

Thank you for purchasing the Conley V-8 engine. You will notice there are several numbered bags of parts. The last page of instructions will describe the contents of each bag. Although every effort is made to insure all parts are included, it is a good idea to check the bags against the parts description. Before you start to assemble the engine you may want to think about the method of finishing the exterior surfaces. The recommended method is to use 600 wet/dry sand paper then buff until a chrome-like finish is achieved. The following points should be followed before trying to assemble the engine.

1. DO NOT REMOVE THE ROD CAPS UNTIL YOU ARE READY TO INSTALL THE RODS ON THE CRANKSHAFT.
2. Pre-fit each part individually, to make sure everything rotates and slides smoothly.
3. If you choose to glass bead or sand blast the engine make sure all screw holes are covered or place a screw in each hole. When finished thoroughly wash each part and use compressed air to remove any residue or abrasive which may have collected in small corners.
4. DO NOT DO ANYTHING TO THE TOPS OF EACH BANK OF CYLINDERS.
5. Leave the parts in each bag until they are called for.
6. Check to make sure there are the proper number of parts in each bag.
7. Make sure all parts are cleaned thoroughly.
8. Although not necessary, a 3/16" open end wrench will be very helpful when adjusting the rocker arms. These wrenches are commonly used for tune-ups and are available at most automotive stores and Sears.
9. Thoroughly clean engine after each running. This will be discussed at the end of the instructions.

BLOCK;

1. As you are looking at the front of the block, the small diameter of the crankshaft will be facing you. The cylinders to the right are numbered 1,3,5,7 and to the left 2,4,6,8. It may be helpful to use a felt tip pin and mark the block. The first thing to do is to fit the rings to each cylinder. You will notice that if a ring is put into a cylinder there is no end gap, therefore it is necessary to file the end of each ring until the proper end gap is achieved. This is easily done by laying the ring on a flat surface and allowing the gap to extend over the edge approx. 1/4 inch. Use a flat (double sided) needle file and while GENTLY applying pressure (with thumb and forefinger) to the outside of each ring, lightly compress the ring diameter while placing the file between the end gap until the ends of the ring touch each side of the file. Using an up-down motion (MAKE SURE FILE IS HELD EXACTLY VERTICAL) gently file each end. After three or four strokes of the file place the ring in the cylinder and check the end gap with a feeler gauge. There should be approximately .003 to .004 clearance.

2. Once all ring end gaps have been set carefully put the ring on the piston. This is easily done by placing the piston in your left hand, with your index and middle finger on the bottom

and your thumb on the top. Lay the ring on the top of the piston and drop the end gap over the edge until it is approximately the same level as the groove. While using your left thumb to hold the ring in that position take your right thumb and in a clockwise motion around the diameter, starting to the right of the end gap, gently expand the ring while applying light downward pressure until the ring is in the groove. DO NOT FORCE THE RING. IF YOU ENCOUNTER A PROBLEM REREAD ABOVE INSTRUCTIONS.

3. After all rings are put on the pistons the connecting rods should be assembled. Since the rods and caps are machined together it is important to mark one side of the rod where the cap joins the body. This can be done with a magic marker or scribe line. Take a small strip of 600 wet/dry, emery paper and lightly polish the rod journals on the crankshaft. During the crankshaft assembly process, some of the Loctite (used to secure the rod bushings) may have migrated onto the bearing surface. Before putting the piston on the rod, remove the cap (one rod at a time) and trial fit on crankshaft. Make sure the rod bearing surfaces are clean. With rod body on crankshaft put cap on rod (make sure marks align) and snug down 4-40 socket head cap screws. Rotate crankshaft to make sure no resistance is found. It may be necessary to loosen and retighten screws. If there is still friction between parts remove rod and check machined surfaces for small chips of metal.

4. Once all rods have been fitted to the crankshaft, place piston (make sure bottom of piston is clean) on rod and put wrist pin through both. Insert a small teflon on each side of the wrist pin. Remove rod cap from one rod and slide piston and rod assembly into the top of number one cylinder until ring rest on top of cylinder. While applying light pressure on the top of the piston gently press in on the side of the ring with a small screwdriver, starting at the end gap and working around the diameter of the ring. After the piston is in the cylinder, align the rod body with the crankshaft, and put the rod cap on, making sure cap is in the proper position. Snug the screws down and turn crankshaft. Once the crankshaft turns free loosen one screw at a time, apply a SMALL drop of Loctite 271 to the end of the threads and retighten. Do the same with the other screw. Once again turn crankshaft and make sure rods are free from binding. Continue this procedure until all rod-piston assemblies are installed. Hint: Putting large 96 tooth gear on crankshaft will help to rotate engine.

