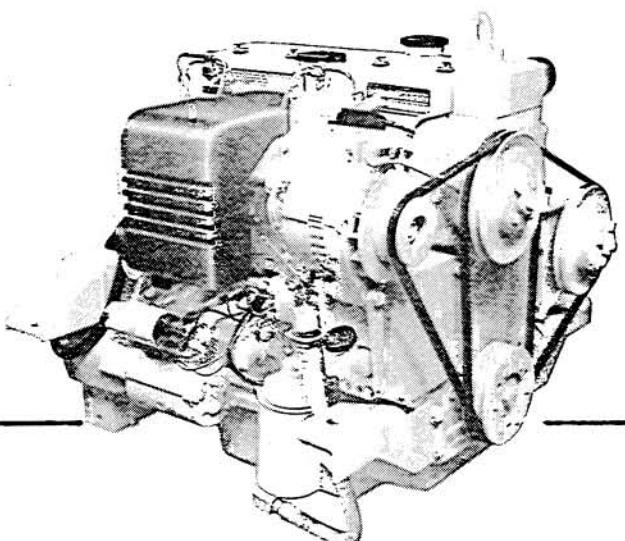


Onan

Parts Manual

**L423D-M
Propulsion
Engine
Diesel**



934-0252
12-87 (SPEC B AND C)
Replaces
4-86 (Spec B and C)
Printed in U.S.A.

Important Safety Precautions

Read and observe these safety precautions when using or working on electric generators, engines and related equipment. Also read and follow the literature provided with the equipment.

Proper operation and maintenance are critical to performance and safety. Electricity, fuel, exhaust, moving parts and batteries present hazards that can cause severe personal injury or death.

FUEL, ENGINE OIL, AND FUMES ARE FLAMMABLE AND TOXIC

Fire, explosion, and personal injury can result from improper practices.

- Used engine oil, and benzene and lead, found in some gasoline, have been identified by government agencies as causing cancer or reproductive toxicity. When checking, draining or adding fuel or oil, do not ingest, breathe the fumes, or contact gasoline or used oil.
- Do not fill tanks with engine running. Do not smoke around the area. Wipe up oil or fuel spills. Do not leave rags in engine compartment or on equipment. Keep this and surrounding area clean.
- Inspect fuel system before each operation and periodically while running.
- Equip fuel supply with a positive fuel shutoff.
- Do not store or transport equipment with fuel in tank.
- Keep an ABC-rated fire extinguisher available near equipment and adjacent areas for use on all types of fires except alcohol.
- Unless provided with equipment or noted otherwise in installation manual, fuel lines must be copper or steel, secured, free of leaks and separated or shielded from electrical wiring.
- Use approved, non-conductive flexible fuel hose for fuel connections. Do not use copper tubing as a flexible connection. It will work-harden and break.

EXHAUST GAS IS DEADLY

- Engine exhaust contains carbon monoxide (CO), an odorless, invisible, poisonous gas. Learn the symptoms of CO poisoning.
- Never sleep in a vessel, vehicle, or room with a genset or engine running unless the area is equipped with an operating CO detector with an audible alarm.
- Each time the engine or genset is started, or at least every day, thoroughly inspect the exhaust system. Shut down the unit and repair leaks immediately.

- Warning: Engine exhaust is known to the State of California to cause cancer, birth defects and other reproductive harm.

Make sure exhaust is properly ventilated.

- Vessel bilge must have an operating power exhaust.
- Vehicle exhaust system must extend beyond vehicle perimeter and not near windows, doors or vents.
- Do not use engine or genset cooling air to heat an area.
- Do not operate engine/genset in enclosed area without ample fresh air ventilation.
- Expel exhaust away from enclosed, sheltered, or occupied areas.
- Make sure exhaust system components are securely fastened and not warped.

MOVING PARTS CAN CAUSE SEVERE PERSONAL INJURY OR DEATH

- Do not remove any guards or covers with the equipment running.
- Keep hands, clothing, hair, and jewelry away from moving parts.
- Before performing any maintenance, disconnect battery (negative [-] cable first) to prevent accidental starting.
- Make sure fasteners and joints are secure. Tighten supports and clamps, keep guards in position over fans, drive belts, etc.
- If adjustments must be made while equipment is running, use extreme caution around hot manifolds and moving parts, etc. Wear safety glasses and protective clothing.

BATTERY GAS IS EXPLOSIVE

- Wear safety glasses and do not smoke while servicing batteries.
- Always disconnect battery negative (-) lead first and reconnect it last. Make sure you connect battery correctly. A direct short across battery terminals can cause an explosion. Do not smoke while servicing batteries. Hydrogen gas given off during charging is explosive.
- Do not disconnect or connect battery cables if fuel vapors are present. Ventilate the area thoroughly.

DO NOT OPERATE IN FLAMMABLE AND EXPLOSIVE ENVIRONMENTS

Flammable vapor can be ignited by equipment operation or cause a diesel engine to overspeed and become difficult to stop, resulting in possible fire, explosion, severe personal injury and death. **Do not operate diesel equipment where a flammable vapor environment can be created by fuel spill, leak, etc., unless equipped with an automatic safety device to block the air intake and stop the engine.**

HOT COOLANT CAN CAUSE SEVERE PERSONAL INJURY

- Hot coolant is under pressure. Do not loosen the coolant pressure cap while the engine is hot. Let the engine cool before opening the pressure cap.

ELECTRICAL SHOCK CAN CAUSE SEVERE PERSONAL INJURY OR DEATH

- Do not service control panel or engine with unit running. High voltages are present. Work that must be done while unit is running should be done only by qualified service personnel.
- Do not connect the generator set to the public utility or to any other electrical power system. Electrocution can occur at a remote site where line or equipment repairs are being made. An approved transfer switch must be used if more than one power source is connected.
- Disconnect starting battery (negative [-] cable first) before removing protective shields or touching electrical equipment. Use insulative mats placed on dry wood platforms. Do not wear jewelry, damp clothing or allow skin surface to be damp when handling electrical equipment.
- Use insulated tools. Do not tamper with interlocks.
- Follow all applicable state and local electrical codes. Have all electrical installations performed by a qualified licensed electrician. Tag open switches to avoid accidental closure.
- With transfer switches, keep cabinet closed and locked. Only authorized personnel should have cabinet or operational keys. Due to serious shock hazard from high voltages within cabinet, all service and adjustments must be performed by an electrician or authorized service representative.

If the cabinet must be opened for any reason:

1. Move genset operation switch or Stop/Auto/Handcrank switch (whichever applies) to Stop.
2. Disconnect genset batteries (negative [-] lead first).
3. Remove AC power to automatic transfer switch. If instructions require otherwise, use extreme caution due to shock hazard.

MEDIUM VOLTAGE GENERATOR SETS (601V TO 15kV)

- Medium voltage acts differently than low voltage. Special equipment and training are required to work on or around medium voltage equipment. Operation and maintenance must be done only by persons trained and qualified to work on such devices. Improper use or procedures will result in severe personal injury or death.
- Do not work on energized equipment. Unauthorized personnel must not be permitted near energized equipment. Induced voltage remains even after equipment is disconnected from the power source. Plan maintenance with authorized personnel so equipment can be de-energized and safely grounded.

GENERAL SAFETY PRECAUTIONS

- Do not work on equipment when mentally or physically fatigued or after consuming alcohol or drugs.
- Carefully follow all applicable local, state and federal codes.
- Never step on equipment (as when entering or leaving the engine compartment). It can stress and break unit components, possibly resulting in dangerous operating conditions from leaking fuel, leaking exhaust fumes, etc.
- Keep equipment and area clean. Oil, grease, dirt, or stowed gear can cause fire or damage equipment by restricting airflow.
- Equipment owners and operators are solely responsible for operating equipment safely. Contact your authorized Onan/Cummins dealer or distributor for more information.

KEEP THIS DOCUMENT NEAR EQUIPMENT FOR EASY REFERENCE.

INDEX

DESCRIPTION	PAGE	DESCRIPTION	PAGE
INTRODUCTION	2	Line, Oil - Remote Filter	16
MODEL IDENTIFICATION LABEL	3	Line, Oil Drain - Remote	15
MODEL SPECIFICATION NUMBER		Linkage, Throttle	38
TO OPTION CODE TABLE	42	Manifold, Exhaust	20,21
Adapter, Oil Filter	13,16	Manifold, Intake	18
Adapter, Transmission	26	Meter, Hour	34-37
Alternator	28	Mount, Engine	39
Alternator Components	29	Paint - Touch Up	40
Belt	23	Pan, Oil	17
Block, Cylinder	4,5	Panel, Instrument - Remote	34-37
Bracket, Lifting	16,20,21	Pickup, Oil	17
Camshaft	4,5	Piston	4,5
Cap, Oil Fill	14	Plug, Glow	32
Connector, Coolant Outlet	22	Pulley, Alternator	23
Controller, Glow Plug	32	Pulley, Coolant Pump	23
Cooler, Oil	4,5	Pulley, Crankshaft	23
Cover, Rocker	14	Pulley, Raw Water Pump	24
Crankshaft	4,5	Pump, Coolant	23
Drain, Oil - Remote	15	Pump, Fuel Transfer	12
Elbow, Exhaust	20,21	Pump, Injection	10
Filter, Fuel	12	Pump, Oil	8,9
Filter, Oil	13,16	Pump, Raw Water	24
Flange, Exhaust	19	Pump Components, Injection	11
Flywheel	27	Sealant, Thread	40
Fuse	32,34-37	Sender, Oil Pressure	34-37
Gauge, Oil Pressure	34-37	Sender, Water Temperature	34-37
Gauge, Water Temperature	34-37	Sensor, Speed - Magnetic	34-37
Gear, Injection Pump	8,9	Signal, Audible	34-37
Gearcase	8,9	Silencer, Air	19
Harness, Wiring	34-37	Starter	30
Head, Cylinder	6,7	Starter Components	31
Housing, Flywheel	25	Switch, Ignition	34-37
Indicator, Oil Level	17	Switch, Oil Pressure	34-37
Injector, Fuel	10	Switch, Start/Stop	34-37
Isolator, Engine Mounting	40	Tachometer	34-37
Kit, Gasket - Heat Exchanger	20,21	Thermostat	23,34-37
Kit, Gasket - Lower End	4,5	Transmission	41
Kit, Gasket - Valve Grind	6,7	Tube, Nozzle Leak Off	12
Kit, Repair - Coolant Pump	23	Tube, Oil Fill - Gearcase	14
Light, Indicator	32,34-37	Voltmeter	34-37
Line, Injection	10		

INTRODUCTION

To assist your Onan Dealer in giving you prompt and efficient replacement parts service, a Sales Option Code plate is part of your Onan nameplate and lists Sales Option Code numbers that identify factory installed parts unique to your engine. Corresponding Code numbers are listed at the top of each parts group and are used to determine correct replacement parts. To aid in identifying Sales Option Codes that apply to your engine, refer to the Model Specification Number to Option Code Table at the rear of this manual.

The diagonal line (/) in the model and specification number separates engine characteristics from the specification number and letter. The specification number denotes customer requested options. The specification letter advances (A to B, B to C, etc.) with major manufacturing changes. This letter designation, when used in the part description, also applies when ordering replacement parts. Left (non-accessory) and right (accessory) sides are determined by facing the rear or drive end (flywheel) of the engine.

Listed below are Sales Option Code Modifier numbers that may appear on your Onan nameplate. These code numbers have no direct service replaceable parts and only modify another related Sales Option Code number by identifying a distinctive feature(s). Parts that differ as a result of the modifier are identified in the parts description for that part.

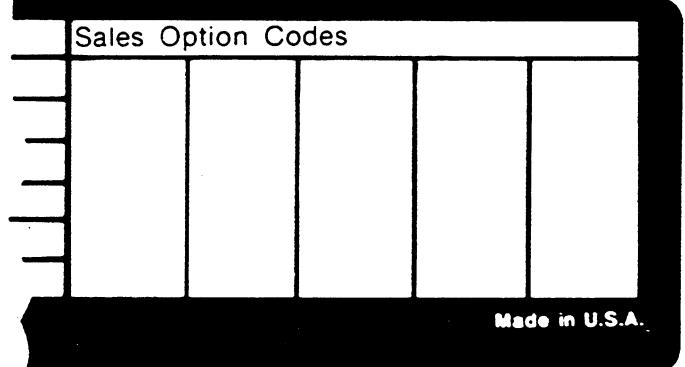
- 15AJ (Fuel System for #2 Diesel Fuel)
- 15AK (Fuel System for Jet A or JP-5 Fuel)
- 15AL (Fuel System for JP-4 Fuel)
- 15AU (Bosch Injection Pump in place of Stanadyne Injection Pump)
- 23CB (No Belts)
- 23CC (No Belts or Alternator Pulley)
- 23CD (Double Pulley and Belts to Replace Single)
- 23CE (Single Pulley and Belts to Replace Double)
- 31AG (12 Volt System)
- 31AH (24 Volt System)
- 31AJ (32 Volt System)
- 35AJ (Fuel Solenoid - Energized to Run)
- 35AK (Fuel Solenoid - Energized to Run, Manual Override)
- 35AL (Fuel Solenoid - Energized to Shut Off, Manual Override)
- 45AA (Auxiliary Gear Drive)
- 45AT (Two Groove Crankshaft Pulley to Replace Single)
- 47 (Literature and Shipping Hardware)
(Alpha letters after the number 47 are variable depending on model)
(Sales Code 47 is not a modifier, however, there are no service replaceable parts)

MODEL IDENTIFICATION LABEL

Onan
Engine

Model No:	
Serial No:	
Rated RPM:	
Static Timing: °BTDC	
Lube Oil Capacity:	
Fuel: Diesel	Firing Order:
Valve Lash:	

Onan Corporation Minneapolis Minnesota 55432 U.S.A.

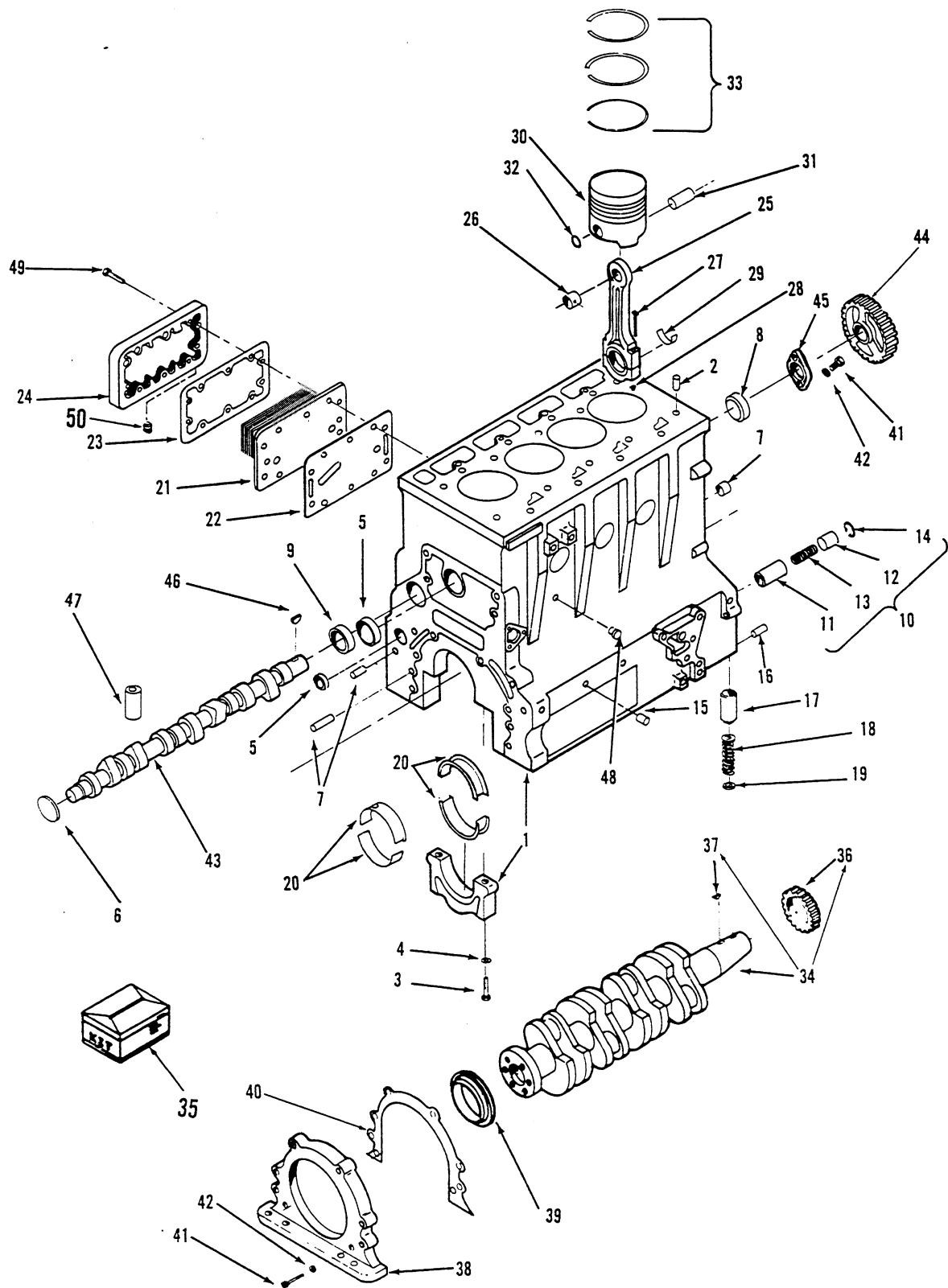


For handy reference, insert your rocker cover nameplate and Sales Option Code information in the spaces above.

