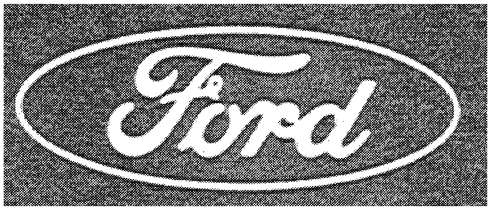

FORD

Tractor Service Data Book

40881040

Reprinted

TRACTOR SERVICE DATA BOOK

INTRODUCTION

This Service Data Book is issued for your information and as a ready reference guide when carrying out repairs and adjustments on Ford agricultural and industrial tractors. Contents include torque values, fault diagnosis, trouble-shooting and service remedies but, in a reference book designed to be compact it is not feasible to include extensive service information. Instead the contents have been selected by placing emphasis on the more complex assemblies such as hydraulics and electrical systems where guidance is possibly more in demand.

Your Service Data Book is complementary to the current Repair Manuals but at no time should this book be considered as a substitute. Where a torque range is indicated set the wrench to the mid-point and ensure wrenches used are frequently monitored for accuracy.

The information in this Service Data Book was correct at the time of going to press but changes to specification or repair procedures of a significant nature will continue to be advised through the medium of Service Bulletins, and every endeavour should be made accordingly to update or amend the information in your book. Several pages in your Service Data Book have been left blank and are ruled and headed up 'Notes'. Utilise these pages for entering any revised details and additional pertinent service information you consider would be useful.

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FORD 2600, 3600, 4100, 4600, 5600, 6600, 6700, 7600, 7700

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FORD TW-10, TW-20 and TW-30

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ENGINE SYSTEMS

TROUBLE SHOOTING

PROBLEM	POSSIBLE CAUSES	REMEDY
Engine does not develop full power— Diesel engine	1. Clogged air cleaner	1. Clean or renew element
	2. Fuel line obstructed	2. Clean
	3. Faulty injectors	3. Clean and reset
	4. Low cylinder compression	4. Replace piston rings or re-bore/re-sleeve as necessary
	5. Incorrect valve lash adjustment	5. Check and reset
	6. Burnt, worn or sticking valves	6. Replace valves and/or guides
	7. Blown head gasket	7. Check head flatness and fit new gasket
	8. Incorrect fuel delivery	8. Check injectors and pump
Engine Knocks	1. Diluted or thin oil	1. Drain and refill with specified oil and replace filter. Ascertain cause of dilution
	2. Insufficient oil supply	2. Check oil level and top up as necessary. Overhaul or replace pump as necessary Check pump filter not clogged
	3. Low oil pressure	3. Overhaul pump or relief valve as necessary
	4. Excessive crankshaft end play	4. Install new thrust bearing liner
	5. Flywheel or ring gear run-out excessive	5. Skim flywheel or fit new ring gear
	6. Excessive connecting rod or main bearing clearance	6. Install new bearing inserts and/or re-grind crankshaft
	7. Bent or twisted connecting rods	7. Replace connecting rods
	8. Crankshaft journals out-of-round	8. Re-grind crankshaft and fit undersize bearing inserts
	9. Excessive piston-to-cylinder bore clearance	9. Re-bore/re-sleeve block and fit new pistons
	10. Excessive piston ring clearance	10. Fit new pistons and rings
	11. Broken rings	11. Fit new rings. Check bore/ pistons for damage

TROUBLESHOOTING (Cont.)

PROBLEM	POSSIBLE CAUSES	REMEDY
Engine knocks (Cont'd.)	13. Piston pin retainer loose or missing	13. Install new retainer. Check bore/pistons for damage
	14. Excessive camshaft end play	14. Install new thrust plate
	15. Imperfections on timing gear teeth	15. Renew timing gear
	16. Excessive timing gear backlash	16. Renew timing gear
Low oil pressure	1. Engine oil level low	1. Top up, as necessary
	2. Wrong grade of oil	2. Drain and refill with correct grade of oil
	3. Blocked oil pump sump screen	3. Clean pump screen
	4. Oil pressure relief valve faulty	4. Fit new relief valve
	5. Oil pump drive shaft worn	5. Replace drive shaft
	6. Excessive oil pump rotor and shaft assembly clearance	6. Overhaul pump
	7. Excessive main or connecting rod bearing clearances	7. Install new bearing inserts and/or re-grind crankshaft
Excessive oil consumption	1. Engine oil level too high	1. Reduce oil level
	2. External oil leaks from engine	2. Renew gaskets/seals, where necessary. Check mating surfaces for damage or distortion
	3. Worn valves, valve guides or seals	3. Replace
	4. Head gasket not sealing	4. Renew gasket. Check head for damage or distortion
	5. Oil loss past the pistons and rings	5. Renew rings and/or re-bore/re-sleeve block as necessary
	6. Oil cooler leak (if fitted)	6. Repair/replace oil cooler assembly

TROUBLESHOOTING (Cont.)

PROBLEM	POSSIBLE CAUSES	REMEDY
Engine overheats	1. Hose connection leaking or collapsed	1. Tighten hose connection. Replace hose if damaged
	2. Radiator cap defective or not sealing	2. Replace radiator cap
	3. Radiator leakage	3. Repair/replace radiator
	4. Improper fan belt adjustment	4. Re-adjust fan belt
	5. Radiator fins restricted	5. Clean with compressed air
	6. Faulty thermostat	6. Renew thermostat
	7. Internal engine leakage	7. Check for source of leakage Renew gasket or defective parts
	8. Water pump faulty	8. Overhaul water pump
	9. Exhaust gas leakage into cooling system	9. Renew cylinder head gasket. Check head for damage or distortion.
	10. Coolant aeration	10. Tighten all connections and check coolant level is correct. Ensure cylinder head gasket has not blown
	11. Cylinder head gasket improperly installed	11. Renew cylinder head gasket
	12. Hot spot due to rust and scale or clogged water jackets	12. Reverse flush entire cooling system
	13. Obstruction to radiator air flow	13. Remove the obstruction
	14. Extended engine idling	14. Do not allow engine to idle for long periods
	15. Oil cooler tube blocked	15. Clean

TROUBLESHOOTING (Cont.)

