

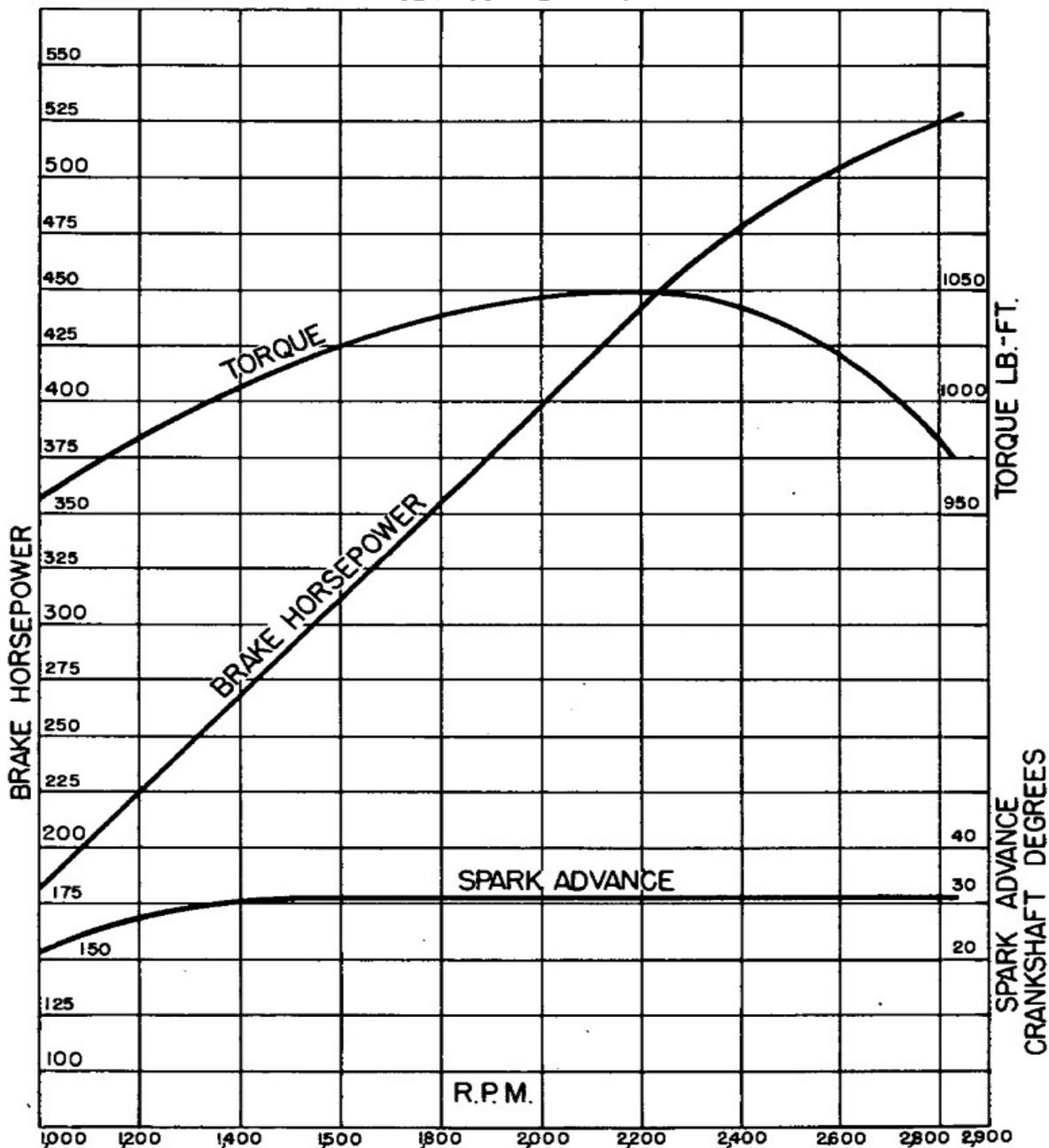
Engine Data Sheet FORD GAA, GAN and GAF

Make and Type:	Ford V-Type, 8-cylinder tank engine	
Model:	GAA, GAN and GAF	
Dimensions, over-all	Length:	59.02 inches
	Width:	33.25 inches
	Height:	47.78 inches
Weight with accessories:	1470 pounds	
Net Horsepower At peak RPM:	500 at 2600 RPM	
Net Torque at Peak RPM:	1050 FT-LBS	
Number of Cylinders:	8	
Bore:	5.4 inches	
Stroke:	6 inches	
Piston displacement:	1100 cubic inches	
Compression ratio:	7.5 to 1	
Ignition Type:	Magneto (2)	
Direction of Rotation(view from rear of engine)		
Crankshaft:	Clockwise	
Starter:	Counterclockwise	
Accessory speeds		
Fans:	1.4 Crankshaft Speed	
Tachometer:	1/2 Crankshaft Speed	
Generators:	1.75 Crank Speed	
Magnetos Rotor Rotation Speed: 1/2 Crankshaft Speed	Magneto Make:	American Bosch, MJF4A-308 R-H, MJF4A-307 L-H
	Right Hand Rotor:	Clockwise
	Left Hand Rotor:	Counterclockwise
	Breaker Point Gap:	1.014 inch to 0.016 inch
Firing Order:	R-1, L-2, R-3, L-1, R-4, L-3, R-2, L-4	
Spark Plug Type: Champion C88-S	Gap Early:	Three-prong Spark Plug, Gap 0.011 in. to 0.014 in.
	Late:	Two-prong Spark Plug, Gap 0.014 in. to 0.017 in.
Valve Timing:	Intake Opens:	5 degrees BTC
