GM POWERTRAIN
INDUSTRIAL ENGINES *by* KEM

INDUSTRIAL GAS ENGINE OPERATORS MANUAL

MODEL - GMG-874
Katolight Spec.

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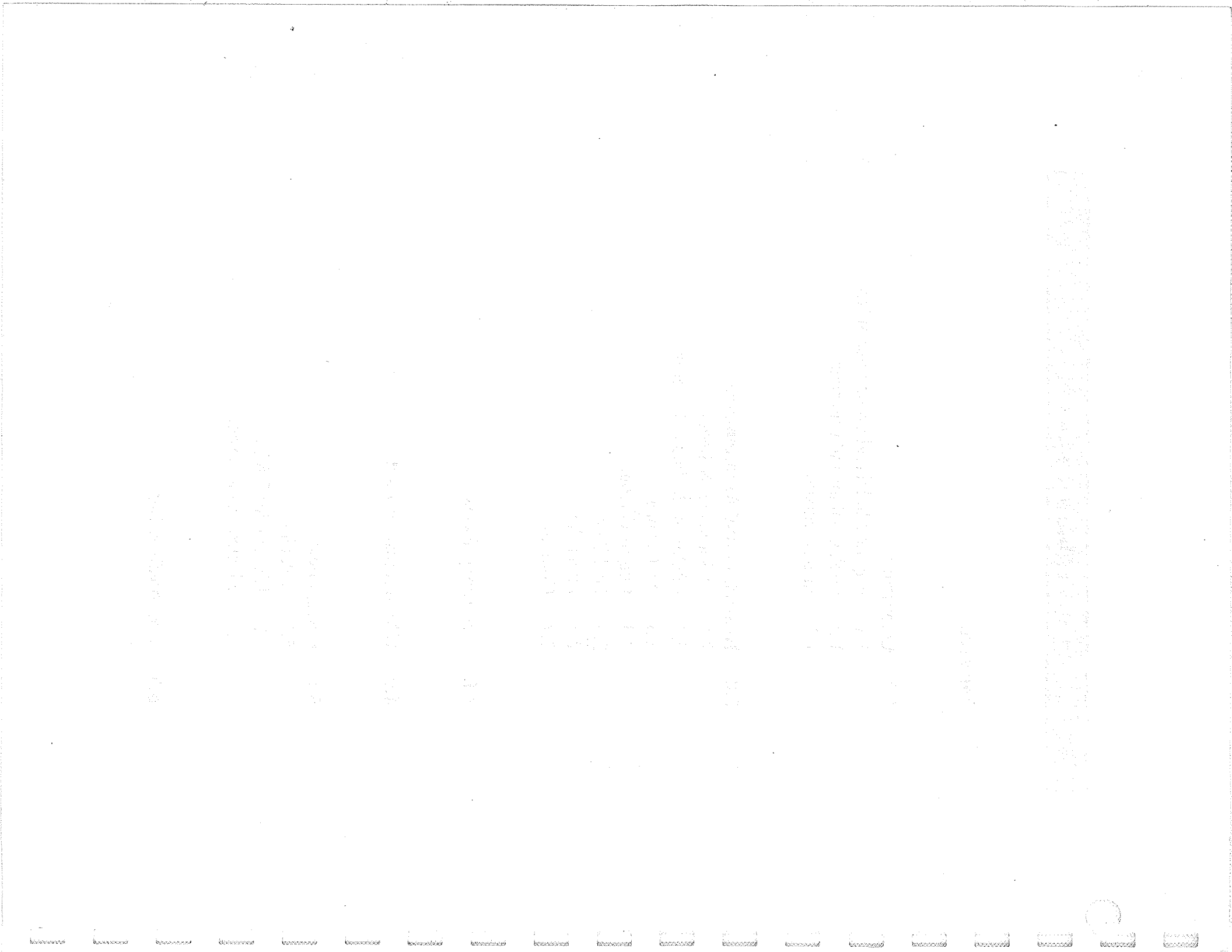


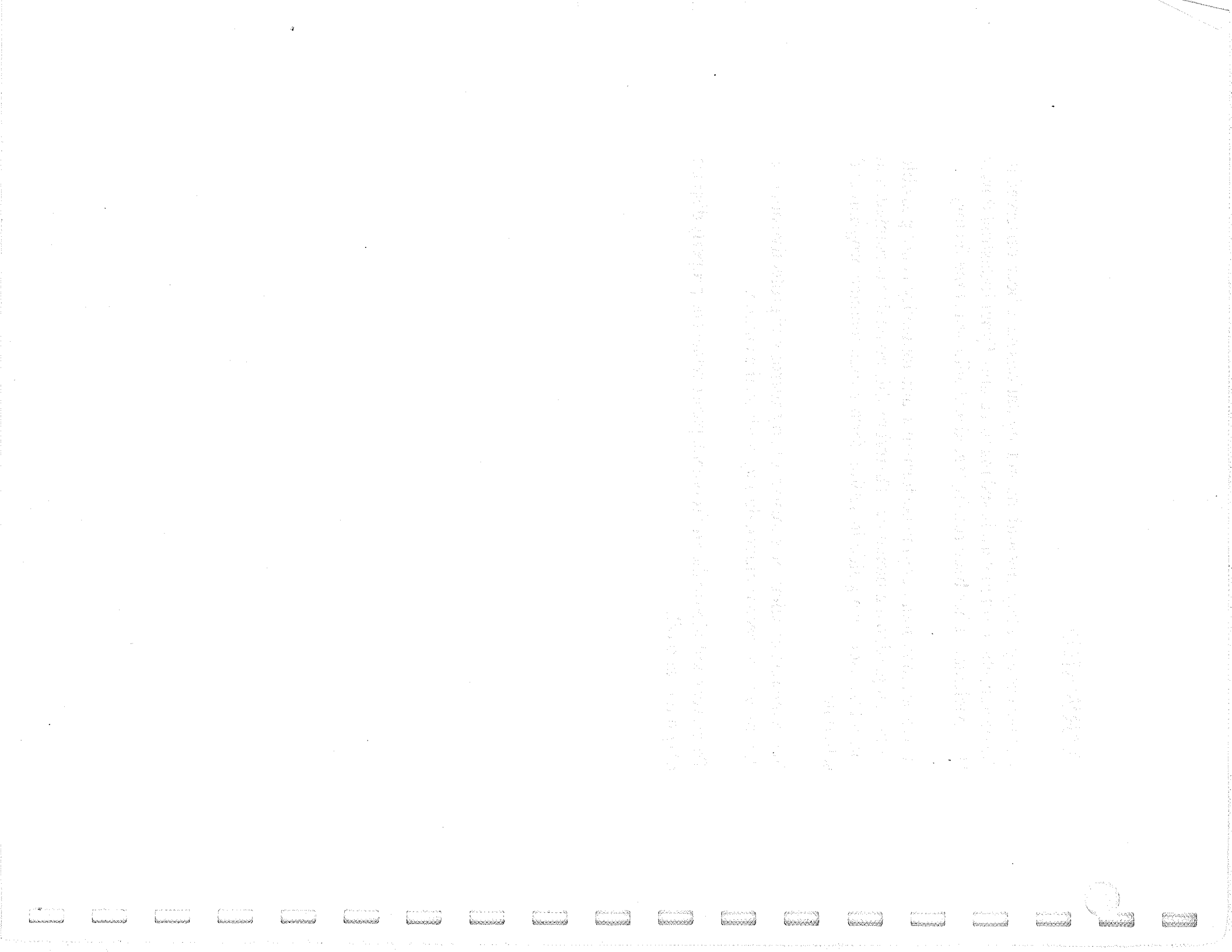
FORWARD

The necessary safety precautions and regulations have been observed in the design, choice of materials and manufacture of your Industrial Power Unit package. It has been run-in, tested and adjusted at the factory.

However, maximum engine performance and longevity is not possible without regard to maintenance. Therefore, this manual is presented, and should be used as a guide in setting forth a maintenance program and schedule.

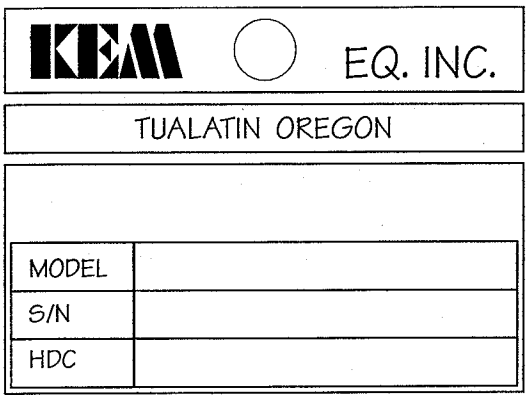
In the interest of safety be sure to refit any guards and protective devices that may have been removed during work on the engine.

To prevent pollution to the environment, please retain and properly dispose of old fuel and oil.



1.1 ENGINE MODEL AND SERIAL NUMBER

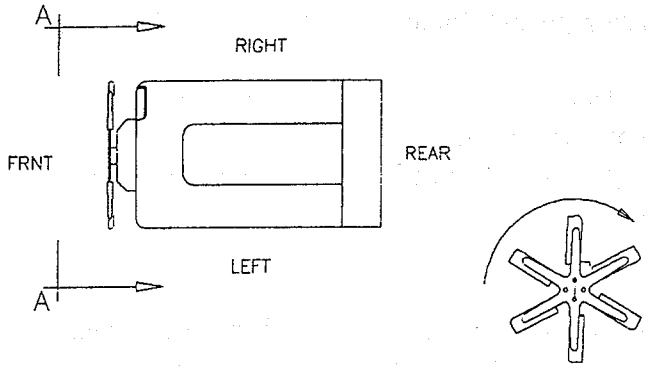
General Description:



Identification placard is located on the right side of the engine, under the starter.

General Description:

The terms "front and rear", "right and left" as well as fan rotation are shown below.



Description and use of hot date code (to give instruction on finding GM parts in the parts list from GM).

Hot Date Code is stamped on serial plate. ***Example: V0109AH***

the underlined section will be your code. Number 9 indicates the model year of your engine. Letters indicate GM engine code. Using the numbers and letters in the hot date code, go to the back of the section (top end or bottom end) and you will find a list of notes, i.e. 1, note 2 . . . Within these notes you will find the number and letters that match your hot date code. Once you find your corresponding code, to the left of it you will find a note #. You will need this note # to find the correct part for your engine.

Example: Note #22

Gasket, head	(1,2,5,9,12,17)	12448061
Gasket, head	(1,5,12,20,22,28)	12346681

The gasket with the corresponding note # would be correct, and to the right of it would be the correct replacement part.

1.2 FUEL, COOLANT AND LUBRICANT

Periodical replenishment and replacement of oil and coolant are the key to the best maintenance, trouble-free performance, and increase of service life of the engine.

GENERAL LUBRICATION INSTRUCTIONS

1. Lubricate every necessary part as specified in "Periodic Check and Service Chart".
2. Always apply the oil of optimum viscosity to ambient temperature. In cold weather, use of too high viscosity oil can be often a cause of difficult engine starting.
3. Prior to the lubrication, be sure to clean oiler, grease gun, oil fillers, grease nipples, etc. If grease nipples or other oil filler parts are broken or bent, replace them at once with new ones.
4. If excessive leaks are noticed from oil seals or packings, etc., replace the seals or packings at once to stop leaks.

Always use clean fuel and pay attention to the following when handling the fuel.

- After the end of the day's work, fill the fuel tank with fuel to its capacity. This is to expel air from the tank as otherwise the moisture in the air might condense into water drops which contaminate the fuel. Also, this gives enough time for dust and water to be separated and settled before operation on the next day.
- Store the fuel in a storage tank for at least 24 hours to allow rust and water to precipitate before use.
- When filling the fuel tank from a drum, take care not to allow deposits on the bottom of the drum to be carried over into the tank.
- Open the drain plug at the bottom of the storage and fuel tanks occasionally to drain off deposits and water.

COOLANT

Use soft water with a low impurity content as the coolant. Use of water containing salt, or water in the vicinity of a mine or spa could accelerate deposit of scale in the water jacket and corrosion of the external surface of the cylinder liner.

Use anti-corrosive in hot weather to prevent corrosion and use anti-freeze in cold weather to prevent freezing of the coolant.

NOTE: If the coolant in the cooling system contains anti-freeze or anti-corrosive, add a solution of the same concentration as the solution initially put into the system.

Cautions on use and handling of anti-freeze

- Use a permanent type anti-freeze.

- When anti-freeze is to be applied or when the coolant with anti-freeze is to be replaced by coolant without anti-freeze to comply with the rise in the atmospheric temperature, wash and clean the cooling system.

The anti-freeze/water mixing ratio depends on the lowest temperature expected.

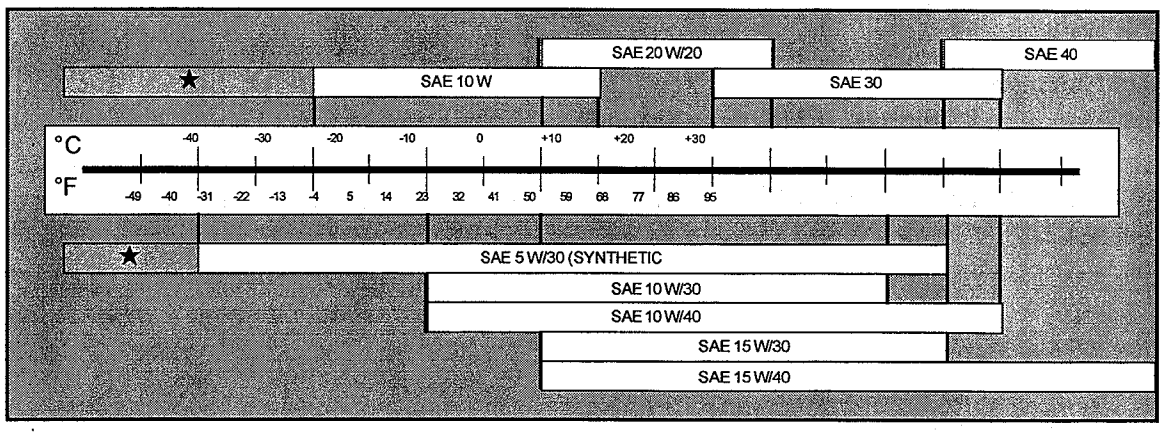
LUBRICANT

Engines which are often operated in more severe conditions require the use of higher quality engine oil. Use the oil and grease conforming to the specifications shown below.

Oil and Grease		Specifications	
Engine Oil	Under normal operating conditions	API CC or higher	40°C or above SAE 40
	Under severe operating conditions or for engine w/turbocharger.	API CD or higher	40 to -5°C SAE 30 10 to -30°C SAE 10W-30
Gear Oil		API GL-3	SAE 80 SAE 90
Brake fluid		SAE J1703	
Multipurpose type grease		NGLI No. 2	
Clutch shifter grease		MIL-G-3545B	

Oil Viscosity

The viscosity of the oil being greatly influenced by the ambient temperature, the choice of the SAE-grade should be governed by the ambient temperature at engine site (see diagram). If temperatures temporarily fall below the limit of the SAE-grade selected, this will merely affect the starting performance, but cause no engine damage.



★ Only with engine oil preheating.

Since a too viscous oil causes starting difficulties, the choice of the viscosity grade during winter operation should be governed by the ambient temperature prevailing at the time of starting the engine. Oil changes as a function of ambient temperatures can be avoided by using multigrade oils, which are again subject to the oil change intervals recommended.

Checking Oil Level

The oil level may be checked by two methods:

1. **Dipstick**
   Pull out dipstick, wipe clean and reinsert as far as it will go, then withdraw. The oil level should be between the marks indicated on the dipstick. If the level is only up to or even below the lower mark, top with oil immediately, preferably up to the upper marking on dipstick.

2. **Sight gauge (when applicable)**
   The oil level in the sight gauge will be approximately 1 1/2 inches down from the top of the glass when the engine oil level is maximum. Verify by checking the dipstick.

GMPT INDUSTRIAL ENGINE INFORMATION

Engine oil requirements:
Type
API-"SH"
Weight - SAE 30 for above 40° F
SAE 15W40 for above 0° F
SAE 10W30 for all temperatures

Oil Changes:
Change oil and filter ever 125 hours or 3 months, whichever comes first.

(NOTE: OEM air cleaners, PCV systems, or engine operating temperatures may vary the oil change interval.)

Oil Temperatures:
Upper limit if 266° F
Ideal running temperature is 221° F
Lower limit is 176° F

Lubrication System: (Maximum allowable degree angles of engine)
8..5 degrees with the front of the engine down
18 degrees with the rear of the engine down
20 degrees side to side

1.3 INSTRUMENTATION

Oil Pressure (20 to 50 PSI)

The oil pressure will vary according to temperature and the viscosity of the oil. If the oil is relatively light, on a warm day the gauge will register on the low end of the scale or approximately 20 PSI. Conversely, if the oil is heavy, on a cold day, gauge readings of 50 PSI would be expected.

Coolant Temperature (160-195°F)

The coolant temperature is regulated by a thermostat.

Volt Meter (12 - 15 volts)

Primarily the voltmeter is provided to indicate the condition of the battery. If the gauge registers in the red above 15 volts, shut the engine down and investigate. The engine will not automatically shut down in the unlikely event of over-voltage.

Should the voltage drop below approximately 12 volts, there will not be enough power to run the electrical system and the engine will quit running.

If the gauge registers in the red below 12 volts, check the condition of the battery.

2.0 INSPECTION AND MAINTENANCE

To prolong the life of the engine and maintain top operating conditions at all times, it is important that the engine is checked and serviced at regular intervals.

Periodic Inspection and Maintenance

1. The simple inspection and maintenance procedures are summarized below. An emergency engine should also be inspected and maintained according to the maintenance standard table described in the chart below.

2. Determine the inspection and maintenance intervals by checking the service meter readings. When the engine is operated under poor or severe conditions, perform inspection and maintenance earlier.

See following pages for maintenance schedules.

2.1 MAINTENANCE SCHEDULE

	CHECK AND SERVICE ITEM		SERVICE INTERVALS						REMARKS
			EVERY 10 HRS.	EVERY 60 HRS.	EVERY 125 HRS.	EVERY 250 HRS.	EVERY 500 HRS.	EVERY 1000 HRS.	
ENGINE GENERAL	Starting condition & noise			O					
	Low speed & acceleration (rated condition)			O					Check for hunting
	Exhaust condition			O					
	Cylinder head, manifold & mounting bracket installation			O*				O	*Applicaple to new engines only
	Compression pressure							O	
	Valve clearance			O*					*New engines only
	Air cleaner element (cyclone type)	Condition				O			
		Replace						●	
	Air cleaner element (flat type)	Condition				O			
		Replace					●		
	Check turbocharger bearing for rotating conditions. Check oil feed pipe joints							O	
LUBRICATION	Oil leaks			O					
	Damaged hose							O	
	Engine oil pan	Check oil for contamination & quantity	O						
		Replace Oil			●	●	●		*On new engine, be sure to replace engine oil.
	Oil filter element	Replace Oil			●	●	●		
FUEL SYS	Leaks-check hose for damage & deterioration			O					
	Fuel filter	Clogging				O			
COOLING SYSTEM	Water leaks-Check hose for damage/deterioration		O						
	Replace coolant & clean system						O		Clean system before & after use of antifreeze.
	Loose or damaged V-belt		O						
	Damaged fan, mounting condition of fan						O		
	Radiator	Water quality	O						
		Cap function				O			
		Clogged and/or damaged core					O		
	Lubrication of water pump and idler pulley				O				
ELECTRICAL	Battery	Electrolyte quantity			O				Every 2 weeks-every week in summer.
		Specific gravity of electrolyte				O			
		Connected condition of terminals				O			
	Loose electrical wiring connections and loose or damaged insulators				O				
MISC.	Check emergency stop equipment for operation				O				
	Lubrication of clutch shifter and fork shaft							O	Use clutch shifter grease.
	Lubrication of bearings case (for direct drive type)							O	Use clutch shifter grease.
	Check meters, gauges and pilot lamps					O			

SYMBOLS=O-Check, adjust or lubricate. / ●-Replace oil, grease or element.

2.2 INTAKE AND EXHAUST SYSTEM

Checking Engine Exhaust Emissions
After the engine has fully warmed up, check the color of exhaust gas.

Colorless or faint blue	Good
Black	Bad, showing incomplete combustion
White	Bad, showing combustion of oil forced up.

Please note: Exhaust gas which is really colorless or faint blue will look white due to winter weather.

2.3 AIR CLEANER

A dirty air cleaner element, if left as it is will decrease engine output. It will also cause increased fuel consumption, increase in harmful contents of exhaust emissions as well as black smoke.

Cyclone Type Air Cleaner

1. **Remove the dust cup and withdraw the element**. On a double element type cleaner, be sure not to remove the inner element when the outer element is cleaned. The inner element should be removed only when the outer element is replaced. Make sure that both elements are replaced at the same time.
2. **Prior to installation, clean the inside of the case and dust cup**, and slowly insert the element. If the air cleaner is placed in a horizontal position, install the dust cup so that the assembling direction indicating mark of the cup with face upward.

NOTE: Make sure that the element and dust cup are securely installed. If left loose, dust will be drawn in and the air cleaner will fail to function properly.

2.4 ENGINE OIL

Replace engine oil - after the first 60 hours and every 250 hours thereafter.

On a new engine, be sure to replace the oil after the first 60 hours of operation.

1. After shutdown, remove the oil while it is still hot. At the same time, the oil filter should be replaced.
2. Install the drain plug and pour in fresh engine oil from the oil filter port up to the FULL mark on the level gauge.
3. After running the engine at idle for several minutes recheck the oil level.

NOTE: A badly contaminated or deteriorated oil should be replaced regardless of the replacement intervals. **Replace the oil filter element each time that the oil is replaced.**

2.5 OIL FILTER

Replace element - Every 125 hours

NOTE: The element cannot be washed and reused.

1. Remove the element by turning counterclockwise. If the element is hard to loosen, use a special tool (filter wrench) for easier removal.
2. Prior to installation of a new element, apply a thin coat of engine oil to the packing of the element and tighten the element fully with a special tool (filter wrench).
3. If the element only has been replaced without replacing the engine oil, replenish to proper level and check the oil level.
4. After installation, thoroughly wipe away spilt oil, start the engine, and check for oil leaks from the packing.

2.6 FUEL FILTER

The fuel filter separates and removes foreign substances and precipitated water contained in fuel. Over a long period of service, however, the filter will be clogged with foreign substances. So the filter should be replaced at regular intervals.

Replace element - Every 500 hours.

1. Remove the element, while using care not to spill fuel.
2. **The element cannot be washed and reused.**
3. After installation, bleed the fuel system and check for fuel leaks.

NOTE: Wipe away spilt fuel as it could start a fire.

2.7 COOLANT

Replace coolant and clean system - Every 500 hours.

Scale and rust are formed in the radiator and engine water jacket in the course of time. It is important to clean the radiator and water jacket to remove deposits of scale and rust as they cause reduction of the cooling efficiency. Also make sure that the system is cleaned if the coolant contains anti-rust or anti-freeze.

When cleaning the system, heat the coolant to 80°C or higher and keep the engine idling. If the water temperature is lower, the thermostat is closed to shut off flow of the coolant to the radiator, making it impossible to clean the system thoroughly.

1. Open the radiator cap and open the drain cocks of the engine crankcase and radiator to remove the coolant.
2. Close the drain cocks and pour coolant into radiator. Run the engine until the coolant is heated to about 80°C.
3. If there is considerable scale or rust, pour in a cleaning solution and run the engine until the solution is heated to about 80°C.

Coolant Cont.

4. Continue to idle the engine for about 30 minutes.
5. After stopping the engine, open the drain cocks of the engine crankcase and radiator to drain off the coolant completely.
6. Close the drain cocks and pour in coolant to rinse the system thoroughly. Rinse until dirty water no longer runs out.
7. Use soft water and fill until it flows out from the overflow pipe.
   NOTE: Use soft water. Use of well water or river water may cause scaling or rusting. Add anti-corrosive to water in hot season to prevent corrosion and add anti-freeze in cold season to prevent freezing of the coolant.
8. After filling the coolant, run the engine for awhile. After stopping the engine, check the coolant level and replenish, if necessary. This rechecking of the coolant level is necessary because the coolant level will fall after initial operation as a result of expelling air from the system.

