

45

Motor Grader

PARTS CATALOG

FORM 70642041
Reprint 4-89

AVOID ACCIDENTS

Most accidents, whether they occur in industry, on the farm, at home or on the highway, are caused by the failure of some individual to follow simple and fundamental safety rules or precautions. For this reason **MOST ACCIDENTS CAN BE PREVENTED** by recognizing the real cause and doing something about it before the accident occurs.

Regardless of the care used in the design and construction of any type of equipment there are many conditions that cannot be completely safeguarded against without interfering with reasonable accessibility and efficient operation.

A careful operator is the best insurance against an accident.
The complete observance of one simple rule would prevent many thousand serious injuries each year.
That rule is:

Never attempt to clean, oil or adjust a machine while it is in motion.

NATIONAL SAFETY COUNCIL

WARNING

On machines having hydraulically, mechanically, and/or cable controlled equipment (such as shovels, loaders, dozers, scrapers, etc.) be certain the equipment is lowered to the ground before servicing, adjusting and/or repairing. If it is necessary to have the hydraulically, mechanically, and/or cable controlled equipment partially or fully raised to gain access to certain items, be sure the equipment is suitably supported by means other than the hydraulic lift cylinders, cable and/or mechanical devices used for controlling the equipment.

Fiatallis is not responsible for any liability arising from any damage resulting from defects caused by parts and/or components not approved by Fiatallis for use in maintaining and/or repairing products manufactured or merchandized by Fiatallis.

In any case, no warranty of any kind is made or shall be imposed with respect to products manufactured or merchandized by Fiatallis when failures are caused by the use of parts and/or components not approved by Fiatallis.

MODEL IDENTIFICATION

The symbol listed below is stamped in front of the model serial number on each unit.

MODEL SYMBOL	ENGINE MODEL	DESCRIPTION
45	10,000	Diesel Motor Grader (naturally aspirated)

RECORD YOUR SERIAL NUMBERS BELOW

GRADER SERIAL NO. _____

ENGINE SERIAL NO. _____

ALLIS-CHALMERS WARRANTY

"ALLIS-CHALMERS MANUFACTURING COMPANY warrants that it will repair F.O.B. its factory, or furnish without charge F.O.B. its factory, a similar part to replace any material in its machinery which within six months, or 1500 hours of use, whichever occurs first, (except six months on utility wheel tractors sold for non-farm use) after the date of delivery by the Dealer, is proven to the satisfaction of the Company to have been defective at the time it was delivered, provided that all parts claimed defective shall be returned properly identified to the Company's factory, charges prepaid.

"This warranty is the only warranty, express, implied or statutory, upon which said machinery is purchased. No other warranty has been made or exists either expressly, or by implication, all statutory and implied warranties being hereby expressly waived and excluded from this transaction, and the Company's liability in connection with this transaction is expressly limited to the repair or replacement of defective parts, all other damages, statutory or otherwise, being hereby expressly waived.

"This warranty applies only to new and unused machinery, which after shipment from the factory of the Company, has not been altered, changed, repaired or treated in any manner whatsoever. No warranty of any kind, statutory, implied, or otherwise, shall apply to trade accessories, attachments, tools, or implements not manufactured by the Company, though sold or operated with the Company's machinery, or to second-hand machinery, or to new and unused machinery, which, after shipment from the factory of the Company, has been altered, changed, repaired, or treated in any manner whatsoever.

"No representative of the Company has authority to change this warranty or this contract in any manner whatsoever, and no attempt to repair or promise to repair or improve the machinery covered by this contract by any representative of the Company shall waive any consideration of the contract or change or extend this warranty in any manner whatsoever.

"Allied or Companion equipment not manufactured by the Company is covered only by the standard warranty of the manufacturer of such allied or companion equipment though sold or operated with the Company's machinery."

IMPORTANT

The terms "right" and "left" used throughout this parts list are determined by facing the direction of forward travel.

The engine is mounted unconventionally with the flywheel toward the front of the machine, but all engine parts are designated in respect to the engine as it would be installed in a conventional machine with the flywheel to the rear.

Attaching parts such as bolts, nuts, rivets, screws, washers, etc. are indented immediately following the parts which they attach.

INSTRUCTIONS FOR ORDERING PARTS

ALWAYS GIVE THE MODEL AND ENGINE SERIAL NUMBER. (Location shown below)

To obtain parts promptly, give part name and part number.

Give post office address, town, county and state where parts are to be shipped. Also specify whether material is to be shipped by freight, express or parcel post.

Order parts from the dealer covering the local territory.

Confirm all telephone or telegraph orders in writing.

Parts for standard motor accessories such as generators and starting motors should be ordered from authorized Service Stations maintained by manufacturers of these units throughout the country.

No credit will be allowed on parts unless they are returned to the dealer from whom they were purchased; from there they will be returned, at the customer's expense, to the factory for inspection.

Unless claims for shortages or errors are made immediately upon receipt of goods, they will not be considered.

When broken goods are received, a full description of the damage should be made by the carrier agent on the freight bill. If this description is insisted upon, full damage can always be collected from the transportation company.

No responsibility is assumed for delay or damage to merchandise while in transit. Our responsibility ceases upon delivery of shipment to the transportation company from whom a receipt is received showing that shipment was in good condition when delivered to them; therefore, claims (if any) should be filed with the transportation company and not with Allis-Chalmers Manufacturing Company.

The right is reserved to change the construction or material of any parts where it seems desirable to do so, without incurring the obligation of installing such changes on units already delivered.

SERIAL NUMBER LOCATIONS

MODEL SERIAL NO: On plate attached to the right side of the frame near the operator's platform.

ENGINE SERIAL NO: On plate attached to the lefthand side of the cylinder block at the rear end.