PROBLEM	POSSIBLE CAUSES	REMEDY
Engine tends to keep firing after fuel is shut off	1. Air cleaner dirty or restricted 2. Oil leak on compressor side of turbo-charger where fitted	1. Clean or renew element 2. Overhaul turbo-charger
Oil pressure warning light fails to operate	1. Bulb burnt out 2. Warning light pressure switch faulty 3. Warning light circuit faulty	1. Renew bulb 2. Renew pressure switch 3. Check and renew wiring
Excessive exhaust smoke	1. Oil leak on compressor or turbine side of turbo-charger, where fitted 2. Exhaust leak on exhaust manifold side of turbo-charger, where fitted 3. Air cleaner dirty or restricted 4. Excessive fuel delivery	1. Overhaul turbo-charger 2. Fit new gasket 3. Clean 4. Overhaul injection pump/injectors
Water temperature gauge fails to reach normal operating temperature	1. Faulty temperature sender switch 2. Incorrect or faulty thermostat 3. Faulty water temperature gauge	1. Renew sender switch 2. Renew thermostat 3. Renew temperature gauge

SPECIFICATIONS

GENERAL SPECIFICATIONS

Model	Ford 2600	Ford 3600	Ford 4100	Ford 4600	Ford 5600	Ford 6600 & 6700	Ford 7600 & 7700
No. of Cylinders (T=Turbo-charged)	3	3	3	3	4	4	4T
Displacement: in³	158	175	183	201	233	256	256
cm³	2588	2861	2977	3289	3814	4186	4186
Bore: in	4·2	4·2	4·2	4·4	4·2	4·4	4·4
mm	106·7	106·7	106·7	111·8	106·7	111·8	111·8
Stroke: in	3·8	4·2	4·4	4·4	4·2	4·2	4·2
mm	96·5	106·7	111·8	111·8	106·7	106·7	106·7
Compression ratio	17·3:1	16·3:1	16·3:1	16·3:1	16·3:1	16·3:1	15·6:1
Firing Order	1–2–3	1–2–3	1–2–3	1–2–3	1–3–4–2	1–3–4–2	1–3–4–2
Rated Engine Speed (rev/min)	2000	2000	2200	2200	2100	2100	2100
Idle Speed (rev/min)	600–700	600–700	600–700	600–700	600–700	600–700	600–700
Maximum No Load Speed (rev/min)	2225–2275	2225–2275	2425–2475	2425–2475	2325–2375	2325–2375	2325–2375

CYLINDER BLOCK

Taper of Cylinder Bore	0.001 in (0.025 mm) Repair limit 0.005 in (0.127 mm) Wear limit
Cylinder Bore Out-of-round	0.001 in (0.025 mm) Repair limit 0.005 in (0.127 mm) Wear limit
Cylinder Bore Diameters	4.2007–4.2032 in (106.698–106.761 mm) 4.4007–4.4032 in (111.778–111.841 mm)
Rear Oil Seal Bore Diameter	5.542–5.546 in (140.77–140.87 mm)
Block to Head Surface Flatness	0.003 in (0.08 mm) in any 6 in (152 mm) or 0.006 in (0.15 mm) overall limit

RETAINING COMPOUND

Cylinder Sleeve to Cylinder Block	Ford Part No. ESW M2G 160A

CYLINDER HEAD

Valve Guide Bore Diameter	0.3728–0.3735 in (9.469–9.487 mm)
Head to Block Surface Flatness	0.003 in (0.08 mm) in any 6 in (152 mm) or 0.006 in (0.15 mm) overall limit.

SPECIFICATIONS (Cont.)

EXHAUST VALVES

Face Angle	44° 15'–44° 30' Relative to Head of Valve
Stem Diameter	Std: 0·3701–0·3708 (9·401–9·418 mm) 0·003 in. (0·076 mm) Oversize: 0·3731–0·3738 in. (9·477–9·495 mm) 0·015 in. (0·38 mm) Oversize: 0·3851–0·3858 (9·781–9·799 mm) 0·030 in. (0·76 mm) Oversize: 0·4001–0·4008 in. (10·163–10·180 mm)
Head Diameter	
Ford 2600, 3600, 4100, 4600 & 5600	1·495–1·505 in. (37·97–38·23 mm)
Ford 6600, 6700, 7600 & 7700	1·505–1·515 in. (38·23–38·48 mm)
Stem-to-Guide Clearance	0·0020 0·0037 in. (0·051–0·094 mm)
Lash Clearance (Cold)	0·017–0·021 in. (0·43–0·53 mm)

INTAKE VALVES

Face Angle	44° 15'–44° 40' Relative to Head of Valve
Normally Aspirated Engine	29° 15'–29° 30' Relative to Head of Valve
Turbo-charged Engine	Std: 0·3711–0·3718 in. (9·426–9·444 mm)
Stem Diameter	0·003 in. (0·076 mm) Oversize: 0·3741–0·3748 in. (9·502–9·520 mm) 0·015 in. (0·381 mm) Oversize: 0·3861–0·3868 in. (9·807–9·825 mm) 0·030 in. (0·762 mm) Oversize: 0·4011–0·4018 in. (10·188–10·206 mm)
Head Diameter	
Normally Aspirated Engine	1·800–1·810 in (45·72–45·97 mm)
Turbo-charged Engine	1·832–1·842 in (46·48–46·77 mm)
Stem-to-Guide Clearance	0·0010–0·0027 in. (0·025–0·069 mm)
Lash Clearance	0·014–0·018 in. (0·36–0·46 mm)

VALVE SPRINGS

Number per Valve	1
Free Length	2·15 in. (54·6 mm)
Load at 1·74 in. Length (44·20 mm)	61–69 lb (27·7–31·3 Kg)
Load at 1·32 in. Length (33·53 mm)	125–139 lb (57·8–63·1 Kg)

VALVE TIMING

Diesel	
Intake Opening	14 Before Top Dead Centre
Intake Closing	38 After Bottom Dead Centre
Exhaust Opening	41 Before Bottom Dead Centre
Exhaust Closing	11 After Top Dead Centre

SPECIFICATIONS (Cont.)