5. After Loctite has set for two hours, oil all rod journals heavily and allow oil to penetrate. Also oil all cylinders both top and bottom. If you have a variable speed drill, carefully tighten chuck on 3/16" shaft on front of engine. With one bank of cylinders in a vertical position place a teaspoon of oil in each cylinder and slowly spin crankshaft for approximately three minutes. Rotate the engine until the other bank of cylinders is vertical and repeat the procedure. Install pan using 4-40 x 3/8 inch socket head cap screws (bag 3). If there is a small gap between the front main bearing cap and the pan, place a small bead of silicone between each and tighten pan screws.

6. Put 3/16" I.D. bearing (bag 9) into cam hole at clutch end of engine. It may be necessary to lightly tap outside edge of

bearing with hammer. The bearing should be flush with end of engine.

7. Slide second 3/16" I.D. (bag 9) bearing onto front of camshaft and insert into front of block. Lightly tap bearing into place, until bearing is flush with front of block.

8. Find two button head 4/40 screws (bag 3). Put a small drop of loctite on one screw and place below camshaft bearing. Tighten down and rotate camshaft and make sure no binding is felt. Do the same with the other screw and place it just above the crankshaft bearing. Both screws go in front of engine to hold bearings in place. In some engines the screw may not tighten all the way against the block. This is perfectly normal. Remember, only tighten these screws until no binding is felt.

9. Take large timing gear (bag 6) and slide onto camshaft, making sure back side of this gear does not touch button head screw. Allow about .010 clearance and tighten set screw against flat.

10. Do the same with small timing gear (bag 6).

11. The bearing for the timing idler gear must be installed into the timing gear (bag 6). Remove flashing from hole in black nylon timing gear. Lightly press flanged gear (flanged side out) into gear. Screw 0-80 button head allen screws into four holes in gear. In some cases it may be necessary to slot these tiny screws. This is easily done by using a Dremel cutoff tool or small Exacto saw blade. In some engines the interference fit of the teeth of the nylon gear is very tight. If this does occur please let me know and I will send you an offset adjustment screw to solve this problem.

12. At this time, you can set the timing and install the idler gear. To set timing, turn camshaft until center punched mark on gear is pointing straight up. Rotate crankshaft until set screw in small gear on crankshaft is also pointing straight up. Place 5-40 x 1/2" socket head cap screw (bag 3) through flanged side of ball bearing in idler gear and shim with brass washers (bag 4) until it aligns with large and small timing gears. Recheck timing. If you notice the gear mesh is tight then use the offset screw (bag 6). Put a 5-40 hex nut on end opposite allen or slotted end and screw into block. Loosen set screws on both steel timing gears. Put three brass washers over offset screw then idler (with button head screws out).

13. Install transmission mounting backplate onto clutch end of block using 4-40 x 1/4" socket head cap screws (bag 3). Just snug down screws, do not tighten all the way at this time.

14. Slide 96 tooth ring gear onto crankshaft followed by 1/2" I.D. stainless steel thrust washer, then 1 3/4" O.D. clutch backing washer, then screw on clutch (FLANGE SIDE OUT). Do not tighten at this time. Put transmission on backplate and turn universal joint. The clutch bell should turn free. If you notice or feel a rubbing of the clutch bell on the clutch shoes then remove backplate and place a small brass washer on each screw, between backplate and block. Once the clutch bell turns free, put a small drop of Loctite 271 on each screw and tighten backplate onto block.

15. Remove the hex nut from the idler gear assembly and put in slot on backplate. Screw in gear assembly. If face of gear

does not align with 96 tooth ring gear remove or add brass washers until proper alignment is achieved. Do not tighten at this time.

16. Place starter motor in backplate and secure with 4-40 x 3/8" socket head cap screws and brass washer (bag 3). Snug down screws, do not tighten at this time.

17. Clean motor shaft with lacquer thinner. Place a small drop of Loctite 271 on shaft and slide 8 tooth gear onto shaft. Place a small drop of Loctite 271 on 4-40 set screw, put into 8 tooth gear and TIGHTEN against flat on motor shaft. Make sure 8 tooth gear aligns with 18 tooth gear.

18. Loosen idler gear and slide up or down until there is no binding between gears. It may be necessary to loosen the 5-40 screw and put a small drop of Loctite 271 on very end of screw.

19. Loosen two 4-40 screws holding motor in place and slide motor until gears turn free and no binding is noticed. Tighten screws. In some cases it may be necessary to use a dremel tool or hand grinder to remove a small amount of metal from the inside of the bell housing casting for clearance of the lower screw of the starter motor.

