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SPECIFICATIONS

ENGINE MODELS	V-304	V-345 ◊	V-392
Number of Cylinders	8	8	8
Bore (inches)	3-7/8	3-7/8	4-1/8
Stroke (inches)	3-7/32	3-21/32	3-21/32
Displacement (cu. in.)	304	345	392
Compression Pressure @ 300 rpm	165	165	165
Engine RPM (Governed)			
Low Idle			
815 Combine	600 ± 25	600 ± 25	—
915 Combine	—	600 ± 25	600 ± 25
High Idle (no load with separator running)†			
815 Combine	3100 ± 25	3100 ± 25	—
915 Combine	—	3100 ± 25	3100 ± 25
Rated Load			
815 Combine	2900	2900	—
915 Combine	—	2900	2900
Compression Ratio	8.19 to 1	8.05 to 1	8.02 to 1
Firing Order	1-8-4-3-6-5-7-2	1-8-4-3-6-5-7-2	1-8-4-3-6-5-7-2
ENGINE TIMING			
Ignition Timing (BTDC) *			
High Idle ± 1 degree**	26	26	26
Spark Plug Type Champion	J-4	J-4	—
Spark Plug Gap Gas	025-.030	.025-.030	.025-.030
Spark Plug Gap LPG	—	.015-.020	—
Distributor Point Gap	.014-.017	.014-.017	.014-.017
Cam Angle (degrees)	28-32	28-32	28-32
CYLINDER BLOCK			
Bore Diameter (Standard)	3.8745-3.8770	3.8745-3.8770	4.1245-4.1270

* Use No. 8 Cylinder for Timing.

** Proper ignition timing at high idle is essential for best performance and engine life. Therefore, the distributor should be set to give the exact timing at high idle. Any variance that may exist then will occur at the low idle end of the advance curve.

† 750 - 755 rpm on Beater Shaft - High Idle, No. Load with separator running.

◊ Specifications apply to gasoline and LPG engines unless otherwise indicated.

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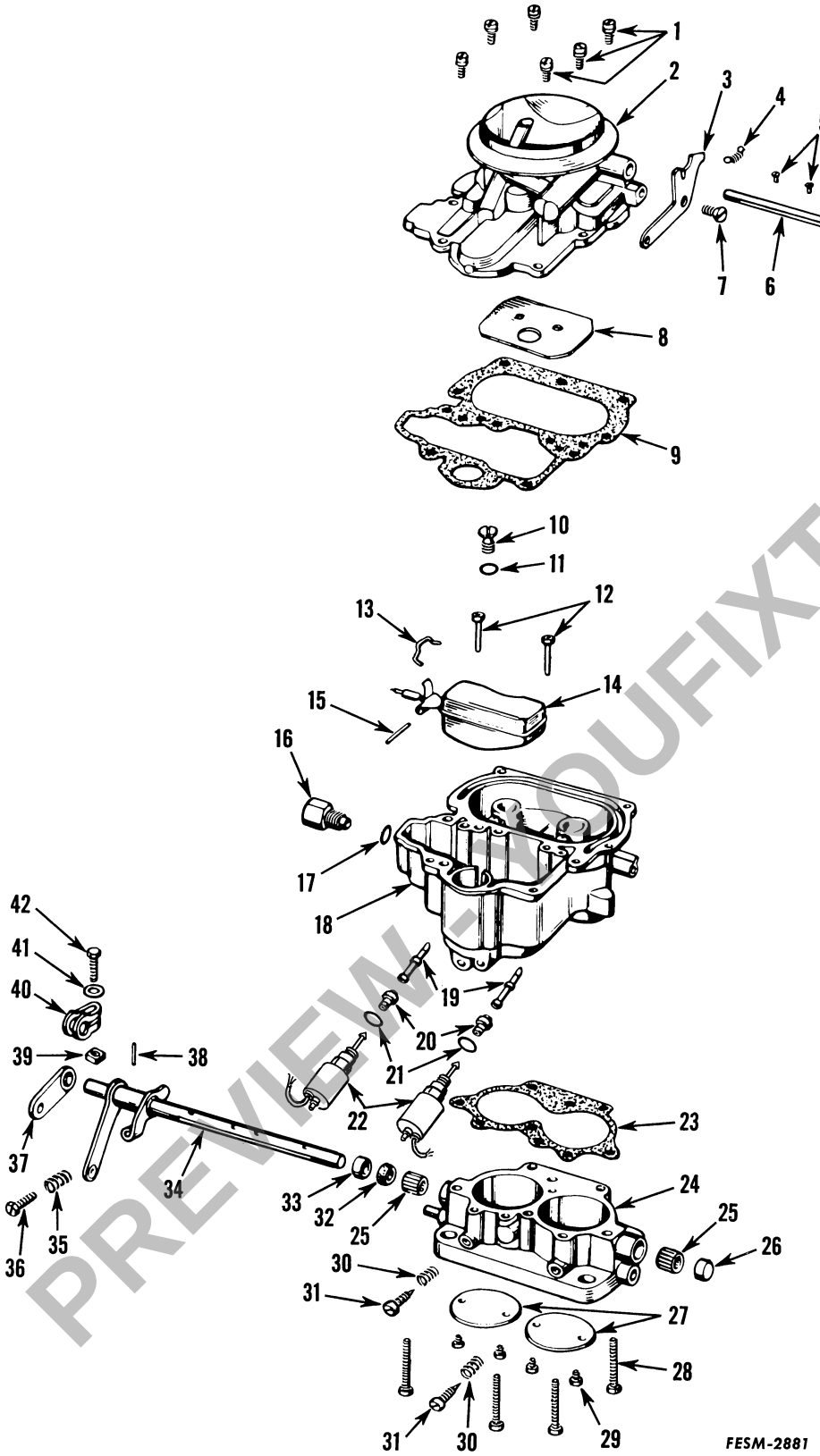
ENGINE MODELS	V-304	V-345 ◊ & V-392
OIL PUMP - Continued		
Oil Pressures (With SAE-30 Oil @ 200° F)		
Minimum (@ Idle Speed)	10-20 psi	10-20 psi
Maximum (@ 1800 rpm)	40-50 psi	40-50 psi
THERMOSTAT		
Standard		
Starts to Open at (Deg. F.)	167-174	167-174
Fully Open at (Deg. F.)	192	192