VALVE INSERTS

Insert Oversize	Exhaust Valve Insert	Intake Valve Seat Insert
	Counterbore Diameter in Cylinder Head	Counter bore Diameter in Cylinder Head
0.010 in (0.254 mm)	1.607–1.608 in (40.82–40.84 mm)	1.907–1.908 in (43.44–43.46 mm)
0.020 in (0.508 mm)	1.617–1.618 in (41.07–41.10 mm)	1.917–1.918 in (43.69–43.72 mm)
0.030 in (0.762 mm)	1.627–1.628 in (41.33–41.36 mm)	1.927–1.928 in (43.95–43.97 mm)

VALVE SEATS

Exhaust Valve Seat Angle	44° 30'–45° 00'
Intake Valve Seat Angle—	
Normally Aspirated Engine	44° 30'–45° 00'
Turbo-charged Engine	59° 30'–60° 00'
Seat Run Out	0.015 in (0.38 mm) Total Indicator Reading Max.
Seat Width	
Exhaust	0.084–0.106 in (2.13–2.69 mm)
Intake	0.082–0.102 in (2.08–2.59 mm)

CAMSHAFT DRIVE GEAR

Number of Teeth	47
End Play	0.001–0.011 in (0.025–0.28 mm)
Bushing Inside Diameter	2.005–2.0015 in (50.813–50.838 mm)
Adaptor Outside Diameter	1.9985–1.9990 in (50.762–50.775 mm)
Backlash with Crankshaft Gear	0.001–0.009 in (0.025–0.23 mm)
Backlash with Camshaft Gear	0.001–0.009 in (0.025–0.23 mm)
Backlash with Fuel Injection Pump Drive Gear	0.001–0.012 in (0.025–0.30 mm)

CAMSHAFT GEAR

Number of Teeth	52
Timing Gear Backlash	0.003–0.008 in (0.08–0.20 mm)

SPECIFICATIONS (Cont.)

ROCKER ARM SHAFT	
Shaft Diameter	1.000–1.001 in (25.40–25.43 mm)
Support Diameter (Internal diameter)	1.002–1.004 in (25.45–25.50 mm)
ROCKER ARM	
Inside Diameter	1.003–1.004 in (25.48–25.50 mm)
TAPPETS	
Clearance to Bore	0.0006–0.0021 in (0.015–0.053 mm)
Tappet Diameter	0.9889–0.9894 in (25.118–25.130 mm)
Tappet Bore Diameter	0.990–0.991 in (25.15–25.17 mm)
CAMSHAFT	
Bearing Journal Diameter	2.3895–2.3905 in (60.693–60.719 mm)
Bearing Clearance	0.001–0.003 in (0.025–0.076 mm)
End Play	0.001–0.007 in (0.025–0.18 mm)
CONNECTING RODS	
Small End Bushing (Internal Diameter)	
Normally Aspirated	1.5003–1.5006 in (38.108–38.115 mm)
Turbo-charged	1.6253–1.6256 in (41.283–41.290 mm)
Clearance Bushing-to-Piston-Pin	0.0005–0.0007 in (0.013–0.018 mm)
Side Float	0.007–0.013 in (0.18–0.33 mm)
Maximum Twist	0.012 in (0.30 mm)
Maximum Bend	0.004 in (0.10 mm)
PISTON PIN	
Outside Diameter—	
Normally Aspirated Engine	1.4997–1.5000 in (38.092–38.100 mm)
Turbo-charged Engine	1.6247–1.6250 in (41.267–41.275 mm)

SPECIFICATIONS (Cont.)

PISTONS

Skirt-to-Cylinder Clearance	
Ford 2600, 3600, 4100 & 5600	0·0075–0·0085 in. (0·191–0·216 mm)
Ford 4600, 6600, 6700, 7600 & 7700	0·0080–0·0090 in. (0·203–0·229 mm)
Taper (Out-of-Round)	0·0025–0·0050 in. (0·063–0·127 mm)
Grading Diameter (at Right Angles to Piston Pin)	
Ford 2600, 3600, 4100 & 5600	4·1927–4·1952 in. (106·40–106·56 mm)
Ford 4600, 6600, 6700, 7600 & 7700	4·3922–4·3947 in. (111·56–111·62 mm) in increments of 0·0005 in. (0·0127 mm)
Piston Pin Clearance	0·0003–0·0005 in. (0·0076–0·0127 mm) at 70°F (21°C)
Piston Crown to Block Face	4.2 in. bore 0.008 in. (0.20 mm) below to 0.004 in. (0.10 mm) above 4.4 in. bore 0.011—0.023 in. (0.28—0.58 mm) above Turbocharged Engines 0—0.012 in. (0—0.3 mm) above

PISTON RINGS

Oil Control:	
Number and Location	1—Directly above Piston Pin
Type	Slotted with Expander
Gap Width	0·015–0·038 in. (0·38–0·97 mm)
Side Clearance	0·0024–0·0041 in. (0·061–0·104 mm)
Compression:	
Number and Location	1—Top and 2—Intermediate above Piston Pin
Side Clearance	
Top Compression	0·0044–0·0061 in. (0·112–0·155 mm)
2nd Compression	0·0039–0·0056 in. (0·099–0·142 mm)
3rd Compression	0·0039· 0·0056 in. (0·099–0·142 mm)
Gap Width	
Top	0·015–0·030 in. (0·38–0·76 mm)
Intermediate	0·013–0·028 in. (0·33–0·71 mm)

Detailed installation instructions and specifications are furnished with each set of piston rings.

SPECIFICATIONS (Cont.)