ALPHABETICAL INDEX

Air Cleaner	91, 92, 93, 95	Moldboard Extensions	230
Air Heater	103	Moldboard Lift	223
Air Pre-Cleaner Extension	297	Moldboard Power Shift	233
Batteries and Cables	279	Moldboard Power Shift Control Valve	237
Brakes	166	Moldboard Power Shift Piping	235
Brake Control	172, 174	Moldboard Rock Bits	231
Bulldozer	307	Moldboard Side Shift	219
Cab	287	Monograms	258
Cab Heater	293	Muffler	99
Camshaft	31, 35	Numerical Index	311
Canopy	298	Odometer	309
Connecting Rod	12, 13	Oil Cooler	37
Crankshaft	19	Oil Filter	43 thru 49
Cylinder Block	9	Oil Pan	29
Cylinder Head	23, 26	Oil Pump	39
Cylinder Sleeve	9	Packaged Parts	4
Defroster Fan	296	Painting	259
Engine and Mounting	7	Piston	12, 13
Engine Clutch	121	Power Control	245
Engine Clutch Control	127	Power Steering	184
Engine Shut-off Control	80	Power Steering Piping	185
Exhaust Manifold	100	Power Take-off	251
Fan	107	Primer	101
Fan Belt Tightener	109	Radiator	110
Flywheel and Housing	20	Radiator Curtain	112
Frame	179	Radiator Shell	257
Front Axle and Wheel Lean	201, 205	Rear Flood Light	282
Front Wheels	163	Rear Axle	101
Front Wheel Spindles and Linkage	197	Rear Wheels	163
Fuel Filter	52 thru 59	Scarifier	300
Fuel Lines	60, 61	Scarifier Control Shafts	303
Fuel Tank	62	Scarifier Lift	305
Gear Shift Controls	152	Seat	255
Gear Shifting Forks	147, 149	Starter	271, 272
Generator	274, 276	Steering Control	183
Hood	257	Steering Pump and Filter	186
Hood Side Plates	283	Supercharger and Drive	85
Horn	261	Supercharger Oil Lines	87
Hose Parts	6	Tandems	157
Hour Meter	280	Throttle Control	77
Hubodometer	310	Timing Gears	19, 31, 35, 65, 67
Hydraulic Pump and Lines	239	Timing Gear Housing	15
Hydraulic Tank	241	Tires, Tubes and Rims	164
Injection Fuel Return Lines	71	Tools	284
Injection Nozzles	65, 73	Transfers	258
Injection Pump	65, 67	Transmission	129 thru 144
Instruction Plates	258	Transmission Brake	155
Instruments	269, 280, 309, 310	Universal Joint	121
Intake Manifold	82, 83	Valves	23, 26
Lights and Wiring	261, 269, 282	Valve Operating Mechanism	31, 35
Main Bearings	19	Water Outlet Manifold	116, 118
Moldboard	226, 228	Water Pump	114
Moldboard Drawbar and Circle	215	Windshield Wiper	294, 295

PACKAGED PARTS

PACKAGE
NUMBER

DESCRIPTION

639956

LINKAGE KIT, gear shift lock
 1 074959 SEAL, clutch fork shaft
 1 074975 BEARING, clutch fork shaft
 1 078810 PIN, joint adjusting yoke
 1 628261 LINK, locking plunger (145 grader)
 1 628271 STUD, plunger rod lever
 1 628463 JOINT, ball and socket
 1 628564 LEVER, plunger rod operating
 1 628727 SHAFT, clutch fork
 1 628734 BRACKET, operating lever
 1 628748 YOKE, joint adjusting
 1 632222 LINK, locking plunger (45 grader)
 2 900801 PIN, cotter, 3/32" x 3/4"
 3 903633 CAPSCREW, 3/8"NC x 1-3/4"
 5 904206 LOCKWASHER, 3/8"
 1 910255 WASHER, plain, SAE std., 3/4"
 1 910302 PIN, cotter, 5/32" x 1-1/4"
 3 911041 NUT, 3/8"NF
 1 911115 WASHER, plain, SAE std., 3/8"
 1 ----- INSTRUCTION SHEET

4335830

GASKET KIT, intermediate, cylinder block (Graders prior to #1780)
 1 035249 GASKET, oil drain plug
 2 4113897 GASKET, oil regulating valve nut
 5 4253106 O-RING, oil filter lines
 1 4254082 O-RING, camshaft hole cover
 1 4254624 O-RING, camshaft hole plug
 1 4335056 GASKET, water pump volute
 1 4336897 O-RING, flywheel housing to crankcase
 1 4346169 GASKET, oil pipe
 1 4346744 GASKET, water pump
 1 4347031 GASKET, water by-pass pipe
 1 4347120 GASKET, timing hole cover
 1 4347880 GASKET, timing gear housing
 1 4348126 GASKET, timing gear cover
 1 4348184 GASKET, oil cooler water outlet
 1 4348185 GASKET, oil cooler water inlet
 1 4348215 GASKET, oil pipe
 1 4348218 GASKET, oil pipe
 1 4371289 GASKET, oil pan cover

4335831

GASKET KIT, cylinder head (Graders prior to #1780)
 6 4251987 O-RING, valve lifter cover nut
 1 4300145 GASKET, engine water outlet elbow
 2 4335279 GASKET, cylinder head cover
 1 4336430 GASKET, front cylinder head
 1 4336431 GASKET, rear cylinder head
 2 4337764 GASKET, valve lifter cover
 6 4338511 GASKET, exhaust manifold
 6 4346138 GASKET, intake manifold
 1 4346330 GASKET, water manifold connecting
 1 4347824 GASKET, supercharger drain flange
 2 4347940 GASKET, thermostat housing
 2 4348133 GASKET, breather tube
 6 4348278 GASKET, water manifold
 2 4349031 GASKET, supercharger
 1 4349384 GASKET, intake manifold cover
 6 4511204 GASKET, injection nozzle