3.0 ACCESSORY PARTS GMG-874

PART NUMBER	DESCRIPTION	QUANTITY
9000821	DELCO LOW MNT STARTER	1
12338064	STARTER BOLTS	2
15450	B.B. CHEV. V BELT	2
K032049	ALTERNATOR, 12V 51 amp MANDO	1
P100	DOUBLE GROOVE PULLEY (ALT)	1
KM2004	CHEV. ALTERNATOR BRACKET	1
KM2199	FRONT SUPPORT	1
KM1012	#3 SAE BELLHOUSING	1
KM1011	11 ½" CLUTCH ADAPTER PLATE	1
602966271	COTTER PIN 3/16" X 2 ½"	1
KM2172-74	EXHAUST SYSTEM, 7.4L IND.	1
PF25	OIL FILTER	1
KT	SERIAL # TAG	1
10218765	OIL INDICATOR	1
12551417	OIL TUBE	1
274244	O RING	1
SP07-075-075	SPACER 7/16" X ¾" X ¾"	1
700430	PLUG WIRE SET	1
9171	CHROME BREATHER CAP	1
KM1045	4BL TO 2BL IND. CARB ADPTR	1
#28	S.S. HOSE CLAMP	2
#24	S.S. HOSE CLAMP	2
7694	BOTTOM RADIATOR HOSE	1
8319	19" PUSHER FAN (STANDARD ROTATION)	1
7240	UPPER RADIATOR HOSE	1
999558SNN	RADIATOR 4.3 , 5.7 W/CAPS	1
300251-6	5/16 VINYLE HOSE BLACK	2FT
183	192 DEGREE THERMOSTAT	1
KM2079	THERM. HOUSING SPACER	1
KM2219	HEAT SHEILD, INSTR. PANEL	1
2-9210	90 DEG. PCV VALVE	1
10105861	SHIELD, SPARK PLUG	8
KM2066	ENGINE LIFTING EYES	2
14091870	VALVE COVER GROMMET	4

4.0 GM ENGINE PARTS

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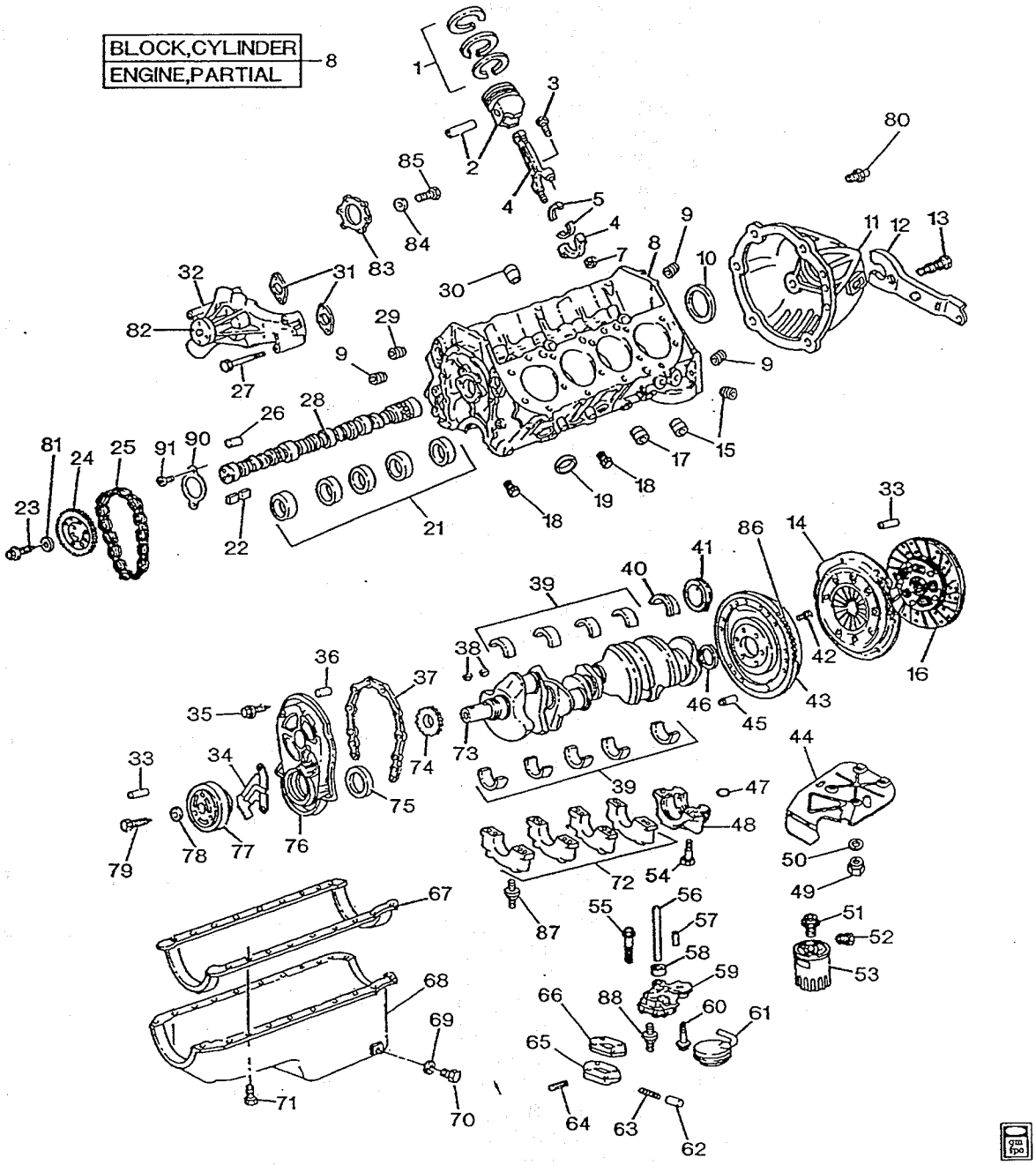

OM00-0017

1991–1999 I ENGINE ASM–7.4L/8.2L V8 PART 1

1.	0.643	RING KIT, PSTN (.005 O.S.) (*14, 27, 40, 41, 42.)	98–99	I (L29)	8 12523922
	0.643	RING KIT, PSTN (.005 O.S.) (*6, 7, 8, 10, 14, 17, 18, 19, 20, 26, 27, 28, 32, 35, 37, 38, 39.)	96–97	I (L19, L29)	8 12523922

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	0.643	RING KIT, PSTN (.005 O.S.) (*6, 7, 8, 9, 10, 11, 12, 13, 14, 17, 18, 19, 20, 21, 26, 27, 28, 34, 35.) ..	94–95	I (L19)	8	12523922
	0.643	RING KIT, PSTN (.030 O.S.) (*14, 27, 40, 41, 42)	98–99	I (L29)	8	12523923
	0.643	RING KIT, PSTN (.030 O.S.) (*6, 7, 8, 10, 14, 17, 18, 19, 20, 26, 27, 28, 32, 35, 37, 38, 39.)	96–97	I (L19)	8	12523923
	0.643	RING KIT, PSTN (.030 O.S.) (*6, 7, 8, 9, 10, 11, 12, 13, 14, 17, 18, 19, 20, 21, 26, 27, 28, 34, 35.) ..	94–95	I (L19)	8	12523923
	0.643	RING KIT, PSTN (.030"O.S.) (*13, 18, 19, 20, 21)	91–93	I (L19)	8	14089096
	0.643	RING KIT, PSTN (*1, 2, 22, 23, 25) (STD)	96–97	I (LX2)	8	12524293
	0.643	RING KIT, PSTN (*1, 2, 22, 23, 25) (.030 O.S.)	96–97	I (LX2)	8	12524294
	0.643	RING KIT, PSTN (*1, 2, 3, 4, 5, 22, 23, 24, 25) (STD)	91–95	I (LX2)	8	12524293
	0.643	RING KIT, PSTN (*1, 2, 3, 4, 5, 22, 23, 24, 25) (.030 O.S.)	94–95	I (LX2)	8	12524294
	0.643	RING KIT, PSTN (*22, 23.) (STD)	98–99	I (LX2)	8	12524293
	0.643	RING KIT, PSTN (*22, 23.) (.030 O.S.)	98–99	I (LX2)	8	12524294
	0.643	RING KIT, PSTN (*6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21) (STD)	91–93	I (L19)	8	14089095
	0.643	RING KIT, PSTN (STD) (14, 27, 40, 41, 42)	98–99	I (L29)	8	12523921
	0.643	RING KIT, PSTN (STD) (6, 7, 8, 10, 14, 17, 18, 19, 20, 26, 27, 28, 32, 34, 35, 37, 38, 39.)	96–97	I (L19)	8	12523921
	0.643	RING KIT, PSTN (STD) (6, 7, 9, 10, 11, 12, 13, 14, 17, 18, 19, 20, 21, 26, 27, 28, 34, 35.)	94–95	I (L19)	8	12523921
2.	0.629	PISTON, (W/PIN) (.030 O.S.) (*10, 14, 17, 18, 19, 20, 32, 37, 38, 39) (.030 O.S.)	96–97	I (L19, EP2)	8	12555796
	0.629	PISTON, (W/PIN) (.030 O.S.) (*14, 40, 41, 43) (.030 O.S.)	98–99	I (L29, EP2)	8	12555796
	0.629	PISTON, (W/PIN) (.005 O.S.) (*27, 42) (.005 O.S.)	98–99	I (L29)	8	12529558
	0.629	PISTON, (W/PIN) (*10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 29, 30, 31, 32.) (STD)	91–93	I (L19)	8	10166822
	0.629	PISTON, (W/PIN) (*10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 29, 30, 31, 32.) (HI LIMIT)	91–93	I (L19)	8	10181376
	0.629	PISTON, (W/PIN) (*10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 29, 30, 31, 32.) (.030 OS)	91–93	I (L19)	8	10181377
	0.629	PISTON, (W/PIN) (*10, 11, 12, 13, 14, 17, 18, 19, 20, 21, 35.) (STD)	94–95	I (L19)	8	10166822
	0.629	PISTON, (W/PIN) (*10, 11, 12, 13, 14, 17, 18, 19, 20, 21, 35.) (STD)	94–95	I (L19)	8	12555794

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	0.629	PISTON, (W/PIN) (*10, 11, 12, 13, 14, 17, 18, 19, 20, 21, 35.) (HI LIMIT–.005 O.S.)	94	I (L19)	8	12555795
	0.629	PISTON, (W/PIN) (*10, 11, 12, 13, 14, 17, 18, 19, 20, 21, 35.) (.030 O.S.) (.030" O.S.)	94	I (L19)	8	12555796
	0.629	PISTON, (W/PIN) (*27, 42) (STD)	98–99	I (L29)	8	10215228
	0.629	PISTON, (W/PIN) (*27, 42) (.030 O.S.)	98–99	I (L29)	8	12529559
	0.629	PISTON, (W/PIN) (*34) (STD)	94–95	I (L19)	8	10232428
	0.629	PISTON, (W/PIN) (*34) (.005 O.S.)	94–95	I (L19)	8	10232430
	0.629	PISTON, (W/PIN) (*34) (.030 O.S.)	94–95	I (L19)	8	10232431
	0.629	PISTON, (W/PIN) (*35) (STD)	96	I (L19)	8	10166822
	0.629	PISTON, (W/PIN) (*6, 7, 8, 26, 27, 28) (STD)	96–97	I (L29)	8	10215228
	0.629	PISTON, (W/PIN) (*6, 7, 8, 26, 27, 28) (.005 O.S.)	96–97	I (L29)	8	12529558
	0.629	PISTON, (W/PIN) (*6, 7, 8, 26, 27, 28) (.030 O.S.)	96–97	I (L29)	8	12529559
	0.629	PISTON, (W/PIN) (*6, 7, 8, 9) (.005 O.S.)	91–93	I (L19)	8	12529558
	0.629	PISTON, (W/PIN) (*6, 7, 8, 9) (.030 O.S.)	91–93	I (L19)	8	12529559
	0.629	PISTON, (W/PIN) (*6, 7, 8, 9, 26, 27, 28.) (STD)	91–95	I (L19)	8	10215228
	0.629	PISTON, (W/PIN) (*6, 7, 8, 9, 26, 27, 28.) (.005 O.S.)	94–95	I (L19)	8	12529558
	0.629	PISTON, (W/PIN) (*6, 7, 8, 9, 26, 27, 28.) (.030 O.S.)	94	I (L19)	8	12529559
	0.629	PISTON, (W/PIN) (HI–LIMIT .005 O.S.) (*10, 14, 17, 18, 19, 20, 32, 37, 38, 39)	96–97	I (L19, EP2)	8	12555795
	0.629	PISTON, (W/PIN) (HI–LIMIT<.005 O.S.) (*14, 40, 41)	98–99	I (L29, EP2)	8	12555795
	0.629	PISTON, (W/PIN) (STD) (*10, 14, 17, 18, 19, 20, 32, 37, 38, 39) (STD)	96–97	I (L19, EP2)	8	12555794
	0.629	PISTON, (W/PIN) (STD) (*14, 17, 18, 40, 41, 43) (STD)	98–99	I (L29)	8	12555794
	0.629	PISTON KIT, ENG (*1, 2, 22, 23, 25) (.032 O.S.) (W/PIN & RINGS)	96–97	I (LX2)	8	12533553
	0.629	PISTON KIT, ENG (*1, 2, 3, 4, 5)	91–93	I (LX2)	8	12533553
	0.629	PISTON KIT, ENG (*1, 2, 3, 4, 5, 22, 23, 24, 25) (W/PIN & RINGS)	91–95	I (LX2)	8	12533507
	0.629	PISTON KIT, ENG (*1, 2, 3, 4, 5, 22, 23, 24, 25) (.032 O.S.) (W/PIN & RINGS)	94–95	I (LX2)	8	12533553
	0.629	PISTON KIT, ENG (*22, 23) (.032 O.S.) (W/PIN & RINGS)	98–99	I (LX2)	8	12533553
	0.629	PISTON KIT, ENG (STD) (*1, 2, 22, 23, 25) (W/PIN & RINGS)	96–99	I (LX2)	8	12533507
3.	0.623	BOLT, CONN ROD (*1, 2, 3, 4, 5, 6, 7, 8, 9, 22, 23, 24, 25, 26, 27, 28.) (7/16–20 X 2.28 (KNURLED SHANK))	91–96	I (L19, LX2)	16	14096148

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	0.623	BOLT, CONN ROD (*1, 2, 6, 7, 8, 22, 23, 25, 26, 27, 28.) (7/16–20 X 2.28 (KNURLED SHANK))	97	I (L29, LX2)	16	14096148
	0.623	BOLT, CONN ROD (*10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 29, 30, 31, 32.)	91–93	I (L19)	RH	14075623
	0.623	BOLT, CONN ROD (*10, 11, 12, 13, 14, 17, 18, 19, 20, 21, 34, 35, 38.)	94–95	I (L19)	RH	14075623
	0.623	BOLT, CONN ROD (*10, 14, 17, 18, 19, 20, 32, 35, 37, 38, 39.) ..	96–97	I (L19)	RH	14075623
	0.623	BOLT, CONN ROD (*14, 27, 40, 41)	98–99	I (L29)	RH	14075623
	0.623	BOLT, CONN ROD (*22, 23, 26, 27, 42) (7/16–20 X 2.28 (KNURLED SHANK))	98–99	I (L29, LX2)	16	14096148
4.	0.603	ROD, CONN (INCL 3, 6, 7) (*10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 29, 30, 31, 32, 34, 35, 37, 38, 39.)	91–97	I (L19, L29)	8	10212764
	0.603	ROD, CONN (INCL 3, 6, 7) (*14, 40, 41.)	98–99	I (L29)	8	10212764
	0.603	ROD, CONN (INCLS 3, 6, 7) (*1, 2, 3, 4, 5, 6, 7, 8, 9, 22, 23, 24, 25, 26, 27, 28.)	91–97	I (LX2, L19, L29)	8	10198922
	0.603	ROD, CONN (INCLS 3, 6, 7) (*22, 23, 27, 42)	98–99	I (L29, LX2)	8	10198922
5.	0.616	BEARING KIT, CONN ROD (STD)	91–97	I (L19, L29, LX2)	8	10181277
	0.616	BEARING KIT, CONN ROD (STD)	98–99	I (L29, LX2)	8	10181277
7.	0.626	NUT, CONN ROD (*1, 2, 3, 4, 5, 6, 7, 8, 9, 22, 23, 24, 25, 26, 27, 28.) (PART OF 4) (7/16–20 X 7/16 THICK)	94–97	I (L19, L29, LX2)	16	3942410
	0.626	NUT, CONN ROD (*10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 29, 30, 31, 32.) (PART OF 4) (3/8–24) (HEX)	91–93	I (L19)	16	3866766
	0.626	NUT, CONN ROD (*10, 11, 12, 13, 14, 17, 18, 19, 20, 21, 34, 35, 37, 38.) (PART OF 4) (3/8–24) (HEX)	94–95	I (L19, L29)	16	3866766
	0.626	NUT, CONN ROD (*10, 14, 17, 18, 19, 20, 32, 34, 35, 37, 38, 39.) (PART OF 4) (3/8–24) (HEX)	96–97	I (L19, L29)	16	3866766
	0.626	NUT, CONN ROD (*14, 40, 41) (PART OF 4) (3/8–24) (HEX)	98–99	I (L29, LX2)	16	3866766
	0.626	NUT, CONN ROD (*22, 23, 27, 42) (PART OF 4) (7/16–20 X 7/16 THICK)	98–99	I (L29, LX2)	16	3942410
8.	0.033	BLOCK, ENG (W/PSTNS) (*6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 22.) (INCLUDES BLK, CR/SHF BRGS, PISTON & PIN, RINGS, RR SEAL.)	91–93	I (L19)	1	12508098

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DISCON	**BLOCK**, ENG (W/PSTNS) (HI PERF) (*6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 22, 26, 27, 28, 29, 30, 31, 32, 34, 35.) (INCLUDES BLK, CR/SHF BRGS, PISTON & PIN, RINGS, RR SEAL.)	91–96	I (L19, L29)	1	12508097
0.033	**BLOCK**, ENG (W/PSTNS) (REFER TO NOTE 33) (*1, 2, 3, 4, 5, 22, 23, 24, 25.) (INCLUDES BLK, CR/SHF BRGS, PISTON & PIN ASM, RINGS, RR SEAL.) ...	91–95	I (LX2)	1	12508086
0.033	**BLOCK**, ENG (W/PSTNS) (REFER TO NOTE 33) (REG PERF) (*6, 7, 8, 9, 10, 11, 12, 13, 14, 17, 18, 19, 20, 21, 26, 27, 28, 34, 35.) (INCLUDES BLK, CR/SHF BRGS, PISTON & PIN, RINGS, RR SEAL.)	94–95	I (L19)	1	12508098
0.033	**ENGINE**, (SERV PARTIAL) (*10, 14, 17, 18, 19, 20, 32, 37, 38, 39) (INCLS BLK, CR/SHF, PISTON ASM)	96–97	I (L29)	1	12558182
0.033	**ENGINE**, (SERV PARTIAL) (*14, 40, 41) (INCLS BLK, CR/SHF, PISTON ASM)	98	I (L29)	1	12558182
0.033	**ENGINE**, (SERV PARTIAL) (*18, 19, 20, 21) (FOR 1991–93 APPLICATIONS, ALSO REQUIRES FRONT COVER 10230954 AND (6) 10242771 BOLTS)	91–93	I (L19)	1	12558182
DISCON	**ENGINE**, (SERV PARTIAL) (*18, 19, 20, 21, 22, 23, 24, 26, 27, 29, 30, 31.) (INCL'S BLK, CR/SHF, CR/SHF BRGS, PISTON & ROD ASM, ROD BRGS, RINGS, RR SEAL)	91–93	I (L19)	1	10181308
0.033	**ENGINE**, (SERV PARTIAL) (*34) (FOR 1994–95 APPLICATIONS, ALSO REQUIRES FRONT COVER 10230954 AND (6) 10242771 BOLTS)	94–95	I (L19)	1	12558182
0.000	**ENGINE**, GASOLINE (GOODWRENCH) (*1, 2, 22, 23, 25) (INCLS BLK, CYL HEADS, CR/SHF, PISTON ASM'S, CM/SHF W/VALVE TRAIN, OIL PUMP, FRT CVR, OIL PAN, VALVE COVERS, BALANCER)	96–97	I (LX2) (MARINE (8.2L) (502 CID)	1	12558073
0.000	**ENGINE**, GASOLINE (GOODWRENCH) (*22, 23) (INCLS BLK, CYL HEADS, CR/SHF, PISTON ASM'S, CM/SHF W/VALVE TRAIN, OIL PUMP, FRT CVR, OIL PAN, VALVE COVERS, BALANCER)	98	I (LX2) (MARINE (8.2L) (502 CID)	1	12558073

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0.000	**ENGINE**, 7.4 L (454 CID) MARINE (INCLS BLK, CYL HEADS, CR?SHF, PISTON ASM'S, CM/SHF W/VALVE TRAIN, OIL PUMP, FRT CVR, OIL PUMP, OIL PAN, VALVE COVERS, BALANCER) (*6, 7, 8, 9)	91–92	I (L19) (SERVICE) (HI–PERF)	1 12560487
0.000	**ENGINE**, 7.4 L (454 CID) MARINE (INCLS BLK, CYL HEADS, CR?SHF, PISTON ASM'S, CM/SHF W/VALVE TRAIN, OIL PUMP, FRT CVR, OIL PUMP, OIL PAN, VALVE COVERS, BALANCER) (*6, 7, 8, 9, 26, 27, 28)	93–95	I (L19) (SERVICE) (HI–PERF)	1 12560487
0.000	**ENGINE**, 7.4 L (454 CID) MARINE (INCLS BLK, CYL HEADS, CR?SHF, PISTON ASM'S, CM/SHF W/VALVE TRAIN, OIL PUMP, FRT CVR, OIL PUMP, OIL PAN, VALVE COVERS, BALANCER) (*6, 7, 8, 9, 26, 27, 28)	96–97	I (L29) (SERVICE) (HI–PERF)	1 12560487
0.000	**ENGINE**, 7.4 L (454 CID) MARINE (INCLS BLK, CYL HEADS, CR?SHF, PISTON ASM'S, CM/SHF W/VALVE TRAIN, OIL PUMP, FRT CVR, OIL PUMP, OIL PAN, VALVE COVERS, BALANCER) (*26, 27)	98–99	I (L29) (SERVICE) (HI–PERF)	1 12560487
0.000	**ENGINE**, 7.4 L (454 CID) MARINE (INCLS BLK, CYL HEADS, CR?SHF, PISTON ASM'S, CM/SHF W/VALVE TRAIN, OIL PUMP, FRT CVR, OIL PUMP, OIL PAN, VALVE COVERS, BALANCER) (*34)	93–95	I (L19) (SERVICE) (BASE)	1 12560488
0.000	**ENGINE**, 7.4 L (454 CID) MARINE (INCLS BLK, CYL HEADS, CR?SHF, PISTON ASM'S, CM/SHF W/VALVE TRAIN, OIL PUMP, FRT CVR, OIL PUMP, OIL PAN, VALVE COVERS, BALANCER) (*35)	94–95	I (L19) (SERVICE) (BASE)	1 12560488
0.000	**ENGINE**, 7.4 L (454 CID) MARINE (INCLS BLK, CYL HEADS, CR?SHF, PISTON ASM'S, CM/SHF W/VALVE TRAIN, OIL PUMP, FRT CVR, OIL PUMP, OIL PAN, VALVE COVERS, BALANCER) (*10, 11, 13, 14, 41)	91–95	I (L19) (SERVICE) (BASE)	1 12560488
0.000	**ENGINE**, 7.4 L (454 CID) MARINE (INCLS BLK, CYL HEADS, CR?SHF, PISTON ASM'S, CM/SHF W/VALVE TRAIN, OIL PUMP, FRT CVR, OIL PUMP, OIL PAN, VALVE COVERS, BALANCER) (*10, 14, 32, 37, 39, 41)	96–97	I (L29) (SERVICE) (BASE)	1 12560488

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	0.000	**ENGINE**, 7.4 L (454 CID) MARINE (INCLS BLK, CYL HEADS, CR?SHF, PISTON ASM'S, CM/SHF W/VALVE TRAIN, OIL PUMP, FRT CVR, OIL PUMP, OIL PAN, VALVE COVERS, BALANCER) (*18, 19, 20, 21) ...	92–95	I (L19) (SERVICE) (INDUSTRAIL)	1	12560489
	0.000	**ENGINE**, 7.4 L (454 CID) MARINE (INCLS BLK, CYL HEADS, CR?SHF, PISTON ASM'S, CM/SHF W/VALVE TRAIN, OIL PUMP, FRT CVR, OIL PUMP, OIL PAN, VALVE COVERS, BALANCER) (*18, 19, 20)	96–97	I (L29) (SERVICE) (INDUSTRAIL)	1	12560489
	0.000	**ENGINE**, 7.4 L (454 CID) MARINE (INCLS BLK, CYL HEADS, CR?SHF, PISTON ASM'S, CM/SHF W/VALVE TRAIN, OIL PUMP, FRT CVR, OIL PUMP, OIL PAN, VALVE COVERS, BALANCER) (*14, 40, 41)	98–99	I (L29) (SERVICE) (INDUSTRAIL)	1	12560489
9.	8.971	**PLUG**, AUTO HEX SOC DRN (ENG BLK OIL GAL) (*1, 2, 3, 4, 5, 6, 7, 8, 9, 10) (8.921)	91–99	I (L19, L29, LX2)	AR	444777
	8.971	**PLUG**, AUTO HEX SOC DRN (ENG BLK OIL GAL) (*11, 12, 13, 14, 15, 16, 17, 18, 19, 20) (8.921)	91–99	I (L19, L29, LX2)	AR	444777
	8.971	**PLUG**, AUTO HEX SOC DRN (ENG BLK OIL GAL) (*21, 22, 23, 24, 25, 26, 27, 28, 29, 30) (8.921)	91–99	I (L19, L29, LX2)	AR	444777
	8.971	**PLUG**, AUTO HEX SOC DRN (ENG BLK OIL GAL) (*31, 32, 33, 34, 35, 36, 37, 38, 40, 41) (8.921)	91–99	I (L19, L29, LX2)	AR	444777
	8.971	**PLUG**, AUTO HEX SOC DRN (ENG BLK OIL GAL) (*42, 43) (8.921)	91–99	I (L19, L29, LX2)	AR	444777
	1.531	**PLUG**, ENG BLK OIL GAL (.125) (8.971)	91–97	I (L19, L29, LX2)	AR	103865
	1.531	**PLUG**, ENG BLK OIL GAL (8.971) (AC–DELCO #3889330)	97–99	I (L29, LX2)	2	3889330
	1.531	**PLUG**, ENG BLK OIL GAL (HEX) (1/4–18X0.56) (STEEL) (USE T/W SEALER) (0.034)	97–99	I (L29, LX2)	2	14084945
	1.531	**PLUG**, ENG BLK OIL GAL (AUTO DRAIN, INT SQ, 3/8–18X.42 PEOR STL) (8.971)	97–99	I (L29, LX2)	3	14090911
	1.531	**PLUG**, ENG BLK OIL GAL (1/4–18 SHORT THD, .41 LONG, STL, ZP 4342M) (1/4–18 SHT THD, .41 L) (STEEL, ZP 4342M) (AUTO HEX SOC DRN) (8.921) .	91–97	I (L19, L29, LX2)	1	444777
	1.531	**PLUG**, ENG BLK OIL GAL (1/4–18 SHORT THD, .41 LONG, STL, ZP 4342M) (1/4–18 SHT THD, .41 L) (STEEL, ZP 4342M) (AUTO HEX SOC DRN) (8.921) .	98–99	I (L29, LX2)	1	444777
10.	0.553	**PLUG**, CM/SHF BRG HOLE	91–97	I (L19, L29, LX2)	1	3999200
	0.553	**PLUG**, CM/SHF BRG HOLE	98–99	I (L29, LX2)	1	3999200
11.	0.683	**HOUSING**, FLYWHL (*19, 20) ..	91–97	I (L19, L29)	1	15530202

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12.	0.795	FORK, CLU (*19 20)	91–97	I (L19, L29)	1	15592270
13.	0.796	STUD, CLU FORK BALL (*19 20)	91–97	I (L19, L29)	1	15592268
14.	N.S.	PLATE, CLU DRVN		.....		
	0.859	CLUTCH KIT, ENG (W/PRESS PLT & DRVN PLT) (*19, 20) (INCLS CLU PRESS & CLU DRVN PLATES) (10 SPLINES))	94–97	I (L19, L29)	1	12388074
15.	1.540	PLUG, ENG BLK OIL CLR HOSE HOLE (AUTO DRAIN, INT SQ, 3/8–18X.42 PEOR STL) (8.971) .	91–99	I (L19, L29, LX2)	1	14090911
	1.540	PLUG, ENG BLK OIL CLR HOSE HOLE (AUTO DRAIN, INT SQ, 3/8–18X.42 PEOR STL) (8.971) .	99	I (L29, LX2)	1	14090911
16.	DISCON	PLATE, CLU PRESS (W/CVR) (*19, 20) (SEE CLUTCH KIT) ...	91–93	I (L19)	1	15638387
	0.859	CLUTCH KIT, ENG (W/PRESS PLT & DRVN PLT) (*19, 20) (INCLS CLU PRESS & CLU DRVN PLATES) (10 SPLINES))	94–97	I (L19, L29)	1	12388074
17.	1.531	PLUG, ENG OIL PRESS GA SEN OR IND SW HOLE (1/8–27X3/8 NPTF) (AUTO, HH, PIPE PLAIN) (8.971) (AC–DELCO #444613) .	91–97	I (L19, L29, LX2)	1	444613
18.	0.034	PLUG, ENG BLK COOL DRN HOLE (WAT DRN HOLE,) (8.971) (AC–DELCO #3889330)	91–98	I (L19, L29, LX2)	2	3889330
	0.034	PLUG, ENG BLK COOL DRN HOLE (WAT DRN HOLE,) (HEX) (1/4–18X0.56) (STEEL) (USE T/W SEALER)	91–98	I (L19, L29, LX2)	2	14084945
	0.034	PLUG, ENG BLK COOL DRN HOLE (WAT DRN HOLE,) (8.971) (AC–DELCO #3889330)	99	I (L29, LX2)	2	3889330
	0.034	PLUG, ENG BLK COOL DRN HOLE (WAT DRN HOLE,) (HEX) (1/4–18X0.56) (STEEL) (USE T/W SEALER)	99	I (L29, LX2)	2	14084945
19.	0.034	PLUG, ENG BLK CORE HOLE (41.5MM DIA) (BRASS)	91–94	I (L19, L29, LX2)	AR	3826504
21.	0.539	BEARING, CM/SHF (*14, 22, 23, 27, 40, 41, 42) (#1)	98–99	I (L29, LX2)	1	12508996
	0.539	BEARING, CM/SHF (*14, 22, 23, 27, 40, 41, 42) (#2 & RR)	98–99	I (L29, LX2)	2	12508997
	0.539	BEARING, CM/SHF (*14, 22, 23, 27, 40, 41, 42) (#3 & 4)	98–99	I (L29, LX2)	2	12508998
	0.539	BEARING, CM/SHF (#1)	91–97	I (L19, L29, LX2)	1	12508996
	0.539	BEARING, CM/SHF (#2 & RR) .	91–97	I (L19, L29, LX2)	2	12508997
	0.539	BEARING, CM/SHF (#3 & 4) ...	91–97	I (L19, L29, LX2)	2	12508998
22.	0.738	KEY, CM/SHF GR (*4, 12, 15, 24, 31.) (19.05MM X 4.75MM) (8.960)	91–93	I (L19)	2	106751
	0.738	KEY, CM/SHF GR (*4, 12, 24.) (19.05MM X 4.75MM) (8.960) ...	94–95	I (L19)	2	106751
23.	0.738	BOLT, CM/SHF SPKT (5/16–18 X 3/4, 300M) (HEX HD, STEEL) (8.900)	96–99	I (L29, LX2)	3	9424877