CRANKSHAFT

Main Journal Diameter —Blue	3.3713--3.3718 in (85.631–85.644 mm)
—Red	3.3718–3.3723 in (85.644–85.656 mm)
Main Journal Length	1.455–1.465 in (36.96–37.21 mm)
Main Journal Wear Limits	0.005 in (0.127 mm) Maximum
Main and Crankpin Fillet Radius	0.12–0.14 in (3.048–3.556 mm)
Thrust Bearing Journal Length	1.459–1.461 in (37.06–37.11 mm)
Intermediate Bearing Journal Length	1.455–1.465 in (36.96–37.21 mm)
Rear Bearing Journal Length	1.495–1.515 in (37.97–38.48 mm)
Crankpin Journal Length	1.678--1.682 in (42.62–42.72 mm)
Crankpin Diameter—Blue	2.7496 - 2.7500 in (69.840–69.850 mm)
—Red	2.7500 2.7504 in (69.850–69.860 mm)
End Play	0.004 0.008 in (0.10–0.20 mm)
Crankpin Out-of-Round	0.0002 in (0.005 mm) Total Indicator Reading
Taper-surface Parallel to Centre Line of Main Journal	0.0002 in (0.005 mm)
Crankshaft Rear Oil Seal Journal Diameter	4.808–4.814 in (122.12--122.28 mm)
Crankshaft Pulley Journal Diameter	1.750- 1.751 in (44.45–44.48 mm)
Crankshaft Timing Gear Journal Diameter	1.820--1.821 in (46.23–46.25 mm)
Crankshaft Flange Runout	0.0015 in (0.038 mm) Max

CRANKSHAFT DRIVE GEAR

Number of Teeth	26

MAIN BEARING

Liner Length (except thrust liner)	1.10–1.11 in (27.94–28.19 mm)
Liner Length (thrust liner)	1.453--1.455 in (39.91--36.96 mm)

CRANKPIN BEARINGS

Liner Length	1.40--1.41 in (35.56- 35.81 mm)

CRANKSHAFT RE-GRINDING

When re-grinding a crankshaft, the main and crankpin journal diameters should be reduced the same amount as the undersize bearings used. The following dimensions apply. The rear end of the crankshaft should be located on the 60° chamfer of the pilot bearing bore.

Undersize Bearing Available	Main Journal Diameters
0.002 in (0.051 mm)	3.3693–3.3698 in (85.580–85.593 mm)
0.010 in (0.254 mm)	3.3618–3.3623 in (85.390–85.402 mm)
0.020 in (0.508 mm)	3.3518–3.3523 in (85.136–85.148 mm)
0.030 in (0.762 mm)	3.3418–3.3423 in (84.882–84.894 mm)
0.040 in (1.016 mm)	3.3318–3.3323 in (84.628–84.640 mm)

Crankpin Journal Diameters	
0.002 in (0.051 mm)	2.7476–2.7480 in (69.789–69.799 mm)
0.010 in (0.254 mm)	2.7400–2.7404 in (69.956–69.606 mm)
0.020 in (0.508 mm)	2.7300–2.7304 in (69.342–69.352 mm)
0.030 in (0.762 mm)	2.7200–2.7204 in (69.088–69.098 mm)
0.040 in (1.016 mm)	2.7100–2.7104 in (68.834–68.844 mm)

CRANKSHAFT BALANCER—4-CYLINDER ENGINE

Gear Backlash	0.002–0.010 in (0.05–0.25 mm)
Shaft-to-Bushing Clearance	0.0002–0.0008 in (0.005–0.020 mm)
Shaft Diameter	0.9895–1.000 in (25.133–25.400 mm)
Backlash between Balancer and Crankshaft Gear	0.002–0.008 in (0.05–0.20 mm)
End Float, Balancer Gear-to-Support	0.008–0.020 in (0.20–0.51 mm)

FLYWHEEL

Runout of Clutch Face (Between Outer Edge of Friction Surface and Mounting Bolt Holes)	0.005 in (0.127 mm)
Ring Gear Runout	0.025 in (0.64 mm)

OIL PUMP

Rotor Clearance	0.001–0.006 in (0.025–0.15 mm)
Rotor-to-Pump Housing Clearance	0.006–0.011 in (0.15–0.28 mm)
Rotor End Play	0.001–0.0035 in (0.025–0.089 mm)
Relief Valve Pressure	60–70 lbf/in² (4.1–4.8 bar) (4.2–4.9 kgf/in²) at 2000 rev/min
Relief Valve Spring Tension	1.07 in (27.2 mm) under 10.7–11.9 lb (4.85–5.4 kg) load

TORQUE SPECIFICATIONS

TORQUE VALUES	lbf ft	(Nm)	(Mkg)
Main Bearing Bolts	115–125	(156–159)	(16–17)
Connecting Rod Nuts	60–65	(82–88)	(8–9)
Cylinder Head Bolts (with Engine Cold)	105–115	(143–156)	(14.5–16)
Intake Manifold-to-Cylinder Head	23–28	(31–37)	(3–3.8)
Exhaust Manifold-to-Cylinder Head	25–30	(34–40)	(3.5–4)
Exhaust Pipe-to-Flange	20–26	(27–35)	(2.8–3.5)
Flywheel-to-Crankshaft	100–110	(136–149)	(14–15)
Oil Pan Drain Plug	25–35	(34–47)	(3.5–4.8)
Valve Rocker Cover Bolts	10–15	(14–20)	(1.42–2)
Crankshaft Pulley-to-Crankshaft	150–180	(203–244)	(21–25)
Self-Locking Screw—Valve Rocker Arm	9–26	(12–35)	(1·2–3.5)
Injector Attachment Bolts	15–18	(20–24)	(2–2.5)
Oil Pump to Block	33–38	(45–51)	(4.6–5.5)
Water Pump-to-Cylinder Block	23–28	(31–37)	(3.2–3.9)
Water Pump Cover-to-Pump	18–22	(24–29)	(2.5–3)
Oil Pan-to-Cylinder Block (Stamped)	20–24	(27–32)	(2.8–3.3)
Oil Pan-to-Cylinder Block (Cast)	25–30	(34–40)	(3.5–4)
Injector Line Nuts	18–22	(24–29)	(2.5–3)
Injection Pump-to-Front Adaptor Plate	15–20	(20–27)	(2–2.7)
Camshaft Drive Gear-to-Block	100–105	(136–142)	(13.8–14.5)
Front Adaptor Plate-to-Cylinder Block	12–15	(16–20)	(1.7–2)
Front Cover-to-Front Adaptor Plate	13–18	(18–24)	(1.8–2.5)
Camshaft Gear Bolts	40–45	(54–61)	(5.5–6.2)
Oil Filter Retaining Bolt	45–50	(61–67)	(6.2–7)
Oil Filter Mounting Bolt Insert	20–30	(27–40)	(2.8–4)
Starting Motor-to-Rear Adaptor Plate	20–25	(27–34)	(2.8–3.5)
Dynamic Balancer—Cylinder Block	60–70	(82–95)	(8.3–9.7)
Governor Drive Gear Nut	85–95	(115–128)	(11.8–13)
Oil Pump Gear Stop	65–75	(88–101)	(9–10.3)
Oil Pressure Switch Assembly	20–25	(27–34)	(2.8–3.4)
Turbo-charger-to-Exhaust Manifold	30–35	(41–47)	(4.2–4.8)
Fan to Pulley Bolts	14–18	(19–24)	(1.9–2.5)