PACKAGED PARTS

PACKAGE
NUMBER

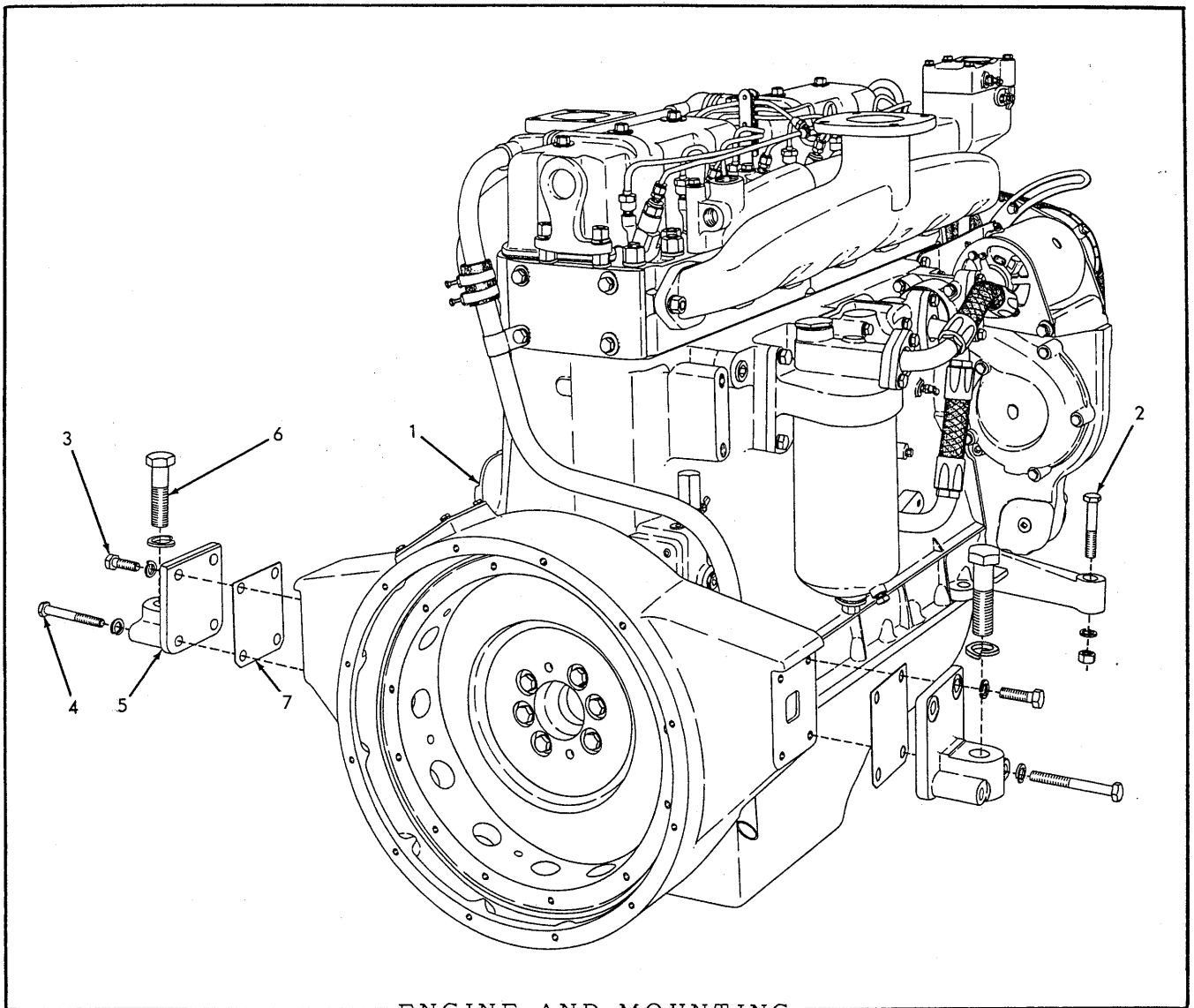
DESCRIPTION

4336577	GASKET KIT, intermediate, cylinder block (Graders #1780 and up)	
	2	035249 GASKET, oil drain plug
	2	4113897 GASKET, oil regulating valve nut
	1	4253106 O-RING, oil filter
	1	4253818 O-RING (Discard. Not for grader)
	1	4253929 O-RING, fan drive (Discard. Not for grader)
	1	4254624 O-RING, camshaft hole plug
	1	4335056 GASKET, water pump volute
	3	4335577 GASKET, oil filter hose
	1	4335578 GASKET, oil filter hose
	1	4335712 GASKET, cover plate
	1	4336345 GASKET, cover plate
	1	4336897 O-RING, flywheel housing to crankcase
	1	4346169 GASKET, oil pipe
	2	4346441 GASKET, oil pipe (Discard. Not for grader)
	1	4346456 GASKET, water inlet elbow
	1	4346744 GASKET, water pump
	1	4347031 GASKET, water by-pass flange
	1	4347120 GASKET, oil filler hole cover
	1	4348136 GASKET, timing gear housing
	1	4348126 GASKET, timing gear cover
	1	4348184 GASKET, oil cooler water outlet
	1	4348185 GASKET, oil cooler water inlet
	2	4348215 GASKET, oil pipe
	1	4348218 GASKET, oil pipe
	1	4349011 GASKET, cover plate
	1	4362458 GASKET, oil pump cover (Discard. Not for grader)
	1	4371289 GASKET, oil pan cover
	2	4373069 GASKET, oil pan cover (Discard. Not for grader)

4337974	PISTON AND SLEEVE KIT (Graders prior to #1780)	
	2	4304699 RETAINER, piston pin
	1	4336190 RING, oil control
	1	4336321 RING, oil control
	1	4337971 SLEEVE, cylinder
	2	4337972 O-RING, cylinder sleeve
	2	4347235 RING, compression
	1	4347281 PIN, piston
	1	4347458 RING, compression
	1	4347676 PISTON

4337975	PISTON AND SLEEVE KIT (Graders #1780 and up)	
	2	4254814 RETAINER, piston pin
	1	4336512 PISTON
	1	4336559 RING, oil control
	1	4337395 PIN, piston
	1	4337971 SLEEVE, cylinder
	2	4337972 O-RING, cylinder sleeve
	2	4347235 RING, compression
	1	4347458 RING, compression

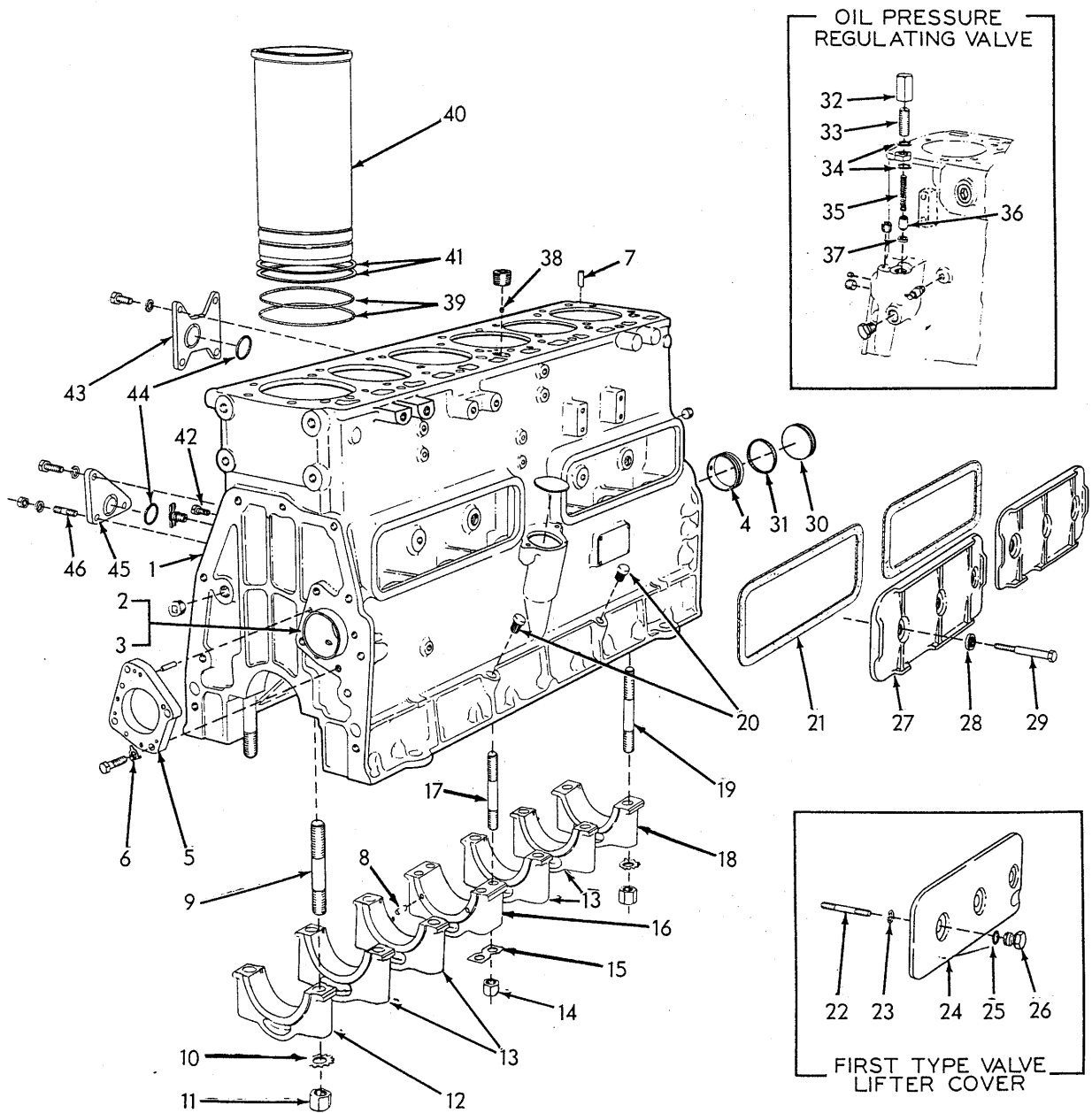
4338735	GASKET KIT, cylinder head (Graders #1780 and up)	
	4	4252796 O-RING
	4	4254294 O-RING, water by-pass tube
	2	4336148 GASKET, rocker cover
	4	4336182 GASKET, water manifold
	1	4336263 GASKET, thermostat housing
	1	4336266 GASKET, engine water outlet elbow
	1	4336430 GASKET, front cylinder head
	1	4336431 GASKET, rear cylinder head
	2	4337764 GASKET, valve lifter cover
	6	4338511 GASKET, exhaust manifold
	6	4346138 GASKET, intake manifold
	2	4348133 GASKET, breather tube
	6	4378031 GASKET, injection nozzle