CYLINDER BLOCK

Code 11AB

5100-0709
5100-0715



CYLINDER BLOCK

Code 11AB

5100-0709

5100-0715

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION	REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
1	110-3291	1	Block Assembly, Cylinder (Includes Parts Marked *)	23	102-0975	1	Gasket, Oil Cooler Cover
2	110-2978	2	*Pin, Cylinder Head Alignment	24	102-0980	1	Cover, Oil Cooler
3	720-1801	10	*Screw, Cap - Hex Head - Special	25	114-0313	4	Rod Assembly, Connecting (Includes Finished Bushing, Bolts and Nuts)
4	740-1801	10	*Washer, Flat - Special	26	114-0316	4	Bushing, Connecting Rod (Semi Finished)
5	PLUG, CUP 517-0141	4	*50.8 MM Stainless Steel	27	114-0315	8	Bolt, Connecting Rod
	517-0144	2	*12.7 MM Steel	28	114-0318	8	Nut, Connecting Rod
	517-0146	1	*31.75 MM Stainless Steel	29	BEARING, CONNECTING ROD (Half)		
	517-0250	1	54.37 MM Stainless Steel (Oversize)	114-0319	8	Standard	
6	517-0140	1	*Plug, Welch (57.15 MM) - Steel	114-0319-01	8	0.25 MM Undersize	
7	PIN, ALIGNMENT 775-0074	2	* 8 MM x 20 MM	114-0319-02	8	0.50 MM Undersize	
	775-0089	2	*10 MM x 20 MM	114-0319-03	8	0.75 MM Undersize	
	775-0078	2	* 8 MM x 40 MM	30	PISTON AND PIN KIT (Includes Retaining Rings)		
8	101-0511	1	*Bearing, Camshaft - Front	112-0201	4	Standard	
9	101-0471	4	*Bearing, Camshaft - Intermediate and Rear	112-0202	4	0.25 MM Oversize	
10	123-1613	1	*Valve Assembly, Pressure Relief (Includes Parts Marked +)	112-0203	4	0.50 MM Oversize	
11	123-1515	1	+Body, Relief Valve	112-0204	4	0.75 MM Oversize	
12	123-1514	1	+Piston, Relief Valve	112-0205	4	1.0 MM Oversize	
13	123-1508	1	+Spring, Relief Valve	31	112-0165	4	Pin, Piston
14	518-0410	1	+Ring, Retaining	32	518-0409	8	Ring, Retaining - Piston Pin
15	505-0274	4	*Plug, Pipe (1/8")	33	RING KIT, PISTON		
16	516-2102	1	*Pin, Regulator Valve Spring	113-0233	4	Standard	
17	123-1514	1	*Piston, Regulator Valve	113-0234	4	0.25 MM Oversize	
18	123-1511	1	*Spring, Regulator Valve	113-0235	4	0.50 MM Oversize	
19	740-1004	1	*Washer, Flat (M6)	113-0236	4	0.75 MM Oversize	
20	BEARING KIT, MAIN (Includes Upper and Lower Bearing Half)		Front	113-0237	4	1.0 MM Oversize	
			Standard	34	104-1508	1	Crankshaft Assembly (Includes Gear and Key)
	101-0689	1	0.25 MM Undersize	35	168-0170	1	Kit, Gasket - Lower End
	101-0690	1	0.50 MM Undersize	36	104-1138	1	Gear, Crankshaft
	101-0691	1	0.75 MM Undersize	37	515-0245	1	Key, Crankshaft Gear
	101-0692	1	Standard	38	101-0713	1	Plate, Rear Seal (Includes Seal)
	101-0681	1	0.25 MM Undersize	39	509-0203	1	Seal, Oil - Rear (Includes Wear Sleeve)
	101-0682	1	0.50 MM Undersize	40	101-0600	1	Gasket, Rear Seal Plate
	101-0683	1	0.75 MM Undersize	41	718-1037	8	Screw, Cap - Hex Head (M8 x 25 MM)
	101-0684	1	Intermediate (Except Center)	42	740-1006	8	Washer, Flat (M8)
	101-0685	2	Standard	43	105-0517	1	Camshaft
	101-0686	2	0.25 MM Undersize	44	105-0515	1	Gear, Camshaft
	101-0687	2	0.50 MM Undersize	45	105-0534	1	Retainer, Camshaft
	101-0688	2	0.75 MM Undersize	46	515-0245	1	Key, Camshaft Gear
	101-0677	1	Rear	47	115-0275	8	Tappet
	101-0678	1	Standard	48	502-0775	1	*Plug, Pipe (3/8")
	101-0679	1	0.25 MM Undersize	49	725-1054	10	Screw, Socket Head (M8 x 40 MM)
	101-0680	1	0.50 MM Undersize	50	504-0028	1	Valve, Coolant Drain
	101-0680	1	0.75 MM Undersize				
21	102-1020	1	Cooler, Oil				
22	102-0973	1	Gasket, Oil Cooler				

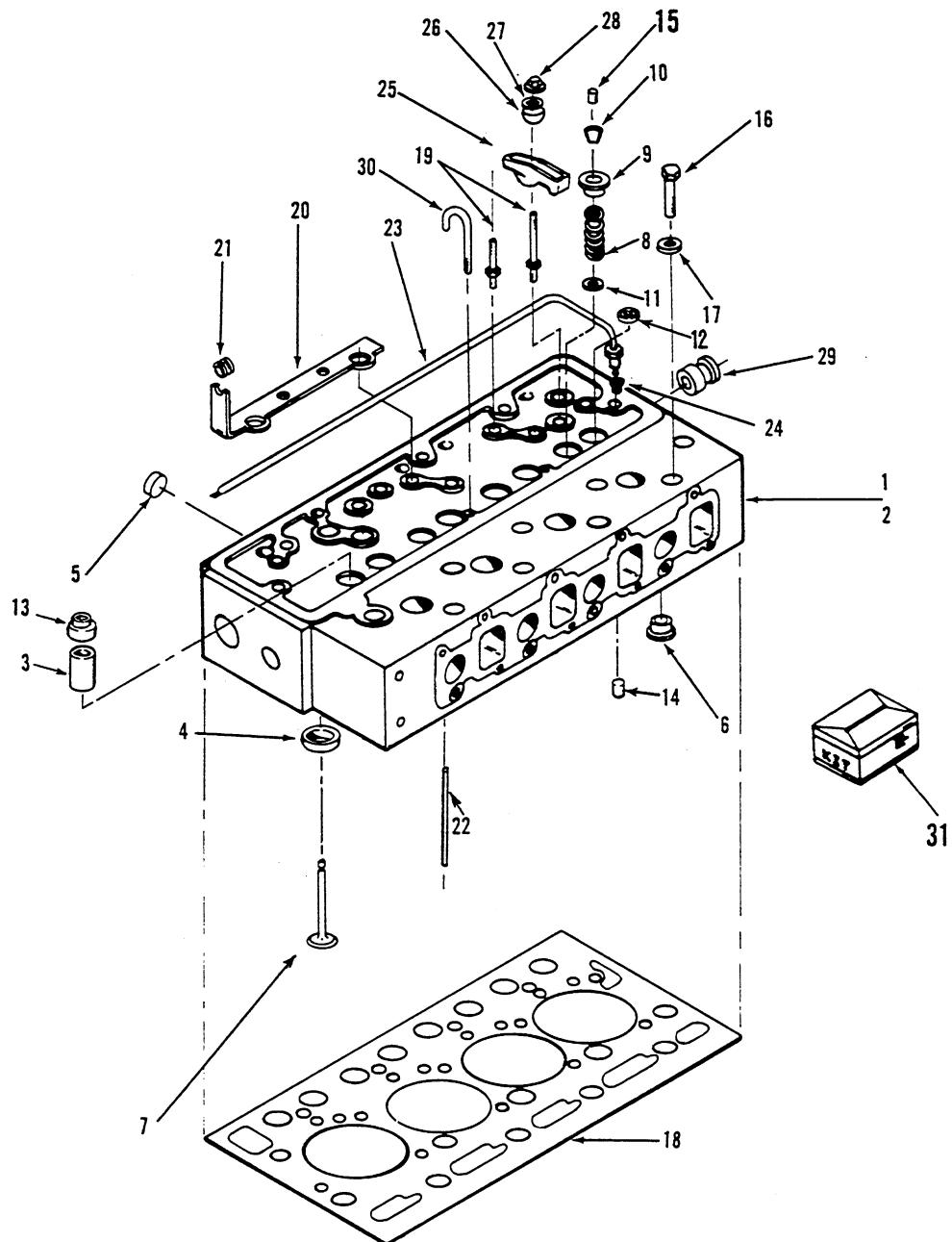
* - Parts Included in 110-3291 Cylinder Block Assembly.

+ - Parts Included in 123-1613 Pressure Relief Valve Assembly.

CYLINDER HEAD

Code 11AB

5100-0871
5100-0916



CYLINDER HEAD

Code 11AB

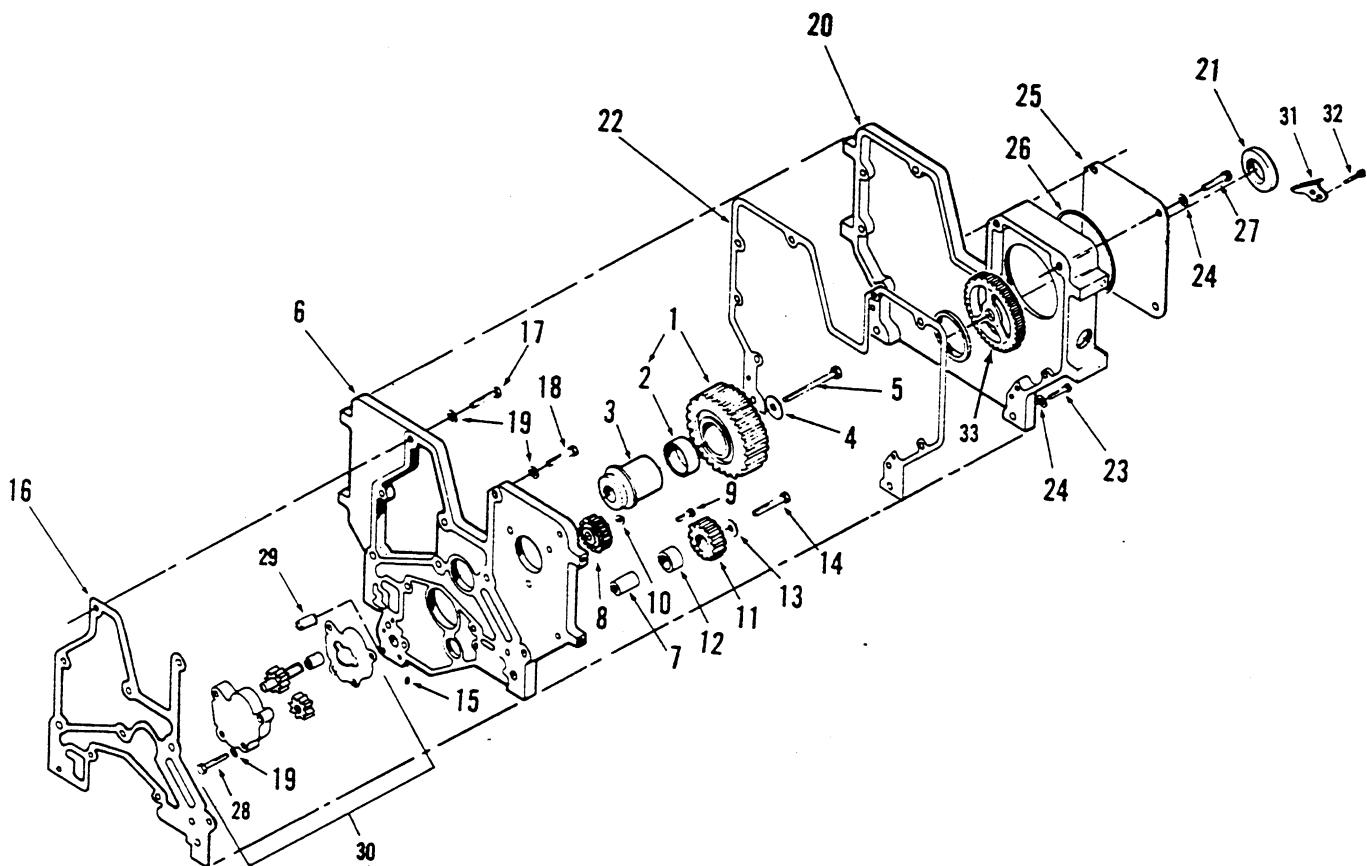
5100-0871
5100-0916

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
1	110-3201	1	Head Assembly, Cylinder (Includes Guides, Seats, Valves, Cup Plugs, Springs, Breather Tubes, Water Pump Adapter, Spacers, Retainers, Collets, Wear Plates, Sleeves and Seals)
2	110-3285	1	Head, Cylinder (Includes Seats, Guides, Cup Plugs, Spacers, Water Pump Adapter and Sleeves)
3	GUIDE, VALVE (Semi Finished) 110-3495 110-3496	4 4	Intake (Std.) Exhaust (Std.)
4	SEAT, VALVE 110-2839 110-3226-01 110-3226-02 110-3226-03	4 4 4 4	Intake Spec B (Std.) Not Original Equipment Begin Spec C Standard .25 MM Oversize .50 MM Oversize
5	PLUG, CUP 517-0142 517-0146 517-0162	7 4 4	Exhaust Standard .25 MM Oversize .50 MM Oversize
6	110-3039	4	Plug, Hot (Swirl)
7	VALVE 110-3066 110-2840	4 4	Intake Exhaust
8	110-3300	8	Spring, Valve
9	110-3015	8	Retainer, Valve Spring
10	110-2752	16	Collet, Valve Lock
11	PLATE, VALVE SPRING WEAR 110-2991 110-2991	8 4	Spec B Begin Spec C (Exhaust)
12	110-3432	4	Spacer, Valve Spring (Intake) Begin Spec C
13	110-3228	8	Seal Assembly, Valve Stem
14	110-2979	4	Sleeve, Sealing
15	110-3245	8	Cap, Valve Stem (Not used on some early models)
16	720-1802	18	Screw, Cap - Hex Head (M12 x 130 MM)
17	740-1801	14	Washer, Flat (M12)
18	110-3012	1	Gasket, Cylinder Head
19	STUD, ROCKER ARM 115-0204 115-0270	4 4	Short Long
20	115-0313	2	Guide, Push Rod
21	508-0228	2	Grommet
22	115-0253	8	Pushrod
23	120-0919	1	Tube, Rocker Arm Oil
24	502-0003	1	Connector, Inverted Male
25	115-0316	8	Arm, Rocker
26	115-0202	8	Ball, Rocker Arm
27	526-2119	8	Washer, Flat
28	115-0315	8	Locknut, Rocker Arm
29	ADAPTER, WATER PUMP 110-3045 110-3490	1 1	Standard 0.5 MM Oversize
30	123-1536	2	Tube, Breather
31	168-0159	1	Kit, Gasket - Valve Grind