FUEL SYSTEMS

TROUBLE SHOOTING

DIESEL FUEL SYSTEMS—GENERAL

PROBLEM	POSSIBLE CAUSES	REMEDY
Fuel not reaching injection pump	1. Fuel shut-off valve closed	1. Check the fuel shut-off valve at the fuel tank is in the 'ON' position
	2. Restricted fuel filters	2. Check and flush the fuel filters clean
	3. Air in system	3. Bleed the fuel filters
	4. Fuel leakage	4. Check the fuel lines and connectors for damage
Fuel reaching nozzles but engine will not start	1. Low cranking speed	1. Check the cranking speed
	2. Incorrect throttle adjustment	2. Check the throttle control rod travel
	3. Incorrect pump timing	3. Check the pump timing
	4. Fuel leakage	4. Check the fuel lines and connectors for leakage
	5. Faulty injectors	5. See injector trouble shooting
	6. Low compression	6. Check the engine compression
Engine hard to start	1. Low cranking speed	1. Check the cranking speed
	2. Incorrect pump timing	2. Check the pump timing
	3. Restricted fuel filters	3. Check and flush the fuel filters clean
	4. Contaminated fuel	4. Check for water in the fuel
	5. Low compression	5. Check the engine compression
	6. Air in system	6. Check for air leaks on the suction side of the system
Engine starts and stops	1. Fuel starvation	1. Check and flush clean restricted fuel lines or fuel filters
	2. Contaminated fuel	2. Check for water in the fuel
	3. Restricted air intake	3. Check for restrictions in the air intake
	4. Engine overheating	4. Check cooling system
	5. Air in system	5. Check for air leaks on the suction side of the system

TROUBLESHOOTING (Cont.)

PROBLEM	POSSIBLE CAUSES	REMEDY
Erratic engine operation (surge, misfiring, poor governor regulation)	1. Fuel leakage	1. Check the injector lines and connectors for leakage
	2. Fuel starvation	2. Check and flush clean restricted fuel lines or filters
	3. Incorrect pump timing	3. Check the pump timing
	4 Contaminated fuel	4. Check for water in the fuel
	5 Air in system	5 Bleed the fuel system
	6. Faulty or sticking injector nozzles	6. See injector trouble shooting
	7 Incorrect engine timing	7. Check for faulty engine valves
Engine does not develop full power or speed	1 Incorrect throttle adjustment	1. Check for insufficient throttle control movement
	2 Incorrect maximum no-load speed	2. Check maximum no-load speed adjustment
	3. Fuel starvation	3 Check and flush clean restricted fuel lines and filters
	4 Air in system	4 Check for air leaks on the suction side of the system
	5 Incorrect timing	5. Check pump timing
	6 Low compression	6. Check engine compression
	7. Incorrect engine timing	7 Check for improper valve adjustment or faulty valves
Engine emits black smoke	1 Restricted air intake	1. Check for a restricted air intake
	2. Engine overheating	2. Check cooling system
	3. Incorrect timing	3. Check the pump timing
	4. Faulty injectors	4. See injector trouble shooting
	5. Low compression	5. Check the engine compression
	6. Incorrect engine timing	6. Check the engine valves

TROUBLESHOOTING (Cont.)

FUEL INJECTORS

PROBLEM	POSSIBLE CAUSES	REMEDY
Nozzle does not 'buzz' whilst injecting	1. Needle valve stuck 2. Leakage 3. Nozzle damaged	1. Check needle valve is clean and not binding 2. Check valve seat is not leaking 3. Examine nozzle retaining cap for damage
Nozzle leak-back	1. Needle valve worn 2. Blocked nozzle assembly 3. Loose nozzle retaining nut	1. Replace nozzle assembly 2. Check for carbon or foreign matter on faces of nozzle and nozzle holder. Flush clean or replace 3. Inspect faces and tighten nozzle retaining nut
Nozzle opening pressure incorrect	1. Incorrectly adjusted nozzle retaining nut 2. Damaged nozzle or seized needle valve 3. Blocked nozzle holes	1. Check adjusting nut for looseness and re-set 2. Replace nozzle assembly 3. Check nozzle holes for carbon or foreign matter. Flush clean or replace
Nozzle seat leakage	1. Nozzle incorrectly seated 2. Sticking or binding needle valve	1. Check for carbon or foreign matter on faces of nozzle or nozzle holder 2. Repair or replace nozzle assembly
Spray pattern distorted	1. Obstructed needle valve 2. Obstructed needle valve holes 3. Damaged nozzle or needle valve	1. Check for carbon or foreign matter on needle valve tip. Flush clean or replace nozzle assembly 2. Check for carbon in needle valve holes. Flush clean or replace nozzle assembly 3. Replace nozzle assembly

TROUBLESHOOTING (Cont.)

TURBOCHARGER

PROBLEM	POSSIBLE CAUSES	REMEDY
1. Engine lacks power or emits black smoke	1. Dirty air cleaner	1. Clean or renew
	2. Loose compressor-to-intake manifold connections	2. Tighten
	3. Leak at engine intake or exhaust manifold	3. Check and renew
	4. Leak at turbocharger mounting flange	4. Check and tighten
	5. Turbo rotating assembly binding	5. Check and renew
	6. Air cleaner to turbocharger duct restricted	6. Clean or renew
	7. Compressor to intake manifold duct restricted	7. Clean or renew
2. Engine exhaust emits blue smoke	1. Dirty air cleaner	1. Clean or renew
	2. Loose compressor-to-intake manifold connections	2. Tighten
	3. Leak at engine intake manifold	3. Check and renew
	4. Plugged engine oil filter	4. Replace
	5. Restricted duct between air cleaner and turbocharger compressor	5. Clean or renew
	6. Seal leak at compressor end of turbocharger	6. Replace
	7. Engine malfunction (rings, pistons, valves, etc.)	7. Perform appropriate overhaul

TROUBLESHOOTING (Cont.)