SPECIAL TORQUES

Size and Thread	Location	Torque (Ft. Lbs.) ◊
5/16-18 and 24	All locations except as listed	15
5/16-18	Oil Pump Mounting	27
3/8-16 and 24	All locations except as listed	27
3/8-16	Water Pump Mounting	42
3/8-16	Manifolds to Cylinder Head	42
3/8-16	Oil Filter Base to Crankcase	30
3/8-24	Connecting Rod Bolts	50
3/8-24	Flywheel to Crankshaft	47
7/16-14 and 20	All locations except as listed	37
7/16-20	Camshaft Gear to Camshaft	60
1/2-13	Cylinder Head Bolts	95
1/2-13	Main Bearing Cap Bolts	80
1/2-13	Oil Filter to Base	32
5/8-18	Pulley Hub to Crankshaft	105
14 mm	Spark Plugs	29
	Generator Pulley Nut	55

NOTE: All Torque Values Based on Threads Lubricated with Engine Oil.
◊ Gas and LPG unless otherwise indicated.

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1. Screws
2. Air intake body
3. Choke lever
4. Return spring
5. Screws
6. Choke shaft
7. Screw
8. Choke plate
9. Gasket
10. Bypass channel plug
11. Gasket
12. Idle jets
13. Float axle spring
14. Float and needle
15. Axle
16. Needle valve seat (fuel inlet)
17. Gasket
18. Fuel bowl
19. Main discharge jet
20. Main metering jet
21. Gaskets
22. Electric shut-off solenoid
23. Gasket
24. Throttle body
25. Bushing
26. Plug
27. Throttle plates
28. Screws
29. Screws
30. Idle needle spring
31. Idle needle
32. Packing
33. Packing retainer
34. Throttle shaft
35. Spring
36. Stop screw
37. Floating lever
38. Pin
39. Nut
40. Stop
41. Washer
42. Screw

Illust. 2-2. Exploded view.