GEARCASE

Code 11AB

5100-0727
5100-0866



GEARCASE

Code 11AB

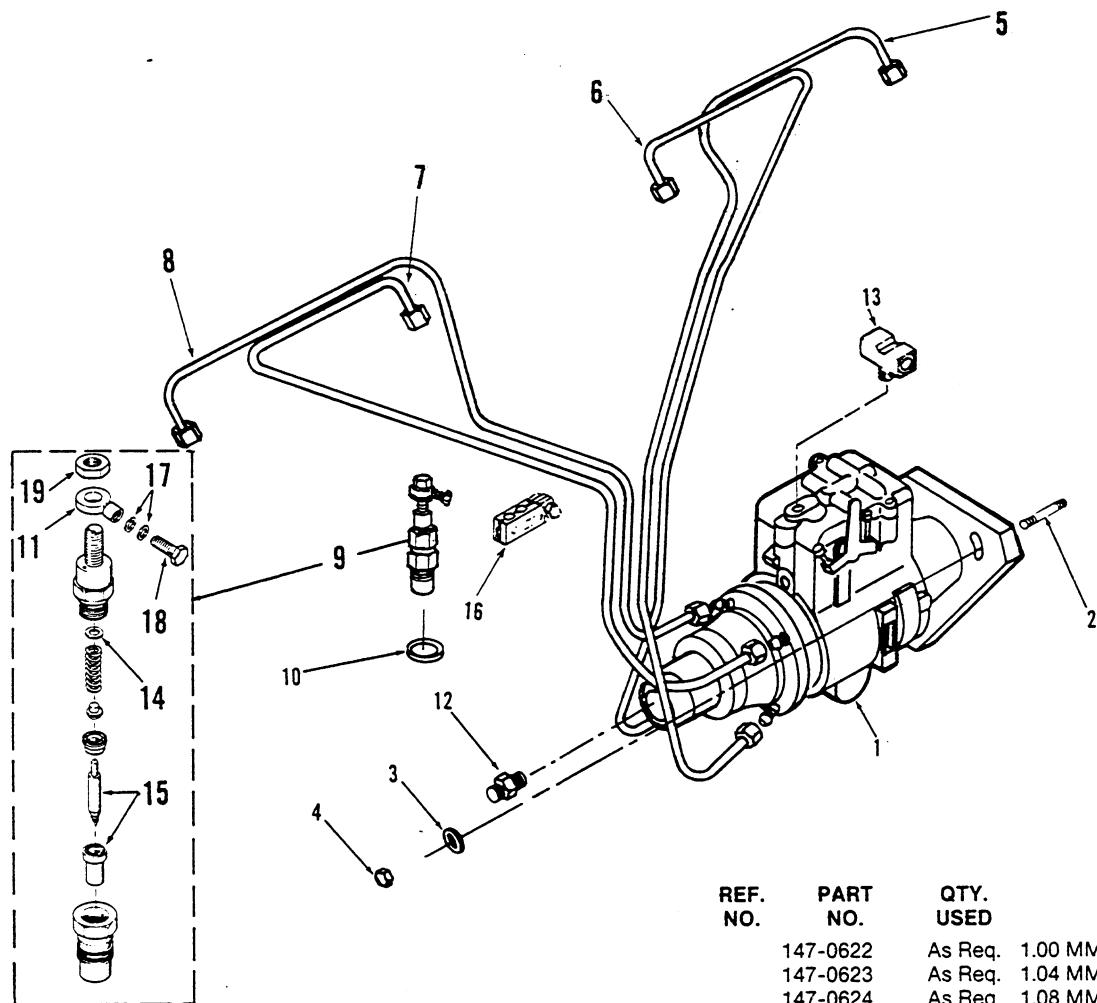
5100-0727
5100-0866

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
1	105-0513	1	Gear, Idler (Includes Finished Bearing)
2	105-0519	1	Bearing, Idler Gear (Semi Finished)
3	105-0508	1	Shaft, Idler Gear
4	526-2127	1	Washer, Flat (M10)
5	718-1064	1	Screw, Cap - Hex Head (M10 x 75 MM)
6	103-0716	1	Backplate, Gearcase
7	120-0983	1	Shaft, Oil Pump Idler Gear
8	120-0885	1	Gear, Oil Pump Drive
9	718-1035	1	Screw, Cap - Hex Head (M8 x 16 MM)
10	526-2106	1	Washer, Flat
11	120-1063	1	Gear, Oil Pump Idler (Includes Finished Bearing)
12	120-1041	1	Bearing, Oil Pump Idler Gear (Semi Finished)
13	526-2107	1	Washer, Flat
14	718-1035	1	Screw, Cap - Hex Head (M8 x 16 MM)
15	725-1802	1	Screw, Hex Socket Set (M16 x 16 MM)
16	103-0733	1	Gasket, Gearcase Backplate
17	SCREW, CAP - HEX HEAD 718-1037 718-1039	1 2	718-1037 M8 x 25 MM 718-1039 M8 x 35 MM
18	725-1801	2	Screw, Low Socket Head Cap (M8 x 16 MM)
19	740-1006	7	Washer, Flat (M8)
20	GEARCASE ASSEMBLY 103-0744 103-0746	1 1	Without Side Oil Fill (Includes Oil Seal and Cup Plug) With Side Oil Fill (Includes Oil Seal and Oil Fill Tube)
21	509-0191	1	Seal, Oil (Includes Wear Sleeve)
22	103-0731	1	Gasket, Gearcase
23	SCREW, CAP - HEX HEAD 718-1046 718-1043 718-1085	2 2 4	718-1046 M8 x 70 MM (Engines Without Code 23BT) 718-1043 M8 x 55 MM (Engines Without Code 23BT) 718-1085 M12 x 85 MM (Engines Without Code 41AA)
24	WASHER, FLAT 740-1006 740-1010	4 4	M8 M12
25	103-0735	1	Cover, Injection Pump Gear
26	509-0263	1	Seal, O-Ring
27	SCREW, CAP - HEX HEAD 718-1048 718-1044 718-1036	1 2 1	718-1048 M8 x 80 MM 718-1044 M8 x 60 MM 718-1036 M8 x 20 MM
28	718-1041	2	Screw, Cap - Hex Head (M8 x 45 MM)
29	120-0979	1	Bearing, Oil Pump Drive Shaft
30	120-1015	1	Pump Kit, Oil (Includes Drive Shaft Bearing)
31	103-0750	1	Plate, Timing
32	815-0578	2	Screw, Cap - HH (M6 x 12.5 MM)
33	147-0427	1	Gear, Injection Pump

FUEL INJECTION

Code 13AB (3600 RPM Variable, ETSO, MO, 12 Volt)

5100-0742

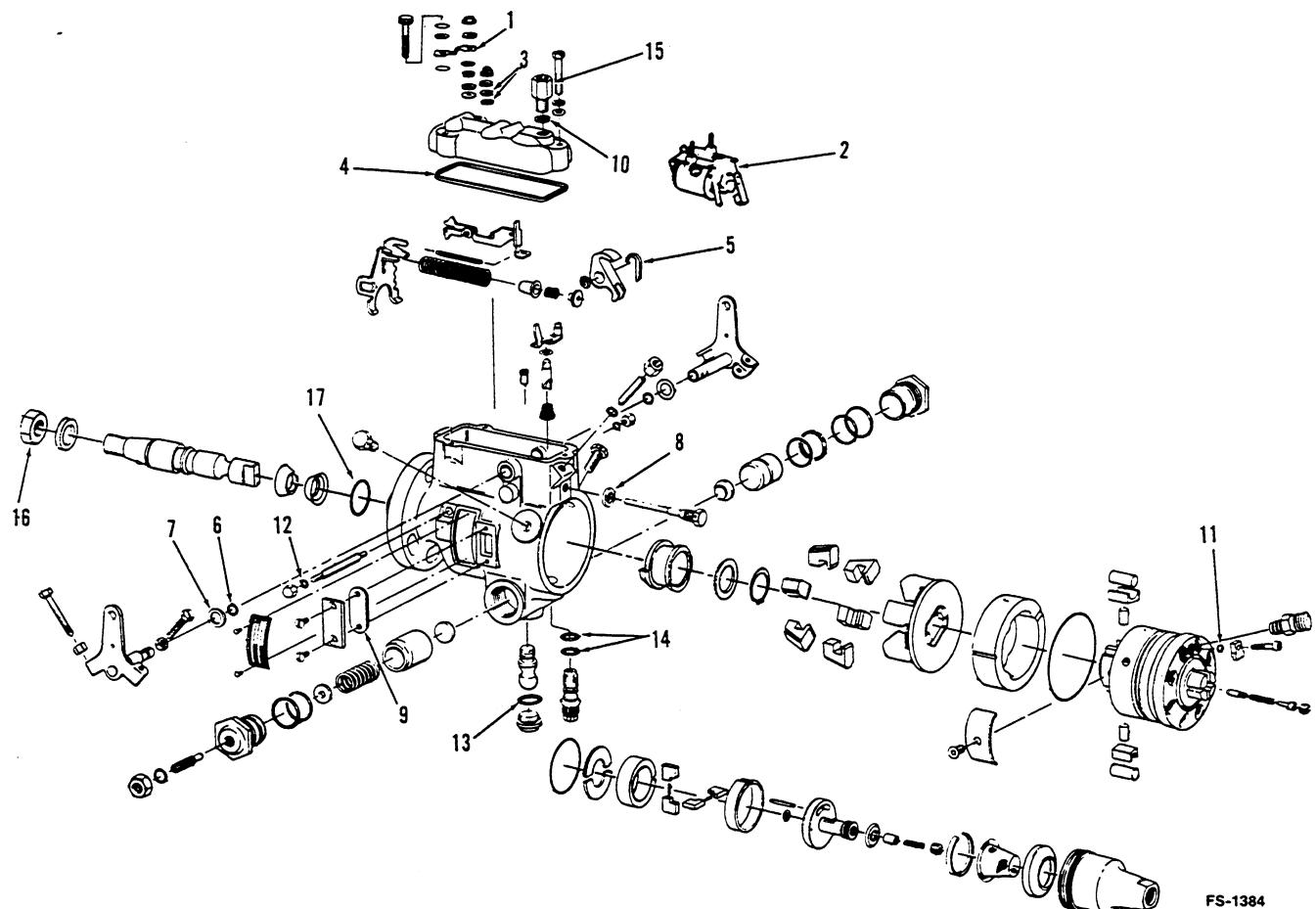


FS-1262

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION	REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
1	147-0462-14	1	Pump, Fuel Injection (See Separate Group for Components)	147-0622		As Req.	1.00 MM
2	520-2403	3	Stud, Injection Pump (M8)	147-0623		As Req.	1.04 MM
3	526-2106	3	Washer, Flat (M8)	147-0624		As Req.	1.08 MM
4	750-1006	3	Nut, Hex (M8)	147-0625		As Req.	1.12 MM
5	147-0675	1	Line, Injection (No. 1 Cylinder)	147-0626		As Req.	1.16 MM
6	147-0676	1	Line, Injection (No. 2 Cylinder)	147-0627		As Req.	1.20 MM
7	147-0677	1	Line, Injection (No. 3 Cylinder)	147-0628		As Req.	1.24 MM
8	147-0678	1	Line, Injection (No. 4 Cylinder)	147-0629		As Req.	1.28 MM
9	147-0700	4	Injector Kit, Fuel (Includes Seal)	147-0630		As Req.	1.32 MM
10	147-0436	4	Seal, Injector	147-0631		As Req.	1.36 MM
11	147-0766	4	Banjo	147-0632		As Req.	1.40 MM
12	502-0733	1	Connector	147-0633		As Req.	1.44 MM
13	502-0057	1	Tee, Pipe (Special)	147-0634		As Req.	1.48 MM
14	WASHER, INJECTION NOZZLE SHIM			147-0635		As Req.	1.52 MM
	147-0617	As Req.	0.80 MM	147-0636		As Req.	1.56 MM
	147-0618	As Req.	0.84 MM	147-0637		As Req.	1.60 MM
	147-0619	As Req.	0.88 MM	147-0638		As Req.	1.64 MM
	147-0620	As Req.	0.92 MM	147-0639		As Req.	1.68 MM
	147-0621	As Req.	0.96 MM	147-0640		As Req.	1.72 MM
				147-0641		As Req.	1.76 MM
				147-0642		As Req.	1.80 MM
				147-0643		As Req.	1.84 MM
				147-0644		As Req.	1.88 MM
				147-0645		As Req.	1.92 MM
				147-0646		As Req.	1.96 MM
				15	147-0647	4	Tip, Nozzle
				16	CLAMP, FUEL LINE		
				147-0680		2	Clamps Two Lines
				147-0679		1	Clamps Four Lines
				17	147-0767	8	Washer
				18	147-0765	4	Screw, Hollow
				19	147-0780	4	Nut, Hex (M19)

FUEL INJECTION PUMP COMPONENTS

Code 13AB (3600 RPM Variable, ETSO, MO, 12 Volt)



FS-1384

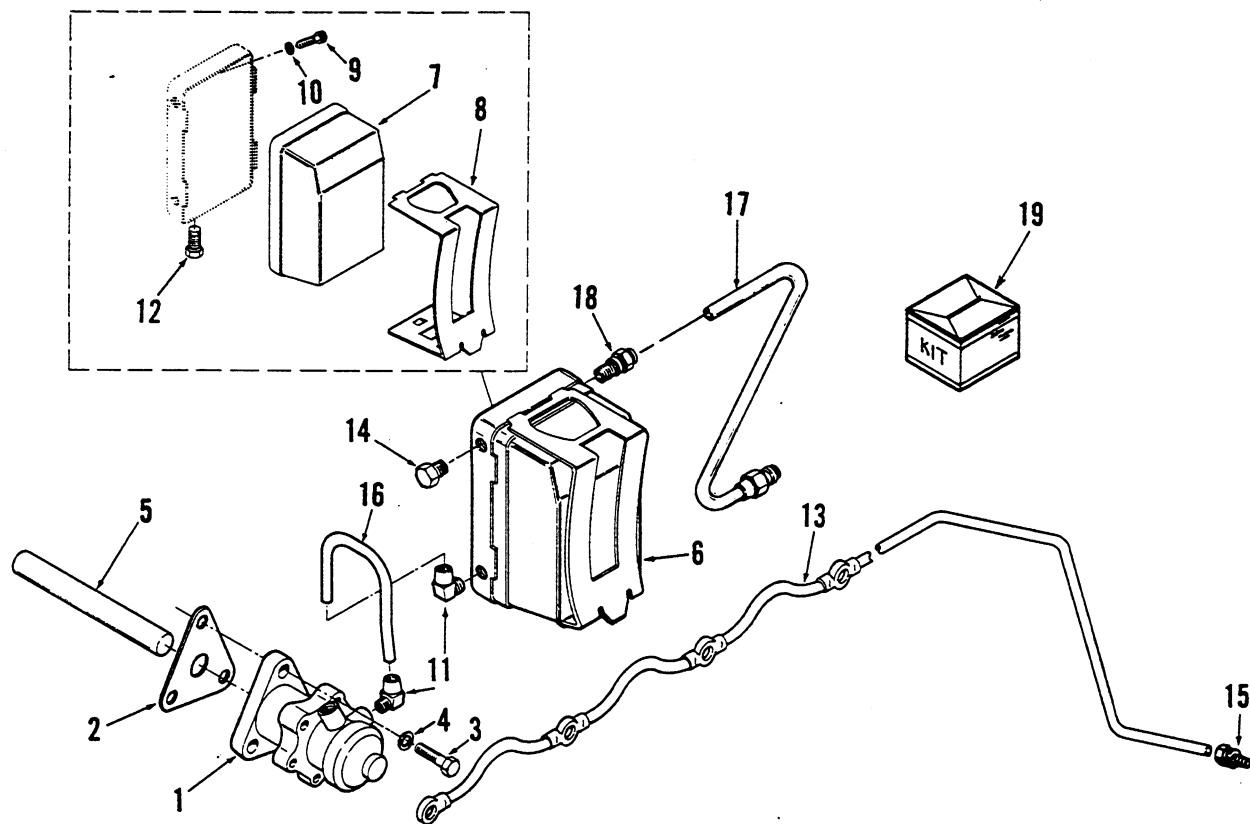
REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
	147-0462-14	1	Pump, Fuel Injection (Complete)
1	147-0592	1	Strap, Terminal Grounding
2	147-0705	1	Solenoid and Frame Kit
3	147-0591	2	Washer, Terminal Insulating
4	147-0590	1	Gasket, Governor Cover
5	147-0589	1	Clip, Shaft Retaining
6	147-0588	2	Seal, Throttle Shaft
7	147-0587	2	Washer, Throttle Shaft Seal
8	147-0586	1	Washer, Guide Stud
9	147-0585	1	Gasket, Timing Line Cover
10	147-0584	1	Seal, Return Line Connector
11	147-0583	1	Seal, Locking Plate
12	147-0582	2	Seal, Pivot Shaft
13	147-0581	1	Seal, Advance Screw Hole Plug
14	147-0580	2	Seal, Head Locating Screws
15	147-0579	1	Connector, Return Line
16	147-0578	1	Nut, Drive Shaft
17	509-0265	1	Seal, Pilot Tube

NOTE: For component parts not listed contact manufacturer shown on nameplate.

FUEL SYSTEM

Code 15AG (Low Pressure, Metal Filter and Lines, with Drain)

5100-0576



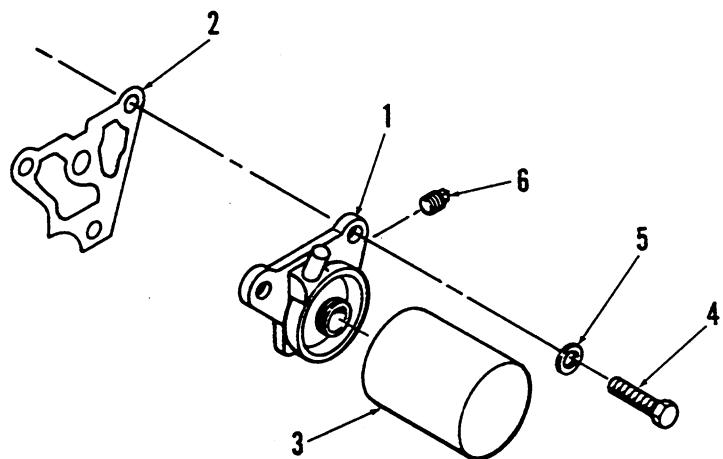
XFS-1555-1

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
1	149-2067	1	Pump Kit, Transfer (Includes Mounting Gasket)
2	149-1728	1	Gasket, Fuel Transfer Pump
3	718-1021	3	Screw, Cap - Hex Head (M6 x 20 MM)
4	740-1004	3	Washer, Flat (M6)
5	149-1732	1	Pushrod, Fuel Transfer Pump
6	149-1803	1	Filter Assembly (Includes Filter, Base, and Clamp)
7	149-1802	1	Filter, Fuel
8	149-1801	1	Clamp, Fuel Filter
9	725-1074	2	Screw, Cap - Socket Head (M10 x 20 MM)
10	740-1008	2	Washer, Flat (M10)
11	502-0774	2	Elbow, Flareless Tube Fitting (Includes Sleeve and Nut)
12	502-0028	1	Plug, Filter Drain (1/8")
13	147-0664	1	Tube, Nozzle Leak Off
14	502-0153	2	Plug (1/4")
15	502-0830	1	Connector, Male (Includes Sleeve and Nut)
16	149-1797	1	Line, Fuel
17	149-1980	1	Line, Fuel
18	502-0773	1	Connector, Flareless (Includes Sleeve and Nut)
19	149-2069	1	Repair Package - Transfer Pump

OIL FILTER

Code 17AK (Horizontal)