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	0.738	BOLT, CM/SHF SPKT (*1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 13, 14, 16, 17, 18, 19, 20, 21, 22, 23, 25, 26, 27, 28, 29, 30, 32.) (5/16–18 X 3/4, 300M) (HEX HD, STEEL) (8.900)	91–93	I (L19)	3	9424877
	0.738	BOLT, CM/SHF SPKT (*1, 2, 3, 5, 6, 7, 8, 9, 10, 11, 13, 14, 17, 18, 19, 20, 21, 22, 23, 25, 26, 27, 28, 34, 35.) (5/16–18 X 3/4, 300M) (HEX HD, STEEL) (8.900)	94–95	I (L19, LX2)	3	9424877
24.	0.736	SPROCKET, CM/SHF (38 TEETH) (.275/.285" TOOTH WIDTH)	96–97	I (L19, L29, LX2) (454)	1	12551401
	0.736	SPROCKET, CM/SHF (38 TEETH) (.275/.285" TOOTH WIDTH)	98	I (L29, LX2) (454) (502)	1	12551401
	0.736	SPROCKET, CM/SHF	99	I (L29, LX2) (454) (502)	1	12560176
	0.736	SPROCKET, CM/SHF (*1, 2, 3, 5, 6, 7, 8, 9) (CAMSHAFT SPROCKET**50 TEETH) (DOUBLE ROLLER CHAIN) (NORMAL ROTATION)	91–93	I (L19) (1ST DES)	1	3891517
	0.736	SPROCKET, CM/SHF (*1, 2, 3, 5, 6, 7, 8, 9) (SINGLE ROLLER CHAIN) (NORMAL ROTATION)	91–93	I (L19) (2ND DES)	1	10106429
	0.736	SPROCKET, CM/SHF (*1, 2, 3, 5, 6, 7, 8, 9, 10, 11, 13, 14, 17, 18, 19, 20, 21, 22, 23, 25, 26, 27, 28, 34, 35.) (SINGLE ROLLER CHAIN) (NORMAL ROTATION)	94–95	I (L19)	1	10106429
	0.736	SPROCKET, CM/SHF (*10, 11, 13, 14, 16, 17, 18, 19, 20, 21, 22, 23, 25, 26, 27, 28, 29, 30, 32.) (SINGLE ROLLER CHAIN) (NORMAL ROTATION)	91–93	I (L19)	1	10106429
	0.736	GEAR, CM/SHF (*4, 12, 15, 24, 31.) (OPPOSITE ROTATION)	91–93	I (L19)	1	6272965
	0.736	GEAR, CM/SHF (*4, 12, 24.) (OPPOSITE ROTATION)	94–95	I (L19)	1	6272965
25.	0.724	CHAIN, CM/SHF TMG (SINGLE ROLLER CHAIN) (NORMAL ROTATION)	96–99	I (L29, LX2)	1	10114177
	0.724	CHAIN, CM/SHF TMG (*1, 2, 3, 5, 6, 7, 8, 9) (DOUBLE CHAIN) (NORMAL ROTATION)	91–93	I (L19, LX2) (1ST DES)	1	3891519
	0.724	CHAIN, CM/SHF TMG (*1, 2, 3, 5, 6, 7, 8, 9) (SINGLE ROLLER CHAIN) (NORMAL ROTATION)	91–93	I (L19, LX2) (2ND DES)	1	10114177
	0.724	CHAIN, CM/SHF TMG (*1, 2, 3, 5, 6, 7, 8, 9, 10, 11, 13, 14, 17, 18, 19, 20, 21, 22, 23, 25, 26, 27, 28, 34, 35.) (SINGLE ROLLER CHAIN) (NORMAL ROTATION)	94–95	I (L19, L29, LX2)	1	10114177
	0.724	CHAIN, CM/SHF TMG (*10, 11, 13, 14, 16, 17, 18, 19, 20, 21, 22, 23, 25, 26, 27, 28, 29, 30, 32.) (SINGLE ROLLER CHAIN) (NORMAL ROTATION)	91–93	I (L19, LX2)	1	10114177
26.	0.738	PIN, CM/SHF SPKT LOC (1/4 X 5/8) (8.939) (PART OF 28)	91–93	I (L19, LX2)	1	12554553

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	0.738	PIN, CM/SHF SPKT LOC (1/4 X 5/8) (8.939) (PART OF 28)	96–99	I (L29, LX2)	1	12554553
	0.738	PIN, CM/SHF SPKT LOC (*1, 2, 3, 5, 6, 7, 8, 9, 10, 11, 13, 14, 17, 18, 19, 20, 21, 22, 23, 25, 26, 27, 28, 34, 35.) (1/4 X 5/8) (8.939) (PART OF 28)	94–95	I (L19, LX2)	1	12554553
27.	1.079	BOLT, W/PMP (*1, 2, 3, 4, 5, 6, 7, 9) (HFH, 3/8–16X1.62, 1.12 THD, 0.76 OD, 280M, POR) (8.900) ...	91–93	I (L19, LX2)	AR	9441547
	1.079	BOLT, W/PMP (*1, 2, 3, 4, 5, 6, 7, 9, 10, 11, 12, 13, 14, 15, 16, 17, 22, 23, 24, 26, 27, 29, 30, 31, 32, 34, 35, 37, 38, 39.) (3/8–16X1.75, 1.12–THD) (8.900)	91–97	I (L19, L29, LX2)	2	9441560
	1.079	BOLT, W/PMP (*14, 17, 22, 23, 26, 27, 41, 42) (3/8–16X1.75, 1.12–THD) (8.900)	98–99	I (L29, LX2)	2	9441560
	1.079	BOLT, W/PMP (*18, 19, 20, 21.) (3/8–16X2.12)	91–96	I (L19, L29, LX2)	4	12552096
	1.079	BOLT, W/PMP (INCLS GASKET) (*18, 19, 20.) (3/8–16X2 3/8) (8.900)	96–97	I (L19)	4	9440982
	1.079	BOLT, W/PMP (INCLS GASKET) (*40.) (3/8–16X2 3/8) (8.900) ...	98–99	I (L29)	4	9440982
28.	0.519	CAMSHAFT, ENG (*INCL 22, 26, 36, 57) (*4, 24.) (INCL 22, 26, 36, 57)	91–95	I (L19, LX2)	1	14096458
	0.519	CAMSHAFT, ENG (*1, 2, 6, 7, 8, 22, 23, 25, 26, 27, 28) (INCL 22, 26, 36, 57)	96–97	I (L29, LX2)	1	12551622
	0.519	CAMSHAFT, ENG (*10, 14, 17, 18, 19, 20, 32, 34, 35, 37, 38, 39) (INCL 22, 26, 36, 57)	96–97	I (L29)	1	12552296
	0.519	CAMSHAFT, ENG (*14, 40, 41) (INCL 22, 26, 36, 57)	98–99	I (L29)	1	12552296
	0.519	CAMSHAFT, ENG (*22, 23, 27, 42) (INCL 22, 26, 36, 57)	98–99	I (L29, LX2)	1	12551622
	0.519	CAMSHAFT, ENG (INCL 22, 26, 27, 28) (*1, 2, 3, 5, 6, 7, 8, 9, 22, 23, 25, 26, 27, 28.) (INCL 22, 26, 36, 57)	91–95	I (L19, LX2)	1	14096209
	0.519	CAMSHAFT, ENG (INCL 22, 26, 36, 57) (*10, 11, 13, 14, 16, 17, 29, 30, 32.) (INCL 22, 26, 36, 57)	91–93	I (L19, LX2)	1	3904359
	0.519	CAMSHAFT, ENG (INCL 22, 26, 36, 57) (*12, 15, 31.) (INCL 22, 26, 36, 57)	91–93	I (L19, LX2)	1	3906688
	0.519	CAMSHAFT, ENG (INCL 22, 26, 36, 57) (*18, 19, 20, 21) (INCL 22, 26, 36, 57)	91–93	I (L19, LX2)	1	3963544
	0.519	CAMSHAFT, ENG (INCL 22, 26, 36, 57) (*10, 11, 13, 14, 17, 34, 35.) (INCL 22, 26, 36, 57)	94–95	I (L19, LX2)	1	3904359
	0.519	CAMSHAFT, ENG (INCL 22, 26, 36, 57) (*12) (INCL 22, 26, 36, 57)	94	I (L19, LX2)	1	3906688
	0.519	CAMSHAFT, ENG (INCL 22, 26, 36, 57) (*18, 19, 20, 21) (INCL 22, 26, 36, 57)	94–95	I (L19)	1	10166850

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29.	1.531	**PLUG**, ENG BLK OIL GAL (ENG BLK OIL GAL FRT END) (1/4–18X.425 HEX) (0.034)	91–97	I (L19, L29, LX2)	3	361997
	1.531	**PLUG**, ENG BLK OIL GAL (ENG BLK OIL GAL FRT END) (1/4–18X.425 HEX) (0.034)	98–99	I (L29, LX2)	3	361997
30.	1.531	**PLUG**, ENG BLK OIL GAL (.125) (8.971)	91–97	I (L19, L29, LX2)	AR	103865
	1.531	**PLUG**, ENG BLK OIL GAL (8.971) (AC–DELCO #3889330)	97–99	I (L29, LX2)	2	3889330
	1.531	**PLUG**, ENG BLK OIL GAL (HEX) (1/4–18X0.56) (STEEL) (USE T/W SEALER) (0.034)	97–99	I (L29, LX2)	2	14084945
	1.531	**PLUG**, ENG BLK OIL GAL (AUTO DRAIN, INT SQ, 3/8–18X.42 PEOR STL) (8.971)	97–99	I (L29, LX2)	3	14090911
	1.531	**PLUG**, ENG BLK OIL GAL (1/4–18 SHORT THD, .41 LONG, STL, ZP 4342M) (1/4–18 SHT THD, .41 L) (STEEL, ZP 4342M) (AUTO HEX SOC DRN) (8.921) .	91–97	I (L19, L29, LX2)	1	444777
	1.531	**PLUG**, ENG BLK OIL GAL (1/4–18 SHORT THD, .41 LONG, STL, ZP 4342M) (1/4–18 SHT THD, .41 L) (STEEL, ZP 4342M) (AUTO HEX SOC DRN) (8.921) .	98–99	I (L29, LX2)	1	444777
31.	1.079	**GASKET**, W/PMP (*1, 2, 3, 4, 5, 6, 7, 9, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 26, 27, 29, 30, 31, 34, 35, 37, 38.)	91–95	I (L19, L29, LX2)	2	3860039
	1.079	**GASKET**, W/PMP (*1, 2, 6, 7, 14, 17, 18, 19, 20, 22, 23, 26, 27, 32, 34, 35, 38, 39.)	96–97	I (L19, L29, LX2)	2	3860039
	1.079	**GASKET**, W/PMP (*14, 19, 22, 23, 27, 40, 41, 42)	98–99	I (L29, LX2)	2	3860039
32.	1.069	**PUMP KIT**, WAT (*1, 2, 3, 4, 5, 6, 7, 9, 11, 12, 13, 14, 15, 16, 17, 22, 23, 24, 26, 27, 29, 30, 31, 34, 35.) (INCL 31, 82, 83)) (AC–DELCO #251–559)	91–95	I (L19, LX2)	1	12527762
	1.069	**PUMP KIT**, WAT (*1, 2, 6, 7, 14, 17, 22, 23, 26, 27, 32, 35, 37, 38, 39.) (INCL 31, 82, 83)) (AC–DELCO #251–559)	96–97	I (L29, LX2)	1	12527762
	1.069	**PUMP KIT**, WAT (*14, 22, 23, 27, 41, 42) (INCL 31, 82, 83)) (AC–DELCO #251–559)	98–99	I (L29, LX2)	1	12527762
	1.069	**PUMP KIT**, WAT (*18, 19, 20.) (INCL 31, 82, 83)) (AC–DELCO #251–558)	96–97	I (L29)	1	12527761
	1.069	**PUMP KIT**, WAT (*40) (INCL 31, 82, 83)) (AC–DELCO #251–558)	98	I (L29)	1	12527761
	1.069	**PUMP KIT**, WAT (*40) (INCL 31, 82, 83))	99	I (L29)	1	12456327
	1.069	**PUMP KIT**, WAT (INCL 31, 82, 83) (*18, 19, 20, 21) (INCL 31, 82, 83)) (AC–DELCO #251–494) ..	91–95	I (L19, LX2)	1	12529308

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33.	0.669	WEIGHT, FLYWHL (PIN GROOVE) (CR/SHF BAL, FLYWHEEL) (WEIGHT, CR/SHF BAL) (8.940) .	91–97	I (L19, L29, LX2)	AR	274584
	0.669	WEIGHT, FLYWHL (PIN GROOVE) (CR/SHF BAL, FLYWHEEL) (WEIGHT, CR/SHF BAL) (8.940) .	91–97	I (L19, L29, LX2)	AR	274584
34.	0.219	INDICATOR, TMG (*4, 12, 15, 24, 31,)	91–95	I (L19, LX2)	1	3993813
35.	0.206	BOLT, ENG FRT CVR (8.900) ...	91–93	I (L19, LX2)	8	9439930
	0.206	BOLT, ENG FRT CVR (1/4–20 X 1/2, 1/8 THD) (300M, PC) (8.900)	94–95	I (L19, LX2)	10	9442895
	0.206	BOLT, ENG FRT CVR	96–97	I (L19, L29, LX2)	6	10243771
	0.206	BOLT, ENG FRT CVR	98–99	I (L29, LX2)	6	10243771
36.	0.206	PIN, ENG FRT CVR LOC (PART OF ITEM #28) (1/4 X 5/8) (8.939)	91–97	I (L19, L29, LX2)	1	12554553
	0.206	PIN, ENG FRT CVR LOC (PART OF ITEM #28) (1/4 X 5/8) (8.939)	98–99	I (L29, LX2)	1	12554553
37.	0.207	GASKET, ENG FRT CVR	91–95	I (L19, LX2)	1	10114161
	0.207	GASKET, ENG FRT CVR	96–99	I (L29, LX2)	1	10198910
38.	0.662	KEY, CR/SHF BALR	91–97	I (L19, L29, LX2)	1	10114166
	0.662	KEY, CR/SHF BALR	98–99	I (L29, LX2)	1	10114166
39.	0.096	BEARING KIT, CR/SHF (STD) (POS#1, 2, 3&4)	91–99	I (L19, L29, LX2)	4	10181306
40.	0.096	BEARING KIT, CR/SHF (#5) ...	91–99	I (L19, L29, LX2)	1	10181307
41.	0.137	SEAL, CR/SHF RR OIL (0.659) ..	96–99	I (L29, LX2)	1	10101164
	0.137	SEAL, CR/SHF RR OIL (*1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 13, 14, 16, 17, 18, 19, 20, 21, 22, 23, 25, 26, 27, 28, 29, 30, 32, 34, 35.) (0.659)	91–95	I (L19, LX2)	1	10101164
	0.137	SEAL, CR/SHF RR OIL (*4, 12, 15, 24, 31, 33.)	91–93	I (L19, LX2)	1	14096971
	0.137	SEAL, CR/SHF RR OIL (*4, 12, 24.)	94–95	I (L19, LX2)	1	14096971
42.	0.669	BOLT, FLYWHL (*1, 2, 6, 7, 14, 17, 18, 19, 20, 22, 23, 26, 27, 32, 37, 38, 39) (7/16–20X.97)	97	I (L29, LX2)	6	12337973
	0.669	BOLT, FLYWHL (*14, 19, 22, 23, 27, 40, 41, 42) (7/16–20X.97) ..	98–99	I (L29, LX2)	6	12337973
	0.669	BOLT, FLYWHL (*14, 22, 23, 40, 41, 42)	98–99	I (L29, LX2)	6	839756
	0.669	BOLT, FLYWHL (*32) (7/16–20X45/64, 300M) (8.900) .	93	I (L19, LX2)	6	3727207
	0.669	BOLT, FLYWHL (*32)	96–97	I (L19, L29)	6	839756
	0.669	BOLT, FLYWHL (*8, 10, 25, 28.) (7/16–20X45/64, 300M) (8.900) .	91–97	I (L19, L29, LX2)	6	3727207
43.	0.666	FLYWHEEL, ENG (*1, 3, 4, 7, 23, 24, 27.)	91–97	I (L19, L29, LX2)	1	14096804
	0.666	FLYWHEEL, ENG (*10) (INCLS RING GEAR)	94–97	I (L19, L29)	1	10101170
	0.666	FLYWHEEL, ENG (*10, 32) (INCLS RING GEAR)	91–93	I (L19)	1	10101170
	0.666	FLYWHEEL, ENG (*11, 12, 14) .	94–95	I (L19, L29)	1	14096994
	0.666	FLYWHEEL, ENG (*11, 12, 14, 15, 30, 31.)	91–93	I (L19)	1	14096994
	0.666	FLYWHEEL, ENG (*13, 17, 18, 19, 20, 21, 29) (INCLS RING GEAR)	91–93	I (L19)	1	10101169

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	0.666	FLYWHEEL, ENG (*13, 17, 18, 19, 20, 21, 29, 34, 35, 38, 39.) (INCLS RING GEAR)	91–97	I (L19, L29)	1	10101169
	0.666	FLYWHEEL, ENG (*14, 32, 37)	96–99	I (L19, L29)	1	14096994
	0.666	FLYWHEEL, ENG (*16)	91–93	I (L19)	1	14097012
	0.666	FLYWHEEL, ENG (*2, 5, 6, 9, 22, 26)	91–97	I (L19, L29, LX2)	1	14096987
	0.666	FLYWHEEL, ENG (*22, 42)	98–99	I (L29, LX2)	1	14096987
	0.666	FLYWHEEL, ENG (*23, 27)	98–99	I (L29, LX2)	1	14096804
	0.666	FLYWHEEL, ENG (*40, 41.) (INCLS RING GEAR)	98–99	I (L29)	1	10101169
	0.666	FLYWHEEL, ENG (*8)	91–93	I (L19)	1	14096996
	0.666	FLYWHEEL, ENG (*8, 25, 28.)	91–97	I (L19, L29)	AR	10185034
44.	1.430	DEFLECTOR, CR/SHF OIL (*14, 22, 23, 27, 40, 41, 42.)	98–99	I (L29, LX2)	1	14097040
45.	0.669	PIN, FLYWHL LOC (PART OF 73) (7/16 DIA. X 7/8)	91–97	I (L19, L29, LX2)	1	3701679
	0.669	PIN, FLYWHL LOC (PART OF 73) (7/16 DIA. X 7/8)	98–99	I (L29, LX2)	1	3701679
46.	0.649	BEARING, CLU PILOT (*19, 20) (NEEDLE) (19/32 ID 1 3/32 O.D.X 3/4)	91–97	I (L19, L29)	1	14061685
47.	0.137	SEAL, CR/SHF #5 BRG CAP OIL HOLE (O RING) (4.133) (AC–DELCO #6264902)	91–99	I (L19, L29, LX2)	1	6264902
48.	N.S.	CAP, CR/SHF #5 BRG	91–99	I (L19, L29, LX2) (10101130)	AR	
49.	0.648	NUT, CR/SHF OIL DFL (HEX 3/8–16) (8.917)	91–97	I (L19, L29, LX2)	5	9442946
	0.648	NUT, CR/SHF OIL DFL (HEX 3/8–16) (8.917)	98–99	I (L29, LX2)	5	9442946
50.	8.929	WASHER, FL–.406X.812X.065ZN (CR/SHF OIL DFL)	91–99	I (L19, L29, LX2)	AR	120394
51.	1.855	FITTING, OIL FLTR	91–93	I (L19, LX2)	1	3853870
	1.855	FITTING, OIL FLTR (*1, 2, 3, 4, 5, 6, 7, 8, 9, 18, 19, 20, 21.)	94–95	I (L19, L29, LX2)	1	3853870
	1.855	FITTING, OIL FLTR (*1, 2, 6, 7, 8, 10, 14, 17, 18, 19, 20, 22, 23, 25, 26, 27, 28.)	96	I (L19, L29, LX2)	1	3853870
	1.855	FITTING, OIL FLTR (*1, 2, 6, 7, 8, 18, 19, 20.)	97	I (L19, L29, LX2)	1	3853870
	1.855	FITTING, OIL FLTR (*14, 40, 41)	98–99	I (L29)	1	3853870
52.	1.837	VALVE, OIL FLTR BYPASS (AC–DELCO #25013759)	91–97	I (L19, L29, LX2)	2	25013759
	1.837	VALVE, OIL FLTR BYPASS (AC–DELCO #25013759)	98–99	I (L29, LX2)	2	25013759
53.	1.836	FILTER, OIL (SPIN ON TYPE) (1 QT CAP) (PF35) (W/O ANTI–DRAIN BACK VALVE) (AC–DELCO #PF35)	91–93	I (L19, LX2)	1	6438384
	1.836	FILTER, OIL (*1, 2, 3, 4, 5, 6, 7, 8, 9, 18, 19, 20, 21.) (SPIN ON) (1.835) (AC–DELCO #PF932)	94–95	I (L19, L29, LX2)	1	25010754
	1.836	FILTER, OIL (*1, 2, 3, 4, 5, 6, 7, 8, 9, 18, 19, 20, 21.) (AC–DELCO #PF1218)	94–95	I (L19, L29, LX2)	1	25160561
	1.836	FILTER, OIL (*1, 2, 6, 7, 8, 18, 19, 20.) (SPIN ON) (1.835) (AC–DELCO #PF932)	96	I (L19, L29, LX2)	1	25010754

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	1.836	FILTER, OIL (*1, 2, 6, 7, 8, 18, 19, 20.) (AC-DELCO #PF1218)	97	I (L19, L29, LX2)	1	25160561
	1.836	FILTER, OIL (*14, 17, 18) (AC-DELCO #PF1218)	98-99	I (L29, LX2)	1	25160561
54.	0.056	BOLT, CR/SHF BRG CAP (INBOARD) (1/2-13X3.52 1.18 THD) (0.095)	91-99	I (L19, L29, LX2)	10	10106461
	0.056	BOLT, CR/SHF BRG CAP (OUTBOARD) (1/2-13X2.78 .84 THD) (0.095)	91-99	I (L19, L29, LX2)	10	10106460
55.	1.723	BOLT, O/PMP CVR (HFH M6X1X20 9.8 PZOR) (8.900) (AC-DELCO #11508600)	94-97	I (L19, L29, LX2)	5	11508600
	1.723	BOLT, O/PMP CVR (HFH M6X1X20 9.8 PZOR) (8.900) (AC-DELCO #11508600)	98-99	I (L29, LX2)	5	11508600
	1.723	BOLT, O/PMP CVR (*10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 29, 30, 31, 32.) (HFH M6X1X20 9.8 PZOR) (8.900) (AC-DELCO #11508600)	91-93	I (L19, LX2)	5	11508600
56.	1.639	SHAFT, O/PMP DRV	91-97	I (L19, L29, LX2)	1	3998289
	1.639	SHAFT, O/PMP DRV	98-99	I (L29, LX2)	1	3998289
57.	0.206	PIN, O/PMP LOC (1/4 X 5/8) (8.939)	91-97	I (L19, L29, LX2)	AR	12554553
	0.206	PIN, O/PMP LOC (1/4 X 5/8) (8.939)	98-99	I (L29, LX2)	AR	12554553
58.	1.639	RETAINER, O/PMP DRV SHF ...	91-97	I (L19, L29, LX2)	1	3764554
	1.639	RETAINER, O/PMP DRV SHF ...	98-99	I (L29, LX2)	1	3764554
59.	1.652	PUMP, OIL	91-99	.....		
	1.652	PUMP, OIL (W/SCRN) (INCL 55, 61, 62, 63, 64) (*1, 2, 3, 4, 5, 6, 7, 9, 22, 23, 24, 25, 26, 27, 28)	91-93	I (L19, LX2)	1	12555167
	1.652	PUMP, OIL (W/SCRN) (INCL 55, 61, 62, 63, 64) (*8, 10)	91-93	I (L19, LX2)	1	14097006
	1.652	PUMP, OIL (W/SCRN) (INCL 55, 61, 62, 63, 64) (*1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 34, 35.)	94	I (L19, LX2)	1	12555167
	1.652	PUMP, OIL (W/SCRN) (INCL 55, 61, 62, 63, 64,)	95-97	I (L19, L29, LX2)	1	12555167
	1.652	PUMP, OIL (W/SCRN) (INCL 55, 61, 62, 63, 64,)	98-99	I (L29, LX2)	1	12555167
60.	1.652	BOLT, O/PMP (*18, 19, 20, 21) (7/16-14 X 2 23/64)	91-97	I (L19, L29)	1	3860382
	1.652	BOLT, O/PMP (*40) (7/16-14 X 2 23/64)	98-99	I (L29)	1	3860382
	1.652	BOLT, O/PMP (2ND DESIGN) (SEE ITEM 88 FOR 1ST DESIGN) (*14, 15) (7/16-14 X 2 23/64) ..	91-93	I (L19, LX2)	1	3860382
61.	N.S.	SCREEN, O/PMP (PART OF 59) (NOT SERVICED PART OF OIL PUMP FOR 1994-97)	94-97	I (L19, L29, LX2) (10241112)	1	
	1.656	SCREEN, O/PMP (PART OF 59) (*8, 10) (PART OF 59)	91-93	I (L19, LX2)	1	14095345
62.	1.609	VALVE, OIL PRESS RLF (PART OF 59, 65)	95-97	I (L19, L29, LX2)	1	3860377

