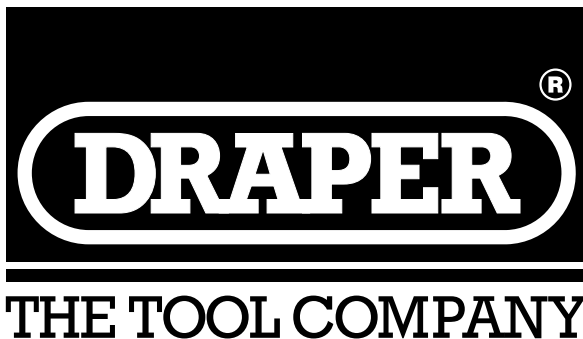


FAULT CODE TABLE

FAULT CODE READING	CODE DESCRIPTION
635/636/637	Transmission temperature switch: Failed
639	TSS failure
645	1st Gear failure
646	2nd Gear failure
647	3rd Gear failure
648	4th Gear failure
649	ETV failure
651	ETV intermittent failure
652	Lock-up solenoid-A/T circuit failure
653	Transmission control switch: Not activated during self-test
998	Fault in ECT/ACT/MAF/TPR circuit



NOTES



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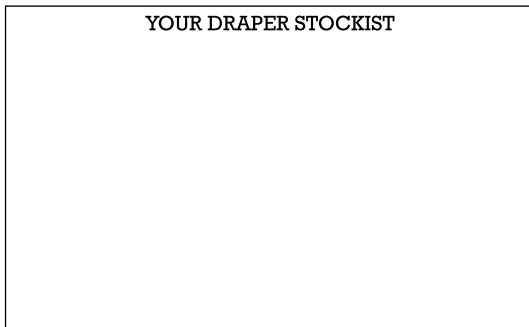
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