5100-0802



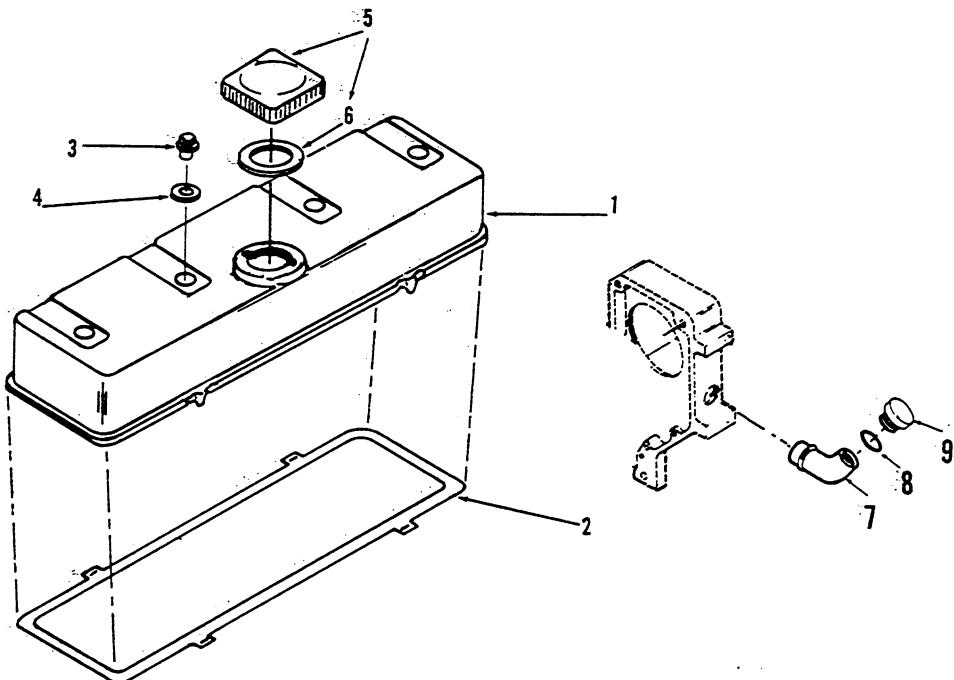
LS-1057-1

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
1	122-0614	1	Adapter, Oil Filter (Includes Gasket)
2	122-0635	1	Gasket
3	122-0550	1	Filter
4	SCREW, CAP 718-1040 725-1053	2	Hex Head (M8 x 40 MM) Socket Head (M8 x 35 MM)
5	WASHER, FLAT (M8) 526-2108 740-1802	2	15.5 MM O.D. 14.0 MM O.D.
6	505-0274	1	Plug, Pipe (1/8")

OIL FILL

Code 17AL (Rocker Cover)
 Code 17AM (Rocker Cover and Side Gearcase)

5100-0078
 5100-0762



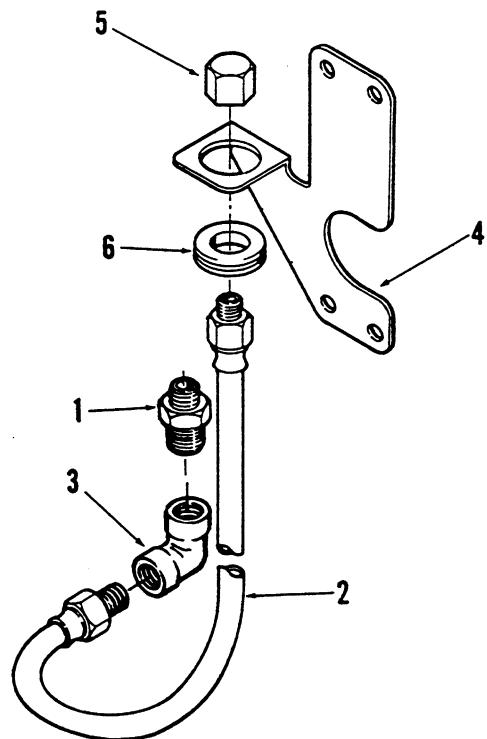
LS-1060

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
1	115-0345	1	Cover Kit, Rocker
2	115-0254	1	Gasket, Rocker Cover
3	115-0320	4	Capnut, Rocker Cover
4	115-0232	4	Gasket, Capnut
5	123-1605	1	Cap, Oil Fill (Includes Gasket)
6	123-1518	1	Gasket, Oil Fill Cap
7	123-1558	1	Tube, Oil Fill
8	509-0142	1	Seal, O-Ring
9	123-1647	1	Cap, Oil Fill

REMOTE OIL DRAIN

Code 17BA

5100-0606



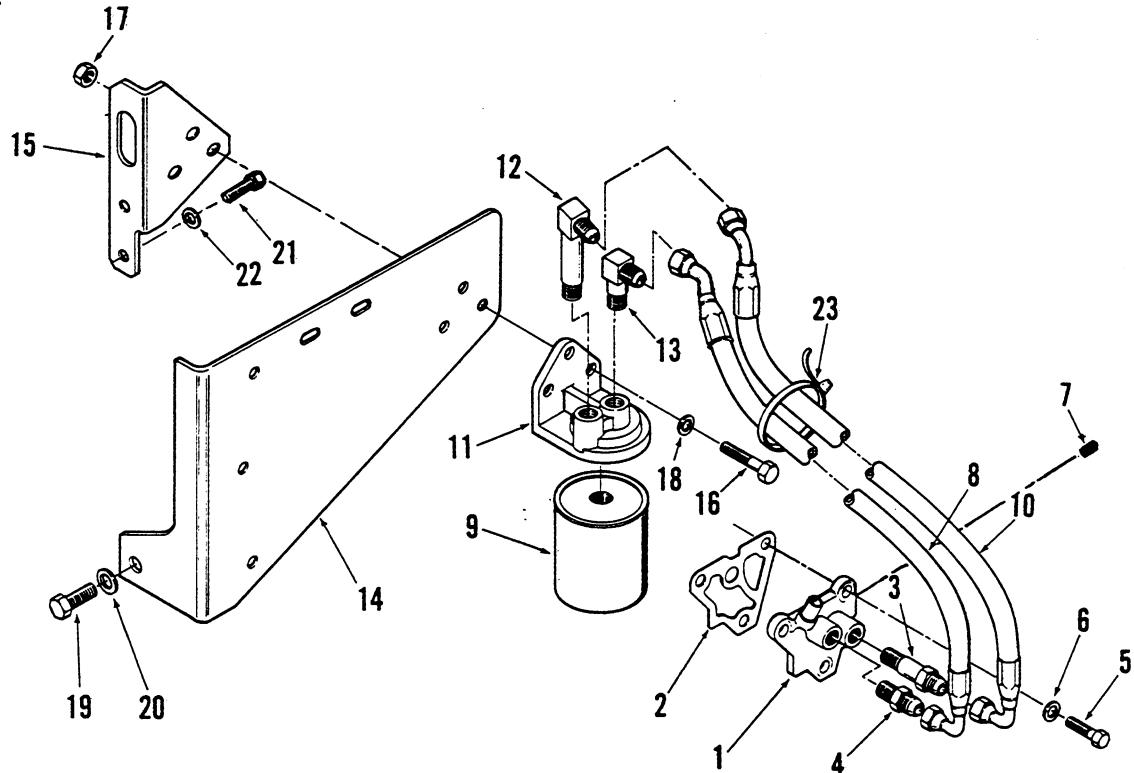
LS-1135-1

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
1	102-1237	1	Adapter, Oil Drain
2	501-0484	1	Line, Oil Drain
3	502-0908	1	Elbow
4	102-1235	1	Bracket, Oil Drain
5	502-0876	1	Cap, Pipe
6	508-0250	1	Grommet

REMOTE OIL FILTER

Code 17BE

5100-0582



XLS-1142

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
1	122-0612	1	Adapter Kit, Oil Filter (Includes Mounting Gasket)
2	122-0635	1	Gasket, Mounting
3	502-0895	1	Adapter, Oil Line (Long)
4	502-0873	1	Adapter, Oil Line (Short)
5	718-1040	3	Screw, Cap - Hex Head (M8 x 40 MM)
6	526-2108	3	Washer, Flat (M8)
7	505-0274	1	Plug, Pipe (1/8")
8	501-0486	1	Line, Oil (With 90° Swivels)
9	122-0550	1	Filter, Oil
10	501-0485	1	Line, Oil (With 90° and 45° Swivels)
11	122-0581	1	Base, Oil Filter
12	502-0893	1	Elbow, 90° (Long)
13	502-0894	1	Elbow, 90° (Short)
14	122-0629	1	Bracket, Base Mounting
15	403-2223	1	Bracket, Lifting
16	718-1038	3	Screw, Cap - Hex Head (M8 x 30 MM)
17	750-1006	3	Nut, Hex (M8)
18	740-1006	3	Washer, Flat (M8)
19	718-1073	1	Screw, Cap - Hex Head (M12 x 25 MM)
20	740-1010	1	Washer, Flat (M12)
21	718-1054	2	Screw, Cap - Hex Head (M10 x 25 MM)
22	526-0174	2	Washer, Flat (M10)
23	332-2262	3	Tie, Cable

OIL PAN

Code 17AA (20° Tilt - Drain to Side and Center)

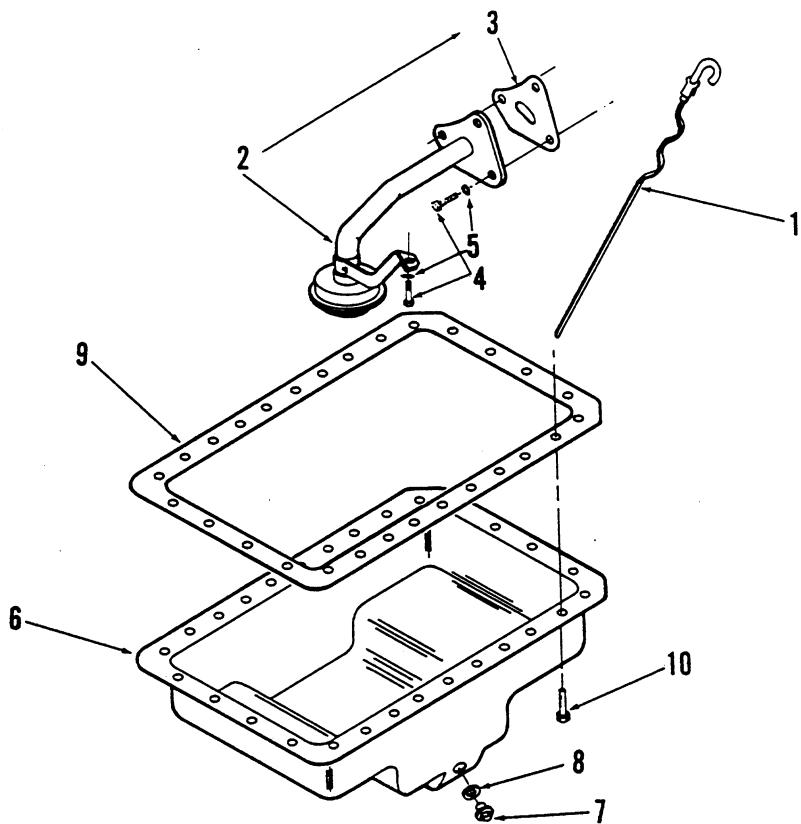
Code 17BF (20° Tilt - Drain to Accessory Side and Front)

Code 17BS (20° Tilt - Drain to Accessory Side and Front, Epoxy Coated)

5100-0358

5100-0648

5100-1003



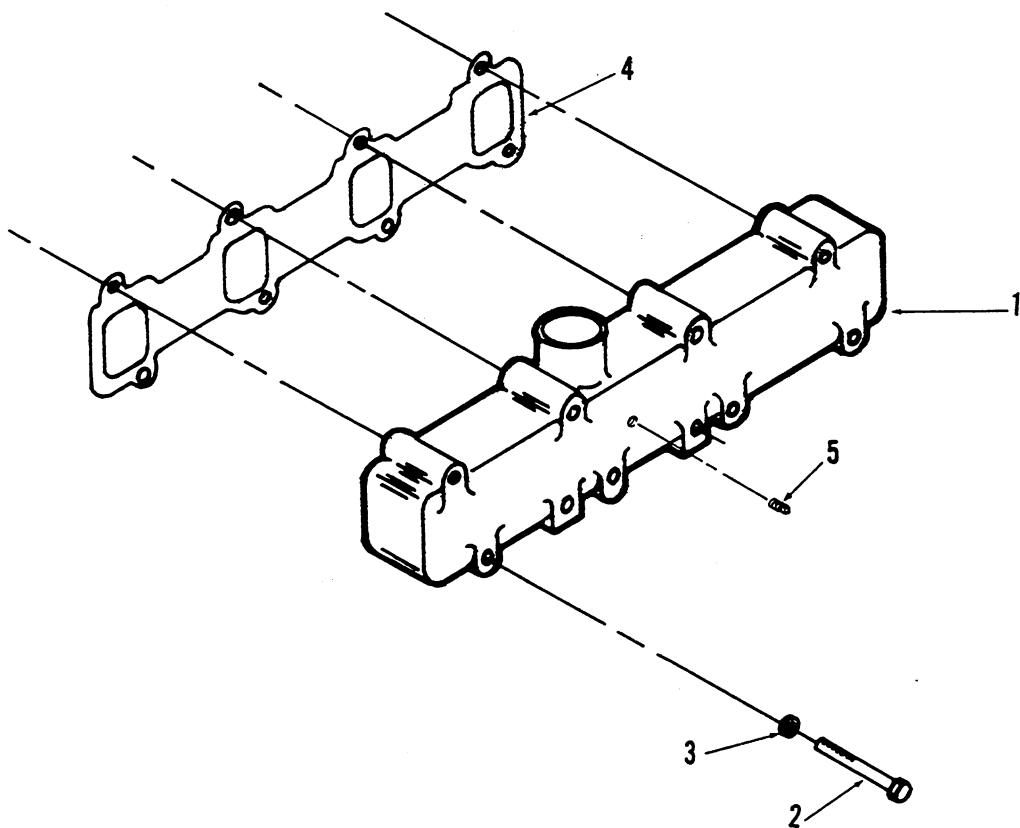
LS-1059

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
1	INDICATOR, OIL LEVEL 123-1711-01 123-1439	1	Code 17AA Code 17BF, 17BS
2	120-1008	1	Pickup Kit, Oil (Includes Mounting Gasket)
3	120-0917	1	Gasket, Oil Pickup
4	SCREW, CAP - HEX HEAD 718-1044 718-1036	2	M8 × 60 MM M8 × 20 MM
5	740-1006	4	Washer, Flat (M8)
6	PAN, OIL 102-1188 102-1272 102-1251-01	1	Code 17AA (Includes Plugs, Gaskets and Adapter) Code 17BF (Includes Plugs, Gaskets and Adapter) Code 17BS
7	102-1146	1	Plug, Oil Drain
8	102-1147	2	Gasket, Oil Drain Plug
9	102-0981	1	Gasket, Oil Pan
10	815-0547	28	Screw, Cap - Hex Head (Includes Washer) - M8 × 20 MM

INTAKE MANIFOLD

Code 19AA (Center Up)

5100-0480



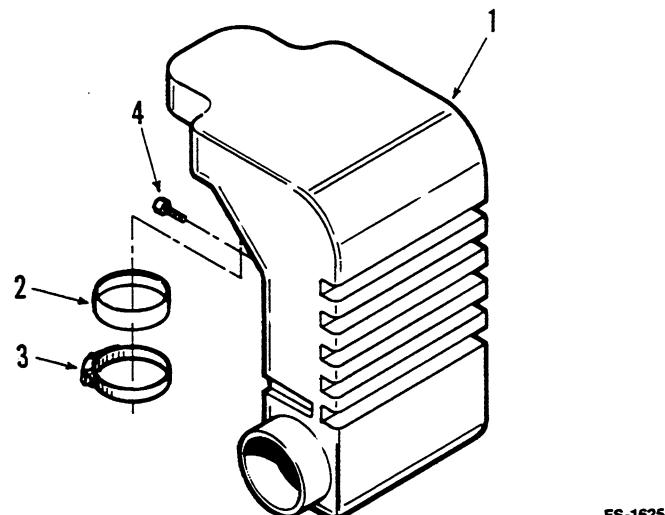
EXS-1050

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
1	154-2460	1	Manifold Kit, Intake (Includes Plug)
2	718-1801	8	Screw, Cap - Hex Head (M8 x 85 MM) (Engines Without Code 31AL, 31AS)
3	740-1006	8	Washer, Flat (M8)
4	154-2261	1	Gasket, Intake Manifold
5	505-0274	1	Plug, Pipe - Countersunk Hex (1/8")

AIR SILENCER

Code 19AG

5500-0071



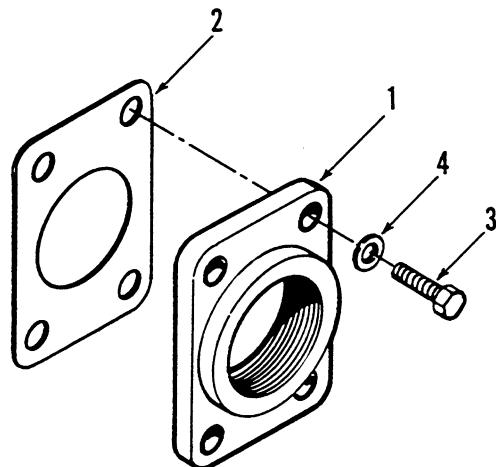
FS-1625

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
1	140-2020	1	Silencer, Air Intake
2	140-1857	1	Sleeve
3	503-0648	1	Clamp
4	821-0014	2	Screw, Cap - Flange Hex Head (5/16-18 x 1/2")