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	1.609	**VALVE**, OIL PRESS RLF (PART OF 59, 65)	98–99	I (L29, LX2)	1	3860377
	1.609	**VALVE**, OIL PRESS RLF (PART OF 59, 65) (*1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 34, 35.)	94	I (L19, LX2)	1	3860377
	1.609	**VALVE**, OIL PRESS RLF (PART OF 59, 65) (*10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 29, 30, 31, 32.)	91–93	I (L19, LX2)	1	3860377
63.	1.609	**SPRING**, OIL PRESS RLF VLV (PART OF 59, 65)	95–97	I (L19, L29, LX2)	1	3870399
	1.609	**SPRING**, OIL PRESS RLF VLV (PART OF 59, 65)	98–99	I (L29, LX2)	1	3870399
	1.609	**SPRING**, OIL PRESS RLF VLV (PART OF 59, 65) (*1, 2, 3, 4, 5, 6, 7, 8, 9, 10)	91–93	I (L19, LX2)	1	3870399
	1.609	**SPRING**, OIL PRESS RLF VLV (PART OF 59, 65) (*1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 34, 35.)	94	I (L19, LX2)	1	3870399
	1.609	**SPRING**, OIL PRESS RLF VLV (PART OF 59, 65) (*10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 29, 30, 31, 32.)	91–93	I (L19, LX2)	1	3860378
64.	1.609	**PIN**, OIL PRESS RLF VLV SPR ST	95–97	I (L19, L29, LX2)	1	838839
	1.609	**PIN**, OIL PRESS RLF VLV SPR ST	98–99	I (L29, LX2)	1	838839
	1.609	**PIN**, OIL PRESS RLF VLV SPR ST (*1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 34, 35.)	94	I (L19, LX2)	1	838839
	1.609	**PIN**, OIL PRESS RLF VLV SPR ST (*10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 29, 30, 31, 32.)	91–93	I (L19, LX2)	1	838839
65.	1.723	**COVER**, O/PMP	94–97	I (L19, L29, LX2)	1	10241110
	1.723	**COVER**, O/PMP	98–99	I (L29, LX2)	1	10241110
	1.723	**COVER**, O/PMP (*10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 29, 30, 31, 32.)	91–93	I (L19, LX2)	1	10241110
66.	1.724	**GASKET**, O/PMP CVR (PART OF 59)	95–97	I (L19, L29, LX2)	1	473396
	1.724	**GASKET**, O/PMP CVR (PART OF 59)	98–99	I (L29, LX2)	1	473396
	1.724	**GASKET**, O/PMP CVR (PART OF 59) (*1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 34, 35.)	94	I (L19, LX2)	1	473396
	1.724	**GASKET**, O/PMP CVR (PART OF 59) (*10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 29, 30, 31, 32.)	91–93	I (L19, LX2)	1	473396
67.	1.429	**GASKET**, OIL PAN	91–97	I (L19, L29, LX2)	1	10106407
	1.429	**GASKET**, OIL PAN	98–99	I (L29, LX2)	1	10106407
68.	1.426	**PAN**, OIL (*1, 2, 6, 7, 8, 10, 14, 17, 22, 23, 24, 25, 26, 27, 28, 34, 35, 37, 38)	96–97	I (L19, L29, LX2)	1	12551666

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	1.426	**PAN**, OIL (*14, 17, 22, 23, 26, 27, 41, 42)	98–99	I (L29, LX2)	1	12551666
	1.426	**PAN**, OIL (*18, 19, 20)	96–97	I (L29)	1	10240722
	1.426	**PAN**, OIL (*40)	98–99	I (L29)	1	10240722
	1.426	**PAN**, OIL (INCL 69, 70) (*1, 2, 5, 14, 15, 17, 22, 23, 24, 26, 27, 29, 30, 31.)	91–93	I (L19, LX2)	1	12551666
	1.426	**PAN**, OIL (INCL 69, 70) (*1, 2, 6, 14, 17, 22, 23, 24, 26, 27, 34, 35.)	94–95	I (L19, LX2)	1	12551666
	1.426	**PAN**, OIL (INCL 69, 70) (*18, 19, 20, 21)	94–95	I (L19, LX2)	1	10240722
	1.426	**PAN**, OIL (INCL 69, 70) (*3, 4, 5, 7, 8, 9, 10, 11, 12, 13, 16, 18, 19, 20, 21, 25, 28, 32.) (W/PLUG & TUBE)	91–93	I (L19, LX2)	1	10240721
	1.426	**PAN**, OIL (INCL 69, 70) (*3, 4, 5, 7, 8, 9, 10, 11, 12, 13, 25, 28.) (W/PLUG & TUBE)	94–95	I (L19, LX2)	1	10240721
69.	1.456	**GASKET**, OIL PAN DRN PLUG	91–95	I (L19, LX2)	1	14090908
	1.456	**SEAL**, OIL PAN DRN PLUG (O RING)	96–97	I (L19, L29)	1	3536966
	1.456	**SEAL**, OIL PAN DRN PLUG (O RING)	98–99	I (L29, LX2)	1	3536966
70.	1.453	**PLUG**, OIL PAN DRN (PART OF 69) (*1, 2, 6, 14, 15, 17, 22, 23, 24, 26, 27, 29, 30, 31.) (HFH 1/2–20X1.00 W/MAGNETIC PLUG)	91–93	I (L19, LX2)	AR	23011420
	1.453	**PLUG**, OIL PAN DRN (PART OF 69) (*1, 2, 6, 14, 17, 18, 19, 20, 21, 22, 23, 24, 26, 27, 34, 35.) (HFH 1/2–20X1.00 W/MAGNETIC PLUG)	94–95	I (L19, LX2)	AR	23011420
	1.453	**PLUG**, OIL PAN DRN (PART OF 69) (*3, 4, 5, 7, 9, 10, 11, 12, 13, 15, 16, 17, 18, 19, 20, 21, 25, 28, 32.) (1/2–20, 81LG)	91–93	I (L19, LX2)	AR	3921988
	1.453	**PLUG**, OIL PAN DRN (PART OF 69) (*3, 4, 5, 7, 9, 10, 11, 12, 13, 15, 16, 17, 18, 19, 20, 21, 25, 28.) (1/2–20, 81LG)	94–95	I (L19, LX2)	AR	3921988
	1.453	**PLUG**, OIL PAN DRN (*1, 2, 6, 7, 8, 10, 14, 17, 22, 23, 25, 26, 27, 28, 32, 34, 35, 37, 38, 39.) (M12X1.75–6G THD, 44.45MM LNG, 15MM FLG HEX HD) (W/MAGNET & SEAL)	96–97	I (L19, L29, LX2)	1	24100042
	1.453	**PLUG**, OIL PAN DRN (*14, 17, 18, 22, 23, 26, 27, 40, 41, 42) (M12X1.75–6G THD, 44.45MM LNG, 15MM FLG HEX HD) (W/MAGNET & SEAL)	98–99	I (L29, LX2)	1	24100042
	1.453	**PLUG**, OIL PAN DRN (*18, 19, 20) (M12X1.75–6G THD, 44.45MM LNG, 15MM FLG HEX HD) (W/MAGNET & SEAL)	97	I (L19)	1	24100042

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71.	1.428	BOLT, OIL PAN (HFH 5/16–18X.62 280M POR DIM A–.48 .65 OD) (8.900) (AC–DELCO #9440224)	91–97	I (L19, L29, LX2)	20	9440224
	1.428	BOLT, OIL PAN (HFH 5/16–18X.62 280M POR DIM A–.48 .65 OD) (8.900) (AC–DELCO #9440224)	98–99	I (L29, LX2)	20	9440224
72.	N.S.	CAP, CR/SHF BRG	91–98	I (L19, L29, LX2) (03963571)	4	
	N.S.	CAP, CR/SHF BRG	97–99	I (L29, LX2) (10106462)	1	
73.	0.646	CRANKSHAFT, (*1, 2, 3, 5, 22, 23, 25)	91–97	I (L19, L29, LX2)	1	10183723
	0.646	CRANKSHAFT, (*10, 11, 13, 14, 16, 17, 18, 19, 20, 21, 29, 30, 32, 34, 35, 37, 38, 39)	91–97	I (L19, L29, LX2)	1	10101162
	0.646	CRANKSHAFT, (*12, 15, 31)	91–95	I (L19, L29)	1	14096981
	0.646	CRANKSHAFT, (*14, 40, 41)	98–99	I (L29, LX2)	1	10101162
	0.646	CRANKSHAFT, (*22, 23)	98–99	I (L29, LX2)	1	10183723
	0.646	CRANKSHAFT, (*27, 42)	98–99	I (L29)	1	14096983
	0.646	CRANKSHAFT, (*4, 24)	91–95	I (LX2)	1	10183725
	0.646	CRANKSHAFT, (*6, 7, 8, 9, 26, 27, 28.)	91–97	I (L19, L29)	1	14096983
74.	0.728	GEAR, CR/SHF (OPPOSITE ROTATION) (*4, 12, 15, 24, 31, 34.)	91–95	I (L19, LX2)	1	3860086
	0.728	SPROCKET, CR/SHF (*1, 2, 3, 5, 6, 7, 8, 9) (DOUBLE ROLLER CHAIN) (NORMAL ROTATION)	91–93	I (L19, LX2) (1ST DES)	1	3891518
	0.728	SPROCKET, CR/SHF (*1, 2, 3, 5, 6, 7, 8, 9) (SINGLE ROLLER CHAIN) (NORMAL ROTATION)	91–93	I (L19, LX2) (2ND DES)	1	12550039
	0.728	SPROCKET, CR/SHF (*1, 2, 3, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 16, 17, 18, 19, 20, 21, 22, 23, 25, 26, 27, 28, 29, 30, 32, 34, 35.) (SINGLE ROLLER CHAIN) (NORMAL ROTATION)	94	I (L19, LX2) (2ND DES)	1	12550039
	0.728	SPROCKET, CR/SHF (*14, 22, 23, 27, 40, 41, 42)	99	I (L29, LX2)	1	12560177
	0.728	SPROCKET, CR/SHF (SINGLE ROLLER CHAIN) (NORMAL ROTATION)	96–97	I (L19, LX2, L29)	1	12550039
	0.728	SPROCKET, CR/SHF (SINGLE ROLLER CHAIN) (NORMAL ROTATION) (14, 22, 23, 27, 40, 41, 42)	98	I (LX2, L29)	1	12550039
75.	0.213	SEAL, CR/SHF FRT OIL (AC–DELCO #296–01)	96–99	I (L29, LX2)	1	10191640
	0.213	SEAL, CR/SHF FRT OIL (PART PF 76) (*1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 24, 31, 34, 35) (AC–DELCO #296–01)	91–95	I (L19, LX2)	1	10191640
	0.213	SEAL, CR/SHF FRT OIL (PART PF 76) (*4, 12, 15, 24, 31.)	91–95	I (L19, LX2)	1	10191642
76.	0.206	COVER, ENG FRT (W/TMG IND)	96–97	I (L19, L29, LX2)	1	10230954
	0.206	COVER, ENG FRT (W/TMG IND)	98–99	I (L29, LX2)	1	10230954

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	0.206	COVER, ENG FRT (W/TMG IND) (INCL 75) (*4, 12, 15)	91–95	I (L19)	1	12551621
	0.206	COVER, ENG FRT (W/TMG IND) (INCL 75) (NORMAL ROTATION) (*1, 2, 3, 5, 6, 7, 8, 9, 10, 11, 13, 14, 16, 17, 18, 19, 20, 21, 22, 24, 25, 26, 27, 28, 29, 30, 31, 32, 34, 35.)	91–95	I (L19, LX2)	1	12551544
	0.206	COVER, ENG FRT (OPPOSITE ROTATION MARINE) (*12)	91–93	I (L19)	1	12557927
77.	0.659	BALANCER, CR/SHF (*1, 2, 3, 4, 5, 6, 7, 8, 9, 22, 23, 24, 25, 26, 27, 28.)	91–95	I (L19, LX2)	1	10216339
	0.659	BALANCER, CR/SHF (*1, 2, 6, 7, 8, 22, 23, 25, 26, 27, 28.)	96–97	I (L19, LX2)	1	10216339
	0.659	BALANCER, CR/SHF (*10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 29, 30, 31, 32, 34, 35.)	91–95	I (L19, LX2)	1	10216338
	0.659	BALANCER, CR/SHF (*10, 14, 17, 18, 19, 20, 32, 34, 35, 37, 38, 39)	96–97	I (L19, LX2)	1	10216338
	0.659	BALANCER, CR/SHF (*14, 40, 41)	98–99	I (L29, LX2)	1	10216338
	0.659	BALANCER, CR/SHF (*22, 23, 27, 42.)	98–99	I (L29, LX2)	1	10216339
78.	0.662	WASHER, CR/SHF BALR	91–97	I (L19, L29, LX2)	1	3864814
	0.662	WASHER, CR/SHF BALR	99	I (L29, LX2)	1	3864814
79.	0.662	BOLT, CR/SHF BALR (1/2–20X1.38) (*1, 2, 3, 4, 5, 6, 7, 8, 9, 10)	91–99	I (L19, L29, LX2)	1	10126796
	0.662	BOLT, CR/SHF BALR (1/2–20X1.38) (*11, 12, 13, 14, 15, 16, 17, 18, 19, 20)	91–97	I (L19, L29, LX2)	1	10126796
	0.662	BOLT, CR/SHF BALR (1/2–20X1.38) (*21, 22, 23, 24, 25, 26, 27, 28, 29, 30)	91–97	I (L19, L29, LX2)	1	10126796
	0.662	BOLT, CR/SHF BALR (1/2–20X1.38) (*31, 32, 33, 34, 35, 36, 37, 38, 39)	91–97	I (L19, L29, LX2)	1	10126796
80.	8.984	FITTING, (CLU FORK BALL STUD LUB) (*19, 20)	91–97	I (L19, L29, LX2)	1	9417901
81.	8.929	WASHER, FLAT 5/16X5/8X1/16 ZP HARD (CM/SHF SPKT) (*1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 13, 14, 16, 17, 18, 19, 20, 21)	91–93	I (L19, LX2)	1	2436162
82.	1.062	HUB, FAN & W/PMP PUL (*1, 2, 3, 4, 5, 6, 7, 9, 11, 12, 13, 14, 17, 22, 23, 24, 26, 27, 29, 30, 31, 34, 35, 37, 38.)	91–97	I (L19, L29, LX2) (OEM–HARDIN & THERMO ELECTRON)	1	354480
	1.062	HUB, FAN & W/PMP PUL (*14, 22, 23, 27, 41, 42.)	98–99	I (L29, LX2) (OEM–HARDIN & THERMO ELECTRON)	1	354480
83.	N.S.	GASKET, W/PMP CVR (PART OF 32) (*1, 2, 3, 4, 5, 6, 7, 9, 11, 12, 13, 14, 15, 16, 17, 22, 23, 24, 26, 27, 29, 30, 31, 34, 35, 37, 38.) ..	91–96	I (L19, L29, LX2) (03734991)	1	
	1.079	GASKET, W/PMP CVR (PART OF 32) (*18, 19, 20, 21)	91–95	I (L19)	1	12555493

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	1.079	GASKET, W/PMP CVR (PART OF 32) (*18, 19, 20)	96-97	I (L29)	1	12555493
	1.079	GASKET, W/PMP CVR (PART OF 32) (*40)	98-99	I (L29)	1	12555493
84.	8.932	WASHER, LK I .S. TOOTH (W/PMP CVR) (.256X.47X .028 CZ)	91-99	I (L19, L29, LX2) (03904620)	AR	120423
85.	1.073	BOLT, W/PMP CVR (*1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 22, 23, 24, 26, 27, 32, 34, 35, 37, 38, 39.) (HFH 1/4-20X.38 280M PZOR .52-OD FULL THD) (8.900)	91-97	I (L19, L29, LX2)	6	9440325
	1.073	BOLT, W/PMP CVR (*1, 2, 6, 7, 14, 17, 22, 23, 26, 27, 32, 37, 38, 39) (HEX SOC TORQ DR 1/4-20X.5, .47 OD) (0.529)	96-97	I (L29, LX2)	6	14093637
	1.073	BOLT, W/PMP CVR (*14, 22, 23, 27, 41, 42) (HEX SOC TORQ DR 1/4-20X.5, .47 OD) (0.529)	98-99	I (L29, LX2)	6	14093637
	1.073	BOLT, W/PMP CVR (*18, 19, 20, 21) (8.900)	91-97	I (L19, L29)	6	9439930
	1.073	BOLT, W/PMP CVR (*40) (8.900)	98-99	I (L29, LX2)	6	9439930
	1.073	BOLT, W/PMP CVR (*6, 7, 8, 10, 11, 12, 13, 14, 17, 22, 23, 25, 26, 27, 28) (8.900)	95-96	I (L19, L29)	6	9439930
86.	0.673	GEAR, FLYWHL RING (PART OF 43)	95-97	I (L19, L29, LX2)	1	460583
	0.673	GEAR, FLYWHL RING (PART OF 43)	98-99	I (L29, LX2)	1	460583
	0.673	GEAR, FLYWHL RING (PART OF 43) (*1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 34, 35.)	91-94	I (L19, LX2)	1	460583
	0.673	GEAR, FLYWHL RING (PART OF 43) (*16) (153 TEETH)	91-93	I (L19)	1	3991407
87.	0.056	STUD, CR/SHF BRG CAP (*1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 17, 22, 23, 24, 25, 26, 27, 28, 34, 35, 37, 38, 40, 41, 42.)	94-97	I (L19, L29, LX2)	4	10224104
	0.056	STUD, CR/SHF BRG CAP (*1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 17, 22, 23, 24, 25, 26, 27, 28, 34, 35, 37, 38, 40, 41, 42.)	98-99	I (L29, LX2)	4	10224104
	0.056	STUD, CR/SHF BRG CAP (*3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32.)	91-93	I (L19, LX2)	4	10224104
88.	1.723	STUD, O/PMP (*1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 16, 17, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32) (3 13/64 O.L.) (1.652)	91-93	I (L19, LX2)	1	3866604
	1.723	STUD, O/PMP (1ST DESIGN) (SEE ITEM 60 FOR 2ND DESIGN) (3 13/64 O.L.) (*14, 15) (1.652)	91-93	I (L19)	1	3866604

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	1.723	STUD, O/PMP (*1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 17, 22, 23, 24, 25, 26, 27, 28, 34, 35, 37, 38) (3 13/64 O.L.) (1.652)	94–97	I (L19, L29, LX2)	1	3866604
	1.723	STUD, O/PMP (3 13/64 O.L.) (*14, 22, 23, 27, 40, 41, 42) (1.652)	98–99	I (L29, LX2)	1	3866604
90.	0.529	RETAINER, CM/SHF	96–97	I (L19, L29, LX2)	1	10168501
	0.529	RETAINER, CM/SHF	98–99	I (L29, LX2)	1	10168501
91.	0.529	BOLT, CM/SHF RET (HEX SOC TORQ DR 1/4–20X.5, .47 OD) ..	96–97	I (L19)	2	14093637
	0.529	BOLT, CM/SHF RET (HEX SOC TORQ DR 1/4–20X.5, .47 OD) ..	98–99	I (L29, LX2)	2	14093637

NOTE 1: 8.2L 502 CID MARINE ENG. 1991 10183766 (1FH); 1992 10183798 (2FH),1993 10191690 (3FH),1994 10198980 (4FH),1995 10171040 (5FH),1996 10214121 (6FH),1997 12551888 (7FH).
NOTE 2: 8.2L 502 CID MARINE ENG.1991 10183768 (1FJ),1992 10183800 (2FJ),1993 10191691 (3FJ),1994 10198981 (4FJ),1995 10171041 (5FJ),1996 10214122 (6FJ),1997 12551889 (7FJ),1998 1255
NOTE 3: 8.2L 502 CID MARINE ENG. 1991 14096901 (1FC); 1992 14097135 (2FC); 1993 10191681 (3FC),1994 10183785 (4FC),1995 10171037 (5FC).
NOTE 4: 8.2L 502 CID MARINE ENG. 1991 14096902 (1FD); 1992 14097136 (2FD); 1993 10191682 (3FD),1994 10198978 (4FD),1995 10171038 (5FD).
NOTE 5: 8.2L 502 CID MARINE ENG. 1991 14097067 (1FF); 1992 14097137 (2FF); 1993 10191683 (3FF),1994 10198979 (4FF),1995 10171039 (5FF).
NOTE 6: 7.4L 454 CID MARINE ENG. 1991 14096800 (1XA); 1992 14097121 (2XA),1993 10183771 (3XA),1994 10191652 (4XA),1995 10171026 (5XA),1996 10214106 (6XA),1997 12551877 (7XA).
NOTE 7: 7.4L 454 CID MARINE ENG. 1991 14096811 (1XF); 1992 14097122 (2XF),1993 10191670 (3XF),1994 10198966 (4XF),1995 10171027 (5XF),1996 10214107 (6XF),1997 12551878 (7XF).
NOTE 8: 7.4L 454 CID MARINE ENG. 1991 14096886 (1XH); 1992 14097123 (2XH),1993 10191671 (3XH),1994 10198967 (4XH),1995 10171025 (5XH),1996 10214104 (6XH),1997 12551879 (7XH).
NOTE 9: 7.4L 454 CID MARINE ENG. 1991 14096889 (1XC); 1992 14097126 (2XC); 1993 10191672 (3XC),1994 10198968 (4XC),1995 10171028 (5XC).
NOTE 10: 7.4L 454 CID MARINE ENG. 1991 14096891 (1XK); 1992 14097127 (2XK),1993 10191673 (3XK),1994 10191653 (4XK),1995 10171029 (5XK),1996 10214109 (6XK),1997 12551881 (7XK).
NOTE 11: 7.4L 454 CID MARINE ENG. 1991 14096892 (1XN); 1992 14097128 (2XN); 1993 10191674 (3XN),1994 10198970 (4XN),1995 10171030 (5XN).
NOTE 12: 7.4L 454 CID MARINE ENG. 1991 14096893 (1XR); 1992 14097129 (2XR); 1993 10191675 (3XR),1994 10198965 (4XR),1995 10171031 (5XR).
NOTE 13: 7.4L 454 CID MARINE ENG. 1991 14096894 (1XS); 1992 14097130 (2XS); 1993 10191676 (3XS),1994 10198972 (4XS),1995 10171032 (5XS).
NOTE 14: 454 CID MARINE ENG.1991 14096895 (1XY),1992 14097131 (2XY),1993 10191677 (3XY),1994 10198973 (4XY),1995 10171033 (5XY),1996 10214113 (6XY),1997 12551882 (7XY),1998 12554435
NOTE 15: 7.4L 454 CID MARINE ENG. 1991 14096896 (1XZ); 1992 14097132 (2XZ); 1993 10191678 (3XZ).
NOTE 16: 7.4L 454 CID MARINE ENG. 1991 14096897 (1XG); 1992 14097133 (2XG); 1993 10191679 (3XG).
NOTE 17: 7.4L 454 CID MARINE ENG. 1991 14096989 (1XW); 1992 14097134 (2XW),1993 10191680 (3XW),1994 10198976 (4XW),1995 10171036 (5XW),1996 10214116 (6XW),1997 12551883 (7XW).
NOTE 18: 7.4L 454 CID INDUSTRIAL ENG.1991 14096990 (1XD),1992 14097138 (2YD),1993 10191684 (3YD),1994 10198962 (4YD),1995 10171022 (5YD),1996 10214099 (6YD),1997 12551869 (7YD).
NOTE 19: 7.4L 454 CID INDUSTRIAL ENG. 1991 14096991 (1XJ); 1992 14097139 (2YJ),1993 10191685 (3YJ),1994 10198963 (4YJ),1995 10171023 (5YJ),1996 10214101 (6YJ),1997 12551871 (7YJ).
NOTE 20: 7.4L 454 CID INDUSTRIAL ENG. 1991 14096992 (1XT); 1992 14097140 (2YT),1993 10191686 (3YT),1994 10198964 (4YT),1995 10171024 (5YT),1996 10214103 (6YT),1997 12551873 (7YT).
NOTE 21: 7.4L 454 CID INDUSTRIAL ENG. 1991 14096993 (1XU); 1992 14097141 (2YU); 1993 10191687 (3YU),1994 10191665 (4YU),1995 10171021 (5YU).
NOTE 22: 8.2L 502 CID MARINE ENG. 1993 10222246 (3HJ),1994 10223083 (4HJ),1995 10235248 (5HJ),1996 12550133 (6HJ),1997 12551890 (7HJ),1998 12554502 (8HJ),1999 12556979 (9HJ).
NOTE 23: 8.2L 502 CID MARINE ENG. 1993 10222247 (3HH),1994 10223080 (4HH),1995 10235245 (5HH),1996 12550130 (6HH),1997 12551891 (7HH),1998 12554503 (8HH),1999 12556980 (9HH).
NOTE 24: 8.2L 502 CID MARINE ENG. 1993 10222248 (3HD),1994 10223082 (4HD),1995 10235247 (5HD).
NOTE 25: 8.2L 502 CID MARINE ENG. 1993 10222249 (3HC),1994 10223081 (4HC),1995 10235246 (5HC),1996 12550131 (6HC),1997 12551892 (7HC).
NOTE 26: 7.4L 454 CID MARINE ENG. 1993 10222250 (3UA),1994 10223073 (4UA),1995 10235239 (5UA),1996 12550126 (6UA),1997 12551884 (7UA).
NOTE 27: 7.4L 454 CID MARINE ENG. 1993 10222251 (3UF),1994 10223074 (4UF),1995 10235240 (5UF),1996 12550127 (6UF),1997 12551885 (7UF),1998 12554453 (8UF),1999 12556971 (9UF).
NOTE 28: 7.4L 454 CID MARINE ENG. 1993 10222252 (3UH),1994 10223075 (4UH),1995 10235241 (5UH),1996 12550128 (6UH),1997 12551886 (7UH).
NOTE 29: 7.4L 454 CID MARINE ENG. 1993 10222253 (3UW).

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NOTE 30: 7.4L 454 CID MARINE ENG. 1993 10222254 (3UY).
NOTE 31: 7.4L 454 CID MARINE ENG. 1993 10222255 (3UZ).
NOTE 32: 7.4L 454 CID MARINE ENG. 1993 10222256 (3UK),
,1996 12555754 (6UK),1997 12555756 (7UK).
NOTE 33: TRANSFER 4–10224104 MAIN BRG STUDS FOR OIL PAN BAFFLE. ON OPPOSITE ROTATION ENGINE INSTALL 14096971 CRANKSHAFT RR SEAL & INSTALL PISTONS WITH RECESSED DIMPLE TOWARD REAR OF
NOTE 34: 7.4L 454 CID MARINE ENG. 1994 10232164 (4UB),1995 10235249 (5UB),1996 12550129 (6UB).
NOTE 35: 7.4L 454 CID MARINE ENG. 1994 12550678 (4XX),1995 12550679 (5XX),1996 12551657 (6XX).
NOTE 36: FOR SECOND SERVICE AFTER CYL HEAD,CYL BLOCK,VALVE,OR VALVE SEAT GRINDING TO CONVERT ENGINE TO ADJUSTABLE LASH VALVE SYSTEM.SEE CHEV.SERV BULLETIN NO.92–256–6A FOR FURTHER I
NOTE 37: 7.4L 454 CID MARINE ENG. ,1995 12553496 (5UD), 1996 12553498 (6UD),1997 12553500 (7UD).
NOTE 38: 7.4L 454 CID MARINE ENG. ,1995 12553495 (5UC),1996 12553497 (6UC),1997 12553499 (7UC).
NOTE 39: 7.4L 454 CID MARINE ENG. 1996 12555753 (6UJ),1997 12555755 (7UJ).
NOTE 40: 7.4L 454 CID INDUSTRIAL ENG.1998 12554419 (8YD),1999 12556953 (9YD),2000 12557305 (0YD).
NOTE 41: 7.4L 454 CID INDUSTRIAL ENG.1998 12554451 (8XW),1999 12556969 (9XW)
NOTE 42: 7.4L 454 CID INDUSTRIAL ENG.1998 12554452 (8UA),1999 12556970 (9UA)
NOTE 43: 7.4L 454 CID MARINE ENG.1999 12556967 (9XY).

