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MANUAL PREVIEW

International Harvester

Service Manual

300 & 400 Series

Diesel Engines

& Fuel Systems

Service Manual

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IH-S-ENG3/400

IH-S-ENG3/400

Equipment Models using this Engine

70 Hydro	1566
86 Hydro	1586
100 Hydro	3388 2+2
186 Hydro	3488 Hydro
453 Hillside Combine	3588
666	3688
686	3788
766	4166
786	4186
815 Combine	4366
886	4386
915 Combine	5088
966	5288
986	5488
1066	6388
1086	5688
1440 Axial Flow Combine	6788
1460 Axial Flow Combine	312
1466	360
1480 Axial Flow Combine	414
1486 Tractor	436
	466

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Section

1

ENGINE

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TURBOCHARGER



11. Always use a safety bar to block hydraulic cylinders. Never rely on the machine hydraulic system to hold when working on loaders, etc. A hydraulic line or cylinder could fail or someone could accidentally strike the control levers causing the loader to fall.

12. Electrical storage batteries give off highly inflammable hydrogen gas when charging and continue to do so for some time after receiving a steady charge. Do not under any circumstances allow an electric spark or an open flame near the battery. Always disconnect a battery cable before working on the electrical system.

13. Hydraulic fluid escaping under pressure can have enough force to penetrate the skin. Hydraulic fluid may also infect a minor cut or opening in the skin. If injured by escaping fluid, see a doctor at once. Serious infection or reaction can result if medical treatment is not given immediately.

Do not attempt to repair or tighten hoses that are under pressure, when the boom is raised, or with the tractor engine running. Cycle all hydraulic control valves to relieve all pressure before disconnecting the lines or performing other work on the hydraulic system. Make sure all connections are tight and hoses and lines are in good condition before applying pressure to the system. To locate a leak under pressure, use a small piece of cardboard or wood. Never use hands.

14. Handle gasoline with care - it is highly flammable:

- (a) Use approved gasoline container.
- (b) Never remove the fuel tank cap or fill the fuel tank when the engine is running, is hot, or indoors. Also, do not smoke when working around flammable fuel.
- (c) When refueling, keep the hose and nozzle of the funnel and container in contact with the metal of the fuel tank to avoid the possibility of an electric spark igniting the fuel. Do not overfill the fuel tank - overflow creates fire hazard. Wipe up spilled gasoline.
- (d) Replace fuel tank cap securely.

15. Always use a protective fixture when inflating tubeless tires that have been repaired or are loose on the rim. Do not inflate over 30 psi to seat the tire bead.

16. Use pullers to remove bearings, bushings, gears, cylinder sleeves, etc. when applicable. Use hammers, punches and chisels only when absolutely necessary. Then, be sure to wear safety glasses.

17. Be careful when using compressed air to dry parts. Use approved air blow guns, do not exceed 30 psi, wear safety glasses or goggles and use proper shielding to protect everyone in the work area.

18. Do not wear rings, wrist watches or loose fitting clothing when working on machinery, they could catch on moving parts causing serious injury. Wear sturdy, rough-soled work shoes. Never adjust and/or service a machine in bare feet, sandals or sneakers.

19. Excessive or repeated skin contact with sealants or solvents may cause skin irritation. In case of skin contact, remove sealant or solvent promptly by washing with soap and water.

IMPORTANT: The above is only a partial list of safe work rules. In addition, always refer to the Operator's Manual for the specific machine for additional safe work rules regarding the machine operation.

Section 1

ENGINE

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SPECIFICATIONS

CRANKCASE CAPACITY (W/FILTERS CHANGED) – QTS. –Cont'd

S-9B Pay Logger	16
453 Hillside Combine	17
815 Combine	20
915 Combine	20
1440 & 1460 Combine	20
1480 Combine	20
1480 Rice Combine	20
1470 Hillside Combine	20