EXHAUST FLANGE

Code 21AG
541-0052 Field Installation Kit

5500-0067



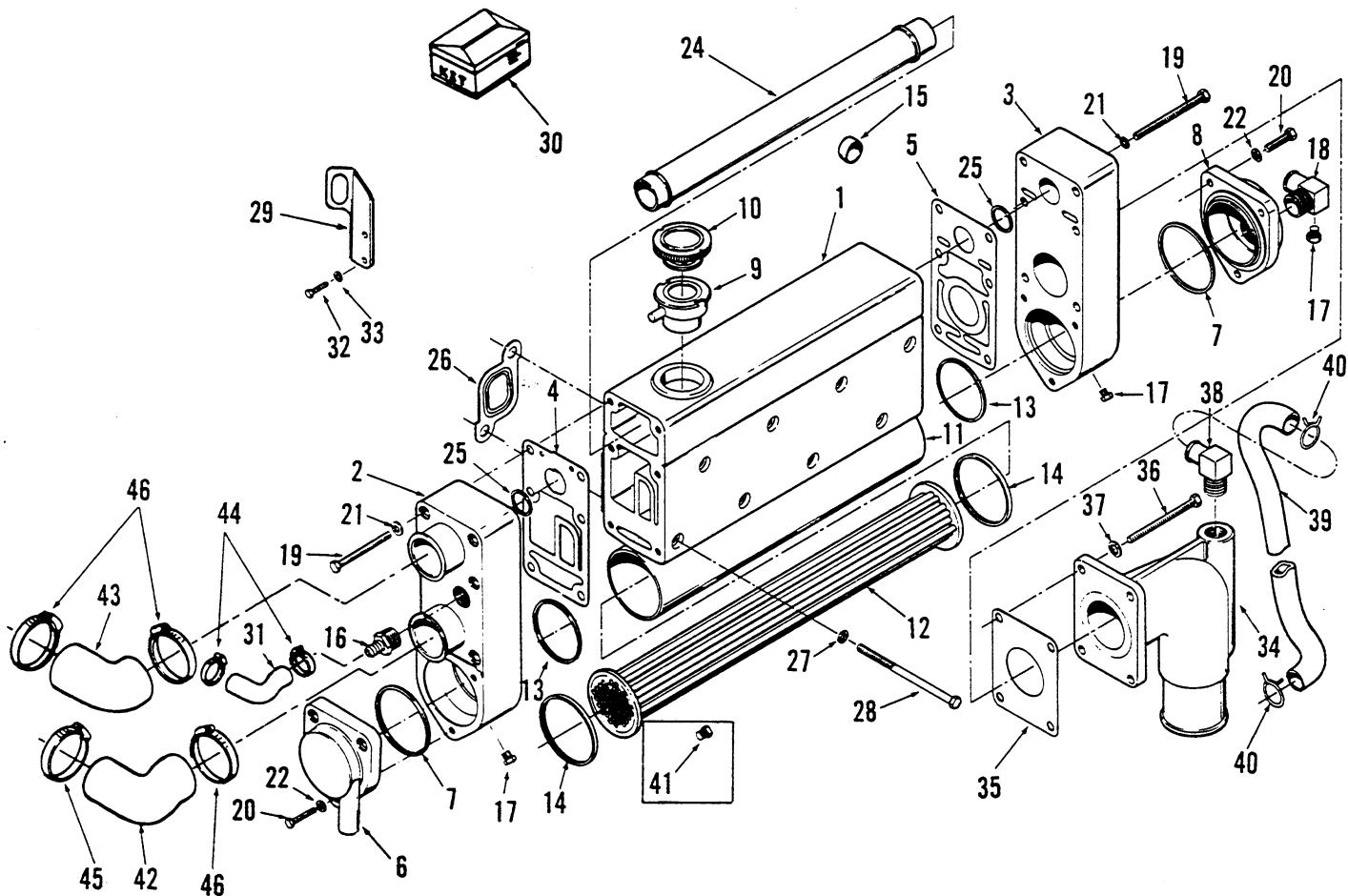
EXS-1137

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
1	154-2546	1	Flange, Exhaust
2	154-2373	1	Gasket
3	720-1047	4	Screw, Cap - Hex Head (M8 x 75 MM)
4	740-1006	4	Washer, Flat (M8)

EXHAUST MANIFOLD AND ELBOW

Code 21AH (Exhaust Manifold and Elbow)
 Code 21AM (Exhaust Elbow)

5100-0579
 5100-0817



XEXS-1098

EXHAUST MANIFOLD AND ELBOW

Code 21AH (Exhaust Manifold and Elbow)
Code 21AM (Exhaust Elbow)

5100-0579
 5100-0817

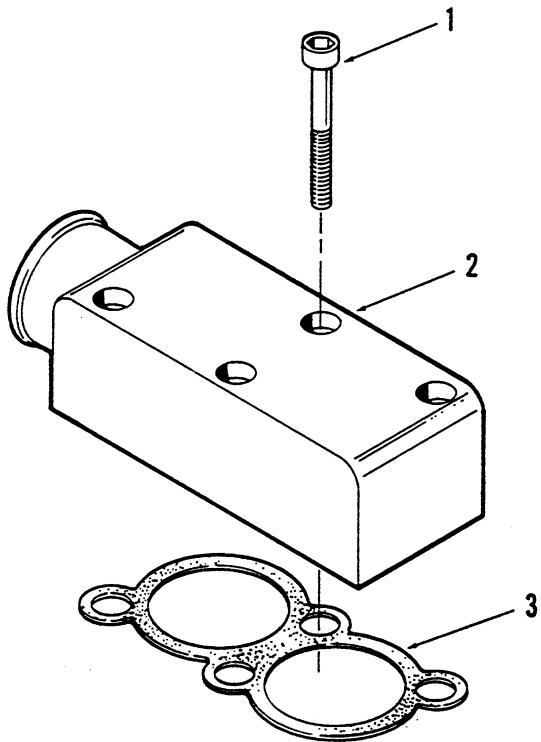
NOTE: Early Spec B Models with Sales Code 21AH (Exhaust Manifold and Elbow) also included parts listed for Code 21AM (Exhaust Elbow).

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
1	154-2346	1	Manifold, Exhaust
2	154-2347	1	Cap, Manifold End (Front)
3	154-2348	1	Cap, Manifold End (Rear)
4	154-2353	1	Gasket, Manifold Front Cap
5	154-2352	1	Gasket, Manifold Rear Cap
6	154-2349	1	Cover, Heat Exchanger (Front)
7	509-0179	2	Seal, "O" Ring - Heat Exchanger Cover
8	154-2350	1	Cover, Heat Exchanger (Rear)
9	130-2304	1	Neck, Filler
10	130-2248	1	Cap, Pressure
11	130-2091	1	Shell, Heat Exchanger
12	130-2386	1	Core, Heat Exchanger
13	130-2147	2	Gasket, Heat Exchanger Shell
14	130-2130	2	Gasket, Heat Exchanger
15	517-0142	3	Plug, Cup
16	502-0836	1	Adapter, Pipe to Hose
17	502-0153	3	Plug, Pipe (1/4")
18	502-0881	1	Elbow, 90°
19	720-1044	8	Screw, Cap - Hex Head (M8 x 60 MM)
20	718-1022	6	Screw, Cap - Hex Head (M6 x 25 MM)
21	740-1006	8	Washer, Flat (M8)
22	740-1004	6	Washer, Flat (M6)
24	154-2431	1	Tube, Coolant Flow
25	509-0190	2	Seal, "O" Ring - Coolant Flow Tube
26	154-2162	4	Gasket, Exhaust Manifold
27	740-1802	8	Washer, Flat (M8)
28	806-2001	8	Screw, Cap - Counter Bore
29	403-2486-01	1	Bracket, Lifting
30	168-0172	1	Kit, Gasket - Heat Exchanger
31	503-1124	1	Hose, Coolant - Manifold
32	718-1054	2	Screw, Cap - Hex Head (M10 x 25 MM)
33	740-1008	2	Washer, Flat (M10)
34	154-2409	1	Elbow, Exhaust - Code 21AM
35	154-2373	1	Gasket, Exhaust Elbow - Code 21AM
36	720-1047	4	Screw, Cap - Hex Head (M8 x 75 MM) - Code 21AM
37	740-1006	4	Washer, Flat (M8) - Code 21AM
38	502-0881	1	Elbow, 90° - Code 21AM
39	503-1242	1	Hose, Exhaust Cooling - Code 21AM
40	503-1138	2	Clamp, Hose - Code 21AM
41	502-0153	1	Plug, Pipe (1/4") (NOTE: Was used on some early models with tapped hole in reference number 38.) Code 21AM
42	503-1125	1	Hose, Coolant - Lower
43	503-1317	1	Hose, Coolant - Upper
44	503-1136	2	Clamp, Hose (#12)
45	503-1140	1	Clamp, Hose (#28)
46	503-1141	3	Clamp, Hose (#32)

COOLANT OUTLET CONNECTOR

Code 23AB (Horizontal, Non-Accessory Side)

5100-0102



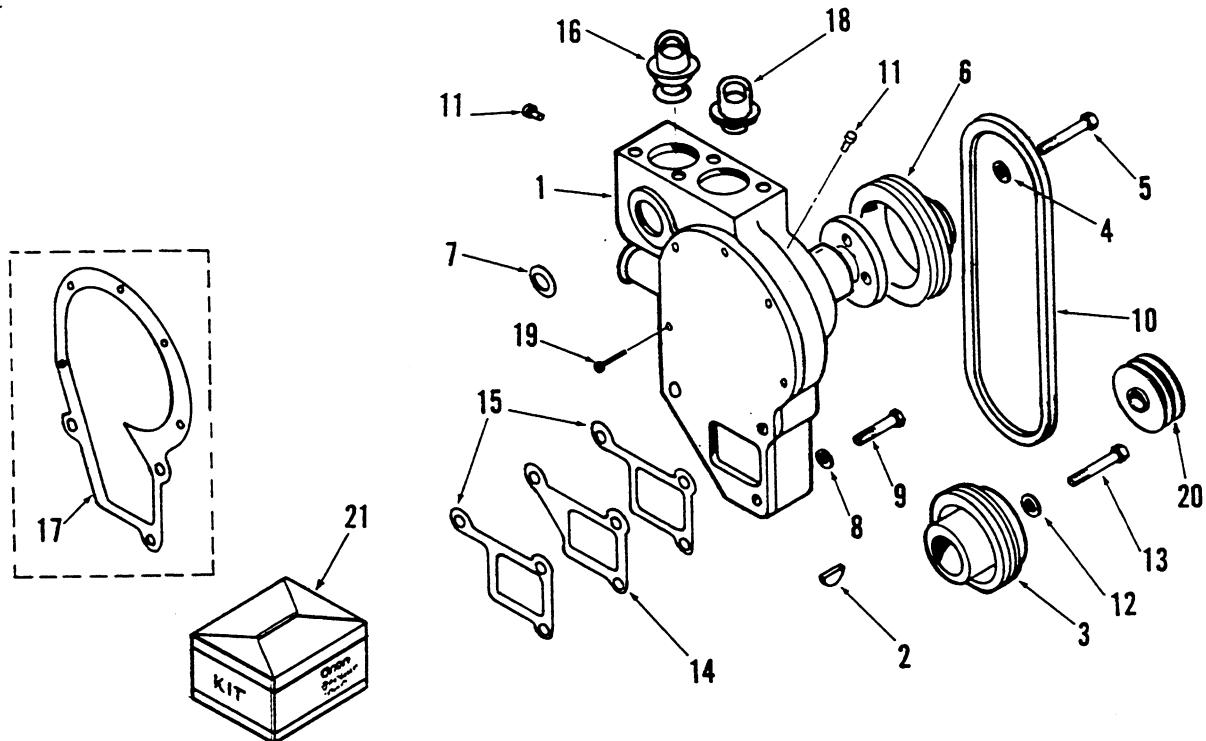
CS-1112

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
1	725-1058	4	Screw, Cap - Socket Head (M8 x 60 MM)
2	309-0475	1	Cover Kit, Thermostat (Includes Gasket)
3	309-0424	1	Gasket, Thermostat Cover

COOLANT PUMP

Code 23BG (Low Flow, .81 Drive Ratio)

5100-0764
 5100-0771-01
 5100-0795
 5100-1004



CS-1108

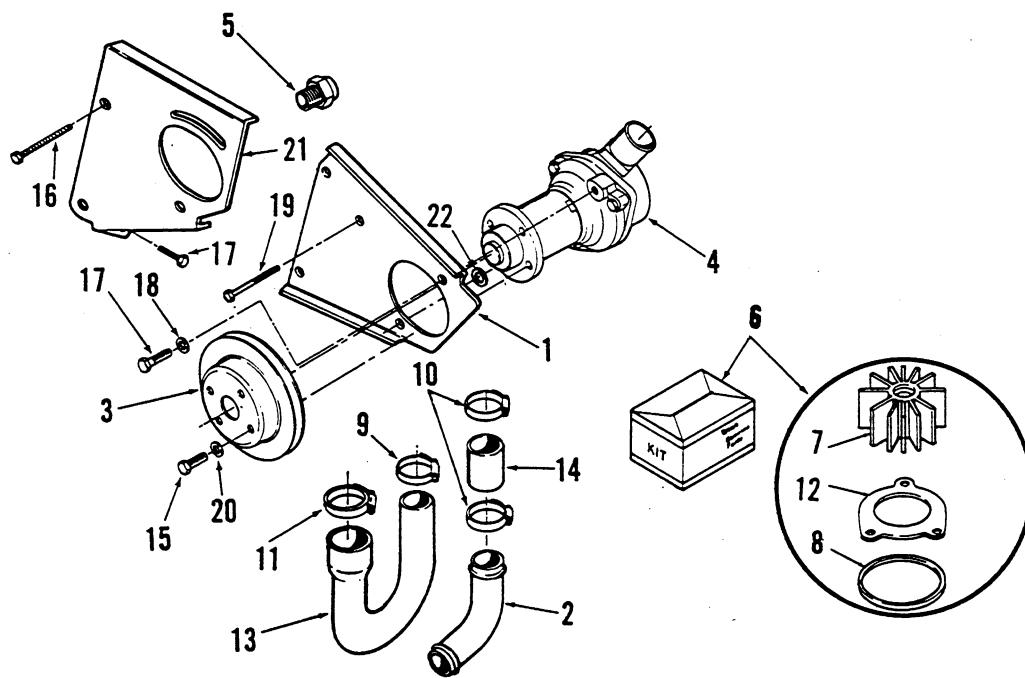
REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION	REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
1	131-0351	1	Pump Kit, Coolant (Includes Gaskets)	11	PLUG, BRASS	3	3/8"
2	515-0245	1	Key, Pulley	12	502-0775	1	3/4"
3	PULLEY, CRANKSHAFT			13	526-0283	1	Washer, Flat (M8)
	104-1466	1	Single Groove	14	720-1123	1	Screw, Cap - Hex Head (M16 x 60 MM)
	104-1467	1	Double Groove	15	131-0324	1	Spacer, Coolant Pump
4	740-1006	4	Washer, Flat (M8)	16	131-0294	2	Gasket, Coolant Pump Mounting
5	718-1035	4	Screw, Cap - Hex Head (M8 x 16 MM)	17	309-0458	1	Thermostat Kit
6	PULLEY, COOLANT PUMP			18	131-0335	1	Gasket, Coolant Pump Backplate
	131-0344	1	Single Groove	19	191-1338	1	Thermostat Kit
	131-0345	1	Double Groove	20	131-0242	1	Screw, Countersunk - Flat Head - Torque Drive (Special)
7	509-0264	1	Seal, O-Ring	21	815-0612	5	PULLEY, ALTERNATOR
8	740-1006	3	Washer, Flat (M8)	191-1342	1	Single Groove	
9	718-1044	3	Screw, Cap - Hex Head (M8 x 60 MM)	191-1338	1	Double Groove	
10	BELT			191-1342	1	Kit, Repair - Coolant Pump (Includes Gaskets, Seal, Hub, Bearing, Impeller and Backplate Mounting Screws)	
	511-0147-22	1	Engines with Double Groove Crankshaft Pulley and Single Groove Alternator and Coolant Pump Pulleys	541-0214-01	1		
	511-0147-13	1	Engines with All Single Groove Pulleys				
			Engines with All Double Groove Pulleys				
	511-0147-01	1	Alternator Belt				
	511-0147-06	1	Raw Water Pump Belt				

RAW WATER PUMP

Code 23BT

5100-0581

5100-1005



CS-1242-1

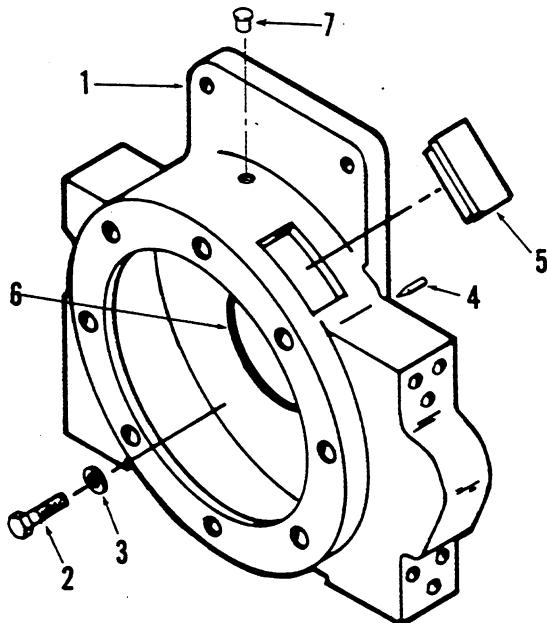
REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION	REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
1	130-2422	1	Bracket, Water Pump Mounting (Used Spec B through a Portion of Spec C)	15	718-1034	4	Screw, Cap - Hex Head (M8 x 14 MM)
2	503-1322	1	Tube, Inlet	16	718-1044	2	Screw, Cap - Hex Head (M8 x 60 MM)
3	131-0344	1	Pulley, Water Pump	17	SCREW, CAP - HEX HEAD (M8 x 25 MM)		
4	132-0278	1	Pump, Raw Water	718-1037		2	Spec B through a Portion of Spec C
5	502-0836	1	Adapter - Pipe to Hose	718-1037		4	Use Began During Spec C
6	132-0283	1	Kit, Service - Water Pump (Includes Seal and Seat Assembly and Parts Marked*)	18	740-1006	2	Washer, Flat (M8)
7	132-0292	1	*Impeller	19	718-1047	1	Screw, Cap - Hex Head (M8 x 75 MM) (Used Spec B through a Portion of Spec C)
8	132-0293	1	*Gasket, Ring	20	740-1006	4	Washer, Flat (M8)
9	503-1138	1	Clamp, Hose (#20)	21	131-0427	1	Bracket, Water Pump Mounting (Use Began During Spec C)
10	503-1140	2	Clamp, Hose (#28)	22	526-1122	2	Washer, Flat (5/16") Use Began During Spec C
11	503-1141	1	Clamp, Hose (#32)				
12	132-0294	1	*Gasket, Cover				
13	503-1318	1	Hose, Outlet				
14	503-1327	1	Hose, Connector				

* - Parts Included in 132-0283 Water Pump Service Kit.