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Problem	Cause
Fuel system conditions affecting Fuel Economy:	1. Poor setting of fuel adjustments to meet conditions of fuel and operation. 2. Leakage of fuel through regulator valves or high-pressure diaphragm. 3. Lack of economizer action, due to diaphragm leakage, valve damage, or vacuum line and connections leaking. 4. Low-pressure regulator valve opening at less than 5/32 inch water manometer, resulting in over-sensitive action or leakage. 5. Unbalanced regulator due to air leak in balance line or connections. 6. Plugged air intake and/or air cleaner.
Other factors that can influence fuel economy:	1. Loss of engine compression due to piston and ring condition or valve leakage. 2. Loss of valve lift due to cam wear or valve lever adjustment. 3. Valve timing error. 4. Ignition timing error. 5. Misfiring due to poor condition of ignition points, plugs and insulation. 6. High friction loss in engine, transmission or final drive due to improper lubrication. 7. Brakes dragging.
Fuel system conditions affecting Power Loss:	1. Excessively lean air-fuel settings of fuel adjustments. 2. Lack of regulator valves response to fuel demand of engine, due to gummy, sticky action of either valve and/or pressures out of range. 3. Plugged fuel filter or inlet screens. 4. Plugged regulator balance line or connections. 5. Air leakage at throttle shaft, carburetor gaskets, intake manifold gaskets, fuel hose or idle tubing.

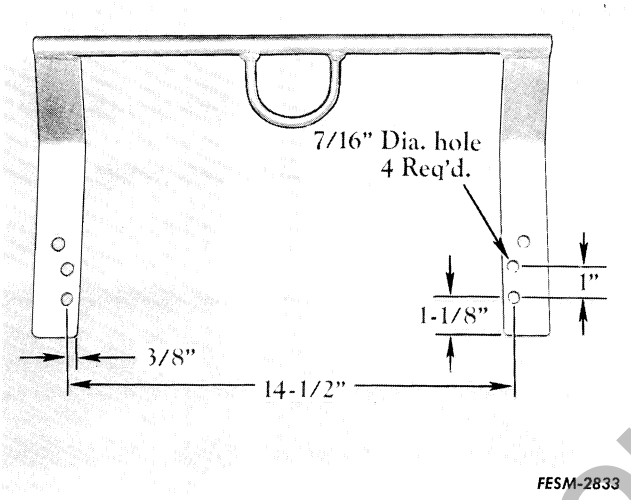
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CYLINDER HEADS AND VALVES

Removal and Disassembly

1. Remove all necessary electrical wiring. Remove the spark plugs, the carburetor, intake manifold, tappet cover, cylinder heads assembly covers, rocker arm assemblies and push rods.



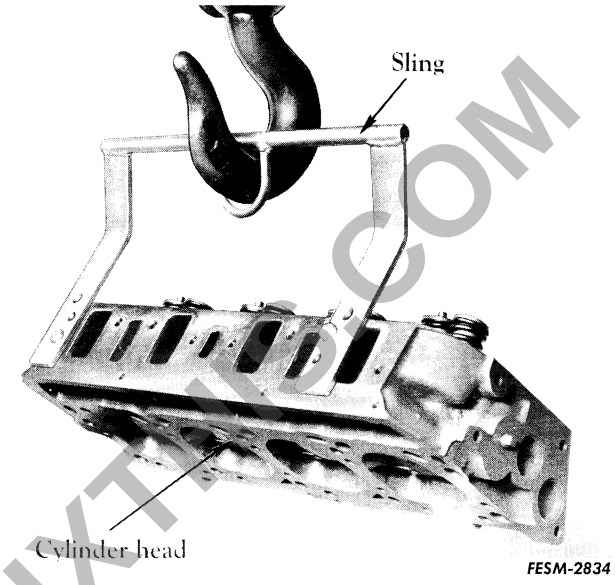
Illust 1-5. Illustration for reworking slings in field.

NOTE: If necessary, modify cylinder head sling SE-1896 by drilling four 7/16 inch holes. Refer to Illust. 1-5 for the locations.

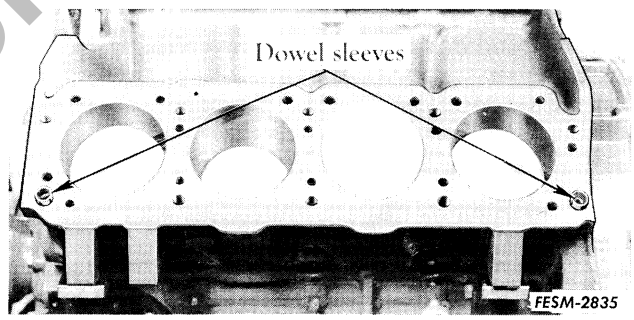
2. Remove the cylinder head bolts. Lift the cylinder head(s) (Illust. 1-6) and remove the gasket(s). The heads are doweled to the crankcase (Illust. 1-7). Do not pry between the head and the crankcase surface.