	Intake Closes:	55 degrees ABC
	Exhaust Opens:	50 degrees BBC
	Exhaust closes:	10 degrees ATC
Type of Valves Used:	exhaust Valve:	Stellite, reinforced seats, sodium-cooled stems for GAN and GAF and some GAA
	Intake Valve:	2112-W-731 steel
Valve Clearance (non adjustable):	Intake:	0.028 inches to 0.031 inches
	Exhaust:	0.029 inches to 0.033 inches
Induction system: Carburetors	Model:	GAA Bendix-Stromberg NA-Y5G GAF and GAN Bendix-Stromberg HD-5 or HH-5
Notes: The Cylinders are numbered 1,2,3,4 on the right and left blocks. Number 1 cylinder is the rear cylinder on each block.		
The GAA V8 started out as a V12 of 1650 cubic inches, it was a very advanced motor for the time, but the Army was already going with the Allison V1710. Ford had already purchased the tooling, and when the Army needed tank motors, the aircraft motor was quickly redesigned.		
Because of it's Aircraft motor heritage, most internal parts are safety wired, to ensure they didn't vibrate loose.		
The GAA was the biggest all aluminum V8 ever produced, and it was a very strong motor, with lots of untapped power potential.		
Description from TM9-1731B OM Ford Tank Engines GAA, GAF and GAN.		