INJECTION PUMP TIMING – STATIC (CRANKSHAFT DEGREES) ± 1 DEGREE

70 Tractor w/D-312	18° BTDC
100 Tractor w/D-436	18° BTDC
666 Tractor w/D-312 Injection Pump #680 345 C91 & C92	18° BTDC
666 Tractor w/D-312 Injection Pump #684 529 C91.	13° BTDC
766 Tractor w/D-360	18° BTDC
966 Tractor w/D-414	18° BTDC
1066 Tractor w/DT-414	18° BTDC
1466 Tractor w/DT-436	18° BTDC
1566 Tractor w/DT-436	15° BTDC
4166 Tractor w/DT-436	18° BTDC®
4366 Tractor w/DT-466	18° BTDC
88 Hydro Tractor w/D-312	18° BTDC
186 Hydro Tractor w/D-436	18° BTDC
686 Tractor w/D-312	13° BTDC
886 Tractor w/D-360	18° BTDC
986 Tractor w/D-436	18° BTDC
1086 Tractor w/DT-414	18° BTDC
1086 Tractor w/DT-414B	15° BTDC
1486 Tractor w/DT-436B	15° BTDC
1486 Tractor w/DT-436	18° BTDC
1586 Tractor w/DT-436	18° BTDC
1586 Tractor w/DT-436B	15° BTDC
4186 Tractor w/DT-436	18° BTDC
4386 Tractor w/DTI-466	17° BTDC
4386 Tractor w/DTI-466B	14° BTDC
3388 Tractor w/DT-436B	15° BTDC
3588 Tractor w/DT-466B	15° BTDC
3788 Tractor w/DT-466B	15° BTDC
3488 Tractor w/D-466	18° BTDC
3688 Tractor w/D-436	18° BTDC
5088 Tractor w/DT-436	15° BTDC
5288 Tractor w/DT-466	17° BTDC
5488 Tractor w/DTI-466	17° BTDC

MANIFOLDS

REMOVAL AND DISASSEMBLY

Remove Manifolds as Follows:

INTAKE MANIFOLD –

(D and DT Engines)

1. Disconnect Turbocharger crossover tube (2, Fig. 3 or Fig. 3a) (if equipped) from intake manifold (1).
2. Remove fuel lines (as an assembly) as follows:
 - a. Disconnect fuel lines (3, Fig. 3 or 3, Fig. 3a) at injection nozzles and pump.
 - b. (Engines equipped with UTDS* Model 100 Fuel Injection Pump only) Loosen clamp (4) securing fuel lines to the hose connecting final fuel filter to injection pump.

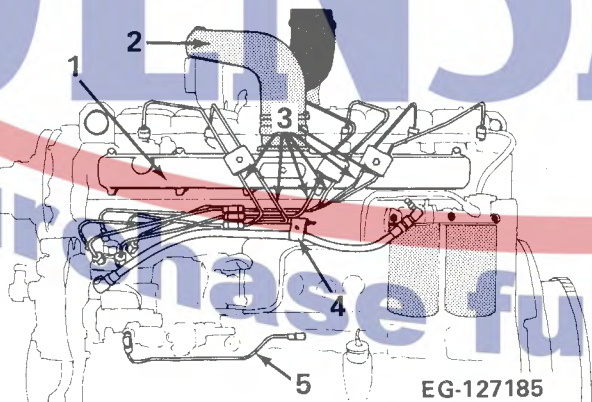


Figure 3 – Left Side View DT-466 (w/UTDS* Model 100 Fuel Injection Pump)

1. Intake Manifold
2. Outlet Pipe
3. Fuel Lines
4. Clamp
5. Lube Oil Tube

c. After removing fuel lines cap all injection nozzle openings, pump and line openings to prevent dirt from entering.

3. Remove cap screws securing intake manifold to cylinder head; then remove manifold and manifold gasket.

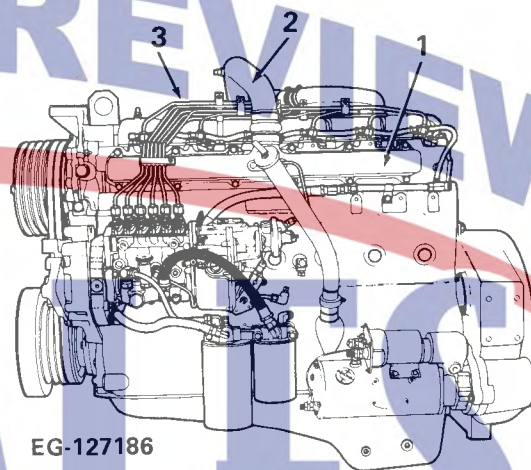


Figure 3a – Left Side View DT-466C (w/Robert Bosch Model MW Fuel Injection Pump)