3. Remove the hydraulic tappets (Illust. 1-8). Rotate the camshaft so that the tappets ride on the lobes for easy removal. Use storage box SE-1894 to assure cleanliness and to keep the tappets in order so that they may be reinstalled in their original bores.

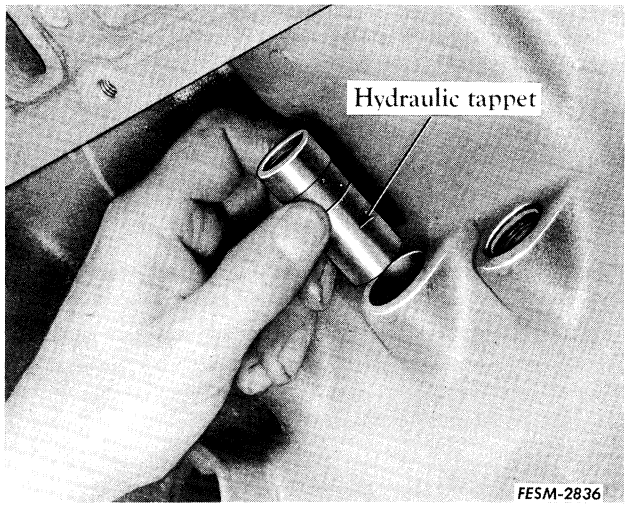
NOTE: Tappets can be removed without disassembling the engine. Refer to Illust. 1-12.



Illust. 1-6. Removing the cylinder head.



Illust. 1-7. Dowel sleeves in block.



Illust. 1-8. Removing the tappet.