ENGINE AND MOUNTING

* Used prior to grader serial No. 1780
 ** Effective with grader serial No. 1780

ITEM	PART NO.	QTY.		DESCRIPTION
		*	**	
1	4347946	1	-	ENGINE ASSEMBLY (Less Air Cleaner, Fan, Starter and Muffler, but includes Generator, Oil and Fuel Filters and Supercharger)
	4336519	-	1	ENGINE ASSEMBLY (Less Air Cleaner, Fan, Starter and Muffler, but includes Generator, Oil and Fuel Filters)
2	034440	2	2	CAPSCREW, 5/8"NF x 3-1/2"
	904209	2	2	LOCKWASHER, 5/8"
	911044	2	2	NUT, 5/8"NF
3	035190	4	4	CAPSCREW, 1/2"NC x 1-1/2"
4	045253	4	4	CAPSCREW, 1/2"NC x 3-3/4"
	904208	8	8	LOCKWASHER, 1/2"
5	085769	2	2	BRACKET, engine supporting, front
6	012762	2	2	CAPSCREW, 7/8"NF x 3-1/4"
	905347	2	2	LOCKWASHER, 7/8"
7	089617	2	2	SHIM, spacing (1/32" thick. Use as req'd)



CYLINDER BLOCK

CYLINDER BLOCK

* Used prior to grader serial No. 1780
 ** Effective with grader serial No. 1780

ITEM	PART NO.	QTY. * **	DESCRIPTION
1	-----	1 -	BLOCK ASSEMBLY (Used prior to engine #45-2025. Order BLOCK ASSEMBLY 4336591. If for engines #90846 thru #45-1209 also order 1 LINE ASSY. 4336524, 1 O-RING 4253106, 1 PLATE 4034292, 1 GASKET 4347655, 2 CAPSCREWS 903630, 2 CAPSCREWS 910211, 4 LOCK WASHERS 904206, 1 STUD 4335371, 1 NUT 910915 and 1 LOCKWASHER 904208. If for engines prior to #90846 also add: 1 TUBE ASSY. 4335043, 1 TUBE ASSY. 4349309, 2 SHAFT ASSYS. 4349294, 2 BRACKETS 4349291, 2 ELBOWS 4335381, 2 ELBOWS 911017 and 2 ELBOWS 913039)
	4336591	1 -	BLOCK ASSEMBLY (Includes items 2 thru 20, 37, 38, 42 thru 46 and hardware indented below)(Effective with engine #45-2025)
	4338151	- 1	BLOCK ASSEMBLY (Includes items 2 thru 4, 7 thru 20, 37, 38, 42 thru 46 and hardware indented below)
	910015	1 -	PLUG, expansion, 2-1/8" diam. (Used prior to engine #45-2025)
	910017	1 1	PLUG, expansion, 2-3/8" diam. (Effective with engine #45-2025)
	919134	1 3	PLUG, pipe, hex-hd., 1/8"NPT
	920333	2 2	PLUG, pipe, hex-hd., 3/8"NPT
	904223	2 -	PLUG, pipe, ctsk-hd., 1/2"NPT
	917970	- 2	PLUG, pipe, hex-socket, 1/2"NPT
	920416	1 1	PLUG, pipe, hex-hd., 1/2"NPT
	904224	1 -	PLUG, pipe, 3/4"NPT
	918851	- 1	PLUG, pipe, hex-socket, 3/4"NPT
	918888	1 1	PLUG, pipe, hex-socket, 1"NPT
	912415	2 2	COCK, drain, 1/4"NPT(1 less used prior to engine #45-1210)
	2	4347879	1 -
4336755		1 -	BEARING, camshaft, front (.010" undersize)
4346100		- 1	BEARING, camshaft, front (Standard size)
4347416		- 1	BEARING, camshaft, front (.010" undersize)
3	4346099	2 2	BEARING, camshaft, intermediate (Standard size)
	4347419	2 2	BEARING, camshaft, intermediate (.010" undersize)
4	4346108	1 1	BEARING, camshaft, rear (Standard size)
	4347413	1 1	BEARING, camshaft, rear (.010" undersize)
5	4347878	1 -	ADAPTER, camshaft front bearing
6	917540	2 -	DOWEL, 3/8" x 1-1/8"
	904541	4 -	CAPSCREW, 1/2"NC x 1-3/4"
	4335175	4 -	LOCKWASHER
7	4336432	- 4	PIN, dowel, cylinder head (Effective with grader #1780)
8	-----	4 4	PIN, dowel, crankshaft thrust flange (See CRANKSHAFT)
9	4348829	2 2	STUD, front main bearing (3/4" diam., 5-1/2" long)