PROBLEM	POSSIBLE CAUSES	REMEDY
3. Excessive engine oil consumption	1. Wrong type or viscosity of engine lubricating oil	1. Renew
	2. Seal leaks at compressor end of turbocharger (indicated by oil in housing or on wheel)	2. Check and renew
4. Noisy turbocharger	1. Dirty air cleaner	1. Clean or renew
	2. Foreign material or object in compressor-to-intake manifold duct	2. Check and clean or renew

SPECIFICATIONS

	Ford 2600		Ford 3600		Ford 4100		Ford 4600		Ford 5600	
	Less Cab	With Cab	Less Cab	With Cab	Less Cab	With Cab	Less Cab	With Cab	Less Cab	With Cab
Fuel tank capacity less auxiliary fuel tank:										
Imperial gallons	10.8	12.5	10.8	12.5	10.8	12.5	13.3	12.5	17.9	17.7
U.S. gallons	13.0	15.0	13.0	15.0	13.0	15.0	16.0	15.0	21.5	21.3
Litres	49.2	57.0	49.2	57.0	49.2	57.0	60.5	57.0	81.4	80.7
Fuel tank capacity with auxiliary fuel tank:										
Imperial gallons	—	—	—	—	—	—	—	—	29.1	28.9
U.S. gallons	—	—	—	—	—	—	—	—	35.0	34.8
Litres	—	—	—	—	—	—	—	—	132	132

SPECIFICATIONS (Cont.)

	Ford 2600	Ford 3600	Ford 4100	Ford 4600	Ford 5600
Injection pump type	Distributor				
Pump timing	273°	270°	270°	270°	257°
Maximum no-load engine speed (rev/min) for Belgium, France, Germany, Italy, Netherlands and Sweden	2180—2200	2180—2200	2355—2375	2350—2370	2245—2265
Maximum no-load engine speed (rev/min) for all countries except Belgium, France, Germany, Italy, Netherlands and Sweden	2225—2275	2225—2275	2425—2475	2425—2475	2325—2375
Idle speed (rev/min)	600—700				

	Ford 2600	Ford 3600, 4100, 4600 & 5600
Fuel injector nozzle opening pressure	3053—3275 lbf/in² (210—226 bar) (215—230 kgf/cm²)	2666—2887 lbf/in² (184—199 bar) (187—203 kgf/cm²)

	Ford 6600		Ford 6700		Ford 7600		Ford 7700	
	Less Cab	With Cab	Less Cab	With Cab	Less Cab	With Cab	Less Cab	With Cab
Fuel tank capacity less auxiliary fuel tank:								
Imperial gallons	17.9	17.7	25.4	25.4	17.9	17.7	25.4	25.4.
U.S. gallons	21.5	21.3	30.5	30.5	21.5	21.3	30.5	30.5
Litres	81.4	80.7	115	115	80.7	80.7	115	115
Fuel tank capacity with auxiliary fuel tank:								
Imperial gallons	29.1	28.9	41.2	41.2	29.1	28.9	41.2	41.2
U.S. gallons	35.0	34.8	49.5	49.5	35.0	34.8	49.5	49.5
Litres	132	132	187	187	187	132	187	187

SPECIFICATIONS (Cont.)

	Ford 6600	Ford 6700	Ford 7600	Ford 7700
Injection pump type	Distributor or in-line type	In-line		
In-line type fuel injection pump lubricating oil capacity	0.62 Imp. pt. (0.76 U.S. pt.) (0.36 litres)			
Fuel injector nozzle opening pressure	2666—2887 lbf/in² (184—199 bar) (187—203 kgf/cm²)		3053—3275 lbf/in² (210—226 bar) (215—230 kgf/cm²)	
Pump timing	255° or 21° B.T.D.C.	21° B.T.D.C.	21° B.T.D.C.	21° B.T.D.C.
Maximum no-load engine speed (rev/min) for Belgium, France, Germany, Italy, Netherlands and Sweden	2325—2375 (distributor) 2245—2265 (in-line)	2245—2265	2283	2283
Maximum no-load engine speed (rev/min) for all countries except Belgium, France, Germany, Italy, Netherlands and Sweden	2325—2375 (distributor) 2240—2270 (in-line)	2240—2270	2325—2375	2325—2375
Idle-speed (rev/min)	600—700			

TORQUE SPECIFICATIONS

FUEL SYSTEM

	lbf. ft.	Nm	mkg
Injector line nuts	18—22	24—29	2.5—3.0
Injector retaining nuts	10—15	13—20	1.4—2.0
Injector pump-to-front adaptor plate	26—30	35—41	3.6—4.2
Injector leak-off line bolts	8—10	11—13	1.1—1.4
Fuel filter line nuts (with extension)	15—30	20—41	2.0—4.2
Injection pump-to-gear bolt	20—25	27—34	2.8—4.0
Injection pump outlet tube bolt	15—20	20—27	2.0—2.8
Injector nozzle retaining nut	44—56	60—76	6.1—7.7
Injector cap nut	44—56	60—76	6.1—7.7
Fuel pump drive	10—23	13—32	1.4—2.1
Fuel filter element pump (diesel)	6—10	8—13	0.8—1.4

TORQUE SPECIFICATIONS (Cont.)

