

Loss of Power/Poor Engine Performance

(Reference the JD-H Service Guide & JD-H Restoration Guide, 2nd or 3rd Ed.)

Let us begin with a scan across the waterfront. The basic rules of thumb for this engine are **Fuel + Compression + Fire = Power.**

1. Fuel = Fresh, clean fuel + Good flow + an open LOAD path + an open Air-In path.

With fresh, clean fuel (not old fuel), you should be able to walk up to the non-running tractor, open both fuel valves and then – at the carburetor, open the bowl drain and collect an unbroken flow of gasoline when opening the drain cock – a stream near pencil size. This is a fuel-flow test.

From the Service Guide, see page 26. There you will find (in paragraph 3-22) open pathway tests for both the LOAD and IDLE sides of your carburetor. And finally, if your tractor acts up just operating it casually, try loosening the joint between carburetor and the air inlet elbow between carburetor and air cleaner – wedge some object between them to the two are at least 3/16-inch apart at the bottom, and then drive it again to see if there is improvement. If there is, one may find air flow into the engine is being restricted. NOTE: Some folks will simply remove the oil bowl from the air cleaner – should give you the same result, but this way does increase danger of a backfire setting off a real fire! Use your judgment on this one.

2. Compression = Valve Timing + Valve Closure.

From the Service Guide, page 9, paragraph 2-10, you will find a test to see if the camshaft and crankshaft are in proper relationship to each other. For the Model “H”, the exhaust valve opens at 45° before bottom dead center, and closes 5° after top dead center; the intake valve opens on top dead center, and closes 50° after bottom dead center. All valve timing should be held to the specification +/- 3°.

From the Service Guide, page 6, paragraph 2-4, you will find instructions for valve tappet settings. The call-out is for 0.015-inch tappet gap at operating temperature (0.017-inch at room temperature). Tappet settings too tight or too loose will affect valve timing. If set too tight, full closure can be jeopardized – resulting in low compression & burned valve facings & correspondingly – weak performance.

The testing here is two-fold; (1) Ensure adequate tappet setting gap, and (2) Conduct compression testing. Compression specifications are listed on Page 1 of the Service Guide.

3. Fire = Amount of spark + Timing of spark + Quality spark plugs.

Take an old spark plug, open the point gap of the plug to nearly ¼-inch. Connect a plug wire to this modified plug, grounding the base to the tractor. When cranking the engine, you should see a blue spark make the jump. If this test passes when cold but fails when hot, suspect the magneto’s condenser or even the coil. Be sure to test both sides, and use the tractor’s actual individual plug wires so that they are being tested too.

The Article “Elect Systems” gives you some theory reading material and also general timing instructions for your magneto. On the final page you will find magneto installation instructions – an expansion of Paragraph 3-24 of your Service Guide.

Running Timing – Spark should be delivered 30° before top dead center, and setting of the magneto’s lag angle coupled with fire at top dead center for starting is the basic scheme for ignition timing of this engine. If in doubt, testing the magneto on a suitable test stand to actually measure for a 30° lag angle is warranted. “Perfect timing” can also be achieved by a person adept as using a timing light, and then making adjustments to the impulse stop ring to achieve TDC starting timing. This procedure is fully outlined in Chapter 7 of the Restoration Guide, both 2nd & 3rd editions.

Spark plugs -- Be advised that the **DENSO L14-U** is proving to be good one! And whatever plugs you select, be sure to remember – don’t choose RESISTOR plugs because they are too hard on the magneto’s coil! With resistor plugs, a sizeable amount of electrical energy sent to the plugs is reflected back into the coil because of impedance miss-match.

The Governor -- And now – tying all this together to make the engine a “responsive” power unit is the governor and its feedback loop to the carburetor. The paragraph below addresses the linkage adjustment between carburetor and governor. The governor is a speed sensor that, when sensing a slowing down of the engine under load, will open the carburetor’s throttle valve to draw more fuel so the load demand can be met.

Linkage Adjustment -- Free up and align all linkage to remove any binding. Adjust or renew any parts causing lost motion, and disconnect throttle rod at carburetor. With hand control in full speed position (engine not running), adjust the length of the carburetor throttle rod so that the rod is 1/2 hole short from entering hole in carburetor throttle shaft lever when carburetor butterfly is in wide-open position. Reconnect throttle rod at carburetor.

The content of this document should give you plenty to pore over and just maybe will help you nail down the cause for lack of responsive power. ++++