SERVICE MANUAL

TRACTOR

380

9-73727

1. Trim along dashed line.
2. Slide into pocket on Binder Spine.

TYPE 1-4

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380 Gen Tractor
Service Manual

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ENGINE DIAGNOSIS

CASE CORPORATION

C.E. Div. 9-67011
August 1977

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GENERAL INFORMATION

Before making any repairs or adjustments on an engine, the mechanic must properly diagnose the trouble.

Locating the trouble and repairing it is only part of the job, a mechanic must find and eliminate the cause of the trouble as well. Too many repairs are made with no thought to removing the causes that made the repair necessary.

For the engine to start and perform properly, three main requirements must be present:

1. Fuel
2. Air.
3. Compression - Ignition

When any of these requirements are not present or limited for some reason, the engine will not start or will fail to operate properly throughout the power range.

Fuel

Fuel system problems can be present anywhere from the fuel tank, through the filters and injection pump as well as the injectors. Correct injection pump timing is important in the overall fuel system performance.

Air

Air in an engine is related to the breathing of the engine; the intake of air into the engine and the expulsion of exhaust. Proper air flow is affected by the air cleaner condition, muffler restriction, valve condition, and adjustment, cylinder head gaskets, condition of cylinder walls, rings, pistons, camshaft and crankshaft timing.

Compression - Ignition

Ignition is the result of adequate compression of the intake air in the cylinder to provide enough heat to fire the fuel being injected into the engine cylinder. Proper spray pattern and atomization of the fuel by the injector is very important. Timing the fuel injection pump to the engine is a vital requirement for proper ignition.

ENGINE HARD TO START OR WILL NOT START

No Smoke From Exhaust

1. Fuel Shut-Off Not Open Completely:

   Improper cable adjustment, damaged cable, cable slipping in clamps will not allow the fuel shut-off to open completely. Check lever to be sure it is opening completely. Adjust cable.

2. Air Filter Plugged:

   A dirty filter will cause rich fuel mixture and low engine power. Service air filter if required.

3. Slow Cranking Speed:

   Starter must crank engine 200 to 300 rpm (r/min) in order to ignite the diesel fuel. Check engine speed while cranking. If cranking is slow, check starter amperage draw to help determine the following defective areas: batteries, cables, solenoid and starting motor.

   Slow cranking speed can be caused by the following internal and external engine defects: scuffing and scoring of pistons and cylinder walls, improper crankshaft or camshaft end play, defective rod or crank bearings, oil pump, water pump and hydraulic pump.

4. Fuel Supply Shut-Off or No Fuel:

   Check that the fuel tank to fuel pump tube is open. Check fuel supply in tank.

5. Air In Fuel System:

   Bleed fuel system until fuel flows steadily with no bubbles. Check for air leaks at fittings between tank and fuel pump.

6. Camshaft Damaged:

   A sheared key in the cam drive gear or a broken camshaft will throw valve and injection pump timing out of sequence affecting engine operation. Check valve timing.

7. Fuel Injection Nozzle Not Seated In Head:

   A nozzle that is not seated in the cylinder head will leak air and not allow enough compression to fire the injected fuel. Check for damaged nozzle gasket or seals, loose nozzle, or broken stud.

8. Fuel Line Plugged:

   A fuel line plugged with dirt will not let fuel through to the injection pump. Remove line at fuel filters and check for fuel flow through line.

9. Clogged Fuel Filter:

   Check and service fuel filters.

10. Wrong Fuel or Contaminated Fuel:

    Wrong fuel or contaminated fuel can cause the engine not to run or to have pre-combustion, causing serious damage to the engine. Drain fuel tank and refill with correct fuel.

11. Piston Rings Worn:

    As piston rings become worn, they lose tension and ability to seal and wipe lubrication oil off cylinder walls. Take a compression test to determine piston ring condition. If readings are low, squirt a small amount of oil into the cylinder and retest. If compression comes up because the oil helps the rings seal, it will be necessary to install new piston rings and possibly new pistons.

12. Injection Pump Malfunction:

    A malfunctioning injection pump will usually under-fuel the engine. Adjust or replace the injection pump.

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