FLYWHEEL HOUSING

Code 27AE (SAE 5 With One Magnetic Pickup)

5100-0214-02
5100-0585



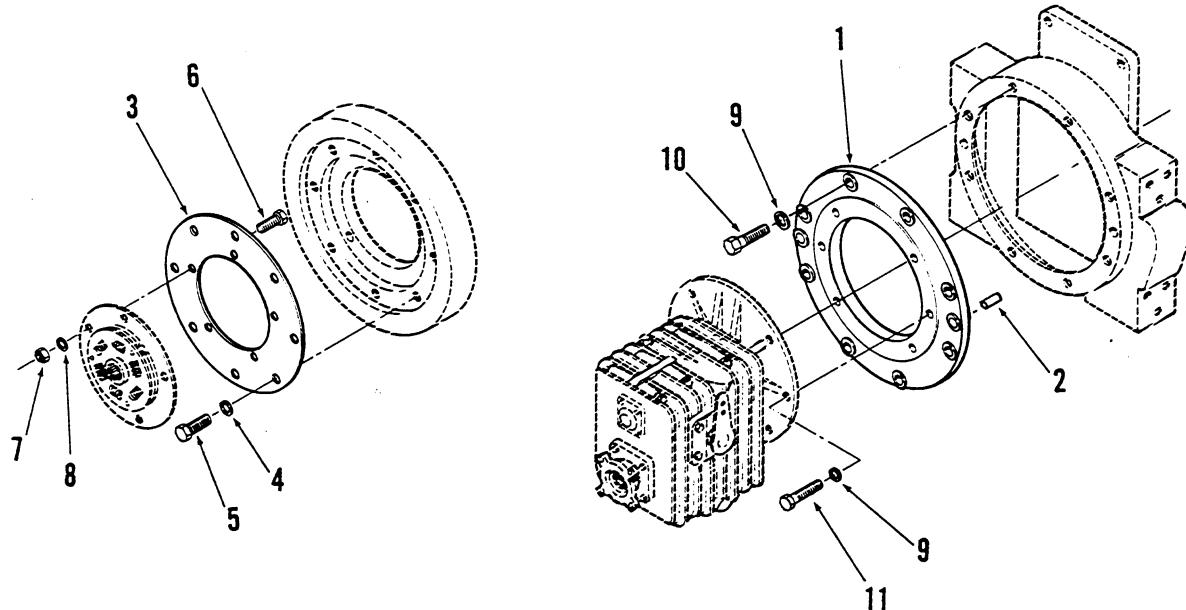
CS-1109

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
1	HOUSING, FLYWHEEL (Includes Seal and Indicator)		
	101-0723	1	Spec B
	101-0698-02	1	Spec C
2	718-1078	6	Screw, Cap - Hex Head (M12 x 50 MM)
3	740-1801	6	Washer, Flat (M12)
4	160-1292	1	Indicator, Timing
5	101-0592	1	Plug, Timing Window
6	101-0630	1	Seal, Flywheel Housing
7	517-0265	1	Plug, Cap

TRANSMISSION ADAPTER

Code 27AK

5500-0063



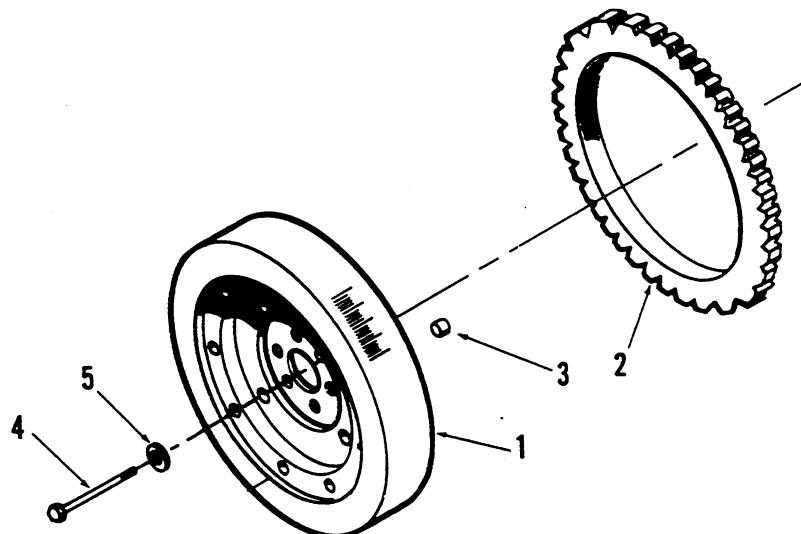
CT-1081

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
1	190-0620	1	Adapter Assembly, Transmission (Includes Parallel Pins)
2	775-0075	2	Pin, Parallel
3	104-1543	1	Plate, Drive
4	740-1006	8	Washer, Flat (M8)
5	718-1036	8	Screw, Cap - Hex Head (M8 x 20 MM)
6	800-0533	5	Screw, Cap - Hex Head (1/4-20 x 3/4") (Hardened)
7	862-0001	5	Nut, Hex (1/4-20)
8	740-1004	5	Washer, Flat (M6)
9	740-1008	14	Washer, Flat (M10)
10	718-1056	8	Screw, Cap - Hex Head (M10 x 35 MM)
11	718-1054	6	Screw, Cap - Hex Head (M10 x 25 MM)

FLYWHEEL

Code 29AA (7.5" Over Center)

5100-0010



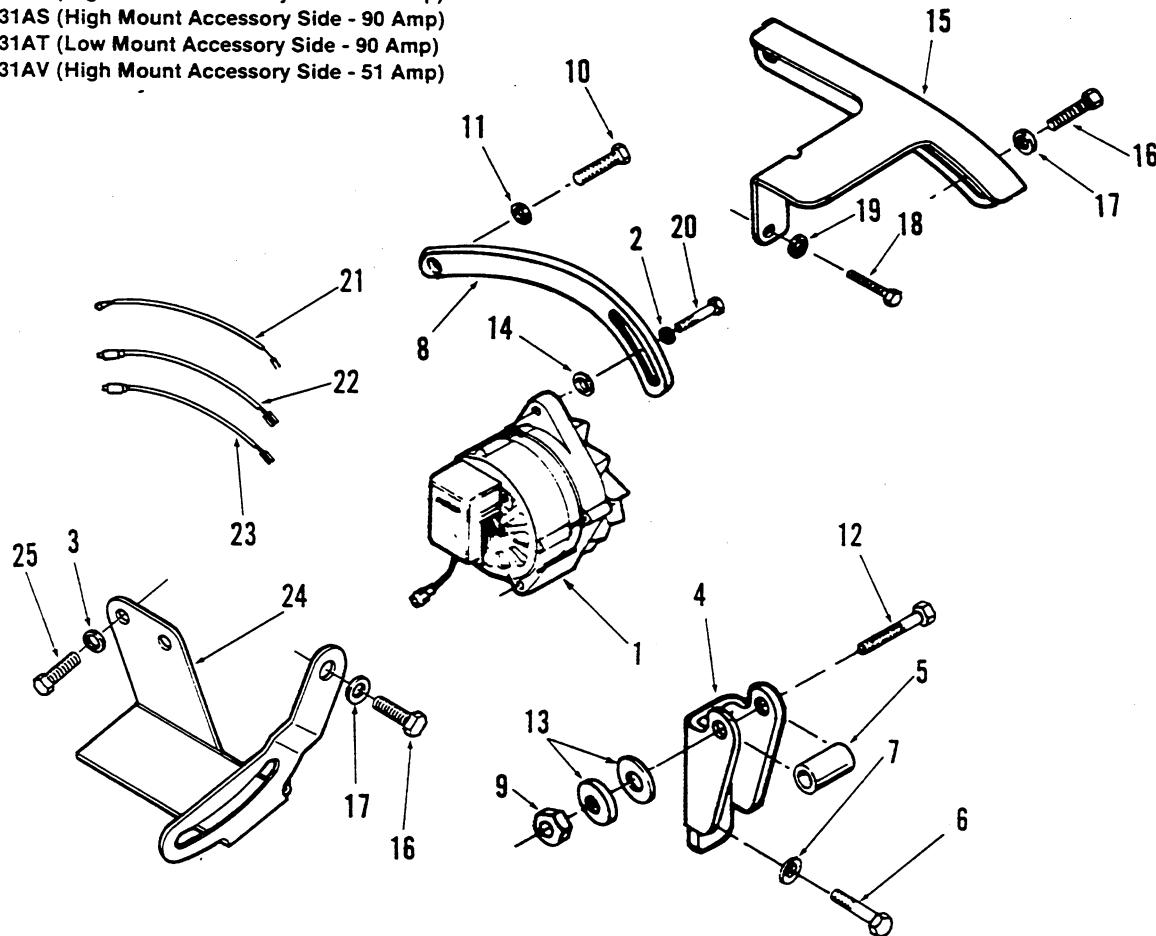
CS-1110

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
1	104-1504	1	Flywheel (Includes Ring Gear and Alignment Pin)
2	104-1169	1	Gear, Ring
3	104-1171	1	Pin, Alignment
4	720-1804	6	Screw, Cap - Hex Head (M10 x 38 MM)
5	740-1008	6	Washer, Flat (M10)

ALTERNATOR

Code 31AA (High Mount Accessory Side - 37 Amp)
 Code 31AL (High Mount Accessory Side - 72 Amp)
 Code 31AS (High Mount Accessory Side - 90 Amp)
 Code 31AT (Low Mount Accessory Side - 90 Amp)
 Code 31AV (High Mount Accessory Side - 51 Amp)

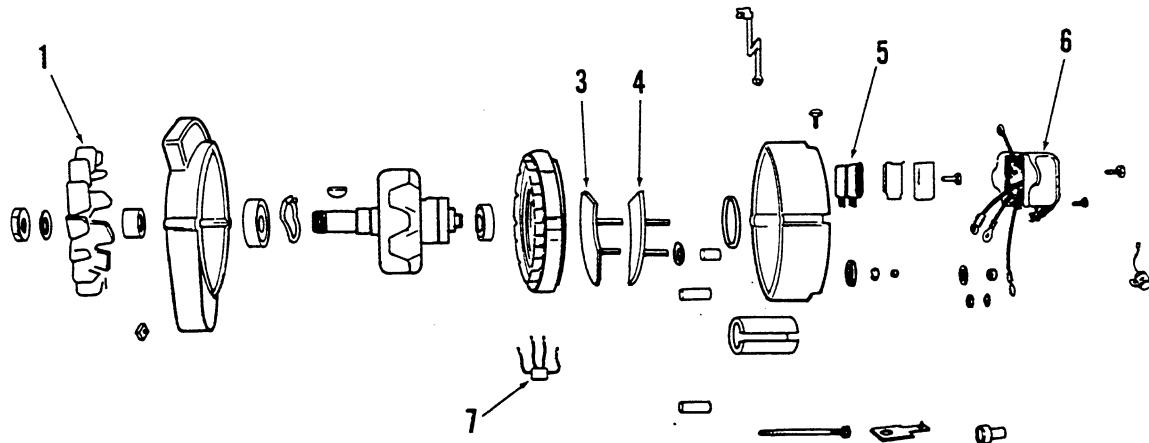
5100-0781
 5100-0784
 5100-0785
 5100-0787
 5100-0889
 5100-0975
 5100-1045



REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION	REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
1	ALTERNATOR (See Separate Group for Components)			13	526-2123	2	Washer, Flat (M10)
	191-1525	1	Code 31AA	14	191-1322	1	Spacer, Alternator Strap
	191-1600	1	Code 31AL	15	191-1555	1	Strap, Alternator Adjusting - Code 31AL, 31AS, 31AV
	191-1664	1	Code 31AS, 31AT	16	800-0028	1	Screw, Cap - Hex Head (5/16-18 x 1") Code 31AL, 31AS, 31AT, 31AV
	191-1634	1	Code 31AV	17	526-0122	1	Washer, Flat (5/16") Code 31AL, 31AS, 31AT, 31AV
2	526-2106	1	Washer, Flat (M8) Code 31AA, 31AS, 31AT, 31AV	18	718-1806	1	Screw, Cap - Hex Head (M8 x 90 MM) Code 31AL, 31AS, 31AV
3	740-1010	2	Washer, Flat (M12) Code 31AT,	19	740-1006	1	Washer, Flat (M8) Code 31AL, 31AS, 31AV
4	BRACKET, ALTERNATOR MOUNTING			20	800-2058	1	Screw, Cap - Hex Head (M8 x 25 MM) Code 31AA, 31AS, 31AT
	191-1331	1	Code 31AA, 31AL, 31AS, 31AV	21	226-3108	1	Lead - Code 31AS, 31AT
	191-1332	1	Code 31AT	22	332-2301	1	Terminal - Code 31AS, 31AT
5	191-1321	1	Spacer, Alternator Bracket	23	332-2298	1	Housing, Terminal - Code 31AS, 31AT
6	718-1037	4	Screw, Cap - Hex Head (M8 x 25 MM)	24	191-1615	1	Bracket, Alternator Adjusting - Code 31AT
7	740-1006	4	Washer, Flat (M8)	25	718-1072	2	Screw, Cap - Hex Head (M12 x 20 MM) Code 31AT
8	191-1365	1	Strap, Alternator Adjusting - Code 31AA				
9	860-2009	1	Nut, Hex (M10)				
10	718-1036	1	Screw, Cap - Hex Head (M8 x 20 MM) Code 31AA, 31AL, 31AS, 31AV				
11	740-1006	1	Washer, Flat (M8)				
12	800-2100	1	Screw, Cap - Hex Head (M10 x 100 MM)				

ALTERNATOR COMPONENTS

Code 31AA (High Mount Accessory Side - 37 Amp)
 Code 31AL (High Mount Accessory Side - 72 Amp)
 Code 31AS (High Mount Accessory Side - 90 Amp)
 Code 31AT (Low Mount Accessory Side - 90 Amp)
 Code 31AV (High Mount Accessory Side - 51 Amp)



ES-1470

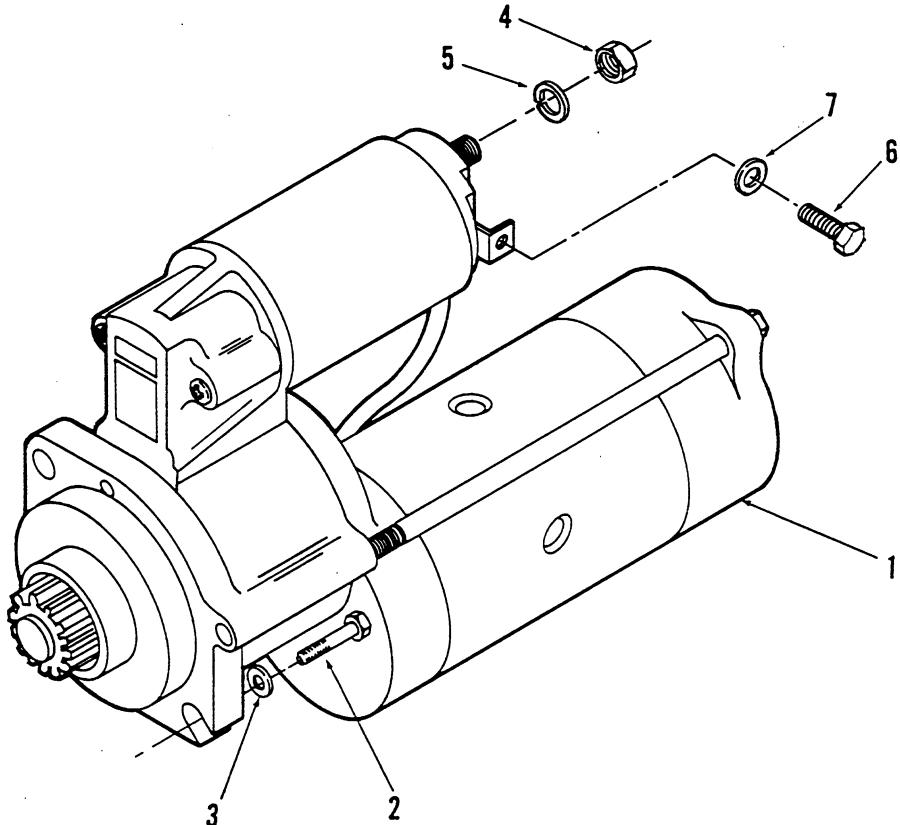
REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
ALTERNATOR (Complete) 12 Volt			
	191-1525	1	Code 31AA
	191-1600	1	Code 31 AL
	191-1664	1	Code 31AS, 31AT
	191-1634	1	Code 31AV
1	191-0943	1	Fan, Alternator - Code 31AA
3	191-1560	1	Diode, Rectifier - Negative - Code 31AA
4	191-1559	1	Diode, Rectifier - Positive - Code 31AA
5	191-1558	1	Brush Assembly - Code 31AA
6	191-1557	1	Regulator, Voltage - Code 31AA
7	191-1556	1	Diode, Trio - Code 31AA

NOTE: Component part numbers for 51, 72 and 90 amp alternators not available at time of printing.