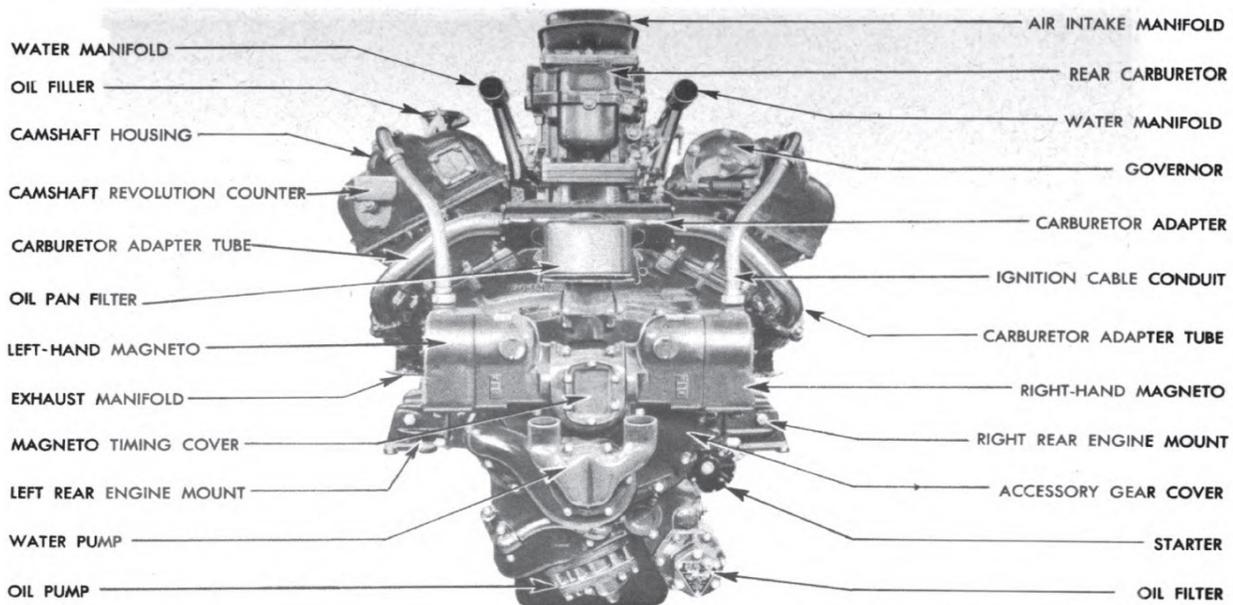
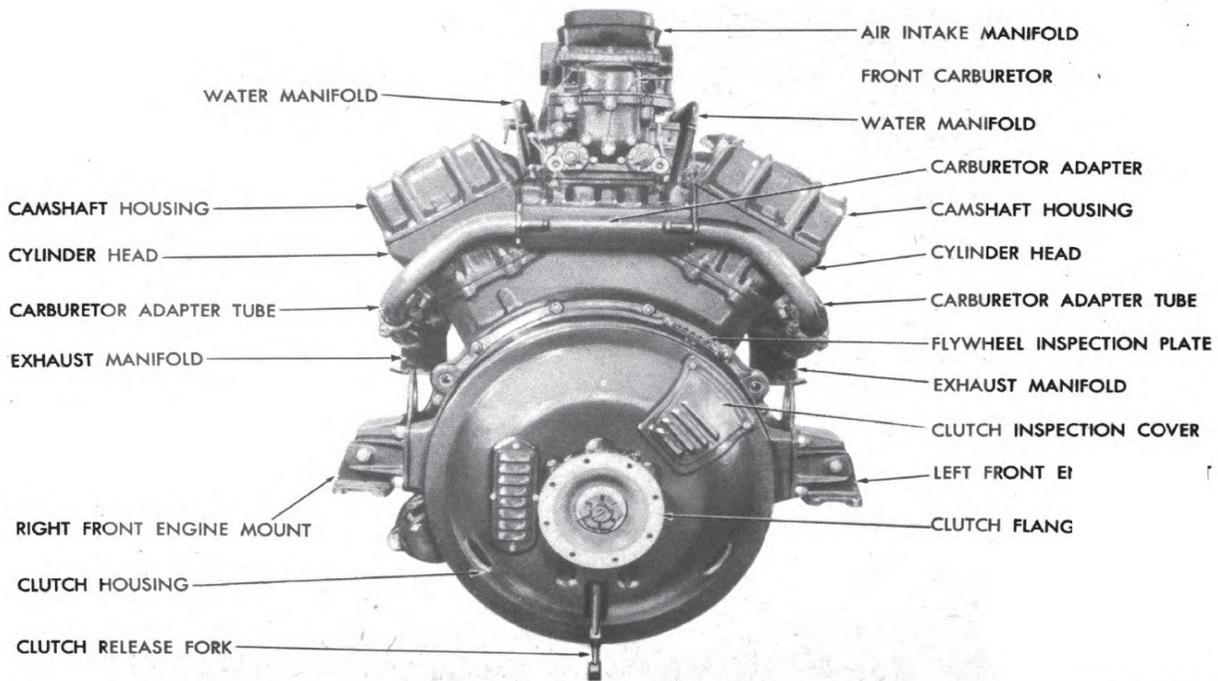
The Models GAA, GAN, and GAF, V8 Ford Tank Engines are the 60-degree, 4-cycle type. The cylinders and crankcase are cast in block and consists of an aluminum casting with hard steel, dry type sleeves in each cylinder bore. Four overhead camshafts are used; One exhaust and one intake per bank of cylinders. Two exhaust and two intake valves are used in each cylinder. Two four cylinder magnetos provide the ignition. These are mounted one at each end of a crossshaft at the rear of the engine and are driven by spiral gears. The engine is water cooled with water jackets extended the full length of the cylinders. The water pump is driven by the accessory drive gear assembly at the rear of the engine. --

The Accessory Drive Gear Assembly was a unit driven directly from the motor, through shafts and gears, and split out power the magnetos, water pump, fan drives and generators. This meant the engine was beltless. This very a very inovative feature.

