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MANUAL PREVIEW

White

Service Manual

Hercules D5000

Engine

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MANUAL PREVIEW

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VALVES (Continued)

Valve Running Clearance in Guides

135 H.P.

155 H.P.

Intake		
Standard.....	0.0019-0.0033 in.	0.0019-0.0033 in.
Maximum	0.0045 in.	0.0045 in.
Exhaust		
Standard.....	0.0036-0.0050 in.	0.0020-0.0031 in.
Maximum	0.0062 in.	0.0043 in.
Valve Face Angle		
Intake & Exhaust.....	45°	
Valve Recess Below Deck		
	0.019-0.030 in.	
Valve Head Diameter		
Intake	2.012-2.002 in.	
Exhaust	1.727-1.717 in.	
Valve Timing		
Valve Clearance for Checking Valve Timing		
Intake	0.010 in.	
Exhaust	0.025 in.	
Intake Opens	5° BTDC	
Intake Closes.....	41° ABDC	
Exhaust Opens	55° BBDC	
Exhaust Closes	3° ATDC	
Valve Lift		
Intake	0.471 in.	
Exhaust	0.472 in.	
Valve Port Diameter		
	Refer to cyl. head specifications	
Maximum Valve Face Runout		
	0.002 in.	
Maximum Valve Seat Runout		
	0.002 in.	
Valve Margin — Minimum.....		
	1/64 in.	
Valve Clearance (Cold)		
Intake	0.010 in.	
Exhaust	0.025 in.	

JENSALES.COM**VALVE GUIDES**

Type	Straight
Material	Cast iron
Valve Guide Bore	
Intake and Exhaust	0.4388-0.4394 in.
Maximum	0.4406 in.
O.D.	0.6885-0.6880 in.
Length	3.46 in.
Valve Guide Height above Counterbore of Cylinder Head	1.260 in.

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CAMSHAFT AND TIMING GEAR COVER

TIMING GEAR COVER REMOVAL

Remove fan and fan belts.

Remove tachometer adapter and drive from timing case. Remove cap screws, washers and lock plate from crankshaft pulley cap screw. Remove crankshaft pulley cap screw. Using holes provided in crankshaft pulley, pull pulley and dampener from crankshaft as an assembly. Before separating dampener and pulley, make sure timing marks on each are in perfect alignment (Fig. 11). If not, replace dampener.

Remove cap screws, washers and tang locks securing dampener to pulley. Separate dampener from pulley and inspect rubber insert in dampener for cracks, cuts or loose fit. Use of damaged or ineffective dampener may result in crankshaft breakage. **NOTE: IF TIMING GEARS, CAMSHAFT OR CRANKSHAFT ARE REPLACED OR MAJOR OVERHAUL OCCURS, REPLACE DAMPENER REGARDLESS OF CONDITION.**

Remove cap screws, washers and nuts from timing gear cover. Remove timing gear cover and gasket from block. Remove seal from timing gear cover. Check backlash on timing gears and compare with specifications. If gear replacement is required, all jointly meshing timing gears must be replaced.

CAMSHAFT REMOVAL

Remove breather, cylinder head covers, rocker arm assemblies and push rods.

Remove high pressure fuel lines between injection pump and injectors. Cap all openings. Remove lube oil filter and cooler assembly from engine. Disconnect fuel filters from side of engine.

Remove side cover plates and lift tappets from bores. Check for wear. Cam follower surfaces must be smooth and flat.

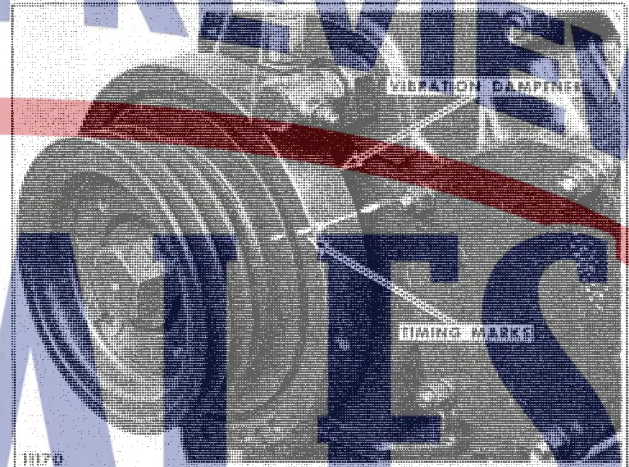


Fig. 11 Vibration Dampener and Timing Marks



Fig. 12 Camshaft Timing Marks

Align timing marks on camshaft and crankshaft gears (Fig. 12). Rotate engine until two holes in camshaft gear expose thrust plate attaching cap screws. Remove thrust plate cap screws and pull camshaft and gears from block.

CLUTCH DISASSEMBLY

Position clutch cover assembly on bed of press with a block under pressure plate so that cover is free to move down. Place a bar or block across top of cover assembly and slightly compress unit. Remove lockplates, adjusting nuts and three 3/8 - 16 x 2-1/2 inch cap screws and washers used to relieve clutch pressure during removal (Fig. 20). Slowly release pressure and lift cover plate from pressure plate and springs. Note location of all parts including arrangement of springs. Lift springs from pressure plate. Saw end off pressure plate pins one at a time and simultaneously pull remainder of pin from bore while inserting a 5/16 x 3/4-inch dowel in opposite end of bore to hold needle bearings in position (Fig. 21). Remove lever and yoke assembly from pressure plate. Remove yoke pins from levers in same manner if required. Remove needle bearings (168-14/pin) from pressure plate pin and yoke pin bores if they require replacement. Replace levers if ends which contact release bearing are worn to full diameter.