STARTER

Code 33AA (12 Volt)

5100-0082

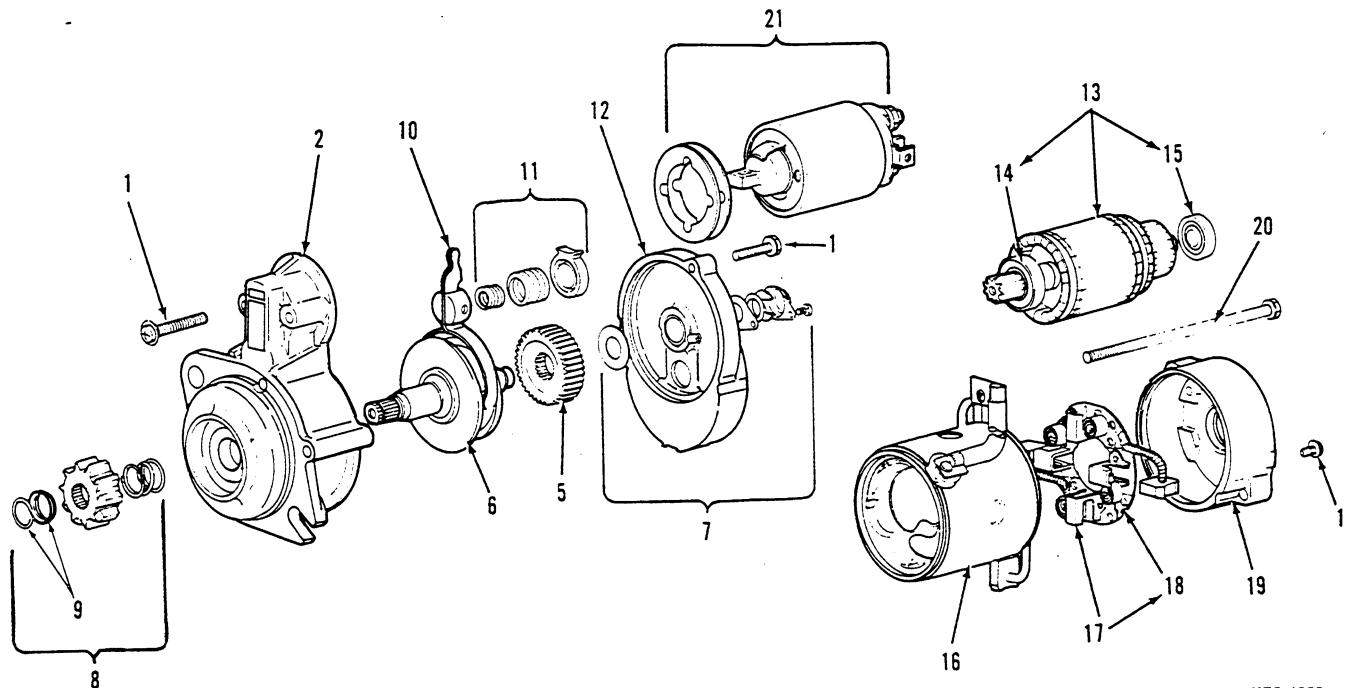


XES-1169

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
1	191-1394	1	Starter (Includes Switch Terminal Hardware) (See Separate Group for Components)
2	720-1806	2	Screw, Cap - Flanged Hex Head (M12 x 30 MM)
3	740-1010	2	Washer, Flat (M12)
4	860-2008	1	Nut, Hex (M8) B+ Terminal
5	850-2008	1	Washer, Lock - Spring (M8) B+ Terminal
6	718-1002	1	Screw, Cap - Hex Head (M5 x 8 MM) Solenoid Terminal
7	850-2005	1	Washer, Lock - Spring (M5) Solenoid Terminal

STARTER COMPONENTS

Code 33AA (12 Volt)



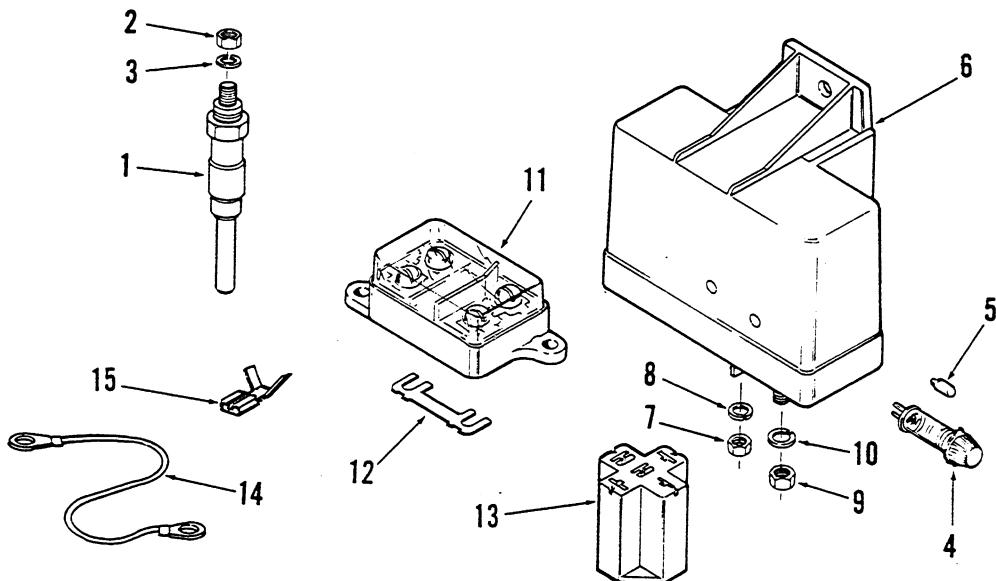
XES-1255

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION	REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
1	191-1394	1	Starter (Complete)	12	191-1439	1	Bracket Assembly, Center
1	191-1450	1	Screw Set	13	191-1438	1	Armature Assembly (Includes Bearings)
2	191-1449	1	Bracket Assembly, Front (Includes Bearing)	14	191-1437	1	Bearing, Center
5	191-1446	1	Gear	15	191-1436	1	Bearing, Rear
6	191-1445	1	Clutch	16	191-1435	1	Yoke Assembly (Includes Pole Shoes, Field Coil and Positive Brushes)
7	191-1444	1	Cover Set (Includes Cover, Plate, Washers, Snap Ring, and Screws)	17	191-1434	1	Holder, Brush (Includes Negative Brushes)
8	191-1443	1	Pinion Set (Includes Pinion, Spring, and Stopper Set)	18	191-1433	4	Spring, Brush
9	191-1442	1	Stopper Set (Includes Stopper and Ring)	19	191-1432	1	Bracket, Rear
10	191-1441	1	Lever Assembly	20	191-1431	1	Bolt Set
11	191-1440	1	Spring Set	21	191-1430	1	Switch Assembly

GLOW PLUG AND CONTROL

Code 33AE (12 Volt 7 Second Glow Plugs, Lead and Control)

5100-0628



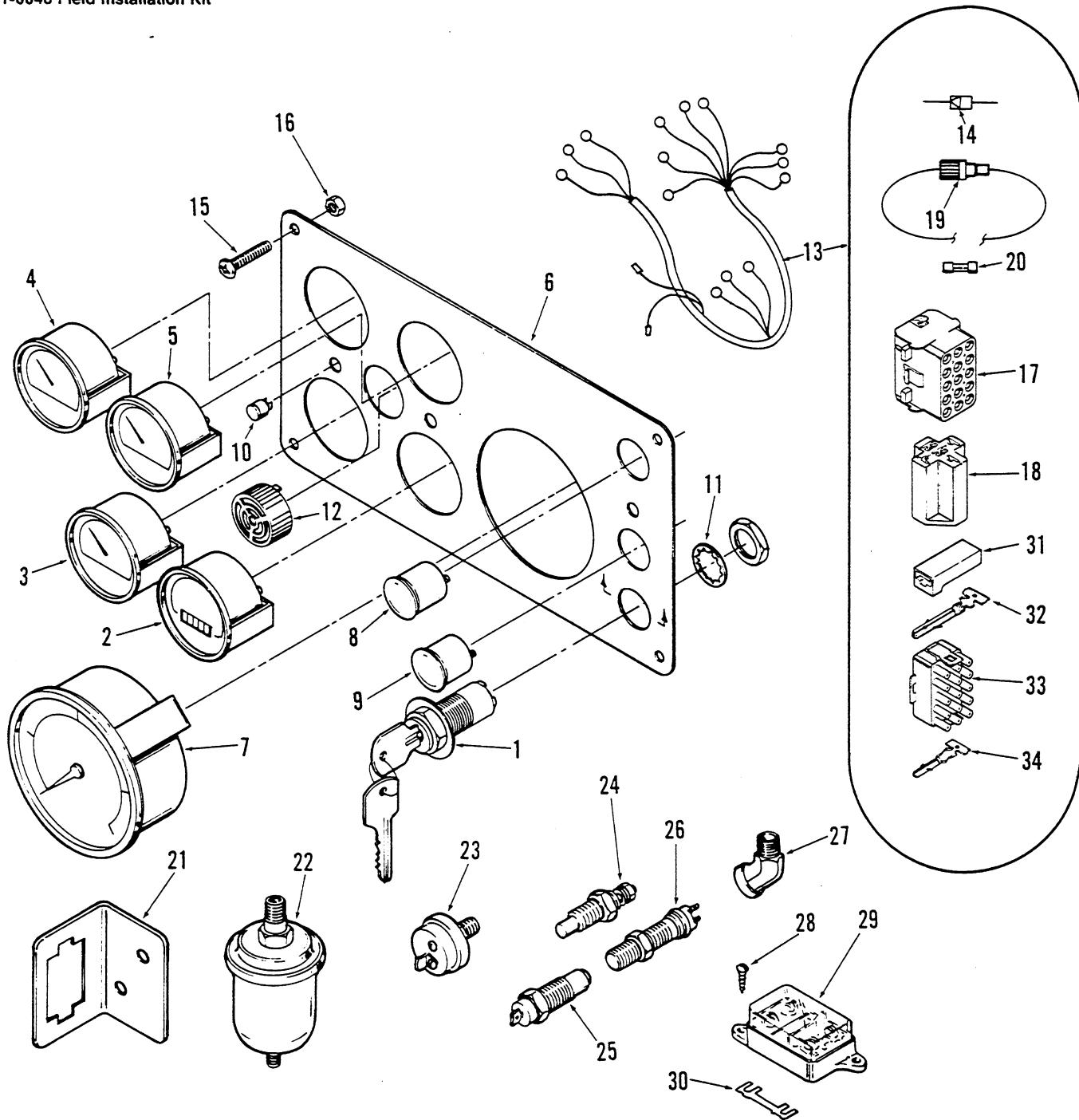
M-1565

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
1	333-0220	4	Plug, Glow
2	750-1002	4	Nut, Hex (M5)
3	850-2005	4	Washer, Lock - Spring (M5)
4	322-0354	1	Light, Indicator
5	322-0353	1	Lamp, Indicator
6	333-0245	1	Controller, Glow Plug
7	750-1002	1	Nut, Hex (M5)
8	850-2005	1	Washer, Lock - Spring (M5)
9	750-1004	1	Nut, Hex (M6)
10	850-2006	1	Washer, Lock - Spring (M6)
11	321-0263	1	Holder, Fuse
12	321-0262-02	1	Fuse, Strap (50 Ampere)
13	307-1690	1	Plug, Harness
14	336-4131	3	Lead, Glow Plug
15	332-1497	4	Connector, Terminal

REMOTE INSTRUMENT PANEL

(Large Panel - 6.5" x 12.4")

Code 35AS
541-0048 Field Installation Kit



SC-1526-1

REMOTE INSTRUMENT PANEL

(Large Panel - 6.5" x 12.4")

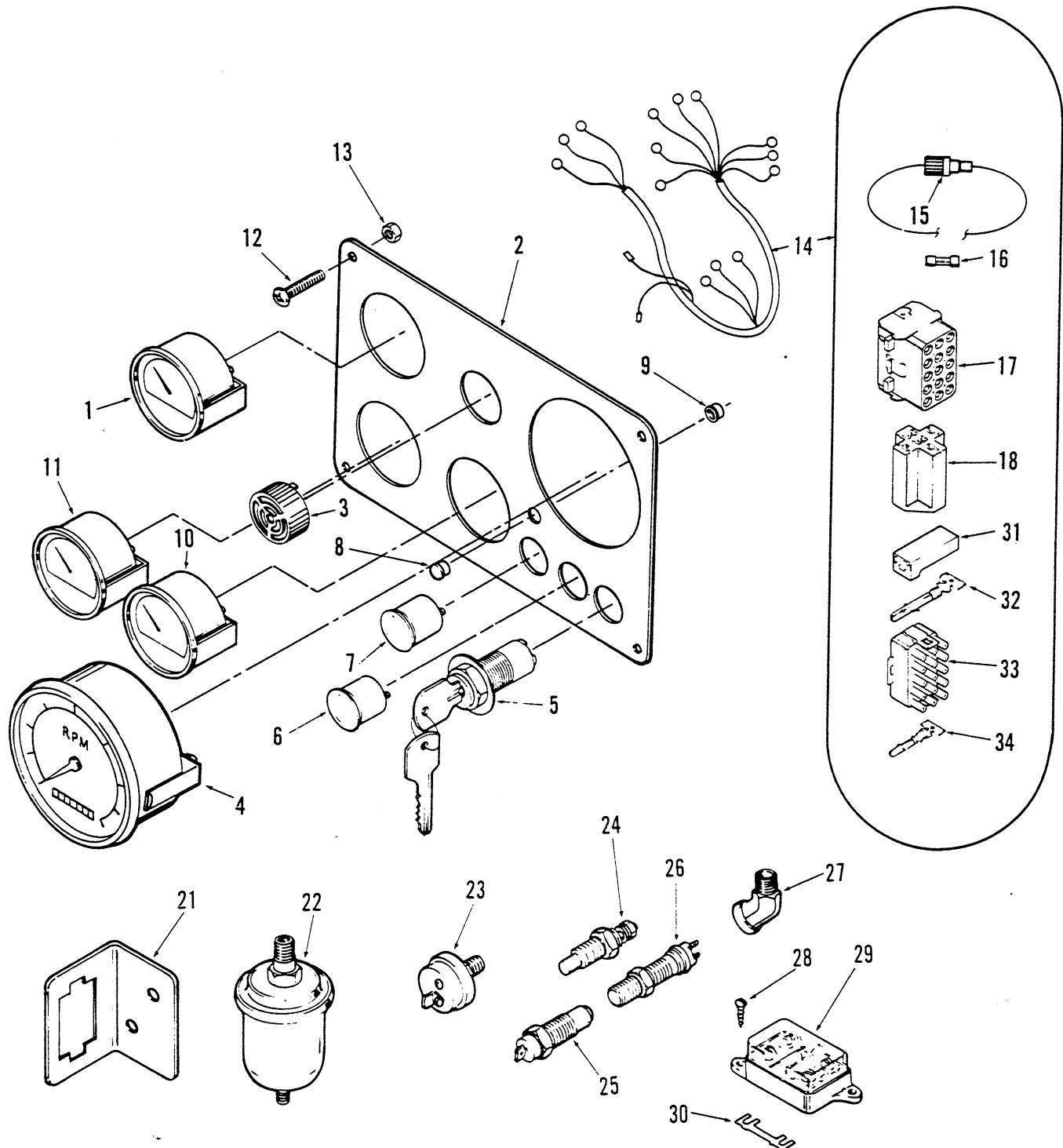
Code 35AS
541-0048 Field Installation Kit

5500-0065

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION	REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
1	308-0790	1	Switch, Ignition (Includes Keys)	19	321-0268	1	#Holder, Fuse
2	302-1717	1	Meter, Hour (Includes Mounting Hardware)	20	321-0254	1	#Fuse (20 Amp)
3	302-1718	1	Voltmeter	21	403-2340	1	Bracket, Connector - Engine Wiring Harness
4	193-0373	1	Gauge, Oil Pressure (Includes Mounting Hardware)	22	193-0363	1	Sender, Oil Pressure
5	193-0372	1	Gauge, Water Temperature (Includes Mounting Hardware)	23	309-0169	1	Switch, Oil Pressure
6	301-8991	1	Panel, Instrument (Used Spec B through a portion of Spec C)	24	193-0318	1	Sender, Water Temperature
7	302-1719	1	Tachometer (Includes Mounting Hardware)	25	309-0437	1	Thermostat
8	308-0794	1	Switch, Start/Stop (With Red Cap)	26	150-1925	1	Sensor, Speed - Magnetic
9	308-0791	1	Switch, Start/Stop (With Black Cap)	27	502-0950	1	Elbow, Street - 45° (Oil Pressure Sender Mounting)
10	322-0370	3	Light, Indicator	28	815-0242	2	Screw, Tapping (#8-32 x 1/2")
11	854-0033	1	Washer, Lock - IT (13/16")	29	321-0263	1	Holder, Fuse - Fuse Not Included (Alternator Bracket Mounted)
12	333-0133	1	Signal, Audible	30	321-0262-02	1	Fuse (50 Amp)
13	HARNESS, WIRING 338-1830	1	Instrument Panel (Includes Parts Marked *)	31	332-0819	1	#Housing, Connector Push On (Alternator Excitation)
	338-1832	1	Engine (Includes Parts Marked#) Instrument Panel Harness to Engine Harness (Includes Parts Marked +)	32	PIN, CONTACT 323-1199	14	#Used with 338-1832 Harness
	338-1831-01	1	10' Long	323-1199	11	+Used with 338-1831-01, -02, -03 Harnesses	
	338-1831-02	1	20' Long	323-1324	3	+Used with 338-1831-01, -02, -03 Harnesses	
	338-1831-03	1	30' Long	33	323-1252	2	+Plug, Circuit (15 Place)
14	357-0075	2	*Diode	34	SOCKET, CONTACT 323-1200	14	*Used with 338-1830 Harness
15	SCREW - Panel Mounting (One Style Used) 815-0614	4	Tapping (#10-16 x 3/4")	323-1200	11	+Used with 338-1831-01, -02, -03 Harnesses	
	815-0613	4	Machine (#10-24 x 1")	323-1323	3	+Used with 338-1831-01, -02, -03 Harnesses	
16	870-1230	4	Nut, Hex - ET (#10-24)				* - Parts Included in 338-1830 Wiring Harness.
17	323-1253	2	#+Cap, Circuit (15 Place)				# - Parts Included in 338-1832 Wiring Harness.
18	307-1690	1	#Plug, Relay Harness (5 Place)				+ - Parts Included in 338-1831-01, -02, -03 Wiring Harnesses.