(Continued)

CYLINDER BLOCK (Continued)

ITEM	PART NO.	QTY. * **	DESCRIPTION
10	4346324	12 12	LOCKWASHER, main bearing stud nut
11	4346191	12 12	NUT, main bearing stud (3/4"NF)
12	4349630	1 1	△ CAP, front main bearing
13	4349632	4 4	△ CAP, intermediate main bearing
14	4346322	4 4	NUT, center main bearing stud (5/8"NF)
15	4346323	2 2	PLATE, locking, center main bearing stud nut
16	4349629	1 1	△ CAP, center main bearing
17	4348831	4 4	STUD, center main bearing (5/8" diam.)
18	4349631	1 1	△ CAP, rear main bearing
19	4348830	10 10	STUD, rear and intermediate main bearings (3/4" diam., 5-7/8" long)
20	4362338	2 2	PLUG, crankcase
21	4337764	2 2	□ GASKET, valve lifter cover
<p><u>NOTE:</u> Items 22 thru 26 comprise the FIRST TYPE VALVE LIFTER COVERS used prior to engine serial No. 45-1293</p>			
22	4346653	6 -	STUD, valve lifter cover
23	4253520	6 -	RING, snap, valve lifter cover nut
24	-----	2 -	COVER, valve lifter, (Order items 27, 28 and 29)
25	4251987	6 -	□ O-RING, valve lifter cover nut
26	4347126	6 -	NUT, valve lifter cover
<p><u>NOTE:</u> Items 27 thru 29 comprise the SECOND TYPE VALVE LIFTER COVERS effective with engine serial No. 45-1293</p>			
27	4335453	2 2	COVER, valve lifter
28	4335456	6 6	WASHER, valve lifter cover bolt
29	4335455	6 6	BOLT, valve lifter cover
30	917724	1 -	PLUG, expansion, 2-3/4" diam. (Used prior to engine #45-1397)
	4335534	1 1	PLUG, camshaft hole (grooved for O-ring)(Effective with engine #45-1397)
31	4254624	1 1	□ O-RING, camshaft hole plug (Effective with engine #45-1397)
32	4660357	1 1	NUT, cap, oil pressure regulating valve
33	4660356	1 1	SCREW, oil pressure regulating valve
	910847	1 1	NUT, jam, 3/4"NF
34	4113897	2 2	□ GASKET, regulating valve nut

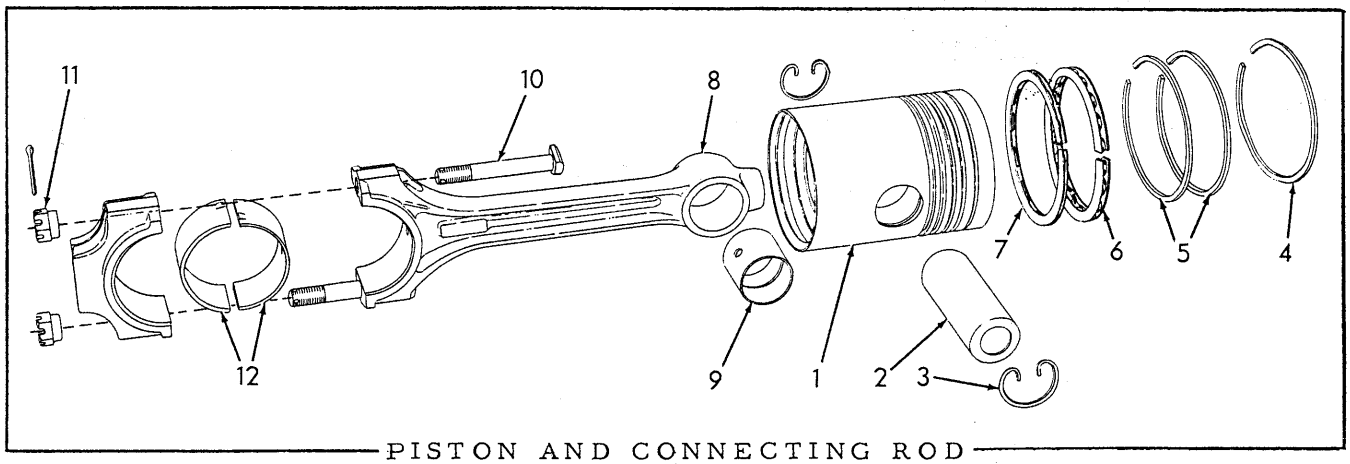
△ Replacement bearing caps are semi-finished and must be line-bored after installing
 □ Also see PACKAGED PARTS

(Continued)

CYLINDER BLOCK (Continued)

ITEM	PART NO.	QTY.		DESCRIPTION
		*	**	
35	4660358	1	1	SPRING, oil pressure regulating valve
36	4500230	1	1	PISTON, oil pressure regulating valve
37	4347465	1	1	INSERT, oil pressure regulating valve seat
38	4347061	1	1	RESTRICTOR, oil passage (Additional 2 used on engines prior to #90846)
39	4346184	12	12	O-RING, cylinder sleeve (black) (Used prior to engine #45-2260)
	4337972	12	12	□O-RING, cylinder sleeve (red) (Effective with engine #45-2260)
40	4337971	6	6	□SLEEVE, cylinder (If for engines prior to #45-2260 also order O-RING 4337972)
41	4348857	-	-	SHIM, cylinder sleeve (.005" thick)
	4348856	-	-	SHIM, cylinder sleeve (.008" thick)
	4348859	-	-	SHIM, cylinder sleeve (.010" thick)
	4348858	-	-	SHIM, cylinder sleeve (.015" thick)
	4348900	-	-	SHIM, cylinder sleeve (.020" thick)
				Use as req'd when re-machining cylinder blocks
42	4335777	2	2	CAPSCREW, crankcase pad (3/8"NC x 3/4", nylok) (Effective with engine #45-1397)
<u>NOTE:</u> Items listed below are furnished only with service replacement cylinder block and are not original equipment.				
43	4335369	1	1	PLATE, cover, oil gallery hole, upper
	903638	4	4	CAPSCREW, 1/2"NC x 1-1/4"
	904208	4	4	LOCKWASHER, 1/2"
44	4253106	2	2	□O-RING, oil gallery hole cover plates
45	4335782	1	1	PLATE, cover, oil gallery hole, lower
	915666	1	1	CAPSCREW, 1/2"NC x 1-3/8"
46	4506946	2	2	STUD
	904208	3	3	LOCKWASHER, 1/2"
	910195	2	2	NUT, 1/2"NF