FUEL INJECTION PUMP—DISTRIBUTOR TYPE

	lbfft	*Nm*	*Mkg*
End Plate Screws	3·8	5·2	0·5
Fuel Inlet Connections	30	40	4·1
Transfer Pump Rotor	5·4	7·3	0·8
Head Locking Screws	14	19·0	2·0
Advance Device Cap Nut	9·2	12·5	1·3
Cam Advance Screw	33	45	4·6
Head Locating Fitting	29	39	4·1
Advance Device Spring and Piston End Caps	21	29	2·9
Fuel Connection Studs (Banjo and Radial)	23	32	2·1
Governor Control Cover Studs	5	6·8	0·7
Governor Control Cover Cup Nuts	3·3	4·5	0·5
Head Locating Fitting End Nut	17	23	2·4
Govenor Control Bracket Screw	1·8	2·4	0·3
Throttle and Shut-Off Shaft Retaining Nuts	2·5	3·4	0·3
Drive Hub Screw (Slacken and re-tighten to this torque three times after testing pump)	24	33	3·3
Drive Plate Screws (First tighten to high torque figure then slacken and re-tighten to low torque figure)	29 (21)	39 (29)	4·0 (2·9)

FUEL INJECTION PUMP IN-LINE TYPE

	lbfft	*Nm*	*Mkg*
Governor Backplate-to-Pump Screws	9	12	1·2
Delivery Valve Holders	40–45	54–61	5·5–6·2
Pump Drive Gear Adaptor Retaining Nut	45	61	6·2
Governor Spring Retaining Bolt	2–4	2·7–5·4	0·3–0·6
Control Fork Socket Screws	2	2·7	0·3
Pump Body Socket Screws	5	6·8	0·7
Fuel Injection Pump to Front Plate	26–30	35–41	3·6–4·2
Injection Pump-to-Gear Bolt	20–25	27–34	2·8–4·0

TURBO CHARGER

	lbfft	*Nm*	*Mkg*
Compressor Wheel-to-Shaft Retaining Nuts	13	19	1·8
Housing Clamp Band Nut	10	13	1·4
Compressor Cover-to-Bearing Housing	5	6·8	0·7
Turbo-Charger-to-Exhaust Manifold	30–35	41–48	4·2–4·8

ELECTRICAL SYSTEM

TROUBLESHOOTING

INSTRUMENTATION

PROBLEM	POSSIBLE CAUSES	REMEDY
Warning lights and gauges inoperative	1. Faulty key start switch 2. Fuse(s) burned out 3. Defective cab load relay 4. Loose or broken wiring	1. Inspect and renew 2. Inspect and renew, check circuit before re-connecting power 3. Check and renew 4. Inspect circuit, tighten connectors or renew wiring
Gauge(s) erratic or inoperative	1. Loose or broken wiring 2. Defective gauge(s) 3. Defective sender 4. Defective voltage stabiliser (Straddle Mount tractors only) 5. Defective fuel tank change-over switch (with auxiliary fuel tank only)	1. Inspect circuit, tighten connections or renew wiring 2. Inspect and renew 3. Check and renew 4. Check and renew 5. Check and renew
Flat deck gauges read maximum all the time (when switched on)	1. Sender line open circuit	1. Check circuit continuity
Oil pressure or air cleaner restriction indicator switch light inoperative	1. Loose or broken wiring 2. Burned out bulb 3. Defective sender unit 4. Defective diode	1. Inspect circuit, tighten connections or renew wiring 2. Check and renew 3. Inspect and renew 4. Check and renew
Windscreen wiper or heater blower motor inoperative	1. Fuse burned out 2. Loose or broken wires or connections 3. Defective switch 4. Defective motor	1. Inspect and renew, check circuit before re-connecting power 2. Inspect circuit, tighten connections or renew wiring 3. Check and renew 4. Check and renew
Windscreen wiper fails to assume park position when turned off	1. Defective switch or wiring 2. Defective motor	1. Check switch and wiring for continuity and renew 2. Check and renew

INSTRUMENTATION (CONT.)

PROBLEM	POSSIBLE CAUSES	REMEDY
Windscreen washer inoperative	1. Reservoir empty 2. Jet feed tube blocked or dislodged 3. Defective switch or wiring 4. Defective motor	1. Fill to correct level 2. Inspect, clean, secure and tighten connections or renew 3. Check circuit continuity and renew 4. Check and renew

STARTING SYSTEM

PROBLEM	POSSIBLE CAUSES	REMEDY
Engine will not crank and starting motor relay or solenoid does not engage	1. Battery discharged 2. Key start switch, safety start switch, relay or solenoid inoperative 3. Starting circuit open or high resistance	1. Check battery and charge or renew 2. Check circuity and repair or renew faulty components 3. Check circuit connections and repair or renew faulty wiring
Engine will not crank but starting motor relay or solenoid engages	1. Engine seized 2. Battery discharged 3. Defective starting motor connections or loose battery connections 4. Starting motor faulty 5. Relay or solenoid contacts burned	1. Check engine crankshaft free to turn 2. Check battery and charge or renew 3. Check, clean and tighten connections 4. Inspect, repair or renew 5. Renew relay or solenoid
Starting motor turns but does not crank engine	1. Defective starting motor drive assembly 2. Defective solenoid or pinion engagement levers 3. Defective flywheel ring gear	1. Inspect and repair or renew 2. Inspect and repair or renew 3. Inspect and renew
Engine cranks slowly	1. Discharged battery 2. Excessive resistance in starting circuit 3. Defective starting motor 4. Tight engine	1. Check battery and charge or renew 2. Check circuit connections and repair or renew faulty wiring 3. Inspect and repair or renew 4. Investigate cause and effect repair

TROUBLESHOOTING (Cont.)

LIGHTING SYSTEM

PROBLEM	POSSIBLE CAUSES	REMEDY
Individual lights do not illuminate	1. Burned out bulb 2. Defective or corroded bulb contacts 3. Fuse burned out 4. Loose or broken wires 5. Poor ground connection	1. Check and renew 2. Inspect, clean or renew 3. Inspect and renew, check circuit before re-connecting power 4. Inspect, secure, repair or renew wiring 5. Inspect, clean and tighten ground connections
Lights burn out repeatedly	1. Loose or corroded wiring connections 2. Loose bulb or lamp mounting bracket 3. Faulty voltage regulator	1. Inspect, secure, repair or renew wiring 2. Inspect, tighten or renew 3. Check and renew voltage regulator
Plough lamps inoperative	1. Side lights switch not turned on 2. See "Individual lights do not illuminate"	1. Ensure side lights are illuminated 2. See "Individual lights do not illuminate"
Flasher lamps do not illuminate	1. Fuse blown 2. Flasher unit inoperative 3. Flasher switch inoperative 4. Defective wiring or connections	1. Inspect and renew, check circuit before re-connecting power 2 Check and renew **NOTE:** *Flasher unit may be bypassed by inter-connecting terminals 49 and 49A This enables circuit continuity to be checked* 3. Check and renew 4. Inspect circuit, clean and tighten connections or renew wiring
Individual flasher lamp does not illuminate	1. Burned out bulb 2. Corroded or loose bulb contacts 3. Poor ground connection or damaged wiring	1. Check and renew 2 Inspect, clean, tighten or renew 3. Inspect, clean and tighten connection, repair or renew wiring
Turn indicator pilot bulb(s) inoperative	1. Faulty bulb(s) 2. Defective flasher unit 3. Faulty wiring or connections 4. Main flasher lamp bulb contacts or ground connection corroded (failing to draw full current)	1. Check and renew 2. Check and renew 3 Inspect, clean and tighten connections or renew wiring 4. Inspect, clean and tighten contacts and ground connections