20. Unscrew clutch, clean threads with lacquer thinner, place two drops of Loctite 271 to threads and securely tighten clutch assembly onto crankshaft. Make sure the large diameter flat washer is on crankshaft first and flanged side of clutch assembly is facing out!!!!

21. Put 16 lifters (bag 7) in holes in center top of block and set block aside. In some cases it may be necessary to use some 600 wet/dry and remove the small tip on the bottom of the lifter.

HEADS:

1. Before starting to lap valves get a small block of wood or a piece of styrofoam and make 8 holes the size of the valve stem and number 1 thru 8. It is extremely important to keep the valves in the same hole to which they were lapped. Work on only one head at a time. You will notice that one of the heads has a pressure fitting on one end. This head is for the right bank of cylinders (as you are looking at the front of the engine). You will also need a small wash tank to rinse the lapping compound from the head and a variable speed drill or variable speed Dremel tool.

2. The small bag with the grey powder is the lapping compound and should be placed in a small container and mixed with oil. Add only enough oil to form a thick slurry. Since the lapping compound is 600 grit it will take 2 to 5 minutes to lapp each valve.

3. Starting from the left side of the head, with the bottom of the head facing up, put a small amount of oil on the valve stem and insert into the valve guide in the head. Using a clean cloth and alcohol wipe off the oil from the stem as it exits the valve guide on the top of the head. Remember to keep the combustion chamber of the head up at all times, when lapping the valves.

4. From bag 5, remove the small length of plastic tubing with the piece of 2-56 threaded rod in one end. Put about 1/2" of

the threaded rod in the drill chuck and tighten. With a small screwdriver apply a small amount of lapping compound between the valve and head. While holding down the face of the valve with left thumb, slide the plastic tubing over the valve stem. Allow approximately $1/32$ " between the end of the plastic tubing and the top of the valve guide. Remember to use the slowest speed and keep the tubing as straight as possible. Turn the drill on and while using light pressure, pull the valve against the valve seat for a couple of seconds. Release the pressure and allow the valve to come off the seat and once again lightly pull against valve stem while running the drill or Dremel tool slow. Repeat this up-down motion for approximately two to three minutes. Keep track of how long it takes you to do one valve. Remove the valve and clean in wash tank until all residue of the lapping compound is gone. A small brush is helpful for this operation. Under a bright light or magnifying glass look at the valve seat in the head. There should be a satin finish around the entire diameter of the seat. Do not worry if the valve seat is wider on one side. Sometimes there is a small misalignment of the valve guide, this is why the seats were cut after the valve guides were installed.

5. Continue to lapp the remaining seven valves. Remember to keep the valves in order. It is easier to lapp all eight valves, then remove and clean the head and valves, as apposed to doing each one individually. This also lessens the chances of getting lapping compound on the valve stems.

6. Once you are satisfied the all valves are seated and heads are thoroughly washed out, the next step is to assemble the valves. Oil the valve stem and place the first valve in the head. While holding the valve against the seat put a valve spring over the valve stem, then an aluminum valve collet (goove side up). While depressing the spring and valve collet put a "E" clip into the groove in the valve stem and release the spring. This operation is best done on a large white sheet of paper or clean table top. Safety glasses should also be worn. Continue this operation until all eight valves are installed.

7. Remove the rocker arm shaft (3/32" x 4" rod), 2-56 x 1/2" socket head cap screws and four shaft supports from bag 4. These supports are 1/4" dia. x 3/4" long with a flat machined on both sides. Put the 2-56 screw down through the center of the shaft supports and screw into the recessed areas on the top of the head. These areas are located just behind and between the valves. To insure the supports are straight, slide rocker arm shaft into the top hole of the end support, until it slides into the hole of the second support. Continue until the shaft easily slides into all the supports.

8. From bag 4, remove two "E" clips, brass washers rocker arms and 1/8" dia. x 3/4" springs. Starting from the left, the rocker arm assembly should be put together, in the following sequence: "E" clip, brass washer, rocker arm, shaft support, rocker arm, brass washer, spring, brass washer, rocker arm, shaft support, rocker arm, washer, spring, brass washer etc. It may be necessary to place two washers on one end of the rocker arm shaft. The end rocker arms on the end should pivot without binding.

9. Do not put the 5-40 set screws and jam nuts in the rocker

arms at this time.

HEAD AND BLOCK ASSEMBLY:

1. Remove ten, 4-40 x 5/8" socket head cap screws, ten brass washers, fourteen, 4-40 x 3/8" socket head cap screws from bag 3.