RPO DEFINITIONS

EP2 – MARINE(EP2)
LX2 – ENGINE,8.2L(8.2),V8(T.B.I.)
L19 – ENGINE,7.4L(7.4N),V8(E.F.I.)
L19 – ENGINE,7.4L(7.4N),V8 (TBI)
L29 – ENGINE,GAS,8 CYL,7.4L(7.4J)MFI

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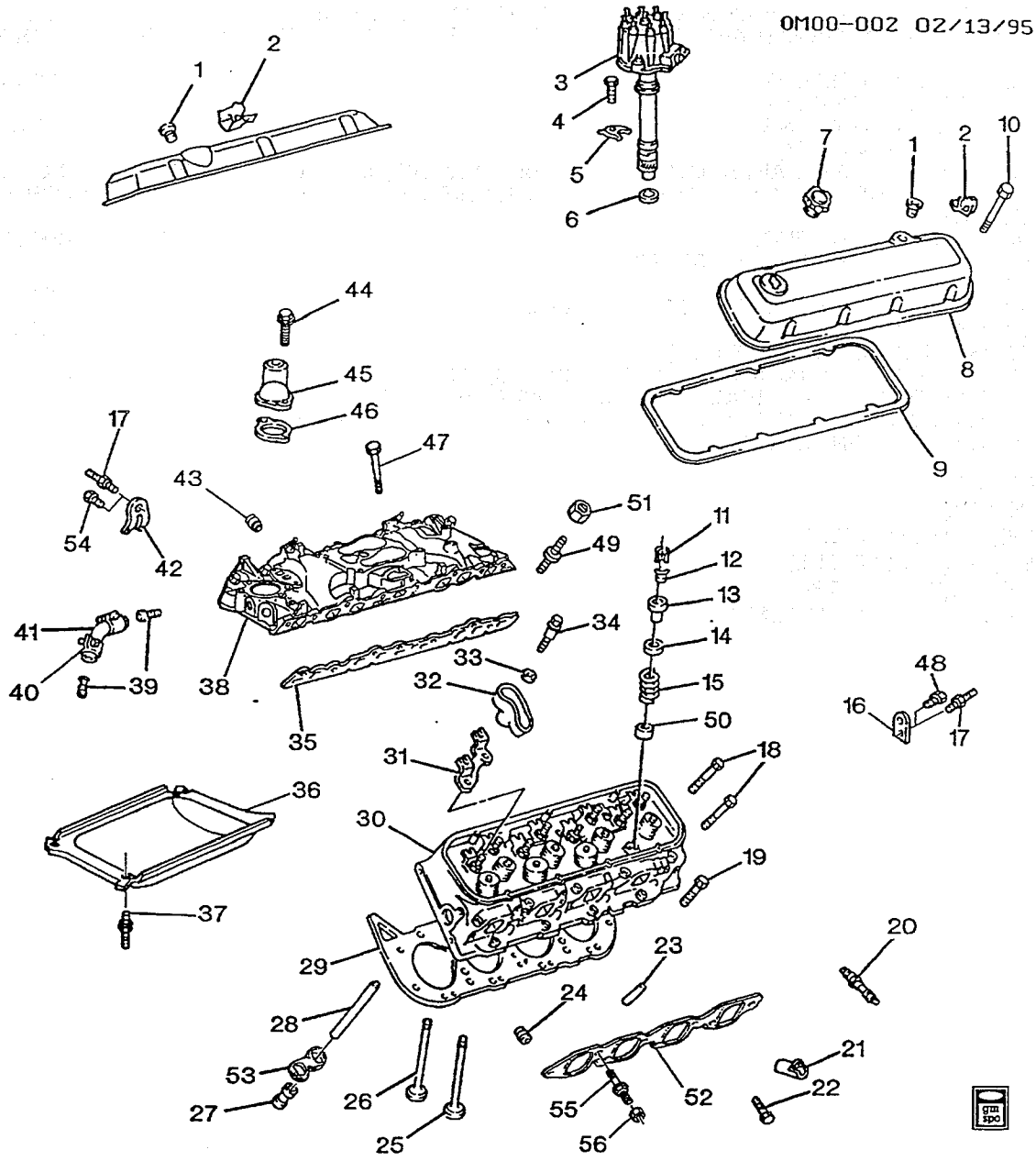

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1991-1999 I ENGINE ASM-7.4L/8.2L V8 PART 2

1.	1.745	GROMMET, PCV VLV (PCV)	91-93	I (L19, LX2)	1	10198949
	1.745	GROMMET, PCV VLV (PCV)	91-97	I (L19, L29, LX2)	1	10198949
	1.745	GROMMET, PCV VLV (PCV)	98-99	I (L29, LX2)	1	10198949
2.	2.251	SUPPORT, SPLG WIRE (*18, 19, 20, 21.)	91-97	I (L19, L29)	5	14085761
	2.251	SUPPORT, SPLG WIRE (*40) ...	98-99	I (L29)	5	14085761
3.	N.S.	DISTRIBUTOR, (FOR INDUSTRIAL ENGINES ONLY-SEE GROUP 2.000 FOR DETAIL ILLUSTRATION) (*18, 19, 20, 21)	91-96	I (L19, L29) (01103377)	1	

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	N.S.	**DISTRIBUTOR**, (FOR INDUSTRIAL ENGINES ONLY–SEE GROUP 2.000 FOR DETAIL ILLUSTRATION) (*18, 19, 20)	97	I (L29) (01104066)	1	
	N.S.	**DISTRIBUTOR**, (–SEE GROUP 2.000 FOR DETAIL ILLUSTRATION) (*22, 23, 25, 26, 27, 28, 32, 37, 38)	97	I (L29) (01104060)	1	
	N.S.	**DISTRIBUTOR**, (–SEE GROUP 2.000 FOR DETAIL ILLUSTRATION) (*14, 40, 41)	98–99	I (L29) (01104060)	1	
4.	2.363	**BOLT**, DISTR CLA (*14, 22, 23, 27, 40, 41, 42) (HFH 3/8–16X .88 280 POR 0.75 OD 0.72 THD) (8.900)	98–99	I (L29)	2	9440169
	2.363	**BOLT**, DISTR CLA (22, 23, 25, 26, 27, 28, 37, 38) (HFH 3/8–16X .88 280 POR 0.75 OD 0.72 THD) (8.900)	97	I (L29, LX2)	2	9440169
5.	2.363	**CLAMP**, DISTR (*10, 14, 17) (PROD 12550662)	96	I (L29)	1	10096197
	2.363	**CLAMP**, DISTR (*14, 40, 41)	98–99	I (L29, LX2)	1	10096197
	2.363	**CLAMP**, DISTR (*18, 19, 20, 21.)	91–97	I (L19, L29, LX2)	1	10096197
	2.363	**CLAMP**, DISTR (*37, 38) (PROD 12550662)	96–97	I (L29)	1	10096197
6.	2.363	**GASKET**, DISTR (*14, 40, 41) (AC–DELCO #10108445)	98–99	I (L29, LX2)	1	10108445
	2.363	**GASKET**, DISTR (*18, 19, 20, 21) (AC–DELCO #10108445)	91–97	I (L19, L29, LX2)	1	10108445
	2.363	**GASKET**, DISTR (*6, 7, 8, 10, 11, 12, 13, 14, 17, 22, 23, 24, 25, 26, 27, 28, 37, 38.) (AC–DELCO #10108445)	95–96	I (L19, L29, LX2)	1	10108445
7.	1.758	**CAP**, OIL FIL (*1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32)	91–93	I (L19, LX2)	1	14096998
	1.758	**CAP**, OIL FIL (*1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 17, 22, 23, 24, 25, 26, 27, 28, 32, 34, 35, 37, 38, 39.)	94–97	I (L19, L29, LX2)	1	14096998
	1.758	**CAP**, OIL FIL (*14, 22, 23, 27, 40, 41, 42) (AC–DELCO #FC179)	99	I (L29, LX2)	1	10243772
	1.758	**CAP**, OIL FIL (*14, 40, 41) (AC–DELCO #FC179)	98–99	I (L29)	1	10243772
	1.758	**CAP**, OIL FIL (*18, 19, 20)	96–97	I (L19)	1	12552284
	1.758	**CAP**, OIL FIL (*18, 19, 20, 21.) (AC–DELCO #FC174)	91–95	I (L19, L29)	1	12551830
	1.758	**CAP**, OIL FIL (*22, 23, 27, 42)	98	I (L29, LX2)	1	14096998
8.	0.386	**COVER**, VLV RKR ARM (*1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 34, 35, 37, 38)	91–97	I (L19, L29, LX2)	2	12553668
	0.386	**COVER**, VLV RKR ARM (*14, 17, 18, 22, 23, 26, 27, 40, 41, 42)	98–99	I (L29, LX2)	1	12558859
	0.386	**COVER**, VLV RKR ARM (*18, 19, 20, 21) (MADE OF ALUMINUM) (LEFT SIDE)	91–97	I (L19, L29)	LH	12553666

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	0.386	COVER, VLV RKR ARM (*18, 19, 20, 21) (RIGHT SIDE)	91–97	I (L19, L29)	RH	12553667
	0.386	COVER, VLV RKR ARM (*39) ...	96–97	I (L19, L29, LX2)	2	12553668
	N.S.	DEFLECTOR, OIL SEP (PART OF ITEM #8) (FITS BACKSIDE OF COVER)	91–97	I (L19, L29, LX2) (10141283)	1	
9.	0.423	GASKET, VLV RKR ARM CVR ...	91–97	I (L19, L29, LX2)	1	10126727
	0.423	GASKET, VLV RKR ARM CVR ...	98–99	I (L29, LX2)	1	10126727
10.	0.413	BOLT, VLV RKR ARM CVR (SPL HFH 1/4–20X.87 DOG PT FULL THD PS .52–OD) (1.428)	91–97	I (L19, L29, LX2)	14	25520079
	0.413	BOLT, VLV RKR ARM CVR (SPL HFH 1/4–20X.87 DOG PT FULL THD PS .52–OD) (1.428)	98	I (L29, LX2)	14	25520079
11.	0.310	KEY, VLV STEM	91–97	I (L19, L29, LX2)	32	3947880
	0.310	KEY, VLV STEM	98–99	I (L29, LX2)	32	3947880
12.	0.309	ROTATOR, VLV (*10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 29, 30, 31, 32, 34, 35.)	91–94	I (L19)	8	14081046
	0.309	ROTATOR, VLV (*10, 11, 12, 13, 14, 15, 17, 18, 19, 20, 21, 34, 35)	95	I (L19)	8	10213463
	0.309	ROTATOR, VLV (*10, 14, 17, 18, 19, 20, 32, 34, 35, 37, 38, 39) ...	96–97	I (L29)	8	10240899
	0.309	ROTATOR, VLV (*14, 40, 41) ...	98–99	I (L29)	8	10240899
13.	0.309	CAP, VLV SPR (W/VLV STEM OIL SEAL) (*1, 2, 3, 4, 5, 6, 7, 8, 9, 22, 23, 24, 25, 26, 27, 28.)	91–93	I (L29, LX2)	16	3879613
	0.309	CAP, VLV SPR (W/VLV STEM OIL SEAL) (*10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 29, 30, 31, 32, 34, 35.) (PART OF ITEM 30) .	91–94	I (L19, LX2)	1	14087548
	0.309	CAP, VLV SPR (*1, 2, 3, 4, 5, 6, 7, 8, 9, 22, 23, 24, 25, 26, 27, 28.) (PART OF ITEM 30) (CAP & SEAL AS SEPARATE PARTS.)	91–94	I (L19, LX2)	1	12550421
	0.309	CAP, VLV SPR (*1, 2, 3, 4, 5, 6, 7, 8, 9, 22, 23, 24, 25, 26, 27, 28.) (PART OF ITEM 30) (CAP & SEAL AS SEPARATE PARTS.)	95	I (L19, L29, LX2)	1	12550421
	0.309	CAP, VLV SPR (*1, 2, 6, 7, 8, 22, 23, 25, 26, 27, 28.) (PART OF ITEM 30) (CAP & SEAL AS SEPARATE PARTS.)	96–97	I (L19, L29, LX2)	1	12550421
	0.309	CAP, VLV SPR (*10, 11, 12, 13, 14, 17, 18, 19, 20, 21, 32, 34, 35, 37, 38, 39.)	95–97	I (L19, L29, LX2)	8	10213464
	0.309	CAP, VLV SPR (*14, 40, 41)	98–99	I (L29)	8	10213464
	0.309	CAP, VLV SPR (*22, 23, 27, 42) (PART OF ITEM 30) (CAP & SEAL AS SEPARATE PARTS.)	98–99	I (L29, LX2)	1	12550421
14.	0.308	SEAL, VLV STEM OIL (*1, 2, 3, 4, 5, 6, 7, 8, 9, 22, 23, 24, 25, 26, 27, 28) (STD) (HAS CAP & SEAL AS SEPARATE PARTS) (FOR 1ST DES SEE 12550421 CAP & SEAL AS ONE PART.)	94	I (L19, L29, LX2) (2ND DES)	1	12550422

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	0.308	SEAL, VLV STEM OIL (*1, 2, 3, 4, 5, 6, 7, 8, 9, 22, 23, 24, 25, 26, 27, 28) (STD) (HAS CAP & SEAL AS SEPARATE PARTS)	95–97	I (L19, L29, LX2)	1	12550422
	0.308	SEAL, VLV STEM OIL (*22, 23, 27, 42.) (STD) (HAS CAP & SEAL AS SEPARATE PARTS)	98–99	I (L29, LX2)	1	12550422
	0.308	SEAL, VLV STEM OIL (USE W/10114119) (*10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 29, 30, 31, 32, 34, 35, 37, 38) (.015 O.S)	91–96	I (L19, L29, LX2)	8	10183724
	0.308	SEAL, VLV STEM OIL (USE W/10183724) (*10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 29, 30, 31, 32, 34, 35, 37, 38, 39) (STD) (0.283)	91–96	I (L19, L29, LX2)	8	10114119
	0.308	SEAL, VLV STEM OIL (USE W/10183724) (*10, 14, 17, 18, 19, 20, 37, 38, 39) (STD) (0.283)	97	I (L29, LX2)	8	10114119
	0.308	SEAL, VLV STEM OIL (USE W/10183724) (*14, 40, 41) (STD) (0.283)	98–99	I (L29, LX2)	8	10114119
15.	0.303	SPRING, VLV (*1, 2, 3, 4, 5, 6, 7, 8, 9, 22, 23, 24, 25, 26, 27, 28) ..	91–94	I (L19, LX2)	1	14097002
	0.303	SPRING, VLV (*1, 2, 3, 4, 5, 6, 7, 8, 9, 22, 23, 24, 25, 26, 27, 28) ..	95–97	I (L19, L29, LX2)	1	14097002
	0.303	SPRING, VLV (*10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 29, 30, 31, 32, 34, 35) (W/DMPR) ...	91–94	I (L19, LX2)	1	14077112
	0.303	SPRING, VLV (*10, 11, 12, 13, 14, 17, 18, 19, 20, 21, 34, 35) (W/DMPR)	95	I (L19, L29, LX2)	1	10213465
	0.303	SPRING, VLV (*10, 14, 16, 17, 18, 19, 20, 32, 34, 35, 37, 38, 39.) (W/O DMPR)	96–97	I (L29, LX2)	1	10240898
	0.303	SPRING, VLV (*14, 40, 41) (W/O DMPR)	98–99	I (L29)	1	10240898
	0.303	SPRING, VLV (*22, 23, 27, 42.) .	98–99	I (L29, LX2)	1	14097002
16.	N.S.	BRACKET, ENG LIFT RR	91–93	I (L19, LX2) (10191694)	1	
	N.S.	BRACKET, ENG LIFT RR	94–95	I (L19, LX2) (10198918)	1	
	N.S.	BRACKET, ENG LIFT RR	96–99	I (L29, LX2) (12551509)	1	
17.	0.004	STUD, ENG LIFT RR BRKT (*1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17,) (3/8X16)	91–93	I (L19)	1	10045714
18.	0.293	BOLT, CYL HD (7/16–14X4.06, 1.3 THD, .725 OD, W/THD SEAL, PO) (7/16–14 X 4.06) (*1, 2, 3, 4, 5, 6, 7, 8, 9, 10)	91–97	I (L19, L29, LX2)	24	10141204
	0.293	BOLT, CYL HD (7/16–14X4.06, 1.3 THD, .725 OD, W/THD SEAL, PO) (7/16–14 X 4.06) (*11, 12, 13, 14, 15, 16, 17, 18, 19, 20) ...	91–97	I (L19, L29, LX2)	24	10141204
	0.293	BOLT, CYL HD (7/16–14X4.06, 1.3 THD, .725 OD, W/THD SEAL, PO) (7/16–14 X 4.06) (*21, 22, 23, 24, 25, 26, 27, 28, 29, 30) ...	91–97	I (L19, L29, LX2)	24	10141204

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	0.293	BOLT, CYL HD (7/16–14X4.06, 1.3 THD, .725 OD, W/THD SEAL, PO) (7/16–14 X 4.06) (*31, 32, 33, 34, 35, 36, 37, 38, 39)	91–97	I (L19, L29, LX2)	24	10141204
	0.293	BOLT, CYL HD (7/16–14X4.06, 1.3 THD, .725 OD, W/THD SEAL, PO) (7/16–14 X 4.06) (*14, 22, 23, 27, 40, 41, 42, 43)	98–99	I (L29, LX2)	24	10141204
19.	0.293	BOLT, CYL HD (7/16–14X2.06, 1.3 THD, .725 OD, W/THD SEAL, PO) (7/16–14 X 2.06)	91–99	I (L19, L29, LX2)	8	10141205
20.	2.270	SPARK PLUG, (TYPE CR43TS) (AC–DELCO #CR43TS)	91–93	I (L19, LX2)	8	5614029
	2.270	SPARK PLUG, (*1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32) (AC–DELCO #MR43T)	91–93	I (L19, LX2)	8	5613438
	2.270	SPARK PLUG, (*1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 17, 22, 23, 24, 25, 26, 27, 28, 32, 34, 35, 37, 38, 39) (AC–DELCO #MR43T)	94–97	I (L19, L29, LX2)	8	5613438
	2.270	SPARK PLUG, (*14, 40) (AC–DELCO #MR43LTS)	98–99	I (L29)	8	5614210
	2.270	SPARK PLUG, (*22, 23, 27, 42) (AC–DELCO #MR43T)	98–99	I (L29, LX2)	8	5613438
	2.270	SPARK PLUG, (*40) (41–932) (AC–DELCO #41–932)	98–99	I (L29)	8	25162556
	2.270	SPARK PLUG, (WITH EXTENDED HEX) (*18, 19, 20, 21)	94–97	I (L19, L29, LX2)	8	5614258
21.	2.251	SHIELD, SPLG WIRE (*20)	94–97	I (L19, L29)	8	10166846
	2.251	SHIELD, SPLG WIRE (LONG) (*20)	91–93	I (L19)	8	465840
	2.251	SHIELD, SPLG WIRE (SHORT) (*20)	91–93	I (L19)	8	3993332
22.	3.275	BOLT, EXH MANIF (*20) (3/8–16X1 3/16) (REQUIRES SEALANT (12345493))	91–97	I (L19)	8	3909821
	3.275	BOLT, EXH MANIF (*20) (3/8–16X1 3/16) (REQUIRES SEALANT (12345493))	96	I (L29)	8	3909821
	3.275	STUD, EXH MANIF (*20) (3/8–16, 5/16–18 X 2 17/64) ...	93–95	I (L19)	8	14103124
	3.275	STUD, EXH MANIF (*20) (3/8–16X1.05)	96–97	I (L19)	15	12554867
23.	0.293	PIN, CYL HD LOC (1/2 X 5/8 O.D.)	91–97	I (L19, L29, LX2)	4	12558081
	0.293	PIN, CYL HD LOC (1/2 X 5/8 O.D.)	98–99	I (L29, LX2)	4	12558081
24.	1.150	PLUG, ENG COOL TEMP IND SW HOLE (HEADLESS SQ SOC, USE W/SEALER #1052080) (8.971) ..	91–97	I (L19, L29, LX2)	2	25522466
	1.150	PLUG, ENG COOL TEMP IND SW HOLE (HEADLESS SQ SOC, USE W/SEALER #1052080) (8.971) ..	98–99	I (L29, LX2)	2	25522466
25.	0.296	VALVE, INT (.003 O.S.) (*40) ...	98–99	I (L29)	8	12551630
	0.296	VALVE, INT (.015 O.S.) (*40) ...	98–99	I (L29)	8	12551631

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	0.296	VALVE, INT (.030 O.S.) (*40) ...	98-99	I (L29)	8	12551632
	0.296	VALVE, INT (PART OF 30) (*18, 19, 20, 21) (STD) (SERVICE NOTE:1.94 DIAMETER)	91-97	I (L19, L29)	8	10114117
	0.296	VALVE, INT (PART OF 30) (*22, 23, 27, 42)	98-99	I (L29, LX2)	8	14097045
	0.296	VALVE, INT (PART OF 30) (1, 2, 3, 4, 5, 6, 7, 8, 9, 22, 23, 24, 25, 26, 27, 28)	91-97	I (L19, L29, LX2)	8	14097045
	0.296	VALVE, INT (PART OF 30) (10, 11, 12, 13, 14, 15, 16, 17, 29, 30, 31, 32, 34, 35, 37, 38, 39) (STD)	91-97	I (L19, LX2)	8	14095491
	DISCON	VALVE, INT (PART OF 30) (10, 11, 12, 13, 14, 15, 16, 17, 29, 30, 31, 32, 34, 35, 37, 38) (.003 O.S.) ...	91-96	I (L19, LX2)	8	14095492
	DISCON	VALVE, INT (PART OF 30) (10, 11, 12, 13, 14, 15, 16, 17, 29, 30, 31, 32, 34, 35, 37, 38) (.015 O.S.) ...	91-96	I (L19, LX2)	8	14095493
	DISCON	VALVE, INT (PART OF 30) (10, 11, 12, 13, 14, 15, 16, 17, 29, 30, 31, 32, 34, 35, 37, 38) (.030 O.S.) ...	91-96	I (L19, LX2)	8	14095494
	DISCON	VALVE, INT (PART OF 30) (10, 14, 17, 32, 37, 38, 39) (.015 O.S.) ...	97	I (L19)	8	14095493
	DISCON	VALVE, INT (PART OF 30) (10, 14, 17, 32, 37, 38, 39) (.030 O.S.) ...	97	I (L19)	8	14095494
	DISCON	VALVE, INT (PART OF 30) (10, 14, 32, 37, 38, 39) (.003 O.S.)	97	I (L19)	8	14095492
	0.296	VALVE, INT (PART OF 30) (14, 40) (STD)	98-99	I (L29)	8	14095491
	0.296	VALVE, INT (STD) (*18, 19, 20) (SERVICE NOTE-2ND SERVICE: 1.66" DIAMETER)	96-97	I (L19, L29)	8	10240894
	0.296	VALVE, INT (STD) (*40)	98-99	I (L29)	8	10240894
26.	0.297	VALVE, EXH	98-99	I (L29, LX2)	8	12554912
	0.297	VALVE, EXH (*1, 2, 3, 4, 5, 6, 7, 8, 9, 22, 23, 24, 25, 26, 27, 28) (STD)	91-97	I (L19, L29, LX2)	8	14097049
	0.297	VALVE, EXH (*1, 2, 3, 4, 5, 6, 7, 8, 9, 22, 23, 24, 25, 26, 27, 28) (.003 O.S.)	91-97	I (L19, L29, LX2)	8	14097050
	0.297	VALVE, EXH (*1, 2, 3, 4, 5, 6, 7, 8, 9, 22, 23, 24, 25, 26, 27, 28) (.015 O.S.)	91-97	I (L19, L29, LX2)	8	14097051
	0.297	VALVE, EXH (*1, 2, 3, 4, 5, 6, 7, 8, 9, 22, 23, 24, 25, 26, 27, 28) (.030 O.S.)	91-97	I (L19, L29, LX2)	8	14097052
	0.297	VALVE, EXH (*10, 11, 12, 13, 14, 15, 16, 17, 29, 30, 31, 32, 34, 35, 37, 38) (STD)	91-95	I (L19, L29)	8	14081040
	0.297	VALVE, EXH (*10, 11, 12, 13, 14, 15, 16, 17, 29, 30, 31, 32, 34, 35, 37, 38) (.003 O.S.)	91-97	I (L19, L29)	8	14091408
	0.297	VALVE, EXH (*10, 11, 12, 13, 14, 15, 16, 17, 29, 30, 31, 32, 34, 35, 37, 38) (.015 O.S.)	91-97	I (L19, L29)	8	14091409
	0.297	VALVE, EXH (*10, 11, 12, 13, 14, 15, 16, 17, 29, 30, 31, 32, 34, 35, 37, 38) (.030 O.S.)	91-97	I (L19, L29)	8	14091410

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	0.297	VALVE, EXH (*10, 14, 17, 32, 34, 35, 37, 38, 39) (STD)	96–97	I (L19, L29)	8	14081040
	0.297	VALVE, EXH (*14, 40) (STD)	98–99	I (L29)	8	14081040
	0.297	VALVE, EXH (*18, 19, 20) (STD) (SERVICE NOTE:1.66" DIAMETER)	91–97	I (L19, L29)	8	10114115
	0.297	VALVE, EXH (*21) (STD)	91–95	I (L19, L29)	8	14077111
	0.297	VALVE, EXH (*22, 23, 27, 42) (STD)	98–99	I (L29, LX2)	8	14097049
	0.297	VALVE, EXH (*22, 23, 27, 42) (.003 O.S.)	98–99	I (L29, LX2)	8	14097050
	0.297	VALVE, EXH (*22, 23, 27, 42) (.015 O.S.)	98–99	I (L29, LX2)	8	14097051
	0.297	VALVE, EXH (*22, 23, 27, 42) (.030 O.S.)	98–99	I (L29, LX2)	8	14097052
	0.297	VALVE, EXH (STD) (*18, 19, 20) (SERVICE NOTE– 2ND SERVICE: 1.72" DIAMETER)	96–97	I (L29)	8	12554912
27.	0.459	LIFTER, VLV (*1, 2, 3, 4, 5, 6, 7, 8, 9, 22, 23, 24, 25, 26, 27, 28) ..	91–95	I (L19, L29)	16	17102353
	0.459	LIFTER, VLV (*1, 2, 6, 7, 8, 22, 23, 25, 27, 28) (AC–DELCO #HL122)	96–97	I (L29, LX2)	16	17120061
	0.459	LIFTER, VLV (*10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 29, 30, 31, 32, 34, 35) (AC–DELCO #HL77A)	91–95	I (L19, LX2)	16	5234200
	0.459	LIFTER, VLV (*10, 14, 17, 18, 19, 20, 32, 34, 35, 37, 38, 39.) (AC–DELCO #HL121)	96–97	I (L29, LX2)	16	17120060
	0.459	LIFTER, VLV (*14, 40, 41) (AC–DELCO #HL121)	98–99	I (L29)	16	17120060
	0.459	LIFTER, VLV (*22, 23, 27, 42) (AC–DELCO #HL122)	98–99	I (L29, LX2)	16	17120061
28.	0.426	ROD, INT VLV PUSH (*1, 2, 3, 4, 5, 6, 7, 8, 9, 22, 23, 24, 25, 26, 27, 28)	91–95	I (L19, LX2)	8	14097068
	0.426	ROD, INT VLV PUSH (*1, 2, 6, 7, 8, 22, 23, 25, 26, 27, 28)	96–97	I (L29, LX2)	8	10227762
	0.426	ROD, INT VLV PUSH (*10, 11, 12, 13, 14, 15, 16, 17, 29, 30, 31, 32, 34, 35)	91–95	I (L19, LX2)	8	14075629
	0.426	ROD, INT VLV PUSH (*10, 14, 17, 18, 19, 20, 32, 34, 35, 37, 38, 39)	96–97	I (L29)	8	10231941
	0.426	ROD, INT VLV PUSH (*14, 22, 23, 27, 40, 41, 42)	98–99	I (L29, LX2)	8	10227762
	0.426	ROD, INT VLV PUSH (*18, 19, 20, 21)	91–95	I (L19)	8	10106423
	0.426	ROD, EXH VLV PUSH (*1, 2, 3, 4, 5, 6, 7, 8, 9, 22, 23, 24, 25, 26, 27, 28)	91–95	I (L19)	8	14097070
	0.426	ROD, EXH VLV PUSH (*1, 2, 6, 7, 8, 22, 23, 25, 26, 27, 28)	96–97	I (L29, LX2)	8	10227763
	0.426	ROD, EXH VLV PUSH (*10, 11, 12, 13, 14, 15, 16, 17, 29, 30, 31, 32, 34, 35)	91–95	I (L19)	8	14075631
	0.426	ROD, EXH VLV PUSH (*10, 14, 17, 18, 19, 20, 32, 34, 35, 37, 38, 39)	96–97	I (L29)	8	10231940