CHARGING SYSTEM

PROBLEM	POSSIBLE CAUSES	REMEDY
Battery low in charge or discharged	1. Loose or worn alternator drive belt 2. Defective battery, will not accept or hold charge Electrolyte level low 3. Excessive resistance due to loose charging system connections 4. Defective battery temperature sensor (where fitted) 5. Defective voltage regulator 6. Defective alternator	1. Check and adjust tension or renew 2. Check condition of battery and renew Check, fill and charge 3. Check, clean and tighten circuit connections 4. Check and renew 5. Check and renew 6. See alternator trouble shooting guide
Alternator charging at high rate (battery overheating)	1. Defective battery 2. Defective battery temperature sensor 3. Defective voltage regulator 4. Defective alternator	1. Check condition of battery and renew 2. Check and renew 3. Check and renew 4. See alternator trouble shooting guide
No output from alternator	1. Alternator drive belt broken 2. Loose connection or broken cable in charging system 3. Defective temperature sensor (where fitted) 4. Defective voltage regulator 5. Defective alternator	1. Renew and tension correctly 2. Inspect system, tighten connections and repair or renew faulty wiring 3. Check and renew 4. Check and renew 5. See alternator trouble shooting guide
Intermittent or low alternator output	1. Alternator drive belt slipping 2. Loose connection or broken cable in charging system 3. Defective temperature sensor (where fitted) 4 Defective voltage regulator 5. Defective alternator	1. Check and adjust tension or renew 2. Inspect system, tighten connections and repair or renew faulty wiring 3. Check and renew 4 Check and renew 5. See alternator trouble shooting guide

TROUBLESHOOTING (Cont.)

ALTERNATOR

PROBLEM	POSSIBLE CAUSES	REMEDY
Warning light dims and/or battery low	1. Faulty external charging circuit connections 2. Faulty rotor slip rings or brushes	1. Inspect system, clean and tighten connections 2. Inspect and repair or renew
Warning light goes out— becomes brighter with increased speed	1. Faulty external charging circuit connections 2. Faulty rectifier or rectifying diodes	1. Inspect system, clean and tighten connections 2. Check and renew
Warning light normal but battery boiling	1. Defective voltage regulator 2. Faulty battery temperature sensor (where fitted)	1. Check and renew 2. Check and renew
Warning light normal but battery discharged	1. Defective voltage regulator 2. Faulty stator 3. Faulty rectifier or rectifying diodes	1. Check and renew 2. Check and renew 3. Check and renew
Warning light illuminated continuously and/or flat battery	1. Loose or worn alternator drive belt 2. Defective surge protection diode (where fitted) 3. Defective isolation diodes (where fitted) 4. Faulty battery temperature sensor (where fitted) 5. Faulty rotor, slip rings or brushes 6. Faulty voltage regulator 7. Defective stator 8. Defective rectifier or rectifying diodes	1. Check and adjust tension or renew 2. Check and renew 3. Check and renew 4. Check and renew 5. Inspect, repair or renew 6. Check and renew 7. Inspect and renew 8. Check and renew
Warning light extinguished continuously and/or flat battery	1. Burned out bulb 2. Alternator internal connections 3. Defective voltage regulator 4. Faulty rotor, slip rings or brushes 5. Defective stator	1. Check and renew 2. Inspect and test circuitry, repair or renew 3. Check and renew 4. Check, repair or renew 5. Check and renew

SPECIFICATIONS

HORN

Voltage	12 Volts
Current Draw	5·2A Max.

OIL PRESSURE SWITCH

Voltage	12 Volts
Operating Pressure	8–12 lbf/in² (0·55–0·83 bar) (0·56–0·84 Kgf/cm²)

ENGINE COOLANT TEMPERATURE SENDER

IMPORTANT: *The following values only apply when the unit is installed and operating under tractor circuit conditions.*

Voltage	12 Volts
Resistance	400 Ohms at 100°F (38°C) 30 Ohms at 250°F (121°C)

AIR CLEANER RESTRICTION SWITCH

Voltage	12 Volts
Operating Pressure	930–920 mbar below atmospheric pressure

GAUGES

IMPORTANT: *The following values only apply when the gauges are installed and operating under tractor circuit conditions.*

Fuel Gauge (Except Ford 6700 and 7700)

Voltage	12 Volts
Resistance at Low Calibration Mark	250 Ohms
at High Calibration Mark	19 Ohms

Fuel Gauge (Ford 6700 and 7700)

Voltage	12 Volts
Resistance at Full Mark	88 Ohms
at Half-Full Mark	44 Ohms
at Empty Mark	1 Ohm

Temperature Gauge (Except Ford 6700 and 7700)

Voltage	12 Volts
Resistance at High Calibration Mark	37 Ohms
at Low Calibration Mark	250 Ohms

Temperature Gauge (Ford 6700 and 7700)

Voltage	12 Volts
Resistance at High Calibration Mark	55 Ohms
at Centre Calibration Mark	113 Ohms
at Lower Calibration Mark	1365 Ohms

WINDSCREEN WIPER MOTOR

Voltage	12 Volts
Current Draw at Low Speed	2A Max. at a Torque of 5lbf/in (0·6 Nm) (0·06 Mkg)
Current Draw at High Speed	2·5A Max. at a Torque of 5 lbf/in (0·6 Nm) (0·06 Mkg)