□Also see PACKAGED PARTS



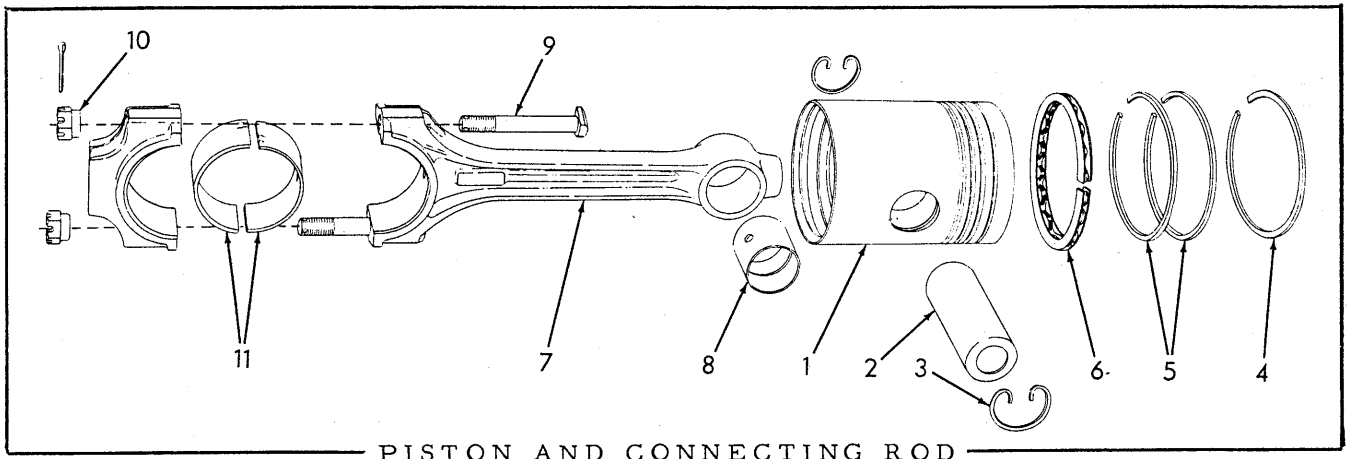
PISTON AND CONNECTING ROD

USAGE: Graders prior to serial No. 1780

ITEM PART NO. QTY. DESCRIPTION

1	4347676	6	□PISTON
2	4347281	6	□PIN, piston
3	4304699	12	□RETAINER, piston pin
4	4347458	6	□RING, compression (top groove) (See item 13)
5	4347235	12	□RING, compression (2nd and 3rd grooves)(See item 13)
6	4336321	6	□RING, oil control (4th groove)(See item 13)
7	4336190	6	□RING, oil control (5th groove)(See item 13)
8	4348451	6	ROD ASSEMBLY, connecting (Includes items 9 thru 11)
9	4340081	6	BUSHING, connecting rod
10	4338510	12	BOLT, connecting rod
11	4338509	12	NUT, connecting rod bolt
	900806	12	PIN, cotter, 1/8" x 1"
12	4335208	12	BEARING, connecting rod (standard size)(Used prior to engine #45-1670)
	4337701	12	BEARING, connecting rod (standard size)(Effective with engine #45-1670)
	4337702	12	BEARING, connecting rod (.010" undersize)
	4337703	12	BEARING, connecting rod (.020" undersize)
	4337704	12	BEARING, connecting rod (.030" undersize)
	4337705	12	BEARING, connecting rod (.040" undersize)
13	4336408	6	RING SET (Consists of items 4 thru 7)(Not illustrated)

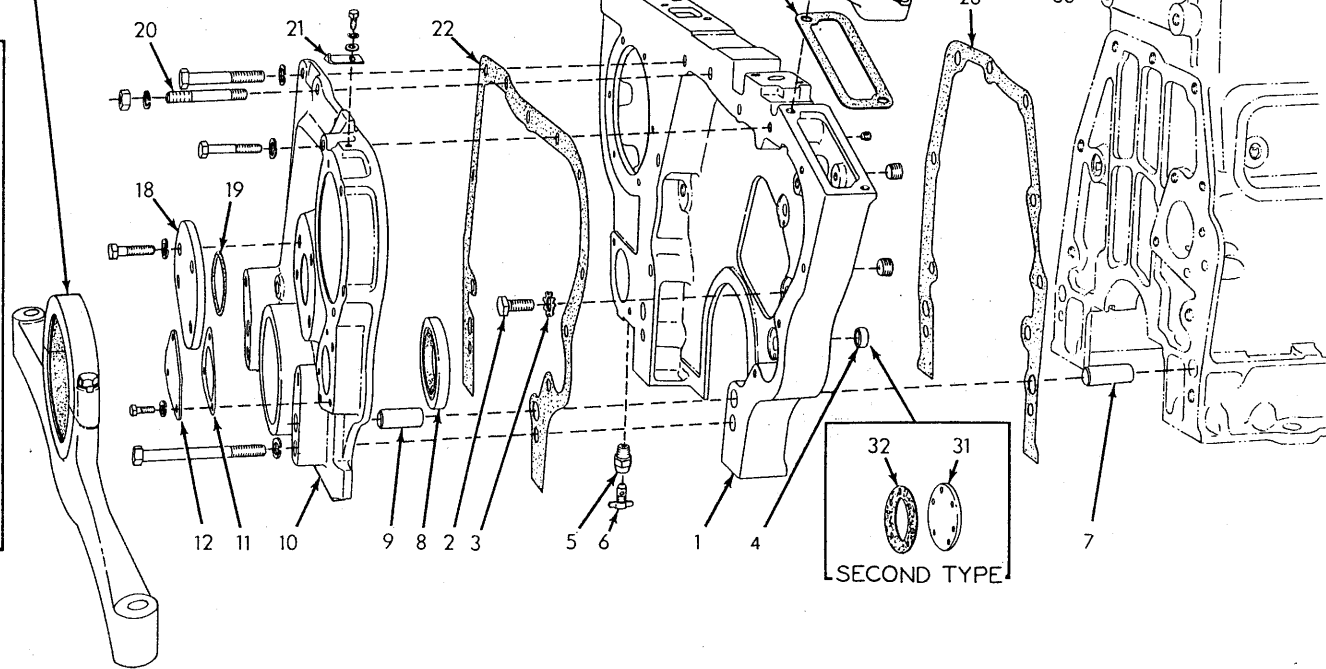
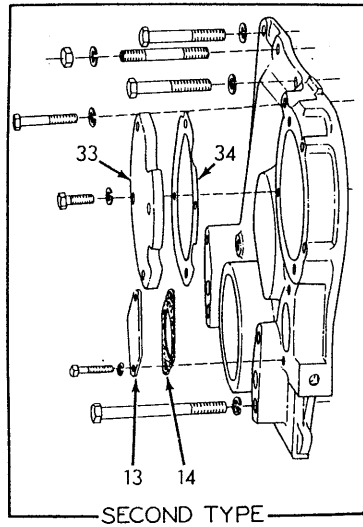
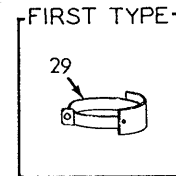
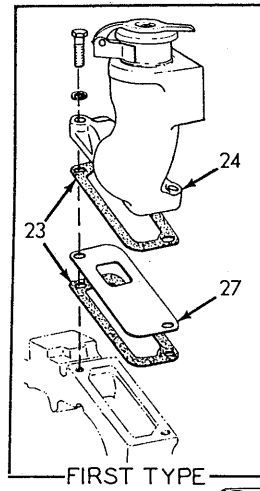
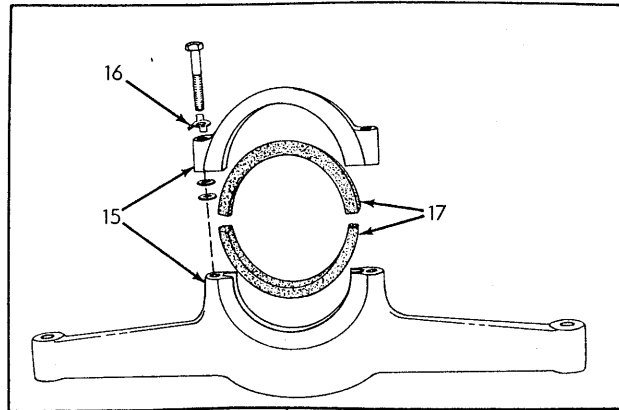
□Also see PACKAGED PARTS