NUMBER OF CYLINDERS: 8 BORE 5.4 IN. STROKE 6.0 IN.
PISTON DISPLACEMENT: 1100 CU IN. COMPRESSION RATIO: 7.5-TO 1
FUEL: OCTANE NO. 80



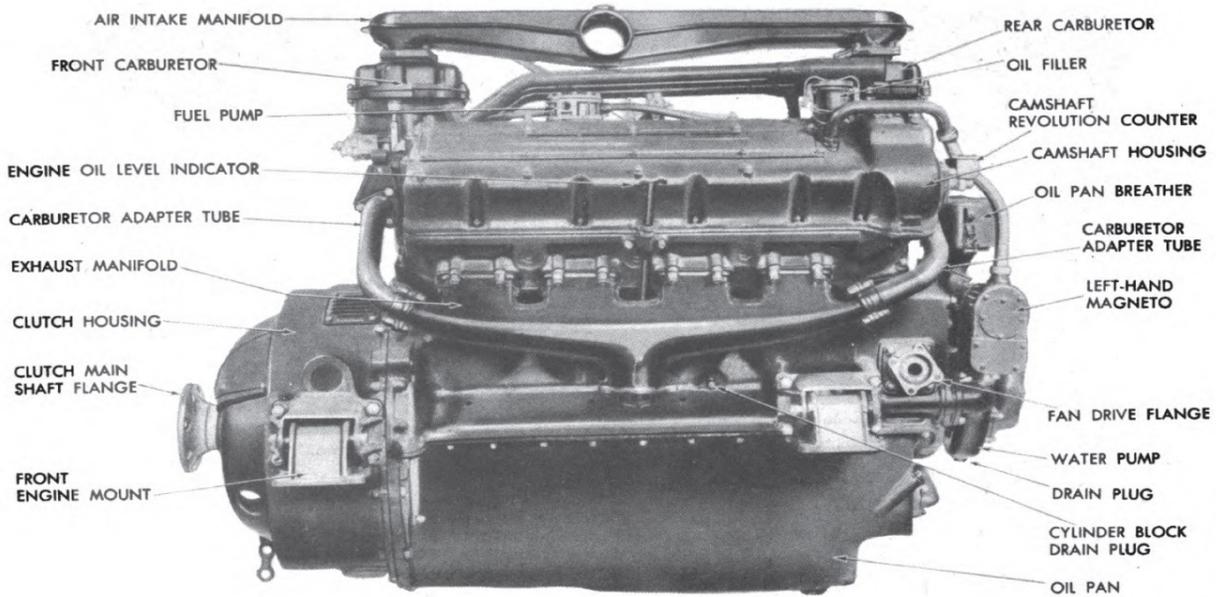
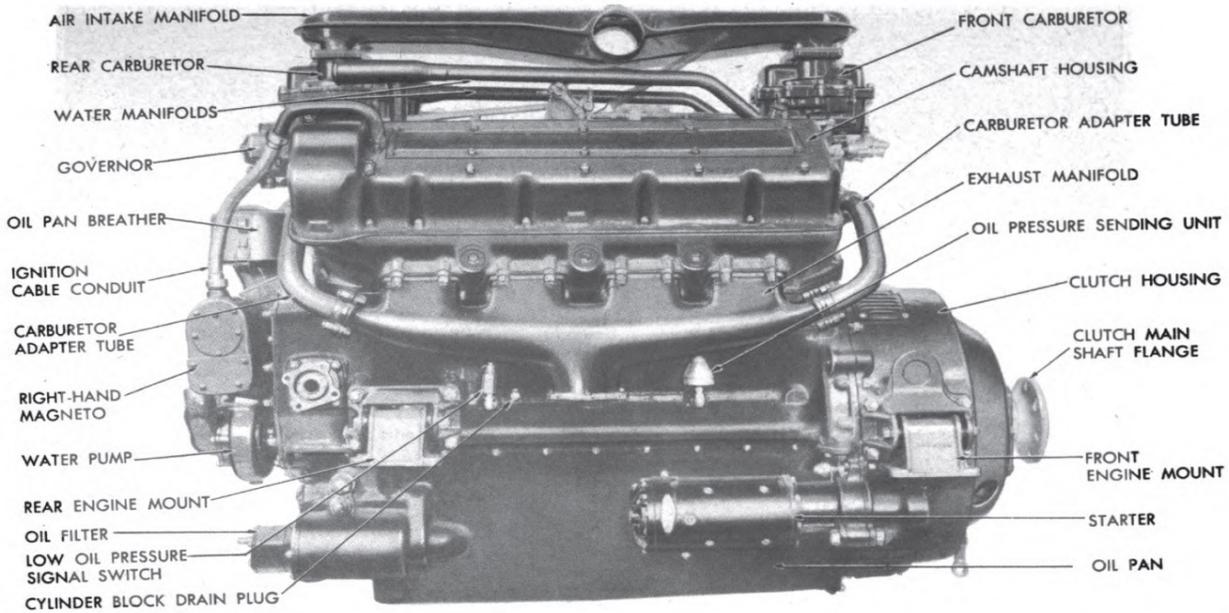
Front and rear views of the Ford GAA