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	0.426	ROD, EXH VLV PUSH (*14, 22, 23, 27, 40, 41, 42)	98-99	I (L29, LX2)	8	10227763
	0.426	ROD, EXH VLV PUSH (*18, 19, 20, 21)	91-95	I (L19)	8	10106425
29.	0.289	GASKET, CYL HD (*1, 2, 3, 4, 5, 22, 23, 24, 25)	91-97	I (L19, L29)	2	14097001
	0.289	GASKET, CYL HD (*14, 22, 23, 27, 41, 42.)	98	I (L29, LX2)	2	12555728
	0.289	GASKET, CYL HD (*18, 19, 20, 21)	91-97	I (L19, L29)	2	12554769
	0.289	GASKET, CYL HD (*22, 23)	98-99	I (LX2)	2	14097001
	0.289	GASKET, CYL HD (*27, 41, 42, 43)	99	I (L29)	2	12555728
	0.289	GASKET, CYL HD (*40)	98-99	I (L29)	2	12554769
	0.289	GASKET, CYL HD (*6, 7, 8, 10, 14, 17, 26, 27, 28, 32, 34, 35, 37, 38, 39.)	96-97	I (L19, L29, LX2)	2	12555728
	0.289	GASKET, CYL HD (*6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 26, 27, 28, 29, 30, 31, 32, 34, 35, 37, 38)	91-95	I (L19, L29, LX2)	2	12555728
	0.289	GASKET KIT, CYL HD (*40) (INCLS CYL HD & INT MANIF GSKTS & VLV SEALS)	99	I (L29)	1	10181395
30.	0.269	HEAD, CYL (MCHG) (*1, 2, 3, 4, 5, 6, 7, 8, 9, 22, 23, 24, 25, 26, 27, 28)	91-93	I (L19, LX2)	2	14096802
	0.269	HEAD, CYL (MCHG) (*1, 2, 3, 4, 5, 6, 7, 8, 9, 22, 23, 24, 25, 26, 27, 28)	94-95	I (L19, L29, LX2)	2	10191660
	0.269	HEAD, CYL (MCHG) (*1, 2, 6, 7, 22, 23, 25, 26, 27, 28)	96-97	I (L19, L29, LX2)	2	10191660
	0.269	HEAD, CYL (MCHG) (*10, 11, 12, 13, 14, 15, 16, 17, 29, 30, 31, 32)	91-93	I (L19)	2	10101136
	0.269	HEAD, CYL (MCHG) (*10, 11, 12, 13, 14, 17, 34, 35, 37, 38)	94-95	I (L19, L29)	2	10191655
	0.269	HEAD, CYL (MCHG) (*10, 14, 17, 32, 34, 35, 37, 38, 39)	96-97	I (L19, L29)	2	10191655
	0.269	HEAD, CYL (MCHG) (*14, 17, 40, 41, 43) (W/O VALVES)	98-99	I (L29)	2	10141280
	0.269	HEAD, CYL (MCHG) (*18, 19, 20) (ORDER COMPONENTS SEPARATELY) (BARE)	91-97	I (L19, L29)	2	10101137
	0.269	HEAD, CYL (MCHG) (*22, 23, 27, 42.)	98-99	I (L29, LX2)	2	10191660
	0.269	HEAD, CYL (W/VLV) (*18, 19, 20) (45 DEGREE EXH VLV SEAT) ...	94-95	I (L19)	2	12552869
	0.269	HEAD, CYL (W/VLV) (*18, 19, 20) (SERVICE NOTE:USE 1998 COMPONENTS WHEN SERVICING THIS HEAD ASSEMBLY.)	96-97	I (L19, L29)	2	12554911
	0.269	HEAD, CYL (W/VLV) (*40)	98-99	I (L29)	2	12554911
	0.269	HEAD, CYL (W/VLV) (INCL 11, 12, 13, 14, 15, 25, 26) (*21) (30 DEGREE EXH VLV SEAT)	91-95	I (L19)	2	12550191
	0.269	HEAD, CYL (W/VLV) (INCL 11, 12, 13, 14, 15, 25, 26) (*21) (45 DEGREE EXH VLV SEAT)	91-95	I (L19)	2	12552869

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	0.269	HEAD, CYL (*14, 17, 18) (W/O VALVES)	96-97	I (L29)	2	10141280
31.	0.439	GUIDE, VLV LFTR PUSH ROD (*1, 2, 3, 4, 5, 6, 7, 8, 9, 22, 23, 24, 25, 26, 27, 28.) (0.426)	91-97	I (L19, L29, LX2)	8	14097005
	0.439	GUIDE, VLV LFTR PUSH ROD (*10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 29, 30, 31, 32) (0.426)	91-93	I (L19, LX2)	8	10114157
	0.439	GUIDE, VLV LFTR PUSH ROD (*10, 11, 12, 13, 14, 17, 18, 19, 20, 21, 32, 34, 35, 37, 38) (0.426)	94-97	I (L19, L29, LX2)	8	10114157
	0.439	GUIDE, VLV LFTR PUSH ROD (*14, 22, 23, 27, 40, 41, 42.) (0.426)	98-99	I (L29, LX2)	8	14097005
32.	0.333	ARM KIT, VLV RKR (*1, 2, 3, 4, 5, 6, 7, 8, 9, 22, 23, 24, 25, 26, 27, 28)	91-97	I (L19, LX2)	16	12523976
	0.333	ARM KIT, VLV RKR (*10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 29, 30, 31, 32, 34, 35)	91-94	I (L19, LX2)	16	12523971
	0.333	ARM KIT, VLV RKR (*10, 11, 12, 13, 14, 17, 18, 19, 20, 21, 32, 34, 35, 37, 38, 39)	95-97	I (L19, L29, LX2)	16	12523971
	0.333	ARM KIT, VLV RKR (*14, 40, 41)	98-99	I (L29, LX2)	16	12523971
	0.333	ARM KIT, VLV RKR (*22; 23, 27, 42)	98-99	I (L29, LX2)	16	12523976
33.	0.429	BALL, VLV RKR ARM	91-94	I (L19, LX2)	16	10114122
	0.429	BALL, VLV RKR ARM	95-97	I (L19, L29, LX2)	16	10213466
	0.429	BALL, VLV RKR ARM (*14, 22, 23, 27, 40, 41, 42)	98-99	I (L29, LX2)	16	10213466
34.	0.429	BOLT, VLV RKR ARM PIV (HFH SHLDR, 3/8-16X.75, 1.79 TL, .56X1.05 SHLDR, .82 OD, 10.9, PL)	91-97	I (L19, L29, LX2)	16	10114123
	0.429	BOLT, VLV RKR ARM PIV (HFH SHLDR, 3/8-16X.75, 1.79 TL, .56X1.05 SHLDR, .82 OD, 10.9, PL)	98-99	I (L29, LX2)	16	10114123
35.	3.270	GASKET, INT MANIF (*14, 17) (SEE KIT 1) (*KIT1) (USED BETWEEN UPPER & LOWER MANIFOLDS)	98-99	I (L29)	2	12534215
36.	3.265	SHIELD, INT MANIF OIL SPH (PART OF 38)	97	I (L19, L29, LX2)	1	346243
	3.265	SHIELD, INT MANIF OIL SPH (*1, 2, 3, 4, 5, 6, 7, 8, 9, 22, 23, 24, 25, 26, 27, 28, 35, 37, 38) (PART OF 38)	91-95	I (L19, LX2)	1	12555320
	3.265	SHIELD, INT MANIF OIL SPH (*1, 2, 6, 7, 8, 10, 14, 17, 18, 19, 20, 22, 23, 25, 26, 27, 28, 34, 35, 37, 38) (PART OF 38)	96-97	I (L19, LX2)	1	12555320
	3.265	SHIELD, INT MANIF OIL SPH (*10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21) (PART OF 38)	91-96	I (L19, L29, LX2)	1	346243
	3.265	SHIELD, INT MANIF OIL SPH (*14, 22, 23, 27, 40, 41, 42) (PART OF 38)	98-99	I (L29, LX2)	1	12555320

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37.	3.601	STUD, EXH MANIF H/SHLD (*10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21)	91-96	I (L19, L29, LX2)	4	10229247
38.	3.265	MANIFOLD, INT (INCL 36, 37) (*10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21)	91-96	I (L19, L29, LX2)	1	14097092
	3.265	MANIFOLD, INT (INCL 36, 37) (*10, 14, 17, 18, 19, 20)	97	I (L19, L29, LX2)	1	14097092
	3.265	MANIFOLD, INT (INCL 36, 37) (*40)	98-99	I (L29)	1	14097092
	3.265	MANIFOLD, INT (INCL 36, 37) (*8)	91-97	I (L19, L29, LX2)	1	3933163
	3.265	MANIFOLD, INT (*32, 39)	96-97	I (L19)	1	10183791
	3.265	MANIFOLD, INT (INCL 36, 37) (*1, 2, 3, 4, 5, 6, 7, 9, 35)	91-95	I (L19, L29, LX2)	1	6269318
	3.265	MANIFOLD, INT (INCL 36, 37) (*1, 2, 6, 7, 35)	96-97	I (L19, L29, LX2)	1	6269318
39.	1.097	CONNECTOR, THERM BYPASS HOSE (*1, 2, 3, 4, 5, 6, 7, 9, 11, 12, 13, 14, 15, 16, 17, 22, 23, 24, 26, 27, 29, 30, 31, 32, 34, 35, 36, 37, 38, 39.) (8.866)	91-97	I (L19, L29, LX2)	1	6272959
	1.097	CONNECTOR, THERM BYPASS HOSE (*14, 22, 23, 27, 40, 41, 42) (8.866)	98-99	I (L29, LX2)	1	6272959
	1.097	CONNECTOR, THERM BYPASS HOSE (*8, 18, 19, 20, 21) (8.866)	91-97	I (L19, L29, LX2)	1	6272959
40.	1.166	CLAMP, THERM BYPASS HOSE (*1, 2, 3, 4, 5, 6, 7, 9, 11, 12, 13, 14, 17, 18, 19, 20, 21, 35) (15.7 TO 31.8 ALL SS) (8.846) (AC-DELCO #12337891)	91-95	I (L19, L29, LX2)	2	12337891
	1.166	CLAMP, THERM BYPASS HOSE (*1, 2, 6, 7, 8, 10, 14, 17, 18, 19, 20, 22, 23, 25, 26, 27, 28, 32, 35, 39.) (15.7 TO 31.8 ALL SS) (8.846) (AC-DELCO #12337891)	96-97	I (L19, L29, LX2)	2	12337891
	1.166	CLAMP, THERM BYPASS HOSE (*14, 22, 23, 27, 40, 41, 42) (15.7 TO 31.8 ALL SS) (8.846) (AC-DELCO #12337891)	98-99	I (L29, LX2)	2	12337891
41.	1.097	HOSE, THERM BYPASS (*1, 2, 3, 4, 5, 6, 7, 9, 11, 12, 13, 14, 17, 18, 19, 20, 21, 35) (8.846)	91-95	I (L19, L29, LX2)	1	1485552
	1.097	HOSE, THERM BYPASS (*1, 2, 6, 7, 14, 15, 16, 17, 18, 20, 32, 39.) (8.846)	97	I (L19, L29, LX2)	1	1485552
	1.097	HOSE, THERM BYPASS (*1, 2, 6, 7, 8, 10, 14, 17, 18, 19, 20, 22, 23, 25, 26, 27, 28, 32, 35, 39.) (8.846)	96	I (L19, L29, LX2)	1	1485552
	1.097	HOSE, THERM BYPASS (*14, 40, 41.) (8.846)	98-99	I (L29)	1	1485552
	1.097	HOSE, THERM BYPASS (*37, 38) (8.846) (PROD 12550662)	96-97	I (L29)	1	1485552
42.	N.S.	BRACKET, ENG LIFT FRT (*8) ..	95	I (L19) (10166836)	1	
	N.S.	BRACKET, ENG LIFT FRT	96	I (L29, LX2) (12551508)	1	
	0.004	BRACKET, ENG LIFT FRT	96-99	I (L19, L29, LX2)	1	10166835

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	0.004	BRACKET, ENG LIFT FRT (*1, 2, 3, 4, 5, 6, 7, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 34, 35)	91–95	I (L19, L29, LX2)	1	10166835
43.	1.073	PLUG, HTR HOSE NIP HOLE (HEADLESS SQ SOC, USE W/SEALER #1052080) (8.971) ..	91–97	I (L19, L29, LX2)	2	25522466
	1.073	PLUG, HTR HOSE NIP HOLE (*18, 19, 20, 21)	94	I (L19)	1	10240430
	1.073	PLUG, HTR HOSE NIP HOLE (*2, 14, 17, 18, 23, 26, 27, 40, 41) (HEADLESS SQ SOC, USE W/SEALER #1052080) (8.971) ..	96–98	I (L29, LX2)	1	25522466
44.	1.153	BOLT, WAT OTLT (*18, 19, 20, 21) (HFH 3/8–16X .88 280 POR 0.75 OD 0.72 THD) (8.900)	91–97	I (L19, L29, LX2)	2	9440169
	1.153	BOLT, WAT OTLT (*40.) (HFH 3/8–16X .88 280 POR 0.75 OD 0.72 THD) (8.900)	98–99	I (L29)	2	9440169
45.	1.153	OUTLET, WAT (*18, 19, 20, 21) (AC–DELCO #15–1570)	91–97	I (L19, L29, LX2)	1	10183720
	1.153	OUTLET, WAT (*40.) (AC–DELCO #15–1570)	98–99	I (L29)	1	10183720
46.	1.154	GASKET, WAT OTLT (*18, 19, 20, 21) (AC–DELCO #10105135) ..	91–97	I (L19, L29)	1	10105135
	1.154	GASKET, WAT OTLT (*40) (AC–DELCO #10105135)	98–99	I (L29)	1	10105135
47.	3.275	BOLT, INT MANIF (HFH, 1/4–20X3.7, 1.57 THD, .050 OD, GM280M GRD 5, GM7114, MACH)	95	I (L19, LX2)	12	12560595
	3.275	BOLT, INT MANIF (HFH, 1/4–20X3.7, 1.57 THD, .050 OD, GM280M GRD 5, GM7114, MACH)	96–99	I (L29, LX2)	12	12560595
	3.275	BOLT, INT MANIF (*1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 17, 18, 19, 20, 21, 35) (3/8–16 X 1.25..68 OD)	91–95	I (L19, L29, LX2)	7	12560470
	3.275	BOLT, INT MANIF (*1, 2, 3, 4, 5, 6, 7, 9, 10, 11, 12, 13, 14, 15, 16, 17, 35) (3/8–16X1.75, 1.12–THD) (8.900)	91–93	I (L19, L29, LX2)	2	9441560
	3.275	BOLT, INT MANIF (*1, 2, 3, 4, 5, 6, 7, 9, 35) (HFH, 3/8–16X1.62, 1.12 THD, 0.76 OD, 280M, POR) (8.900)	94–95	I (L19, L29, LX2)	2	9441547
	3.275	BOLT, INT MANIF (*1, 2, 6, 35) (3/8–16X1.75, 1.12–THD) (8.900)	97	I (L19, L29, LX2)	2	9441560
	3.275	BOLT, INT MANIF (*1, 2, 6, 7, 35) (HFH, 3/8–16X1.62, 1.12 THD, 0.76 OD, 280M, POR) (8.900) ...	96–97	I (L19, L29, LX2)	2	9441547
	3.275	BOLT, INT MANIF (*1, 2, 6, 7, 8, 14, 17, 22, 23, 24, 25, 26, 27, 35.) (3/8–16X1.75, 1.12–THD) (8.900)	96	I (L19, L29, LX2)	2	9441560

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	3.275	BOLT, INT MANIF (*14, 40) (USED TO ATTACH UPR TO LWR MANIFOLD)	98–99	I (L29)	8	12558618
	3.275	BOLT, INT MANIF (*14, 40, 41) (3/8–16 X 1.25..68 OD)	98–99	I (L29)	12	12560470
	3.275	BOLT, INT MANIF (*40) (HFH 3/8–16X1.38 280M PZOR) (8.900)	98–99	I (L29)	1	9439918
	3.275	BOLT, INT MANIF (*6, 7, 8, 10, 11, 12, 13, 14, 17, 22, 23, 24, 25, 26, 27, 28.) (3/8–16X1.75, 1.12–THD) (8.900)	95	I (L19, L29, LX2)	2	9441560
	3.275	BOLT, INT MANIF (*6, 7, 8, 14, 17, 22, 23, 25, 26, 27, 28) (HEX 3/8–16X5 1/4 300M PS 1.00 THD) (8.900)	96	I (L19)	AR	9441546
	3.275	BOLT, INT MANIF (*8, 10, 14, 17, 18, 19, 20, 32, 39.) (3/8–16 X 1.25..68 OD)	96–97	I (L19, L29, LX2)	7	12560470
48.	0.004	BOLT, ENG LIFT RR BRKT (HFH, 7/16X.88, .70 THD, .86 OD, 300M, PC) (8.900)	91–95	I (L19, LX2)	AR	9442448
	0.004	BOLT, ENG LIFT RR BRKT (HFH, 7/16X.88, .70 THD, .86 OD, 300M, PC) (8.900)	96–99	I (L29, LX2)	AR	9442448
	0.004	BOLT, ENG LIFT FRT BRKT (*1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32) (, POR) (HFH, 3/8–16X 7/8, 300M) (8.900)	91–93	I (L19)	AR	9440329
	0.004	BOLT, ENG LIFT FRT BRKT (*14, 22, 23, 40, 41, 42) (, POR) (HFH, 3/8–16X 7/8, 300M) (8.900)	97–99	I (L29, LX2)	AR	9440329
	0.004	BOLT, ENG LIFT FRT BRKT (*14, 40, 41) (HFH 3/8–16X .88 280 POR 0.75 OD 0.72 THD) (8.900)	98–99	I (L29)	2	9440169
	0.004	BOLT, ENG LIFT FRT BRKT (*18, 19, 20) (HFH 3/8–16X .88 280 POR 0.75 OD 0.72 THD) (8.900)	96–97	I (L29, LX2)	2	9440169
	0.004	BOLT, ENG LIFT FRT BRKT (*18, 19, 20, 21) (HFH, 7/16X.88, .70 THD, .86 OD, 300M, PC) (8.900)	91–93	I (L19)	AR	9442448
	0.004	BOLT, ENG LIFT FRT BRKT (*22, 23) (8.900)	98–99	I (L29)	AR	9424330
	0.004	BOLT, ENG LIFT FRT BRKT (*22, 23, 24, 25, 26, 27, 28, 34) (8.900)	94–95	I (L19)	AR	9424330
	0.004	BOLT, ENG LIFT FRT BRKT (*22, 23, 25, 26, 27, 28, 37, 38.) (8.900)	96–97	I (L19)	AR	9424330
49.	0.429	STUD, VLV RKR ARM PIV (0.413)	91–97	I (L19, L29, LX2)	1	10198929
	0.429	STUD, VLV RKR ARM PIV (0.413)	98–99	I (L29, LX2)	1	10198929
50.	0.303	SHIM, VLV SPR (*1, 2, 3, 4, 5, 6, 7, 8, 9, 22, 23, 24, 25, 26, 27, 28)	91–97	I (L19, L29, LX2)	8	3875916
	0.303	SHIM, VLV SPR (*22, 23, 27, 42)	98–99	I (L29, LX2)	8	3875916

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51.	0.429	**NUT**, VLV RKR ARM (FOR 2ND SERV AFTER CYL HD, CYL BLK, VLV OR VLV SEAT GRINDING TO CONVERT ENG TO ADJ LASH VLV SYS. SEE CHEV SERV BULLETIN 92–354–6A FOR FURTHER INF	91–97 I (L19, L29, LX2)	16	**10198930**
	0.429	**NUT**, VLV RKR ARM (FOR 2ND SERV AFTER CYL HD, CYL BLK, VLV OR VLV SEAT GRINDING TO CONVERT ENG TO ADJ LASH VLV SYS. SEE CHEV SERV BULLETIN 92–354–6A FOR FURTHER INF	98–99 I (L29, LX2)	16	**10198930**
52.	3.270	**GASKET**, EXH MANIF (NEVER USED IN PRODUCTION, USED FOR SERVICE, OEM SPECIAL PRODUCTS)	91–94 I (L19, L29, LX2)	2	**12551449**
	3.270	**GASKET**, EXH MANIF (NEVER USED IN PRODUCTION, USED FOR SERVICE, OEM SPECIAL PRODUCTS) (*20)	95–97 I (L19)	2	**12551449**
53.	0.439	**GUIDE**, VLV LFTR (RESTRICTOR VLV ROT)	96–99 I (L29, LX2)	8	**12551397**
54.	0.004	**BOLT**, ENG LIFT FRT BRKT (*1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32) (, POR) (HFH, 3/8–16X 7/8, 300M) (8.900)	91–93 I (L19)	AR	**9440329**
	0.004	**BOLT**, ENG LIFT FRT BRKT (*14, 22, 23, 40, 41, 42) (, POR) (HFH, 3/8–16X 7/8, 300M) (8.900)	97–99 I (L29, LX2)	AR	**9440329**
	0.004	**BOLT**, ENG LIFT FRT BRKT (*14, 40, 41) (HFH 3/8–16X .88 280 POR 0.75 OD 0.72 THD) (8.900)	98–99 I (L29)	2	**9440169**
	0.004	**BOLT**, ENG LIFT FRT BRKT (*18, 19, 20) (HFH 3/8–16X .88'280 POR 0.75 OD 0.72 THD) (8.900)	96–97 I (L29, LX2)	2	**9440169**
	0.004	**BOLT**, ENG LIFT FRT BRKT (*18, 19, 20, 21) (HFH, 7/16X.88, .70 THD, .86 OD, 300M, PC) (8.900)	91–93 I (L19)	AR	**9442448**
	0.004	**BOLT**, ENG LIFT FRT BRKT (*22, 23) (8.900)	98–99 I (L29)	AR	**9424330**
	0.004	**BOLT**, ENG LIFT FRT BRKT (*22, 23, 24, 25, 26, 27, 28, 34) (8.900)	94–95 I (L19)	AR	**9424330**
	0.004	**BOLT**, ENG LIFT FRT BRKT (*22, 23, 25, 26, 27, 28, 37, 38.) (8.900)	96–97 I (L19)	AR	**9424330**
55.	3.275	**STUD**, EXH MANIF (*20) (3/8–16, 5/16–18 X 2 17/64) ...	93–95 I (L19)	8	**14103124**
	3.275	**STUD**, EXH MANIF (*20) (3/8–16X1.05)	96–97 I (L19)	15	**12554867**
56.	3.604	**NUT**, EXH MANIF (HFH, 3/8–16X.425, .8 DIA, GM301M, GM7111M, PREV TORQUE) (HEX 3/8–16) (8.917)	95–97 I (L19, L29)	15	**9442946**
59.	N.S.	**GASKET**, INT MANIF (*KIT1) ...	.....		
60.	N.S.	**GASKET**, INT MANIF (*KIT1) ...	.....		

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61.	3.265	MANIFOLD, LWR INT (*14, 17, 41)	98–99	I (L29)	1	12557391
62.	3.275	BOLT, INT MANIF (HFH, 1/4–20X3.7, 1.57 THD, .050 OD, GM280M GRD 5, GM7114, MACH)	95	I (L19, LX2)	12	12560595
	3.275	BOLT, INT MANIF (HFH, 1/4–20X3.7, 1.57 THD, .050 OD, GM280M GRD 5, GM7114, MACH)	96–99	I (L29, LX2)	12	12560595
	3.275	BOLT, INT MANIF (*1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 17, 18, 19, 20, 21, 35) (3/8–16 X 1.25..68 OD)	91–95	I (L19, L29, LX2)	7	12560470
	3.275	BOLT, INT MANIF (*1, 2, 3, 4, 5, 6, 7, 9, 10, 11, 12, 13, 14, 15, 16, 17, 35) (3/8–16X1.75, 1.12–THD) (8.900)	91–93	I (L19, L29, LX2)	2	9441560
	3.275	BOLT, INT MANIF (*1, 2, 3, 4, 5, 6, 7, 9, 35) (HFH, 3/8–16X1.62, 1.12 THD, 0.76 OD, 280M, POR) (8.900)	94–95	I (L19, L29, LX2)	2	9441547
	3.275	BOLT, INT MANIF (*1, 2, 6, 35) (3/8–16X1.75, 1.12–THD) (8.900)	97	I (L19, L29, LX2)	2	9441560
	3.275	BOLT, INT MANIF (*1, 2, 6, 7, 35) (HFH, 3/8–16X1.62, 1.12 THD, 0.76 OD, 280M, POR) (8.900)	96–97	I (L19, L29, LX2)	2	9441547
	3.275	BOLT, INT MANIF (*1, 2, 6, 7, 8, 14, 17, 22, 23, 24, 25, 26, 27, 35.) (3/8–16X1.75, 1.12–THD) (8.900)	96	I (L19, L29, LX2)	2	9441560
	3.275	BOLT, INT MANIF (*14, 40) (USED TO ATTACH UPR TO LWR MANIFOLD)	98–99	I (L29)	8	12558618
	3.275	BOLT, INT MANIF (*14, 40, 41) (3/8–16 X 1.25..68 OD)	98–99	I (L29)	12	12560470
	3.275	BOLT, INT MANIF (*40) (HFH 3/8–16X1.38 280M PZOR) (8.900)	98–99	I (L29)	1	9439918
	3.275	BOLT, INT MANIF (*6, 7, 8, 10, 11, 12, 13, 14, 17, 22, 23, 24, 25, 26, 27, 28.) (3/8–16X1.75, 1.12–THD) (8.900)	95	I (L19, L29, LX2)	2	9441560
	3.275	BOLT, INT MANIF (*6, 7, 8, 14, 17, 22, 23, 25, 26, 27, 28) (HEX 3/8–16X5 1/4 300M PS 1.00 THD) (8.900)	96	I (L19)	AR	9441546
	3.275	BOLT, INT MANIF (*8, 10, 14, 17, 18, 19, 20, 32, 39.) (3/8–16 X 1.25..68 OD)	96–97	I (L19, L29, LX2)	7	12560470
63.	N.S.	RAIL, F/INJN FUEL (SEE GROUP 3.000 "FUEL RAIL"FOR DETAIL PART LIST)				
64.	3.330	STUD, F/INJN FUEL RL (*14, 17, 41) (6/16=18X17.5MM, M8X1.25X16, 280M, POR) (2.183) (AC–DELCO #14103198)	98–99	I (L29)	1	14103198

