

Fault Diagnosis

FAULT DIAGNOSIS CHART

Fault	Possible Cause	Rectification
Low cranking speed	1, 2, 3, 4.	A, B, C, D.
Will not start	5, 6, 7, 8, 9, 10, 12, 13, 14, 15, 16, 17, 18, 19, 20, 22, 31, 32, 33.	E, F, G, H, J, K, M, N, O, P, Q, R, S, T, U, W, AF, AG, AH.
Difficult starting	5, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 18, 19, 20, 21, 22, 24, 29, 31, 32, 33.	E, G, H, J, K, L, M, N, O, P, Q, S, T, U, V, W, Y, AD, AF, AG, AH.
Lack of power	8, 9, 10, 11, 12, 13, 14, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 31, 32, 33.	H, J, K, L, M, N, O, S, T, U, V, W, X, Y, Z, AA, AB, AF, AG, AH.
Misfiring	8, 9, 10, 12, 13, 14, 16, 18, 19, 20, 25, 26, 28, 29, 30, 32.	H, J, K, M, N, O, Q, S, T, U, Z, AA, AC, AD, AE, AG.
Excessive fuel consumption	11, 13, 14, 16, 18, 19, 20, 22, 23, 24, 25, 27, 28, 29, 31, 32, 33.	L, N, O, Q, S, T, U, W, X, Y, Z, AB, AC, AD, AF, AG, AH.
Black exhaust	11, 13, 14, 16, 18, 19, 20, 22, 24, 25, 27, 28, 29, 31, 32, 33.	L, N, O, Q, S, T, U, W, Y, Z, AB, AC, AD, AF, AG, AH.
Blue/white exhaust	4, 16, 18, 19, 20, 25, 27, 31, 33, 34, 35, 45, 56.	D, Q, S, T, U, Z, AB, AF, AH, AK, AU, BF.
Low oil pressure	4, 36, 37, 39, 40, 42, 43, 44, 58.	D, AL, AM, AN, AO, AP, AR, AS, AT, BH.
Knocking	9, 14, 16, 18, 19, 22, 26, 28, 29, 31, 33, 35, 36, 45, 46, 59.	J, O, Q, S, T, W, AA, AC, AD, AF, AH, AK, AL, AU, AV, BJ.
Erratic running	7, 8, 9, 10, 11, 12, 13, 14, 16, 20, 21, 23, 26, 28, 29, 30, 33, 35, 45, 59.	G, H, J, K, L, M, N, O, Q, U, V, X, AA, AC, AD, AE, AH, AK, AU, BJ.
Vibration	13, 14, 20, 23, 25, 26, 29, 30, 33, 45, 47, 48, 49.	N, O, U, X, Z, AA, AD, AE, AH, AU, AW, AX, AY.
High oil pressure	4, 38, 41.	D, AN, AQ.
Overheating	11, 13, 14, 16, 18, 19, 24, 25, 45, 50, 51, 52, 53, 54, 57.	L, N, O, Q, S, T, Y, Z, AU, AZ, BA, BB, BC, BD, BG.
Excessive crank-case pressure	25, 31, 33, 34, 45, 55.	Z, AF, AH, AJ, AU, BE.
Poor compression	11, 19, 25, 28, 29, 31, 32, 33, 34, 46, 59.	L, T, Z, AC, AD, AF, AG, AH, AJ, AV, BJ.
Starts and stops	10, 11, 12.	K, L, M.

Fault Diagnosis

Key to possible cause	Key to rectification
1 BATTERY CAPACITY FLOW	A FIT FULLY CHARGED BATTERY
2 BAD ELECTRICAL CONNECTIONS	B TRACE AND RECTIFY ANY FAULTY ELECTRICAL CONNECTION
3 FAULTY STARTER MOTOR	C RENEW OR REPAIR STARTER MOTOR
4 INCORRECT GRADE OF LUBRICATING OIL	D CHECK THAT APPROVED GRADE OF OIL IS USED
5 LOW CRANKING SPEED	E CHECK ITEMS A, B, C AND D
6 FUEL TANK EMPTY	F REPLENISH FUEL TANK. THEN BLEED SYSTEM AS DETAILED
7 FAULTY STOP CONTROL OPERATION	G CHECK STOP CONTROL LINKAGE TO INJECTION PUMP FOR CORRECT OPERATION AND RECTIFY, IF NECESSARY
8 BLOCKED FUEL FEED PIPE	H TRACE AND RECTIFY BLOCKAGE
9 FAULTY FUEL LIFT PUMP	J CHECK OUTPUT OF LIFT PUMP
10 CHOKED FUEL FILTER	K RENEW FUEL FILTER ELEMENT/S OR FILTER ASSEMBLY
11 RESTRICTION IN AIR CLEANER	L SERVICE AIR CLEANER
12 AIR IN FUEL SYSTEM	M BLEED FUEL SYSTEM AS DETAILED
13 FAULTY FUEL INJECTION PUMP	N RENEW FUEL INJECTION PUMP
14 FAULTY INJECTOR OR INCORRECT TYPE	O CHECK INJECTOR FOR CORRECT TYPE AND OPERATION
15 INCORRECT USE OF COLD START EQUIPMENT	P USE CORRECT STARTING SEQUENCE
16 FAULTY COLD STARTING EQUIPMENT	Q CHECK FOR CORRECT ELECTRICAL CONNECTIONS AND ADEQUATE FUEL SUPPLY TO COLD START AID
17 BROKEN FUEL INJECTION PUMP DRIVE	R RENEW FUEL INJECTION PUMP
18 INCORRECT FUEL PUMP TIMING	S ADJUST TIMING OF FUEL INJECTION PUMP
19 INCORRECT VALVE TIMING	T CHECK AND RESET VALVE TIMING
20 POOR COMPRESSION	U CARRY OUT TOP OVERHAUL OF ENGINE