The Ford GAA series V8s were governed to approximately to 2600 RPM. This governer was complicated enough the only maintenance the Crew was allowed to do it on it was install and remove it. If it failed in some way, they just swapped in a rebuilt unit and sent the old one back the ordanace maintenance depot.

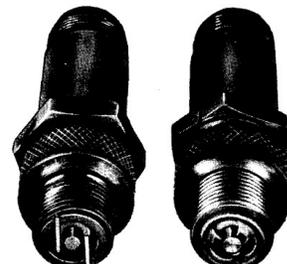
The fuel pump was required to maintain from 4 1/2 to 6 pounds fuel pressue. Replacement required the removal of two fuel line connectors and two bolts.

Left and right views of the Ford GAA



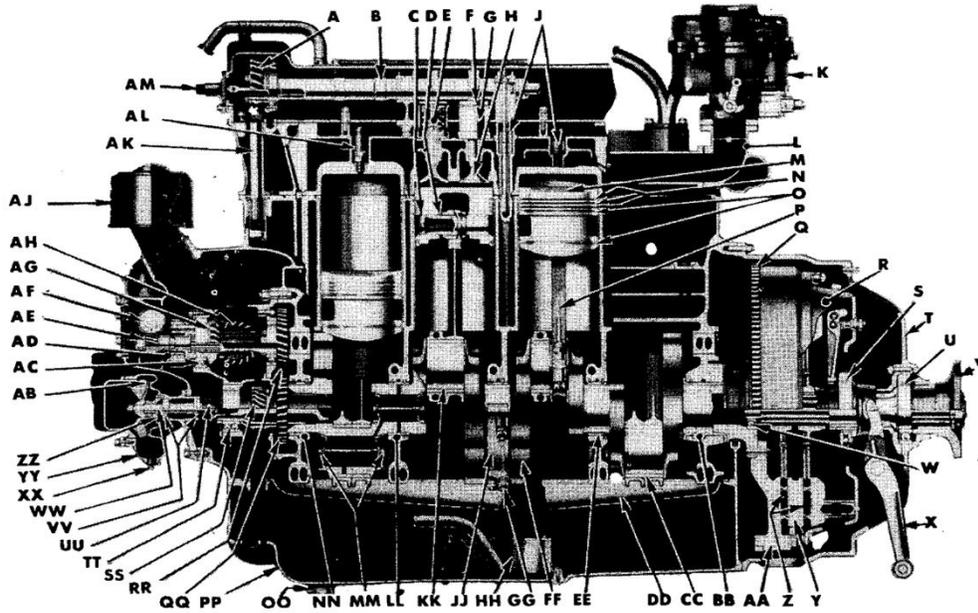
Odds and Ends.

The Ford GAA served a few decades with the US Army, and was oddly, never further developed. This was probably due to the Army being more interested in air cooled V-12s for future tanks. The engine would see a lot of use in civilian hands. The most exciting of these uses was in Tractor Towing competitions. The GAA really doesn't take much to wake up, and really make power, unfortunately, these things are not practical for tank applications. The two main things are either turbos or superchargers, along with fuel injection and modern ECM in some cases. With these modifications the motor is capable of making more than 2000 horse power.