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65.	3.330	BOLT, F/INJN FUEL RL (AC–DELCO #21007109)	98–99	I (L29)	1	21007109
66.	3.330	BOLT, F/INJN FUEL RL (HFH 1/4–20X.62 280M POR) (8.900)	98–99	I (L29)	2	9440033
67.	N.S.	GASKET, INT MANIF (*KIT1, KIT2)				
68.	3.726	STUD, TBI (*14, 17) (3.336)	98–99	I (L29)	3	12551917
70.	3.336	GASKET, THROT BODY (*14, 17, 41) (AC–DELCO #40–732)	98–99	I (L29)	1	12551240
	3.336	GASKET, THROT BODY (*6, 7, 8, 10, 11, 12, 13, 14, 17, 22, 23, 24, 25, 26, 27, 28.) (AC–DELCO #40–718)	95–96	I (L19)	4	10105379
71.	N.S.	BODY, THROT (SEE GROUP 3.000 "THROTTLE BODY"FOR DETAIL PART LIST)				
72.	3.336	NUT, THROT BODY	91–99			
73.	3.265	MANIFOLD, UPR INT (*14, 17, 41)	98–99	I (L29)	1	12558835
74.	3.275	BOLT, INT MANIF (*14, 40) (USED TO ATTACHED UPR TO LWR MANIFOLD)	98–99	I (L29)	8	12558618
75.	3.680	GASKET, EGR VLV (*14, 17, 41) (AC–DELCO #219–175)	98–99	I (L29)	1	3522442
	3.680	GASKET, EGR VLV (*2, 6, 7, 8, 10, 14, 20, 23, 25, 26, 27, 34.) (AC–DELCO #219–175)	96	I (L19)	1	3522442
	3.680	GASKET, EGR VLV (*32, 39) (AC–DELCO #219–175)	97	I (L29)	1	3522442
76.	3.671	COVER, EGR VLV OPG (*32, 39)	96–97	I (L19)	1	10239188
	3.671	COVER, EGR VLV OPG (USED W/O EGR VALVE) (*14, 41)	98–99	I (L29)	1	12554606
77.	3.671	BOLT, EGR VLV (*14, 17, 41) (5/16–18 X 7/8, 300M) (8.900)	98–99	I (L29)	2	9442184
	3.671	BOLT, EGR VLV (*32, 39) (5/16–18 X 7/8, 300M) (8.900)	96–97	I (L19)	2	9442184
79.	0.459	RETAINER, VLV LFTR GDE (1 PC) (RESTRICTOR)	96–99	I (L29, LX2)	1	12551399
80.	0.459	BOLT, VLV LFTR GDE RET (HFH 5/16–18X.62 280M POR DIM A–.48 .65 OD) (8.900) (AC–DELCO #9440224)	96–97	I (L19, L29)	1	9440224
	0.459	BOLT, VLV LFTR GDE RET (HFH 5/16–18X062 280M POR DIM A–.48 .65 OD) (8.900) (AC–DELCO #9440224)	98–99	I (L29, LX2)	4	9440224
81.	3.265	PLUG, INT MANIF WAT PASG HOLE (*14, 17.) (HEADLESS SQ SOC, USE W/SEALER #1052080) (8.971)	98–99	I (L29)	1	25522466
	3.265	PLUG, INT MANIF WAT PASG HOLE (*14, 41.) (3/4–14, STEEL) (SQ SOCKET DRAIN) (8.971) (AC–DELCO #9409961)	98–99	I (L29)	1	9409961

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SERVICE KITS

1.	3.270	GASKET KIT, INT MANIF (*1, 2, 3, 4, 5, 6, 7, 8, 9) (INCLS 59, 60)	91–93	I (L19, LX2)	1	
	3.270	GASKET KIT, INT MANIF (*1, 2, 3, 4, 5, 6, 7, 8, 9, 35) (INCLS 59, 60)	94–95	I (L19, L29, LX2)	1	
	3.270	GASKET KIT, INT MANIF (*1, 2, 6, 7, 8, 35) (INCLS 59, 60)	96–97	I (L29)	1	
	3.270	GASKET KIT, INT MANIF (*10, 11, 12, 13, 14, 15, 16, 17) (INCLS 59, 60)	91–93	I (L19, LX2)	1	
	3.270	GASKET KIT, INT MANIF (*10, 11, 12, 13, 14, 17) (INCLS 59, 60)	95	I (L19)	1	
	3.270	GASKET KIT, INT MANIF (*10, 14, 17) (INCLS 59, 60)	96	I (L19, L29)	1	
	3.270	GASKET KIT, INT MANIF (*10, 14, 17) (INCLS 59, 60)	96–97	I (L29)	1	
	3.270	GASKET KIT, INT MANIF (*14, 41) (INCLS 59, 60)	98–99	I (L29)	1	
	3.270	GASKET KIT, INT MANIF (*18, 19, 20) (INCLS 59, 60)	96–97	I (L19, L29)	1	
	3.270	GASKET KIT, INT MANIF (*18, 19, 20, 21) (INCLS 59, 60)	91–95	I (L19, L29)	1	
	3.270	GASKET KIT, INT MANIF (*22, 23, 26, 27) (INCLS 59, 60)	98–99	I (L29, LX2)	1	
	3.270	GASKET KIT, INT MANIF (*37, 38) (INCLS 59, 60) (PROD 12550662)	96–97	I (L19, L29)	1	
	3.270	GASKET KIT, INT MANIF (*40) (INCLS 59, 60)	98	I (L29)	1	
	3.270	GASKET KIT, INT MANIF (*40) (INCLS 6, 29, 35) (INCLS 59, 60) (FOA)	99	I (L29)	1	
2.	3.270	GASKET, INT MANIF (*14, 17) (INCL 67) (USED BETWEEN UPPER & LOWER MANIFOLDS)	98–99	I (L29)	2	12534215

NOTE 1: 8.2L 502 CID MARINE ENG. 1991 10183766 (1FH); 1992 10183798 (2FH), 1993 10191690 (3FH),1994 10198980 (4FH),1995 10171040 (5FH),1996 10214121 (6FH),1997 12551888 (7FH).
NOTE 2: 8.2L 502 CID MARINE ENG. 1991 10183768 (1FJ); 1992 10183800 (2FJ); 1993 10191691 (3FJ),1994 10198981 (4FJ),1995 10171041 (5FJ),1996 10214122 (6FJ),1997 12551889 (7FJ).
NOTE 3: 8.2L 502 CID MARINE ENG. 1991 14096901 (1FC); 1992 14097135 (2FC); 1993 10191681 (3FC),1994 10183785 (4FC),1995 10171037 (5FC).
NOTE 4: 8.2L 502 CID MARINE ENG. 1991 14096902 (1FD); 1992 14097136 (2FD); 1993 10191682 (3FD),1994 10198978 (4FD),1995 10171038 (5FD).
NOTE 5: 8.2L 502 CID MARINE ENG. 1991 14097067 (1FF); 1992 14097137 (2FF); 1993 10191683 (3FF),1994 10198979 (4FF),1995 10171039 (5FF).
NOTE 6: 7.4L 454 CID MARINE ENG. 1991 14096800 (1XA); 1992 14097121 (2XA); 1993 10183771 (3XA),1994 10191652 (4XA),1995 10171026 (5XA),1996 10214106 (6XA),1997 12551877 (7XA).
NOTE 7: 7.4L 454 CID MARINE ENG. 1991 14096811 (1XF); 1992 14097122 (2XF); 1993 10191670 (3XF),1994 10198966 (4XF),1995 10171027 (5XF),1996 10214107 (6XF),1997 12551878 (7XF).
NOTE 8: 7.4L 454 CID MARINE ENG. 1991 14096886 (1XH); 1992 14097123 (2XH), 1993 10191671 (3XH),1994 10198967 (4XH),1995 10171025 (5XH),1996 10214104 (6XH),1997 12551879 (7XH).
NOTE 9: 7.4L 454 CID MARINE ENG. 1991 14096889 (1XC); 1992 14097126 (2XC); 1993 10191672 (3XC),1994 10198968 (4XC),1995 10171028 (5XC).
NOTE 10: 7.4L 454 CID MARINE ENG. 1991 14096891 (1XK); 1992 14097127 (2XK); 1993 10191673 (3XK),1994 10191653 (4XK),1995 10171029 (5XK),1996 10214109 (6XK),1997 12551881 (7XK).
NOTE 11: 7.4L 454 CID MARINE ENG. 1991 14096892 (1XN); 1992 14097128 (2XN); 1993 10191674 (3XN),1994 10198970 (4XN),1995 10171030 (5XN).
NOTE 12: 7.4L 454 CID MARINE ENG. 1991 14096893 (1XR); 1992 14097129 (2XR); 1993 10191675 (3XR),1994 10198965 (4XR),1995 10171031 (5XR).
NOTE 13: 7.4L 454 CID MARINE ENG. 1991 14096894 (1XS); 1992 14097130 (2XS); 1993 10191676 (3XS),1994 10198972 (4XS),1995 10171032 (5XS).
NOTE 14: 454 MARINE ENG.1991 14096895 (1XY),1992 14097131 (2XY),1993 10191677 (3XY),1994 10198973 (4XY),1995 10171033 (5XY),1996 10214113 (6XY),1997 12551882 (7XY),1998 12554435 (8X

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NOTE 15: 7.4L 454 CID MARINE ENG. 1991 14096896 (1XZ); 1992 14097132 (2XZ); 1993 10191678 (3XZ).
NOTE 16: 7.4L 454 CID MARINE ENG. 1991 14096897 (1XG); 1992 14097133 (2XG); 1993 10191679 (3XG).
NOTE 17: 7.4L 454 CID MARINE ENG. 1991 14096989 (1XW); 1992 14097134 (2XW); 1993 10191680 (3XW),1994 10198976 (4XW),1995 10171036 (5XW),1996 10214116 (6XW),1997 12551883 (7XW).
NOTE 18: 7.4L 454 CID INDUSTRIAL ENG. 1991 14096990 (1XD),1992 14097138 (2YD),1993 10191684 (3YD),1994 10198962 (4YD),1995 10171022 (5YD),1996 10214099 (6YD),1997 12551869 (7YD).
NOTE 19: 7.4L 454 CID INDUSTRIAL ENG. 1991 14096991 (1XJ); 1992 14097139 (2YJ); 1993 10191685 (3YJ),1994 10198963 (4YJ),1995 10171023 (5YJ),1996 10214101 (6YJ),1997 12551871 (7YJ).
NOTE 20: 7.4L 454 CID INDUSTRIAL ENG. 1991 14096992 (1XT); 1992 14097140 (2YT); 1993 10191686 (3YT),1994 10198964 (4YT),1995 10171024 (5YT),1996 10214103 (6YT),1997 12551873 (7YT).
NOTE 21: 7.4L 454 CID INDUSTRIAL ENG. 1991 14096993 (1XU); 1992 14097141 (2YU); 1993 10191687 (3YU),1994 10191665 (4YU),1995 10171021 (5YU).
NOTE 22: 8.2L 502 CID MARINE ENG. 1993 10222246 (3HJ),1994 10223083 (4HJ),1995 10235248 (5HJ),1996 12550133 (6HJ),1997 12551890 (7HJ),1998 12554502 (8HJ),1999 12556979 (9HJ).
NOTE 23: 8.2L 502 CID MARINE ENG. 1993 10222247 (3HH),1994 10223080 (4HH),1995 10235245 (5HH),1996 12550130 (6HH),1997 12551891 (7HH),1998 12554503 (8HH),1999 12556980 (9HH).
NOTE 24: 8.2L 502 CID MARINE ENG. 1993 10222248 (3HD),1994 10223082 (4HD),1995 10235247 (5HD).
NOTE 25: 8.2L 502 CID MARINE ENG. 1993 10222249 (3HC),1994 10223081 (4HC),1995 10235246 (5HC),1996 12550131 (6HC),1997 12551892 (7HC).
NOTE 26: 7.4L 454 CID MARINE ENG. 1993 10222250 (3UA),1994 10223073 (4UA),1995 10235239 (5UA),1996 12550126 (6UA),1997 12551884 (7UA).
NOTE 27: 7.4L 454 CID MARINE ENG. 1993 10222251 (3UF),1994 10223074 (4UF),1995 10235240 (5UF),1996 12550127 (6UF),1997 12551885 (7UF),1998 12554543 (8UF),1999 12556971 (9UF).
NOTE 28: 7.4L 454 CID MARINE ENG. 1993 10222252 (3UH),1994 10223075 (4UH),1995 10235241 (5UH),1996 12550128 (6UH),1997 12551886 (7UH).
NOTE 29: 7.4L 454 CID MARINE ENG. 1993 10222253 (3UW).
NOTE 30: 7.4L 454 CID MARINE ENG. 1993 10222254 (3UY).
NOTE 31: 7.4L 454 CID MARINE ENG. 1993 10222255 (3UZ).
NOTE 32: 7.4L 454 CID MARINE ENG. 1993 10222256 (3UK), 1996 12555754 (6UK),1997 12555756 (7UK).
NOTE 34: 7.4L 454 CID MARINE ENG. 1994 10232164 (4UB),1995 10235249(5UB),1996 12550129 (6UB).
NOTE 35: 7.4L 454 CID MARINE ENG. 1994 12550678 (4XX),1995 12550679 (5XX),1996 12551657 (6XX).
NOTE 36: FOR SECOND SERVICE AFTER CYL HEAD,CYL BLOCK,VALVE,OR VALVE SEAT GRINDING.TO CONVERT ENGINE TO ADJUSTABLE LASH VALVE SYSTEM.SEE CHEV.SERV BULLETIN NO.92–254–6A FOR FURTHER I
NOTE 37: 7.4L 454 CID MARINE ENG. 1995 12553496 (5U6), 1996 12553498 (6UD),1997 12553500 (7UD).
NOTE 38: 7.4L 454 CID MARINE ENG. 1995 12553495 (5UC),1996 12553497 (6UC),1997 12553499 (7UC).
NOTE 39: 7.4L 454 CID MARINE ENG. 1996 12555753 (6UJ),1997 12555755 (7UJ).
NOTE 40: 7.4L 454 CID INDUSTRIAL ENG. 1998 12554419 (8YD),1999 12556953 (9YD).
NOTE 41: 7.4L 454 CID INDUSTRIAL ENG. 1998 12554451 (8XW),1999 12556969 (9XW).
NOTE 42: 7.4L 454 CID INDUSTRIAL ENG. 1998 12554452 (8UA),1999 12556970 (9UA).
NOTE 43: 7.4L 454 CID MARINE ENG. ,1999 12556967 (9XY).

RPO DEFINITIONS

LX2 – ENGINE,8.2L(8.2),V8(T.B.I.)
L19 – ENGINE,7.4L(7.4N),V8(E.F.I.)
L19 – ENGINE,7.4L(7.4N),V8 (TBI)
L29 – ENGINE,GAS,8 CYL,7.4L(7.4J)MFI

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5.1 VELOCITY GOVERNOR

The SENSITIVITY ADJUSTMENT is factory set and sealed to cover a range of engine speeds. Only in rate instances should the sensitivity adjustment be changed. To readjust the sensitivity setting proceed as follows:

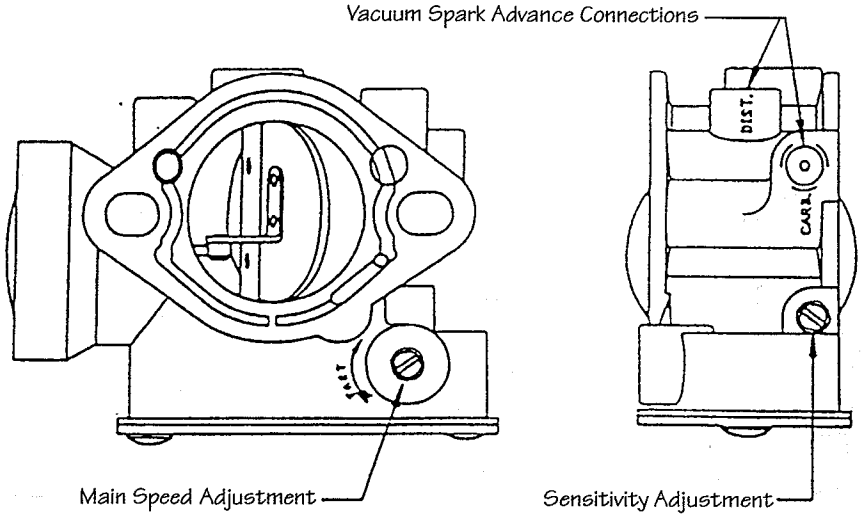
1. Remove the plug covering the sensitivity adjusting screw by carefully drilling a 1/8 diameter hole thru the center of the plug and prying the plug out.

2. If engine is too sensitive, turn the SENSITIVITY SCREW 1/4 turn clockwise, and readjust the MAIN ADJUSTMENT to obtain the desired speed. End each adjustment with a clockwise turn of the screw. Repeat as needed.

3. If the engine speed drops excessively when loaded, turn the SENSITIVITY SCREW 1/2 turn counter-clockwise, then turn this screw 1/4 turn clockwise. Readjust the MAIN ADJUSTMENT to obtain the desired speed. End each adjustment with a clockwise turn of the screw. Repeat this procedure as needed.

4. When all adjustments are completed, seal the adjusting screws using HOOF SEAL KIT 200-940. If the seal kit is not available, seal each screw by forcing SILICONE SEALER into the cavity around the screw. Sealer must enter the screw slot to lock the screw from turning.

   NOTE: If spark advance ports in governor are not used, plug these holes in the governor with 1/8" pipe plugs.
   Also, if carburetor has vacuum controlled power jets, plug the connecting channel in the carburetor flange so that the power jet hole vents to the vacuum channel on the governor flange through a slotted gasket.



INSTRUCTION SHEET

REMOVE: Air cleaner and carburetor, after disconnecting throttle linkage, choke cable, spark advance tubing, and fuel line. Also remove and discard the old gasket and studs.

INSTALL: Long studs, gasket, governor, gasket, aluminum spacer (if needed for carburetor linkage clearance), gasket, and carburetor. Also install drilled brass nut on one carburetor stud.

CONNECT: Fuel line, choke cable, throttle linkage, and vacuum spark-advance tubing.

CHECK: Carburetor for smooth throttle action to wide open position, and choke control linkage.

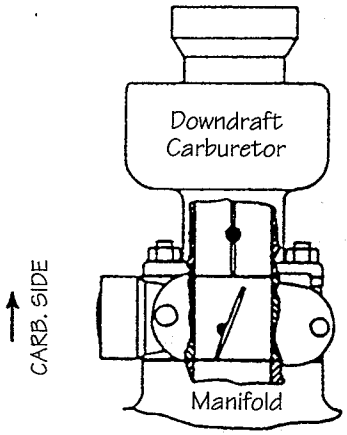
START: The engine. check for fuel and vacuum leaks. Allow the engine to warm up to normal operating temperature.

ADJUST: Governor for required engine speed with carburetor wide open. Turn governor adjusting screw clockwise for higher speeds, and counter-clockwise for lower speeds. Always end any speed adjustment with a clockwise turn of the screw to remove lost motion within the governor linkage.

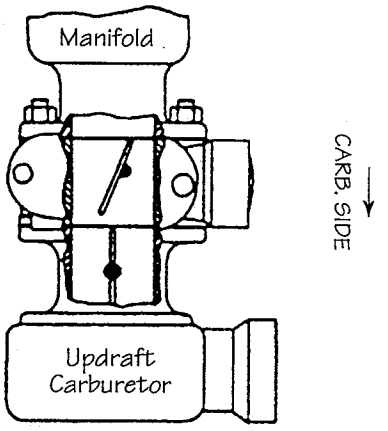
SEAL: Governor to engine by passing seal wire (Kit 200-481) through hole in brass nut, around carburetor body, and through two holes in Hoof Seal Body. Twist wire ends together and snip off excess wire. Snap Seal Cover over Seal Body.

INSTALL: Air cleaner. Road test the vehicle, and make final speed adjustments as needed. Recheck to fuel or vacuum leaks.

SEAL: Governor adjustment by placing Brass Locking Disc (Kit 200-940) on top of adjusting screw so that tang on disc is located in slot of screw. Then place Expansion Plug over Brass Disc and tap the plub with a 1/4" diameter punch and hammer to set the plug in place.



NOTE:
Arrow cast on side of governor must always point toward carburetor.



5.2 ELECTRONIC GOVERNOR

225 SERIES ELECTRONIC ACTUATOR

INTRODUCTION

The 225 Series actuator is a rotary output, linear torque proportional electric servo designed for mechanical actuation of fuel system control levers. The actuator is energized by appropriate speed control unit signals, and is capable of 25 degrees rotation.

INSTALLATION

the actuator must be rigidly mounted as close as possible to the engine throttle lever. When selecting the mounting location, consideration must be given to possible linkage obstructions.

The linkage should be direct, short, and as light as possible. Low friction rod end bearings should be used throughout the linkage system.

The linkage should be adjusted so that the fuel control minimum fuel and maximum fuel stops are used rather than the internal actuator stops.

A. Drill the actuator mounting holes in a pre-fabricated mounting bracket. Mounting hole configuration is illustrated in Diagram 4. The position of the actuator on the mounting bracket should insure minimal misalignment between each end of the governor system linkage. The linkage ball bearing rod ends can tolerate a maximum misalignment of 10 degrees.

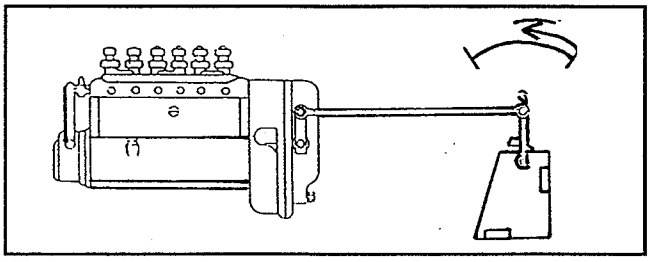
B. Affix the actuator bracket to the selected location on engine.

C. Attach the actuator securely to the mounting bracket.

D. Adjust and secure the linkage rod and rod end bearings. For proportional actuators to operate with linear control systems, it is important to obtain a linear relationship between actuator stroke and fuel delivery.

Diesel Fuel Systems

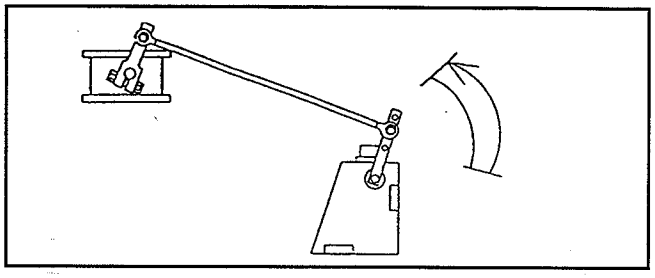
For diesel fuel systems, the linkage configuration is typically linear. The actuator lever should be nearly parallel to the fuel control lever and perpendicular to the linkage rod at the mid fuel position. See Diagram 1.



Fuel Control Lever At Mid Fuel Position
DIAGRAM 1

Carbureted Fuel Systems

For carbureted fuel systems, the linkage is typically non-linear. The ideal linkage relationship is for the carburetor butterfly valve lever to be parallel with the actuator lever and the linkage rod to be perpendicular to the actuator lever at maximum fuel position. See Diagram 2.



Carburetor Fuel Valve At Mid Fuel Position
DIAGRAM 2

The actuators with 2 pin connectors are prewired for 12 or 24V. Use the included harness to connect the actuator to the speed control unit.

E. Fabricate a cable harness to connect the speed control unit to the actuator. The recommended wire size of the cable harness is at least #16 gauge (1.5 mm) for 12 volt systems and #18 (1.0 mm) for 24 volt systems. The wiring must be capable of handling typical current levels of 8 amps for 112 volt systems and 4 amps for 24 volt systems without experiencing a significant voltage drop. Larger gauge wire will be necessary for cable lengths greater than 10 ft. (3 meters).

If an actuator with a military connector is used, the electrical connector EC 1000 must be prewired in a configuration to match the system voltage supply. See Diagram #.

32 Volt Operation

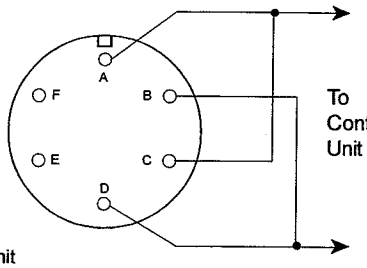
Wire the actuator electrical connector as illustrated for 24 Volt operation. A 1.5 ohm, 25 Watt resistor must be added in series with pin A of actuator and the output terminal of the speed control unit.

F. Connect A and D of the military connector or the 2 pin connector harness to the speed control unit. Refer to applicable speed control unit literature.

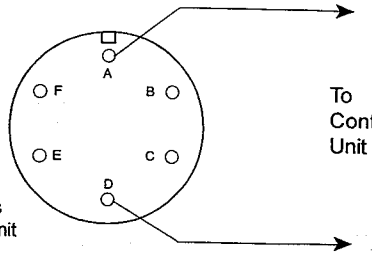
Before Starting The Engine

G. Push the actuator lever to the maximum full fuel position. Upon release, the linkage should return smoothly to minimum fuel position. Recheck the linkage to insure both the linkage and the levers are securely fastened and that no binding is present.

DIAGRAM 3
Military Connector Wiring



12 Volt Operation
A to C
B to D
A & D to output terminals
of speed control unit



24 Volt Operation
B to C
A & D to output terminals
of speed control unit

LINKAGE ADJUSTMENT

The linkage can be optimized by adjusting for an actuator current difference from no engine load to full engine load of approximately 2 amps for 12 volt systems or 1 amp for 24 volt systems.

The no load current is altered by varying the length of the linkage, and the range is adjusted by changing the hole used by the rod end bearing on the actuator lever.

Smaller angles of actuator travel may improve transient performance, but will reduce the force available at the fuel control lever. Adjusting the actuator to operate through at least one half (12 degrees) of its stroke will provide near optimum response.

TROUBLESHOOTING

If the governor system fails to operate, make the following tests at the actuator mounted connector while moving the actuator through its stroke.

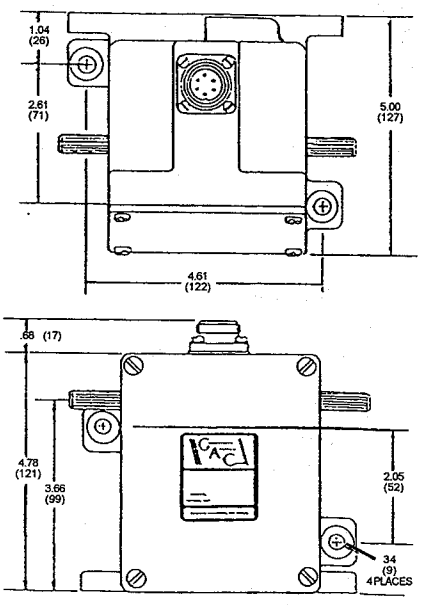
Measure the Resistance

ACB 225/ADB 225	
A to B	2.5 ohms
C to D	2.5 ohms
A to C	Infinity
A to Housing	Infinity
C to Housing	Infinity

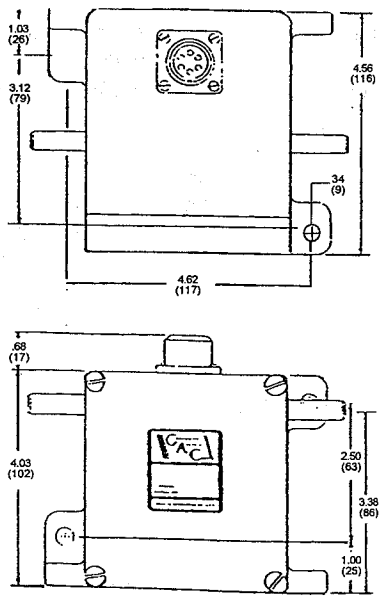
ADC 225	
Red to White (12V)	1.25 ohms
Red to White (24V)	5.0 ohms
Red to Housing	Infinity
White to Housing	Infinity

Energize the actuator to full fuel (follow steps in control unit publication) and manually move the actuator through its range. No binding or sticking should occur.

If the actuator passes these tests, the problem is elsewhere in the system. Refer to the control unit troubleshooting publication.