USAGE: Graders serial No. 1780 and up

ITEM	PART NO.	QTY.	DESCRIPTION
1	4336512	6	□PISTON
2	4337395	6	□PIN, piston
3	4254814	12	□RETAINER, piston pin
4	4347458	6	□RING, compression (top groove)(See item 12)
5	4347235	12	□RING, compression (See item 12)
6	4336559	6	□RING, oil control (See item 12)
7	4339018	6	ROD ASSEMBLY, connecting (Includes items 8 thru 10)
8	4339017	6	BUSHING, connecting rod
9	4338510	12	BOLT, connecting rod
10	4338509	12	NUT, connecting rod bolt
	900806	12	PIN, cotter, 1/8" x 1"
11	4337701	12	BEARING, connecting rod (standard size)
	4337702	12	BEARING, connecting rod (.010" undersize)
	4337703	12	BEARING, connecting rod (.020" undersize)
	4337704	12	BEARING, connecting rod (.030" undersize)
	4337705	12	BEARING, connecting rod (.040" undersize)
12	4336578	6	RING SET, piston (Not Illustrated)

□Also see PACKAGED PARTS



TIMING GEAR HOUSING

TIMING GEAR HOUSING

* Used prior to grader serial No. 1780
 ** Effective with grader serial No. 1780

ITEM	PART NO.	QTY.		DESCRIPTION
		*	**	
1	4347874	1	-	HOUSING, timing gear (Used prior to engine #45-1257)
	4335274	1	-	HOUSING ASSEMBLY, timing gear (Includes item 4)(Effective with engine #45-1257)
	4337228	-	1	HOUSING, timing gear
	904260	1	-	PLUG, pipe, ctsk-hd., 3/8"NPT
	904223	1	-	PLUG, pipe, ctsk-hd., 1/2"NPT
	919134	-	1	PLUG, pipe, hex-hd., 1/8"NPT
	917970	-	1	PLUG, pipe, hex-socket, 1/2"NPT
2	4004054	3	3	CAPSCREW, 1/2"NC x 1-1/16"
3	4253490	3	3	LOCKWASHER
4	4253924	1	-	PLUG, cup (3/4"O. D.)
5	915433	1	-	COCK, drain, 1/4"NPT (Used prior to grader #820)
	201671	1	1	COCK, drain, 3/8"NPT (Includes item 6)(Effective with grader #820)
6	209359	1	1	STEM, drain cock (For 201671 COCK only)
7	4346246	2	2	PIN, dowel, timing gear housing
8	4338507	1	1	SEAL, oil crankshaft
9	4348107	2	2	PIN, dowel, timing gear cover
10	4337281	-	1	COVER ASSEMBLY, timing gear housing (Includes item 9)(If for engines prior to #45-2140 also order 1 CAPSCREW 921299)
	4347887	1	-	COVER ASSEMBLY, timing gear housing (Includes item 9)
	904283	3	3	CAPSCREW, 1/2"NC x 3"
	903782	1	1	CAPSCREW, 1/2"NC x 3-1/2"
	910257	2	2	CAPSCREW, 1/2"NC x 4-3/4"(1 less used effective with engine #45-2140)
	915635	5	3	CAPSCREW, 3/8"NC x 1-7/8"
	904281	-	2	CAPSCREW, 3/8"NC x 2-1/4"
	921299	-	1	CAPSCREW, 1/2"NC x 4" (Effective with engine #45-2140)
	908191	1	-	WASHER, plain (copper)(Used prior to engine #45-1210)
	904208	6	6	LOCKWASHER, 1/2"
	904206	5	5	LOCKWASHER, 3/8"
11	4376605	1	-	GASKET, cover plate
12	4348285	1	-	PLATE, cover, timing gear
	905661	3	-	CAPSCREW, 5/16"NC x 5/8"
	904205	3	-	LOCKWASHER, 5/16"
13	4335711	-	1	PLATE, cover, timing gear
14	4335712	-	1	GASKET, cover plate