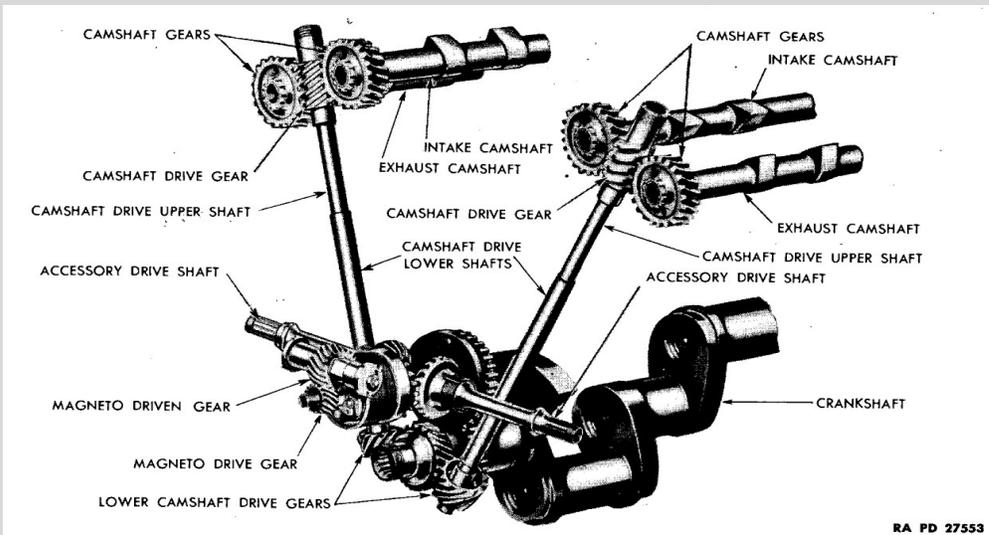
NEW TYPE
SPARK PLUG 7058742

OLD TYPE
SPARK PLUG A296664



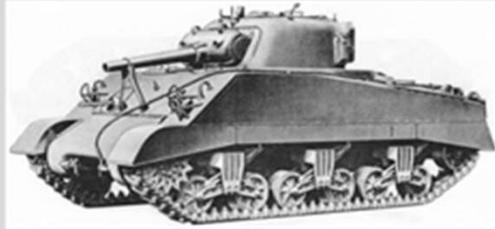
Early Type GAA Engine — Longitudinal Sectional View

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|--|---|---|
| A —CAMSHAFT GEAR | V —FLANGE, CLUTCH MAINSHAFT | RR —HELICAL DRIVEN GEAR AND SHAFT, ACCESSORY DRIVE |
| B —CAMSHAFT | W —CLUTCH SHAFT PILOT BEARING | SS —CRANKSHAFT WORM GEAR |
| C —PISTON PIN RETAINER | X —CLUTCH THROW OUT ARM | TT —BEARING |
| D —PISTON PIN | Y —CENTER DRIVE PLATE | UU —WATER PUMP DRIVING QUILL |
| E —VALVE SPRING | Z —DRIVEN DISKS | VV —WATER PUMP BEARINGS |
| F —PUSH ROD | AA —FLYWHEEL | WW —WATER PUMP SHAFT |
| G —PUSH ROD GUIDE | BB —FRONT MAIN BEARING | XX —WATER PUMP DRAIN PLUG |
| H —VALVE | CC —CONNECTING ROD BEARING LINER | YY —WATER PUMP HOUSING |
| J —CYLINDER HEAD NUTS | DD —OIL PAN BAFFLE | ZZ —WATER PUMP SEAL |
| K —CARBURETOR | EE —NO. 4 MAIN BEARING | AB —WATER PUMP IMPELLER |
| L —CARBURETOR ADAPTER HOUSING | FF —CRANK SHAFT | AC —BEARING |
| M —PISTON | GG —MAIN BEARING STUD AND NUT | AD —MAGNETO ADVANCE GOVERNOR |
| N —COMPRESSION RINGS | HH —OIL PUMP SCREEN | AE —MAGNETO DRIVE GEAR |
| O —OIL RINGS | JJ —NO. 3 MAIN BEARING | AF —MAGNETO DRIVEN GEAR |
| P —CONNECTING RODS | KK —MAIN BEARING LINER | AG —ACCESSORY SHAFT BEVEL DRIVEN PINION |
| Q —STARTER RING GEAR | LL —NO. 2 MAIN BEARING | AH —ACCESSORY SHAFT BEVEL DRIVEN GEAR |
| R —CLUTCH PRESSURE PLATE ASS'Y. | MM —CRANKSHAFT OIL PASSAGE SEALS | AJ —CRANKCASE BREATHER |
| S —CLUTCH RELEASE BEARING | NN —NO. 1 MAIN BEARING | AK —UPPER CAM DRIVE SHAFT |
| T —CLUTCH HOUSING | OO —OIL PAN DRAIN PLUG | AL —SPARK PLUG |
| U —BEARING, CLUTCH MAINSHAFT | PP —OIL PAN | AM —TACHOMETER DRIVE |
| | QQ —CRANKSHAFT HELICAL GEAR | |



Produced by the Sherman Tank Site

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Sources: TM9-748, and TM9-1731B



Ford GAF at Bovington