1. Intake Manifold
2. Outlet Pipe
3. Fuel Lines

*United Technologies Diesel Systems
(formerly AMBAC)

Section 2

FUEL SYSTEM Contents

U.T.D.S. MODEL 100 (AMBAC) INJECTION PUMP

ROBERT BOSCH MODEL MW INJECTION PUMP

1. **UNITED TECHNOLOGIES DIESEL SYSTEM (U.T.D.S.) MODEL 100 - formerly American Bosch (AMBAC) Model 100 INJECTION PUMP**

Pages 2 - 2 thru Page 2 - 129

2. **ROBERT BOSCH MODEL MW INJECTION PUMP**

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3. **NOZZLES AND NOZZLE HOLDERS FOR USE WITH MODEL 100 AND MODEL M-W.**

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NOTE: For test bench and fuel rate specifications refer to Service Manual GSS-1460 "Diesel Fuel Injection Pump Test Bench and Fuel Rate Specifications".

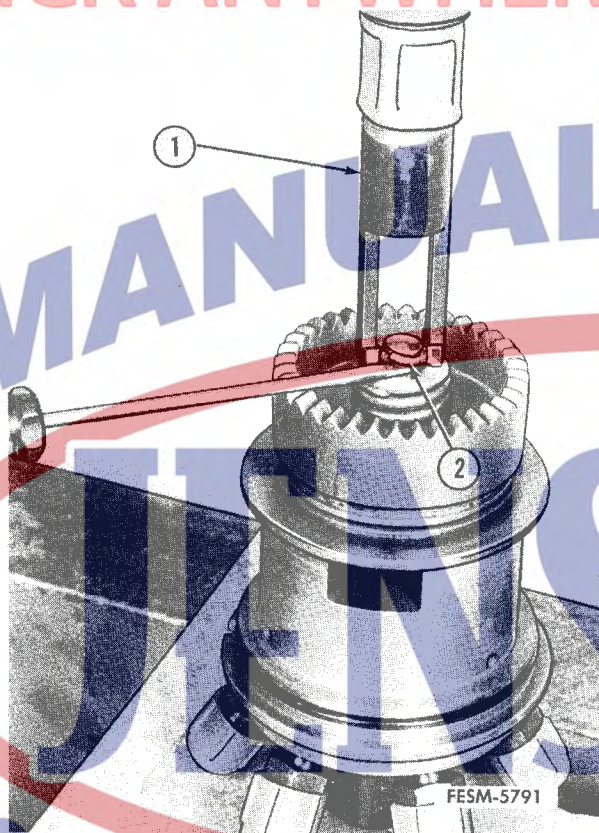
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U.T.D.S. MODEL 100 (AMBAC) INJECTION PUMP

Servicing Components

Hydraulic Head



IMPORTANT: Make certain head and tool are centered and straight before depressing spring to avoid dropping and damaging the head.

2. Place the hydraulic head in a press as shown. Using the plunger spring compressor tool (1) 05-500-8, depress the spring seat and spring. Remove the split retaining ring (2) using a small screwdriver.

1. Plunger spring compressor tool 05-500-8
2. Split retaining ring

3. It may be necessary to raise the plunger slightly (when the spring is depressed) with a screwdriver blade, in order to remove the retaining rings. Remove the lower spring seat, spring and washer.

4. Remove the face gear retainer (3), and remove the face gear (2) and plunger guide. Remove the thrust washer (1) from the hydraulic head.

5. Pull the plunger out of the head and remove the plunger sleeve. The plunger, plunger sleeve and hydraulic head are mated parts and must always be kept together.



1. Thrust washer
2. Face gear
3. Retainer

IMPORTANT: DO NOT CLAMP HYDRAULIC HEAD DIRECTLY IN A VISE. A holding bar 05-500-10 is available for supporting the hydraulic assembly in a vise.

Section 3

TURBOCHARGER CONTENTS

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