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GENERAL INFORMATION

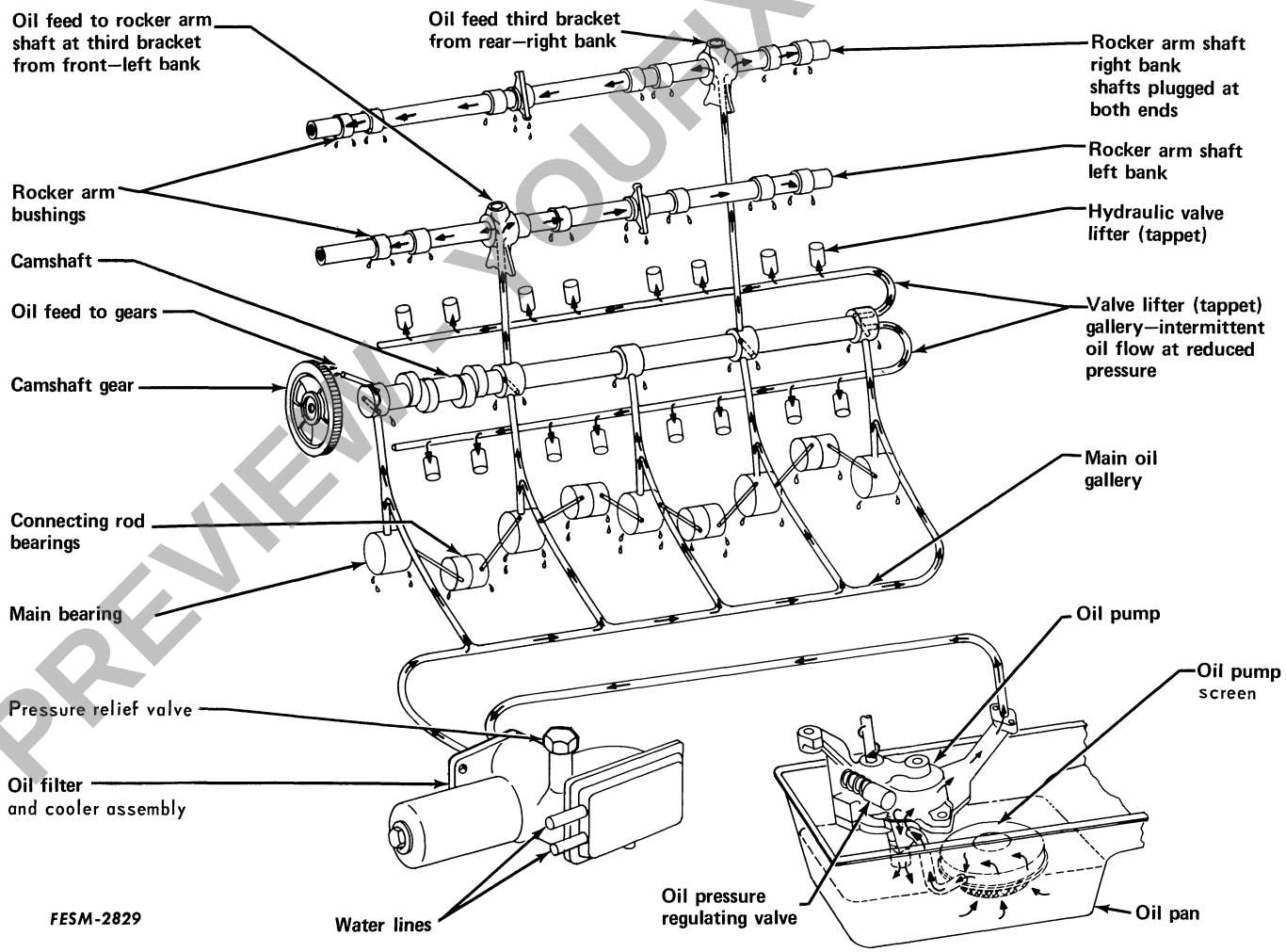
Engine Lubrication System

Oil from the oil pan sump is forced through the pressure-feed lubrication system by an internally mounted gear type pump which is driven by the distributor drive shaft. A spring loaded relief valve in the pump limits the maximum pressure of the system. Oil relieved by the valve is directed back into the oil pan sump under the surface of the oil to eliminate aeration.

The engine is equipped with a full flow type filter which filters all of the oil entering the engine. The filter has a relief valve which permits oil to bypass the filter if it becomes clogged, thereby maintaining an emergency supply of oil to the engine at all times.

NOTE: The clogging of the filter could be brought about by neglecting to change the oil filter element at regularly established periods and based upon the condition of the oil.

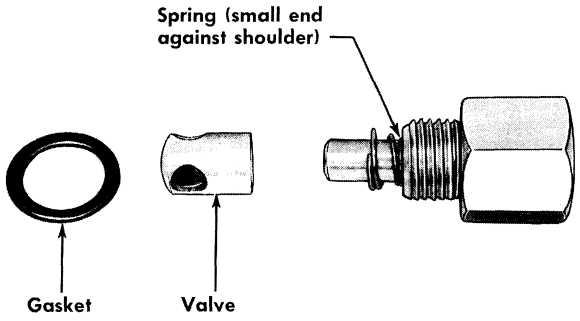
The oil from the filter flows into the main oil gallery which supplies oil to all the camshaft and main bearings through drilled passage in each main bearing web.



Illust. 1-1. Diagramatic view of lubricating system.

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Hi-Pressure Valve



Illust. 3-14. Hi-pressure valve assembly.

Install and secure a new Hi-pressure valve assembly. The small end of the assembly spring is located against the fitting and the large end of the spring is against the valve.

Pressure Test

1. Attach a compressed air hose to the inlet fitting. Position a gauge over the low-pressure valve orifice.



Illust. 3-15. Low pressure test.

2. Turn on the air supply and note the gauge reading. It should read 5-8 pounds with the inlet pressure of 130-180 psi.

If the reading is high, remove one gasket from the inlet fitting and recheck. A second gasket may be removed if necessary to arrive at a correct pressure. AT LEAST ONE GASKET MUST REMAIN ON THE INLET FITTING.

If the reading increases (pressure creeps upward), the low pressure valve is leaking and must be reworked. Inspect the valve lever and bracket if the problem persists.

Check the pressure under simulated operating conditions by holding the air gauge slightly away from the orifice allowing some air to escape. Pressure will drop slightly and return to the original reading when the air gauge is reseated.

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