Fault Diagnosis

21	BLOCKED FUEL TANK VENT	V	REMOVE OBSTRUCTION FROM FUEL TANK VENT
22	INCORRECT TYPE OR GRADE OF FUEL	W	CHECK THAT SUPPLY TANK IS FILLED WITH DIESEL FUEL AND NOT GASOLINE
23	STICKING THROTTLE OR RESTRICTED MOVEMENT	X	CHECK THROTTLE LINKAGE FOR FREEDOM OF MOVEMENT AND LUBRICATE OR RECTIFY AS NECESSARY
24	EXHAUST PIPE RESTRICTION	Y	CHECK EXHAUST PIPE AND REMOVE ANY RESTRICTION
25	CYLINDER HEAD GASKET LEAKING	Z	CHECK BOW OF HEAD AND BLOCK. FIT NEW GASKET
26	OVERHEATING	AA	CHECK FOR ITEMS L, N, O, Q, S, T, Y, Z, AB, BB, BC, BD, BE, BH OR AU
27	COLD RUNNING	AB	TEST THERMOSTAT FOR CORRECT OPERATION
28	INCORRECT TAPPET ADJUSTMENT	AC	CHECK AND RESET VALVE CLEARANCES WHERE NECESSARY
29	STICKING VALVES	AD	CARRY OUT ENGINE TOP OVERHAUL
30	INCORRECT HIGH PRESSURE PIPES	AE	CHECK FOR INCORRECT DIAMETER OF HIGH PRESSURE PIPES AND REPLACE ANY INCORRECT PIPES
31	WORN CYLINDER BORES	AF	REBORE OR RENEW CYLINDER LINERS, REFER 'MANUFACTURING DATA'
32	PITTED VALVES AND SEATS	AG	RECONDITION VALVE SEATS AND FIT NEW VALVES
33	BROKEN, WORN OR STICKING PISTON RING/S	AH	RENEW PISTON RINGS WITH SERVICE RING PACK
34	WORN VALVE STEMS AND GUIDES	AJ	CHECK DIAMETERS OF VALVE STEMS AND INTERNAL DIAMETERS OF GUIDES AND RENEW WORN PARTS
35	OVERFULL AIR CLEANER OR USE OF INCORRECT GRADE OF OIL	AK	REMOVE AIR CLEANER, CLEAN AND REFILL WITH CORRECT GRADE OF OIL TO THE INDICATED LEVEL
36	WORN OR DAMAGED BEARINGS	AL	CHECK BEARINGS AND RENEW ANY DAMAGED OR WORN PARTS
37	INSUFFICIENT OIL IN SUMP	AM	CHECK OIL LEVEL AND TOP UP IF NECESSARY
38	INACCURATE GAUGE	AN	CHECK GAUGE WITH MASTER UNIT
39	OIL PUMP WORN	AO	RENEW OIL PUMP

40	PRESSURE RELIEF VALVE STICKING OPEN	AP	CHECK RELIEF VALVE BORE AND PLUNGER FOR DAMAGE AND SPRING FOR CORRECT TENSION
41	PRESSURE RELIEF VALVE STICKING CLOSED	AQ	CHECK RELIEF VALVE BORE AND PLUNGER FOR DAMAGE. CLEAN ANY BURRS OR RENEW PLUNGER, IF NECESSARY
42	BROKEN RELIEF VALVE SPRING	AR	RENEW RELIEF VALVE SPRING
43	FAULTY SUCTION PIPE	AS	RENEW SUCTION PIPE TO OIL PUMP
44	CHOKED OIL FILTER	AT	RENEW LUBRICATING OIL FILTER
45	PISTON SEIZURE/PICK UP	AU	CARRY OUT COMPLETE OVERHAUL OF ENGINE
46	INCORRECT PISTON HEIGHT	AV	CHECK PISTON HEIGHT AND ENSURE THAT CORRECT PISTON IS FITTED
47	DAMAGED FAN	AW	RENEW COOLING FAN
48	FAULTY ENGINE MOUNTING (HOUSING)	AX	CHECK AND RECTIFY MOUNTING
49	INCORRECTLY ALIGNED FLYWHEEL HOUSING OR FLYWHEEL	AY	CHECK ALIGNMENT OF FLYWHEEL AND HOUSING AND RECTIFY MISALIGNED PART
50	FAULTY THERMOSTAT	AZ	CARRY OUT ITEM AB
51	RESTRICTION IN WATER JACKET	BA	CHECK COOLANT FOR SIGNS OF EXCESS SEDIMENT OR SCALE AND IF NECESSARY FLUSH WATER JACKET. USING A PROPRIETARY DESCALING SOLUTION
52	LOOSE FAN BELT	BB	ADJUST FAN BELT TO CORRECT TENSION
53	CHOKED RADIATOR	BC	FLUSH RADIATOR TO REMOVE SEDIMENT OR SCALE
54	FAULTY WATER PUMP	BD	RENEW WATER PUMP
55	CHOKED BREATHER PIPE	BE	REMOVE AND CLEAN OUT BREATHER PIPE
56	DAMAGED VALVE STEM OIL DEFLECTORS (IF FITTED)	BF	RENEW DAMAGED OIL DEFLECTORS
57	COOLANT LEVEL TOO LOW	BG	TOP UP COOLING SYSTEM AND CHECK FOR ANY LEAKS
58	BLOCKED SUMP STRAINER	BH	REMOVE SUMP AND CLEAN OIL STRAINER
59	BROKEN VALVE SPRING	BJ	RENEW VALVE SPRING