ACB225 and ACC225

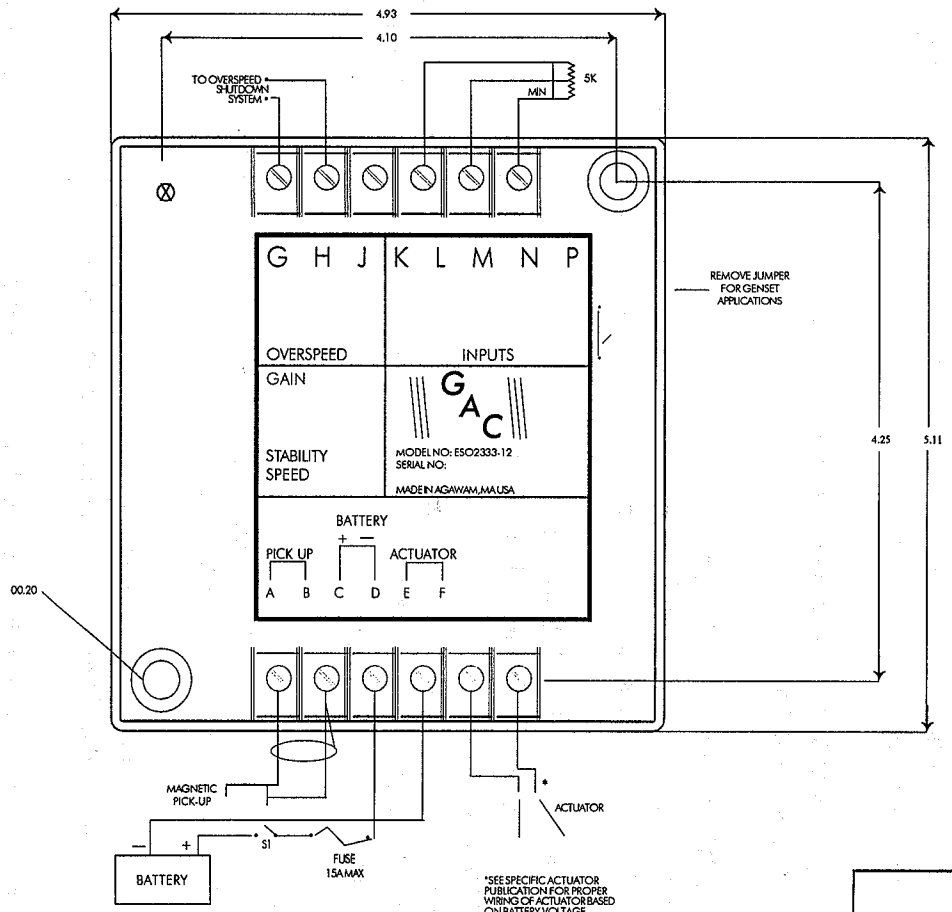


ADB225 and ABC225

DIAGRAM 4
Actuator Outline Dimensions

REV	DESCRIPTION	ZONE

WD234



CRITICALITY OF DIMENSIONS

● CRITICAL ○ MAJOR

◆ CUSTOMER DEFINED

WIRING DIAGRAM

DATE 4-15-97	SIZE B	DRAWING WD234	REV
DATE			
NEXT ASSY.	SCALE	SHEET OF	

5.3 ELECTRONIC GOVERNOR

ADJUSTMENT - Before starting engine
Check to insure the GAIN, and STABILITY controls, and if applied the external SPEED TRIM control, are set to mid-position.

ENGINE START
The controller is factory set at approximately engine idle speed. (1000 Hz. Speed Sensor Signal)

Crank the engine with D.C. battery power applied to the governor system. The actuator will energize fully to the maximum fuel position until the engine has started. The governor should be controlling the engine at low idle speed.

If the engine is unstable after starting, turn the GAIN and STABILITY adjustments counterclockwise until the engine is stable.

GOVERNOR SPEED SETTING
The governed speed setpoint is increased by a clockwise rotation of the SPEED adjustment control. Fine, precise speed adjustments can be obtained with an optional Speed Trim control.

GOVERNOR PERFORMANCE
Once the engine is at the operating speed and at no load, the following governor performance adjustments can be made.

A. Rotate the GAIN adjustment clockwise until instability develops. Gradually move the adjustment counterclockwise until stability returns. Then move the adjustment 1/8 turn counterclockwise to insure stable performance.

B. Rotate the STABILITY adjustment clockwise until instability develops. Gradually move the adjustment counterclockwise until stability returns. Then move the adjustment 1/8 turn counterclockwise to insure stable performance.

C. Gain and stability adjustments may require minor changes after engine load is applied. Normally, adjustments at no load achieve satisfactory performance.

D. The dead time compensation can be changed with posts E1, E2, and E3 to optimize the control system. If a rapid instability, greater that 2Hz., is present at the actuator lever, cut the jumper between post E1 and E2. If the fast instability is still present, remove the jumper between posts E4 and E5. If slow instability, low gain setting, or poor response exists, add a 22 mfd. Capacitor between posts E2 (-) and E3 (-).

If the throttle is erratic, but performance is good, removing the E4 to E5 jumper will tend to steady the throttle.

To be performed by qualified personnel only.

6.0 TROUBLESHOOTING

IGNITION

1. Gas fuel requires the finest heavy duty spark plugs, with gaps not over .030". More voltage is required to bridge the plug gap than that required using gasoline as a fuel.
2. Spark timing requires rigid adherence to factory recommendations, as natural gas burns relatively slowly. Late timing will result in power loss, excessive heating of the exhaust valves and high exhaust stack temperatures. With no vaporization of liquid fuel in the cylinder to help cool valves during intake and compression cycles, excessive exhaust temperatures may burn or reduce the life of exhaust valves.
3. Propane requires retarded spark setting from that specified for natural gas under load, as the burning rate is faster than that of natural gas. An automatic or manual spark timing adjustment is necessary for dual fuel applications of natural and L.P. gas, particularly with a high compression ratio or a turbo-charged engine.
4. Gasoline engines require a spark plug gap of .045".
5. Dual fuel engines require a spark plug gap of .025.

HIGH ENERGY IGNITION (HEI) DISTRIBUTOR TIMING

These instructions relate to High Energy Ignition (HEI) distributor systems with electronic spark timing.

Distributor Ignition Systems with EST accomplishes the spark timing function electronically. This results in longer spark plug life, eliminates mechanical contacts and scheduled maintenance, provides better cold weather starting and is environmentally protected.

EST achieves new standards of distributor ignition performance by providing 40% more output voltage and 85% higher energy level. With higher energy available, combustion is more reliable and complete.

Available for GM based L4, V6, and V8 engines.

TIMING PROCEDURE

1. Do not use a timing light that requires piercing of the secondary insulation. Use only a timing light with inductive pick-up or jumper type connectors. Piercing the secondary insulation will cause spark plug misfiring and may damage the internal conductor resulting in failure of the secondary wire later.
2. Install timing light at #1 spark plug lead, per manufacturer's instructions.
3. Do not connect alligator clip lead of the initial timing connector to a B+ source until after engine is started. If the initial timing connector is connected to B+ source while engine is started, the ignition control module (ICM) in the distributor may be damaged. If the engine must be restarted while the initial timing connector is installed, detach alligator clip lead from B+ source to avoid damaging the ICM.

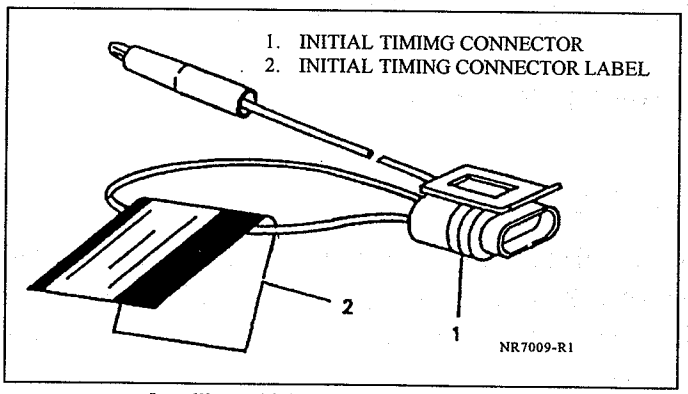
Troubleshooting Cont.

4. Start the engine and allow it to warm to operating temperature. (Follow engine manufacturer's instructions.) Connect alligator clip on long lead of the initial timing connector to convenient B+ voltage source, such as battery terminal on starter solenoid. This removes all advance from electronic spark timing. Engine will probably slow down when connection is made. Engine speed should be around 650 RPM. Loosen the distributor clamp screw just enough to rotate distributor, and set base timing to specification shown for engine.

ENGINE TIMING SPECIFICATIONS:		
INDUSTRIAL		DO NOT EXCEED:
454	INITIAL 6°	TOTAL 30°
350	INITIAL 6°	TOTAL 28°
262	INITIAL 2°	TOTAL 26°
181	INITIAL 0°	TOTAL 20°

Set idle speed to 700 RPM ± 50 RPM
NOTE: Reduce initial timing if total exceeds limits.

5. When timing is set to specification, secure distributor in position with clamp screw.
6. Tighten clamp screw to torque specified.
7. Recheck timing to assure that distributor did not move during tightening.



Installing Initial Timing Connector Label

8. Disconnect the initial timing connector from B+ source. Label the initial timing connector as shown by folding adhesive label (in package) over one of the wires, matching the edges to cover the adhesive. Keep with engine for future use.

Troubleshooting Cont.

CARBURETION

1. Gas carburetion, because of its simplicity, is unlikely to give any problems when properly installed with an adequate supply of gas. Since the carburetor has the least complicated function to perform, and has the least moving parts, it would be well to exhaust every other avenue of possible mechanical or electrical failure before tampering with gas pressure or carburetor adjustments, particularly if the system has been functioning normally in the past.
2. If carburetion is definitely at fault, the first corrective step is to measure gas inlet pressures at idle and full load with a water manometer. Do not attempt to measure gas pressure with a mercury manometer. If this pressure is determined to be correct for the B.T.U. content of the fuel and the light load mixtures it is desired to maintain, proceed to the next step described under paragraph 3.

   a. Pressures recommended for various conditions of load and fuel heat content are covered in paragraph 8.
3. If conditions still indicate carburetor malfunction, remove the air valve cover (or covers) and lift out the spring and air-gas valve complete with diaphragm.

   a. Inspect diaphragm for possible holes, or charring from excessive heat or backfiring. The diaphragm should be reasonably flexible. Diaphragm life under normal conditions should be as much as five years without difficulty. Heat from proximity to exhaust manifolds, or from turbo-charged air which is not properly cooled due to insufficient or hot water passing through the inter-cooler, can shorten diaphragm life considerably. Impco has a silicone rubber on fibre-glass diaphragm for extreme heat conditions, on special order.

   b. If diaphragms prove sound, check the inside diameter of the air valve cup and the fins on the outside of the gas jet which guide the air valve. Under ultra high frequency vibrations sometimes encountered in deep well pumping, it is possible to find grooves worn in the cup by the fins, which may lead to poor metering as the valve tries to pass up and down over the step. Impco has a specially constructed metering bowl for this infrequent emergency.

   c. Also inspect the inside diameter of the gas jet, and the O.D. of the small tapered gas valve for possible wear from the same cause.

   d. If everything to this point appears o.k., wash all the parts thoroughly in kerosene or the equivalent. If the fuel is digester (sewage) gas, wash parts in water and detergent. This residue will not dissolve in petroleum products.

   e. Reassemble cleaned or replaced parts in the bowl, centering the spring on the air valve, and replace and fasten the cover. From the air-fuel outlet of the mixer to the throttle body, reach in with fingers or non-sharp rod, and lift valve several times to assure free travel with the spring closing the valve. Check the gas valve for leaks in closed position by sucking on the gas inlet. It should be sealed.

Carburetion Cont.

A water manometer may be easily constructed if no manufactured model is available. Using transparent plastic tubing from a hardware store, a" can be formed on a board with a ruler taped next to the "U" approximately half way between the top and bottom. Fill the " U" tube half way with water and measure the number of inches between the two levels of water when pressure is applied to one end of the tube.

Failing this, a piece of automotive vacuum hose may be marked off into inches at one end. This end may be weighted by forcing a small steel nut or one or two washers over the scaled end. Drop the weighted end in a container of water. With the other end fastened to the pressure source, adjust the pressure to the point where bubbles start to flow at the depth in inches at which the desired pressure is reached. Quite an exact check can be made by raising or lowering the hose slightly to see the exact depth at which bubbles start to flow.

With the engine running at idle, gas pressure should be 5 to 7" depending on light load air-fuel mixtures you wish to maintain. Using 1050 B.T.U. natural gas, 7' pressure will produce a straight power mixture, while 5" pressure will give economy mixtures at light load.

At full load of 2" to 7" of mercury intake manifold vacuum, the gas pressure ideally should not drop more than 2" of water column, although this is of no matter as long as the power adjustment on the carburetor is effective in controlling full load mixtures.

If the power adjustment is not effective, it indicates:

A. The engine is lightly loaded and gas metering valve is not withdrawn from the gas jet.
   1. Mixture may be richened by increasing gas pressure.

B. Heat content of the fuel is less than 1000 B.T.U. per cubic foot.
   1. Increase gas pressure. It may be raised to 12" to 16" of water column if necessary.

C. If mixture is still too lean:
   1. Try DG (digester gas) air-gas valve assembly in the carburetor with normal gas pressure of 5" to 7".

D. If mixture is still too lean:
   1. The B.T.U. content must be as low as 600 to 700 B.T.U. per cubic foot.
   2. Substitute a complete DG (digester gas) mixer in place of the standard model. This DG model is effective down to 600 B.T.U. per cubic foot.

4. To understand the flexible control of the mixture under various conditions of load, refer to figure #3 showing a cut away of an Impco #200 carburetor. This shows the air gas valve assembly to be the only moving part in the mixers. The air flow measuring valve rises precisely in relation to the volume of air consumed by the engine, which is in turn controlled by engine speed and throttle position.

Carburetion Cont.

The cut away shows the air-gas valve assembly lifted about one third of the available travel. Notice that the greatest restriction to gas flow is the shaped gas metering valve, the bulk of which is not yet withdrawn from the gas jet. In this position, the power adjustment valve has little or no control over mixtures, since even in its fully closed position, its restriction to gas flow is less than that of the metering valve.

Mixtures may be leaned or richened with the valve in this or less open positions, by increasing or decreasing gas pressure to the carburetor.

5. Full power mixtures are controlled by the power mixture adjustment. This adjustment must be made with the engine under full or working load. With the gas metering valve withdrawn from the jet, the major restriction to gas flow becomes the power mixture adjustment, which is most effective at full load, and decreasingly effective down to approximately one half load where it no longer has much effect.

6. This dual control of mixtures at different load settings, makes it possible to maintain a straight best power mixture from idle to full power with increased gas pressure up to certain limits, or a lean light load mixture may be obtained with lower gas pressure and readjustment of the power mixture adjustment to proper full load mixtures.

7. Illustration #4 is a graph showing air fuel mixtures obtained at light and full load with various inlet pressures to the carburetor. Graphs for different engine configurations will vary as to the percentage of load where the curve moves from the mixture controlled by gas pressure, to the mixture controlled by the power mixture adjustment.

   This is so because of the relationship of carburetor size to engine displacement and speed. A large engine with a comparatively small carburetor, will withdraw the gas metering valve form the jet more quickly, and at a lesser percentage of load than a large carburetor on a small engine. Different Impco carburetors vary slightly as to ideal gas inlet pressure for best economy. 5" of water column gas pressure is a compromise which suits most conditions with 1050 B.T.U. fuel.

8. For fuel with less heat (B.T.U.'s) per cubic foot, an increase in gas inlet pressure to 10" to 12" of water column will compensate for fuel down to 900 - 950 B.T.U. heat value.

   Fuel with even less heating value in the 800 B.T.U. range requires a special gas valve #DG-AV1-12. Digester gas with 650 B.T.U. heat value requires a special mixing bowl with restricted air passages. These would be the DG-200 mixer, DG-200D mixer and DG-200T mixer (DG for digester gas).

9. No compensation in mixtures is necessary because of altitude changes. Air and gas expand essentially the same amount at high altitude, whereas a liquid fuel has a constant density so that mixtures richen at high altitude.

Carburetion Cont.

Power declines 3% for each 1000 feet of altitude even with correct air fuel mixtures, so that loss with a liquid fuel is even greater, and consumption of liquid tuel per horsepower hour increases at higher altitude unless the carburetor or diesel injection system is adjusted to compensate for altitude.

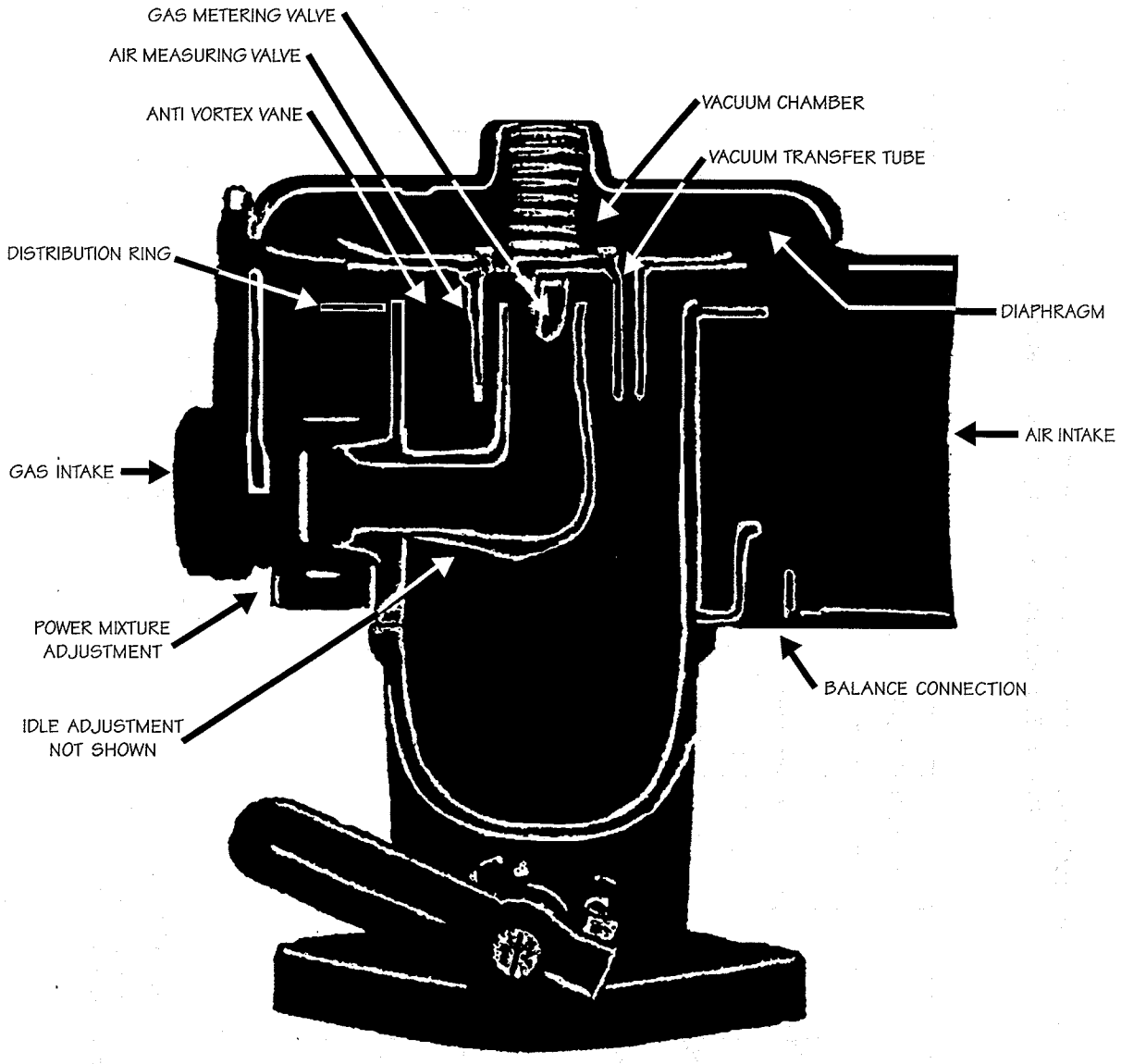
10. A turbo-charged engine likewise causes no problem with air fuel mixture ratios. By using a balance pressure connection from the air inlet at the carburetor to the atmospheric vent of the gas regulator, both air and gas densities increase equally. Volume of air-gas flow is the same as in a naturally aspirated engine, however the weight of air and fuel flowing is increased by pressurizing each. In order to check the fuel to air pressure differential which should still be approximately 5" of water column at idle for 1050 B.T.U. gas, it is necessary to connect the water manometer to the air pressure entering the carburetor, and to the gas pressure entering the carburetor. This will measure the difference in pressures only, not the total pressure of either. This difference should be the same as that of a naturally aspirated system.

    One minor difference in mixtures occurs due to compression heating of the air by the turbo-compressor. This air temperature is almost always controlled by the use of an inter-cooler, however the temperature still rises a bit above ambient temperature. This causes a slight richening of the air-fuel ratio, since the gas remains at relatively constant temperature, as the air temperature is raised. A slight adjustment of the power mixture towards lean will compensate for the air temperature rise.

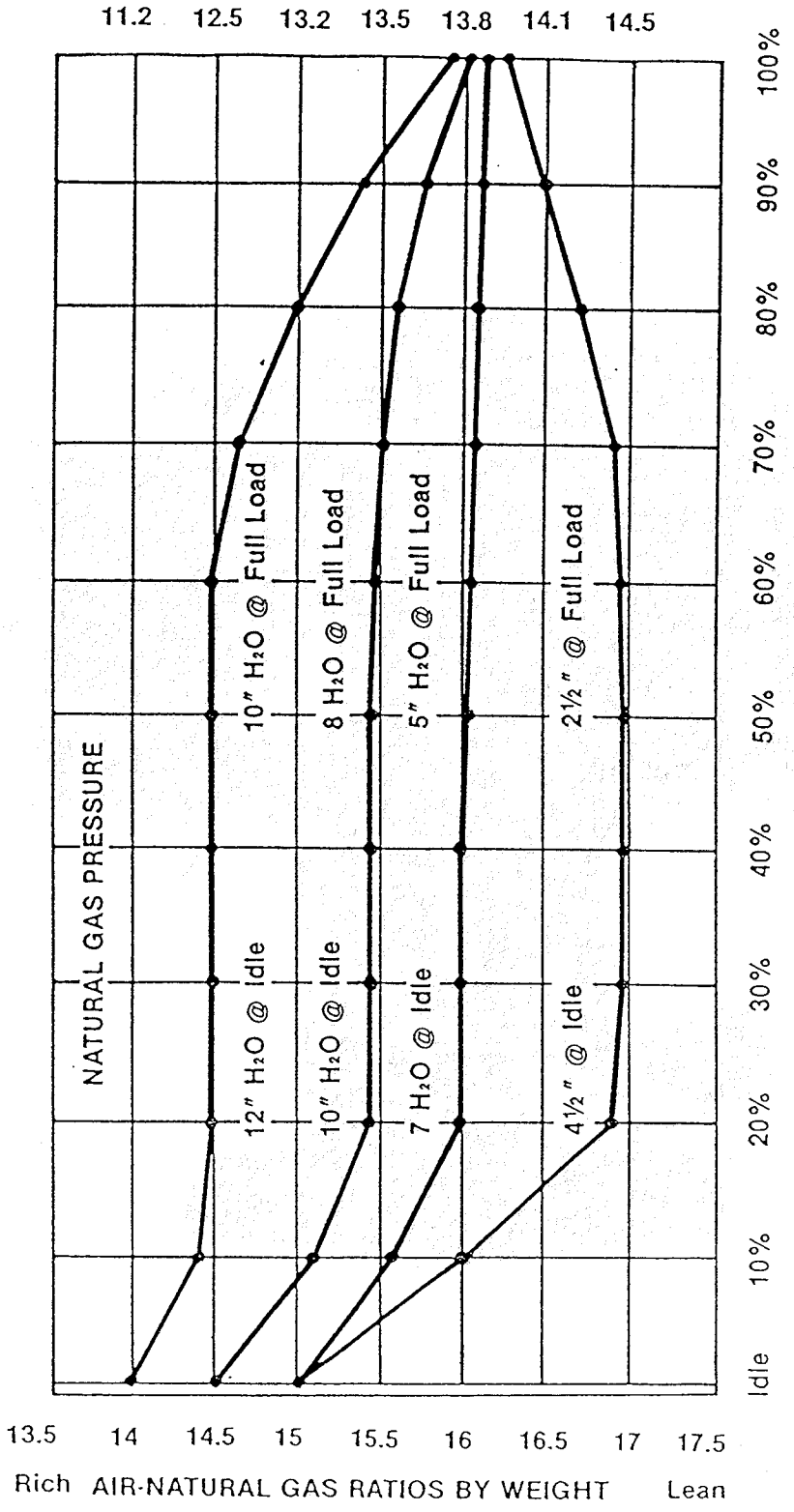
11. Hot intake air to a naturally aspirated engine cuts power production materially, as well as increasing the possibility of detonation and pre- ignition which can injure or destroy an engine in short order. Aside from power loss from detonation, there is a loss of 1% of power for each 10 of air temperature rise. Roughly 7# of air is required to produce one horsepower for one hour. Since heating air lightens it (as in a hot air balloon) a greater volume of hot air is required to weigh 7#. An engine at full load will only breathe a fixed volume of air, so that the number of available pounds of air are reduced by using hot air to the carburetor.

12. Heated air to the carburetor is especially critical in a turbo-charged installation using propane fuel full or part time. Water temperature is required to be 60' through the inter-cooler for a 10 to 1 compression ratio with turbo-charger, in order to avoid detonation. This cold water is seldom available.

DIAPHRAGM OPERATED AIR VALVE GAS CARBURETOR



EQUIVALENT READINGS ON GASOLINE SCALE OF EXHAUST GAS ANALYZER



GRAPH: Mixture Comparison At Light Loads — Full Load Mixtures Readjusted For Each Pressure
1050 B.T.U. Natural Gas (High Heat Value)

ENGINE: Ford 352 cubic inches w/Impco #425-12 Carburetor.

NOTE: Exhause gas analyzers do not read accurately below 14.5 to 1 on the gasoline scale. They will not register leaner mixtures, and may reverse with very lean air-fuel ratios.

Fig. #4

TROUBLE SHOOTING CHART

POSSIBLE CAUSE:	PROBLEM: ENGINE FAILURE OR FAILURE TO START	TEMPERATURE WARNING	ENGINE PERFORMANCE LOW	ENGINE OIL PRESSURE LOW OR ZERO	ENGINE OIL CONSUMPTION HIGH	ENGINE NOT RUNNING SMOOTHLY	ENGINE SMOKING	ENGINE BACKFIRING
IGNITION FUSE OR FUSES	♦							
BATTERY LOW	♦							
FOULED PLUGS OR WIRES	♦		♦			♦		
FUEL FILTER CLOGGED	♦		♦			♦		
FUEL PRESSURE LOW	♦		♦			♦		♦
FUEL TANK EMPTY	♦							♦
AIR IN FUEL SYSTEM	♦		♦			♦		♦
DEFECTIVE FUEL INJECTOR	♦					♦	♦	
AIR CLEANER CLOGGED		♦	♦				♦	
OIL LEVEL TOO HIGH		♦		♦				
OIL LEVEL TOO LOW				♦				
WRONG SAE GRADE OF OIL		♦		♦				
OIL PUMP SUCTION LEAK				♦				
OIL LINE OR FILTER LEAK				♦				
CRANKSHAFT BEARING WORN				♦				
COMPRESSION LOW	♦		♦		♦		♦	
CYLINDERS OR RINGS WORN	♦				♦		♦	
VALVE GUIDES WORN					♦		♦	
DRIVE COUPLING FAILURE		♦						
FAN DRIVE OR IDLER FAILURE		♦						
RADIATOR CLOGGED		♦						
FAN BELT LOOSE OR BROKEN		♦