CLUTCH ASSEMBLY

Apply a light amount of lubricant to needle bearings. Assemble yokes to levers and while holding needle bearings in place with dowel, insert yoke pin into position. Peen yoke pins to secure yokes to levers. Install lever and yoke assemblies on pressure plate in same manner (Fig. 21). Check springs to specifications and position on pressure plate in same manner as removed. Position partially assembled pressure plate on bed of press. Place cover plate over pressure plate, lining up marks (made before disassembly) on cover plate and pressure plate. Compress assembly slowly, lining up threaded end of yokes with holes in cover plate. Thread adjusting nuts on yokes until threaded end of yoke is flush with top of nut. Install lock plates over adjusting nuts and thread lock plate cap screws into cover. Do not tighten cap screws. Before releasing press, install three 3/8 - 16 x 2-1/2 inch cap screws and washers to hold clutch assembly compressed (Fig. 20). Release tension and adjust clutch lever as outlined under Clutch Release Lever Adjustment.



Fig. 18 Clutch Driven Plate

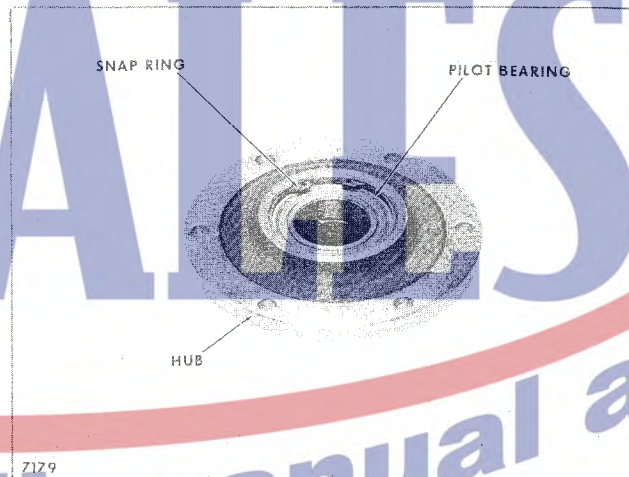


Fig. 19 Pilot Bearing and Hub



Fig. 20 Compressing Clutch Cover Assembly

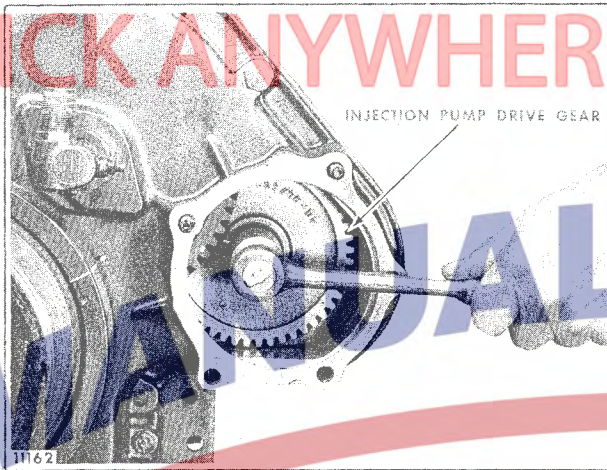


Fig. 43 Drive Gear Cover And Gasket Clamping Nut Removal

HIGH NO-LOAD SPEED — CHECK AND ADJUST IDLE SPEED BEFORE ADJUSTING HIGH NO-LOAD SPEED. Disconnect governor rod from injection pump lever. Loosen adjusting screw lock nut, hold injection pump lever against high no-load stop and turn adjusting screw until high no-load speed shown in Specifications is obtained. Tighten lock nut. Connect governor rod to injection pump lever being careful not to change length of rod. Push governor hand lever to full throttle position. This position must require an overtravel of injection pump lever. If there is no overtravel, place governor rod in next lower hole in lower governor control bell crank arm (Fig. 42). Adjust length of rod to provide overtravel in both idle and high no-load positions.

REMOVAL

Thoroughly clean and dry pump and injection tube exteriors. No dirt, or other foreign material must be allowed to enter fuel system. **THIS IS IMPORTANT.**

Remove injection pump timing gear cover and gasket. Remove nut and washer clamping gear to pump shaft (Fig. 43).

Disconnect governor control rod and electric fuel shut off wire at pump. Remove high pressure fuel line clamps to allow line flexibility during pump removal. Disconnect fuel supply, fuel return and high pressure fuel lines at injection pump connections. **NOTE: ALL OPENINGS MUST BE CAPPED WHEN LINES ARE DISCONNECTED.**



Fig. 44 Injection Pump Removal

Remove pump mounting nuts and washers from flange mounting studs. It will be necessary to unscrew each nut halfway, then pull pump rearward to finally remove nuts and washers. Remove pump (Fig. 44). Spread a clean cloth over openings in plate.

INSTALLATION

Clean and wipe dry shoulder on pump drive shaft and near face of pump drive gear. These two mating surfaces must be clean and dry in order to provide proper clamping action.

Place key in pump drive shaft and seal on pump flange if removed. Slide drive shaft through drive gear and install pump on engine with lockwashers and nuts. Put gear retaining washer and nut on drive shaft and torque to specification.

Turn crankshaft in direction of rotation until timing mark (20° B.T.D.C.) on vibration dampener aligns with pointer on timing gear housing. With injection pump mounting nuts loose, remove pump timing window cover and rotate pump to align two timing marks in window (Fig. 45). Tighten pump mounting nuts securely and install timing window cover and pump drive gear cover.

CAUTION

NEVER LOOSEN OR TURN INJECTION PUMP ASSEMBLY WHILE ENGINE IS RUNNING AS COCKING MAY FORCE PUMP ASSEMBLY TO