□Also see PACKAGED PARTS

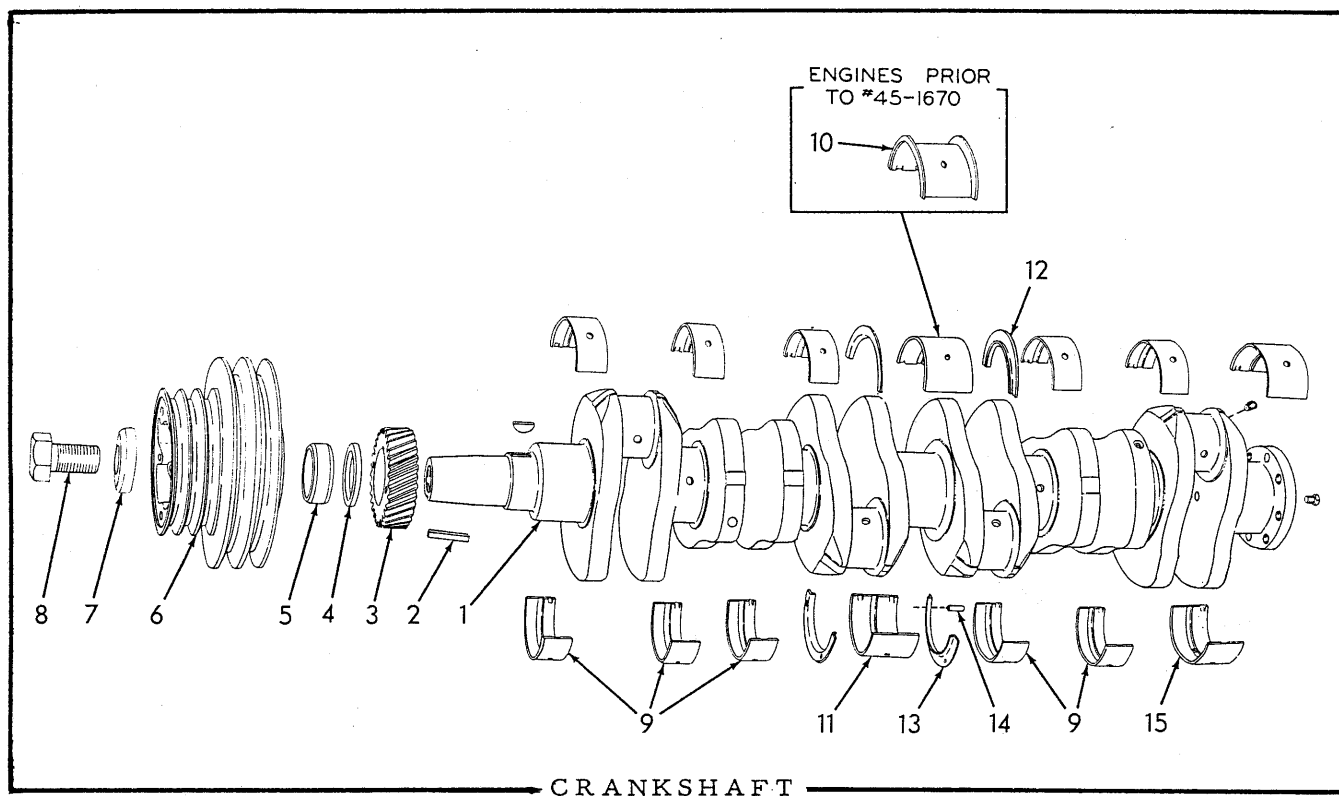
(Continued)

TIMING GEAR HOUSING (Continued)

ITEM	PART NO.	QTY.		DESCRIPTION
		*	**	
15	4349324	1	-	BRACKET, engine mounting (Includes cap)(Used prior to engine #45-1612)
	4335069	1	1	BRACKET, engine mounting (Includes cap)(Effective with engine #45-1612)
16	4254891	2	2	CAPSCREW, 1/2"NC x 2-1/2"
	916009	10	10	WASHER, plain (1/32" thick. Use as req'd)
	4335550	2	2	LOCKWASHER
17	4364864	2	2	LINER, engine mounting bracket (rubber)(Used prior to engine #45-1932)
	4336491	-	2	LINER, engine mounting bracket (nylon)(Effective with engine #45-1932)
18	4347935	1	-	COVER, timing gear cover camshaft hole
	903638	4	-	CAPSCREW, 1/2"NC x 1-1/4"
	904208	4	-	LOCKWASHER, 1/2"
19	4254082	1	-	□O-RING, camshaft hole cover
20	4335371	1	1	STUD, timing gear housing
	904208	1	1	LOCKWASHER, 1/2"
	910195	1	1	NUT, 1/2"NF
21	4347673	1	-	POINTER, timing
	903626	1	-	CAPSCREW, 5/16"NC x 3/4"
	904205	1	-	LOCKWASHER, 5/16"
	910335	1	-	WASHER, plain, SAE std., 5/16"
22	4348126	1	1	□GASKET, timing gear housing cover
23	4347120	1	1	□GASKET, oil filter hole cover (1 additional used prior to grader #365)
24	4338049	1	1	FILLER ASSEMBLY, oil (Includes item 23 and 24)
	910245	2	2	CAPSCREW, 3/8"NC x 1-3/8"
	904206	2	2	LOCKWASHER, 3/8"
25	4335022	1	1	STRAINER, oil filler (Effective with grader #365)
26	4366461	1	1	CAP ASSEMBLY, oil filler (Serviced only as a unit)
27	089765	1	-	BAFFLE, oil filler (Used prior to grader #365)
28	4347880	1	-	□GASKET, timing gear housing
	4348136	-	1	□GASKET, timing gear housing
29	4379291	1	1	PLATE AND STRAP ASSEMBLY, oil data (Used prior to engine #45-2271)
30	4379141	-	1	PLATE, oil data (Effective with engine #45-2271)
	904516	-	4	SCREW, drive, #6 x 1/4"
31	4336346	-	1	COVER, timing gear housing
	905661	-	6	CAPSCREW, 5/16"NC x 5/8"
	917230	-	6	WASHER, plain, copper, 5/16"
32	4336345	-	1	□GASKET, housing cover
33	4348310	-	1	PLATE, cover, injection pump driving gear
	903775	-	4	CAPSCREW, 3/8"NC x 7/8"
	904206	-	4	LOCKWASHER, 3/8"
34	4349011	-	1	□GASKET, cover plate

□Also see PACKAGED PARTS

MEMO



* Engines prior to serial No. 45-1670
 ** Effective with engine serial No. 45-1670

ITEM	PART NO.	QTY.		DESCRIPTION
		*	**	
1	4337718	1	1	CRANKSHAFT ASSEMBLY (Includes PLUGS indented below)
	917673	6	6	PLUG, pipe, hex-socket, 1/8"NPT
	919840	1	1	PLUG, pipe, hex-head, 1/4"NPT
2	4003490	1	1	KEY, crankshaft pulley
3	4346205	1	1	GEAR, crankshaft (Used prior to engine #45-2235)
	4337060	-	1	GEAR, crankshaft (hardened)(Effective with engine #45-2235)
	905127	1	1	KEY, "B" woodruff, 5/16" x 1"
4	4374391	1	1	SPACER, front oil seal sleeve (Used prior to engine #45-2289)
5	4374390	1	1	SLEEVE, front oil seal (Used prior to engine #45-2289)
6	4347899	1	1	PULLEY, crankshaft
7	4371503	1	1	WASHER, crankshaft pulley bolt
8	4347897	1	1	CAPSCREW, crankshaft pulley
9	4337710	10	10	BEARING, front and intermediate main (standard size)
	4337711	10	10	BEARING, front and intermediate main (.010" undersize)
	4337712	10	10	BEARING, front and intermediate main (.020" undersize)
	4337713	10	10	BEARING, front and intermediate main (.030" undersize)
	4337714	10	10	BEARING, front and intermediate main (.040" undersize)

(Continued)