REMOTE INSTRUMENT PANEL (Small Panel - 6" x 10")

Code 35AS
541-0086 Field Installation Kit



REMOTE INSTRUMENT PANEL

(Small Panel - 6" x 10")

Code 35AS
541-0086 Field Installation Kit

5500-0065

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION	REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
1	193-0373	1	Gauge, Oil Pressure (Includes Mounting Hardware)	21	403-2340	1	Bracket, Connector - Engine Wiring Harness
2	301-9417	1	Panel, Instrument (Use Began During Spec C)	22	193-0363	1	Sender, Oil Pressure
3	333-0133	1	Signal, Audible	23	309-0169	1	Switch, Oil Pressure
4	302-1768	1	Meter, Tachometer/Hour	24	193-0306	1	Sender, Water Temperature
5	308-0790	1	Switch, Ignition (Includes Keys, Boot and Mounting Hardware)	25	309-0437	1	Thermostat
6	308-0794	1	Switch, Start/Stop (With Red Cap)	26	150-1925	1	Sensor, Speed - Magnetic
7	308-0791	1	Switch, Start/Stop (With Black Cap)	27	502-0950	1	Elbow, Street - 45° (Oil Pressure Sender Mounting)
8	322-0370	1	Light, Indicator	28	815-0242	2	Screw, Tapping (#8-32 x 1/2")
9	518-0494	1	Clip, Retainer	29	321-0263	1	Holder, Fuse - Fuse Not Included (Alternator Bracket Mounted)
10	193-0372	1	Gauge, Water Temperature (Includes Mounting Hardware)	30	321-0262-02	1	Fuse (50 Amp)
11	302-1718	1	Voltmeter	31	332-0819	1	#Housing, Connector Push On (Alternator Excitation)
12	SCREW - Panel Mounting (One Style Used)			32	PIN, CONTACT		
	815-0614	4	Tapping (#10-16 x 3/4")	323-1199		14	#Used with 338-1832 Harness
	815-0613	4	Machine (#10-24 x 1")	323-1199		11	+Used with 338-1831-01, -02, -03 Harnesses
13	870-1230	4	Nut, Hex - ET (#10-24)	323-1324		3	+Used with 338-1831-01, -02, -03 Harnesses
14	HARNESS, WIRING			33	323-1252	2	+Plug, Circuit (15 Place)
	338-1917	1	Instrument Panel (Includes Parts Marked *)	34	SOCKET, CONTACT		
	338-1832	1	Engine (Includes Parts Marked#) Instrument Panel Harness to Engine Harness (Includes Parts Marked +)	323-1200		14	*Used with 338-1917 Harness
	338-1831-01	1	10' Long	323-1200		11	+Used with 338-1831-01, -02, -03 Harnesses
	338-1831-02	1	20' Long	323-1323		3	+Used with 338-1831-01, -02, -03 Harnesses
	338-1831-03	1	30' Long				
15	321-0268	1	#Holder, Fuse				
16	321-0254	1	#Fuse (20 Amp)				
17	323-1253	2	#+Cap, Circuit (15 Place)				
18	307-1690	1	#Plug, Relay Harness (5 Place)				

* - Parts Included in 338-1917 Wiring Harness.

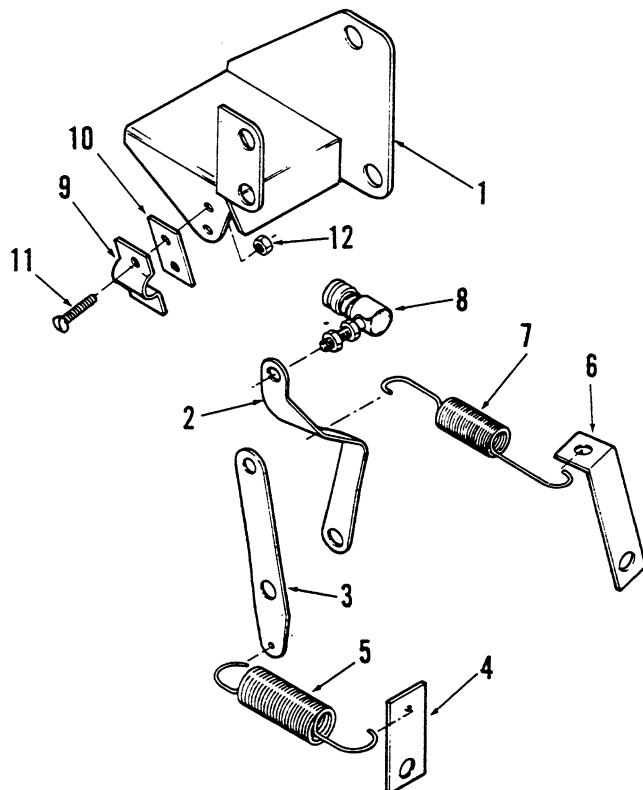
- Parts Included in 338-1832 Wiring Harness.

+ - Parts Included in 338-1831-01, -02, -03 Wiring Harnesses.

THROTTLE LINKAGE

Code 39AE

5500-0070



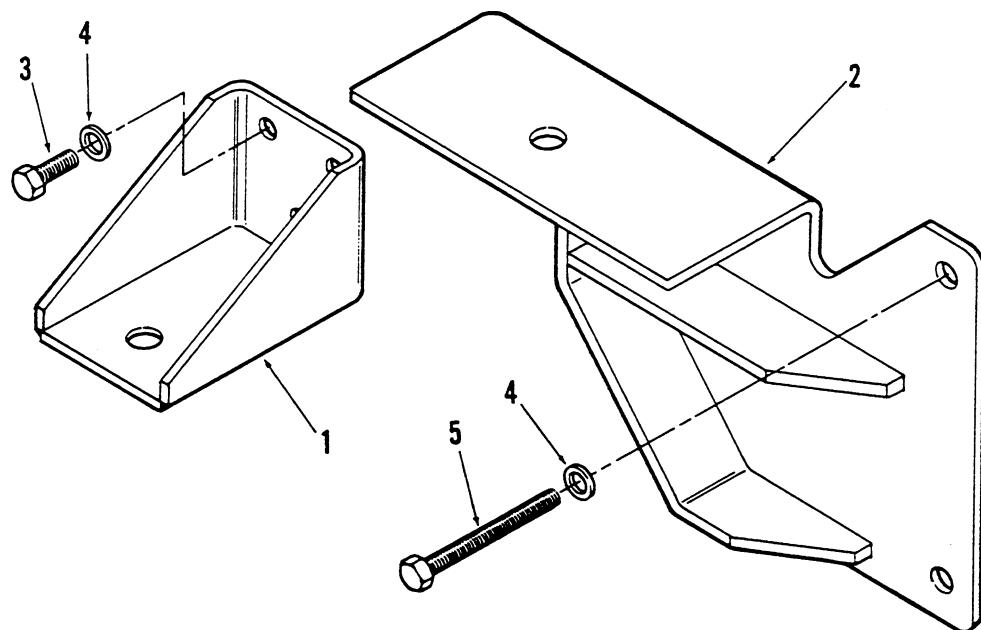
FS-1624

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
1	152-0264	1	Bracket, Throttle
2	147-0744	1	Lever, Injection Pump Throttle (Long)
3	147-0752	1	Lever, Injection Pump Shutoff (Short)
4	147-0743	1	Bracket, Shutoff Spring
5	150-1264	1	Spring, Shutoff Lever Return
6	150-2057	1	Bracket, Throttle Spring
7	150-2056	1	Spring, Throttle Lever Return
8	150-2110	1	Joint, Ball
9	150-2111	1	Clamp, Cable
10	150-2112	1	Clamp, Cable
11	812-0103	2	Screw, Round Head (10-24 x 3/4")
12	870-1230	2	Nut, Locking (10-24)

ENGINE MOUNT

Code 41AE (22.5" Centers)

5500-0062



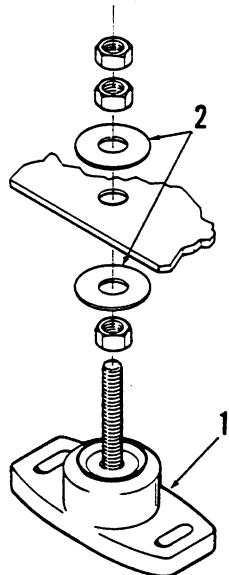
M-1586

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
1	403-2233	2	Bracket, Mounting - Rear
2	BRACKET, MOUNTING		
	403-2237	1	Left Front
	403-2236	1	Right Front
3	718-1073	6	Screw, Cap - Hex Head (M12 x 25 MM)
4	740-1010	10	Washer, Flat (M12)
5	718-1086	4	Screw, Cap - Hex Head (M12 x 90 MM)

ISOLATORS

Code 41AF

5500-0061



M-1587

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
1	402-0555	4	Isolator, Engine Mounting (Includes Hex Nuts)
2	740-1014	8	Washer, Flat (M16)

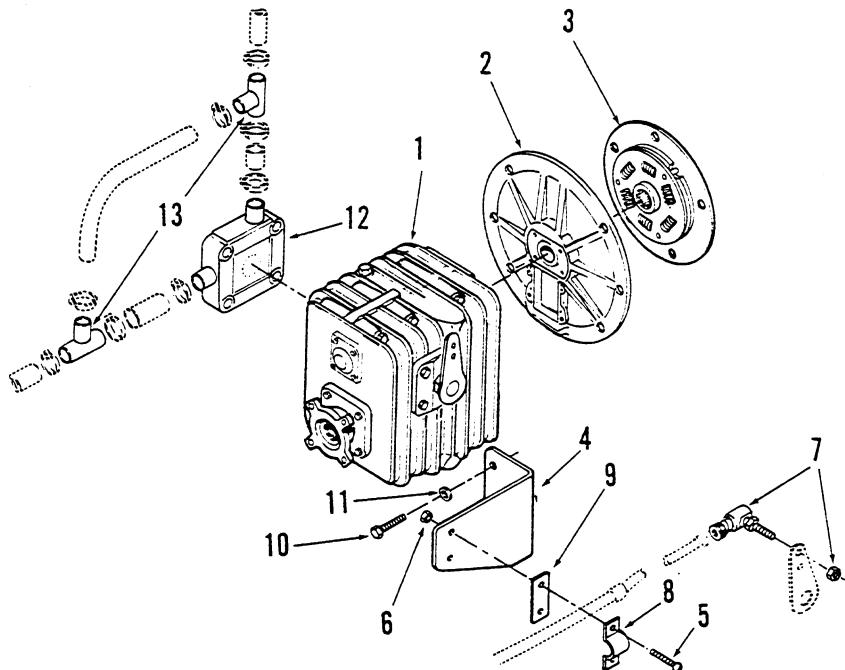
PAINT AND THREAD SEALANT

PART NO.	QTY. USED	PART DESCRIPTION
PAINT, TOUCH UP (Enamel - 13 oz. Pressurized Spray Can)		
525-0494	—	Off White
525-0529	—	Brilliant White
518-0452	—	Sealant, Thread (50 cc Bottle)

TRANSMISSION

Code 45AM (1.88:1 Forward Ratio, 1.95:1 Reverse Ratio)
 Code 45AN (2.63:1 Forward Ratio, 1.95:1 Reverse Ratio)
 Code 45AU (1.88:1 Forward Ratio, 2.10:1 Reverse Ratio)
 Code 45AV (2.74:1 Forward Ratio, 2.72:1 Reverse Ratio)
 541-0074 Field Installation Kit

5100-0825
 5100-0985
 5500-0064
 5500-0066



M-1611

NOTE: For component parts not listed contact manufacturer shown on nameplate.

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
1	TRANSMISSION		
	190-0638-02	1	Code 45AM
	190-0638-03	1	Code 45AN
	190-0639-02	1	Code 45AU
	190-0639-03	1	Code 45AV
2	FLANGE (Includes Mounting Hardware)		
	190-0636-01	1	Code 45AM, 45AN
	190-0636-02	1	Code 45AU, 45AV
3	COUPLING, FLEXIBLE		
	190-0637-01	1	Code 45AM, 45AN
	190-0637-02	1	Code 45AU, 45AV
4	BRACKET, SHIFT CONTROL MOUNTING		
	190-0635	1	Code 45AM, 45AN
	190-0644	1	Code 45AU, 45AV
5	812-0103	2	Screw, Machine - Round Head (10-24 x 3/4")
6	870-1230	2	Nut, Hex - With ET (10-24)
7	150-2110	1	Joint, Ball
8	150-2111	1	Clamp - Upper
9	150-2112	1	Clamp - Lower
10	718-1035	2	Screw, Cap - Hex Head (M8 x 16 MM)
11	740-1006	2	Washer, Flat (M8)
12	190-0633	1	Cooler, Transmission
13	502-0968	2	Tee, Pipe - Plastic

MODEL SPECIFICATION NUMBER TO OPTION CODE TABLE

This table lists the applicable option codes below the specification number. Using the specification number from your engine nameplate determine the option codes that apply to your engine.

SPEC NO.	10179	10210	10293	10326	10344	10363	10397	10430	10438	10439	10441	10723	10724
OPTION	11AB												
	13AB												
	15AG												
	15AJ												
	17AM	17AA	17AM										
	17BA	17AK	17BA										
	17BE	17AL	17BE	17BS	17BE	17BE							
	17BF	17BA	17BF	17BS	19AA	17BS	17BS						
	19AA	19AG	19AA	19AA									
	21AH	21AH	21AH	19AG	21AG	21AH	19AG						
CODE	23AB	23AB	23AB	21AG	21AG	21AG	21AH	21AG	21AG	21AG	21AH	21AM	21AG
	23BG	23BG	23BG	21AH	21AH	21AH	23AB	21AH	21AH	21AH	23AB	23AB	21AH
	23BT	27AE	23BT	23AB	23AB	23AB	23BG	23AB	23AB	23AB	23BG	23BG	21AM
	23CE	29AA	23CE	23BG	23BG	23BG	23BT	23BG	23BG	23BG	23BT	23BT	23AB
	27AE	31AG	27AE	23BT	23BT	23BT	27AE	23BT	23BT	23BT	27AE	27AE	23BG
	29AA	31AL	29AA	27AE	27AE	27AE	29AA	27AE	27AE	27AE	27AK	29AA	23BT
	31AA	33AA	31AG	27AK	29AA	27AK	31AA	27AK	29AA	27AK	29AA	31AA	27AE
	31AG	33AE	31AL	29AA	31AA	29AA	31AG	29AA	31AA	29AA	31AA	31AG	27AK
	33AA	35AL	33AA	31AG	31AG	31AA	33AA	31AA	31AG	31AG	31AG	33AA	29AA
	33AE	33AE	31AV	33AA	31AG	33AE	31AG	33AA	31AV	33AA	33AE	31AA	31AA
NUMBERS	35AL	35AL	33AA	33AE	33AA	35AL	33AA	33AE	33AA	33AE	35AL	31AG	
	45AT	45AT	33AE	35AL	33AE	35AS	33AE	35AL	33AE	35AL	33AA		
				35AL	35AS	35AL	39AE	35AL	35AS	35AL	35AS		
				35AS	39AE	35AS		35AS	39AE	35AS	39AE		
				39AE	41AE	39AE		39AE	41AE	39AE	41AE		
				41AE	41AF	41AE		41AE	41AF	41AE	41AF		
				41AF		41AF		41AF		41AF	45AU		
					45AU			45AU		45AU		41AF	
												45AU	

Onan

Onan Corporation
1400 73rd Avenue N.E.
Minneapolis, Minnesota 55432

Telephone: (612) 574-5000
Telex: 275477
Cable ONAN