2. Wipe bottom of head and top of block with lacquer thinner. Also make sure the tapped holes for the head bolts are clean.

3. Place an "O" ring (bag 3) into the recessed area on the intake side of one head. Put intake manifold over "O" rings and lightly hold in place with 4-40 x 3/8" socket head cap screws (bag 3). Do the same with the other head. REMEMBER, THE HEAD WITH THE PRESSURE FITTING ON ONE END IN THE RIGHT HEAD (AS YOU ARE LOOKING AT THE FRONT OF THE BLOCK). This pressure fitting is used to activate the diaphragm pump on the carburator.

4. The intake manifold screws should not be tight at this time. Take the ten, 4-40 x 5/8" (bag 3) socket head cap screws and put a brass washer on each. These screws are to be used in the upper holes in the heads.

5. Carefully put a very light bead of Loctite 510 around the top of each cylinder. Try to keep the bead approximately 1/4" away from the edge of the cylinder.

6. Carefully put the head-intake assembly onto the block and apply firm downward pressure on each head. Remove the assembly and wipe off any Loctite which may have squished into the cylinder. Once again put the head-intake assembly onto the block and put all the head bolts through the holes in the head. As you are looking at the side of the engine block, with the transmission to the right, the head bolts are numbered as follows: starting from the top left and moving to the right 1,2,3,4,5. and starting from the lower left and moving to the right 6,7,8,9,10. Prior to tightening head bolts number 2 and 4 (on both heads) place a small amount of Loctite 510 on the bottom of the washer. The head bolts should be tightened in the following order: 3,8,2,7,4,9,1,6,5,10. Immediately go to the other head and tighten in the same order. Tighten the intake manifold bolts. Return to the first head and repeat the tightening sequence, then do the same to the other head. Since there are no torque specifications, it is important not to overtighten the screws to the point of stripping the threads. The Loctite material not only serves as a head gasket but also acts as a glue to hold the head down. In some engines the push rods rub the side of the holes in the head. It may be necessary to enlarge the push rod hole for proper clearance. This is easily done by drilling 9/64" through the existing push rod hole. If the heads are already installed, there is no need to remove the heads for this drilling operation. Just make sure to remove any chips with compressed air.

6. After the heads are installed, remove the four screws holding the intake manifold down. Lift off the manifold and "O" rings. Thoroughly clean both surfaces of head and manifold with lacquer thinner. Clean "O" rings with alcohol. Place a small bead of silicone caulk in recess on head. Lightly press "O" ring into silicone and remove any excess from the interior of the port. Place another bead of silicone on the top of the "O" ring and reinstall intake manifold. Tighten four screws evenly.

PUSHROD AND ROCKER ARM:

1. Remove sixteen pushrods from bag 7, sixteen 5-40 x 3/8" set screws and 5-40 jam nuts from bag 4.
2. Starting from the left slide one push rod through the back of the rocker arm, through the hole in the head. Make sure the end of the push rod is seated in the recessed pocket in the lifter.
3. Screw the 5-40 allen set screw into the rocker arm just until it starts to come through the bottom. The allen end should be up. With a pair of needle nose pliers or tweezers hold the 5-40 hex nut on the bottom of the rocker arm while turning the set screw.
4. Continue turning until the push rod is seated in the cup of the set screw.
5. Remove transmission and rotate the engine counter clockwise until the lifter is at its lowest point. The clearance between the rocker arm and valve should be approximately .004 to .006.
6. Once this clearance adjustment has been made tighten the jam nut against the bottom of the rocker arm. Rotate engine two or three revolutions and recheck clearance.
7. With thumb and forefinger (with the lifter at its lowest point) pivot the rocker arm back and forth to get a sense of what .004 clearance feels like. This will be very helpful after you have run the engine and wish to randomly check valve clearance. Also after the engine has run for a while the rocker arm surface will wear a slight amount or the end of the valve stem may wear at which point a feeler gauge may not be useable.
8. Continue this procedure until all rocker arms are adjusted on both heads.

MISCELLANEOUS:

1. Remove 4-40 x 3/4" socket head cap screws from bag 3 and insert in to the top and bottom holes of the timing cover.
2. Before putting timing cover onto engine make sure that the flat on the water pump aligns with slot in large timing gear. Once the pump and gear align tighten 4-40 screws. In some engines it may be necessary to grind a small amount of the casting on the timing cover, so it does not compress the front crankshaft bearing. An easy way to tell is to remove the transmission housing and the timing cover. Rotate the crankshaft by hand. Place timing cover on engine and tighten down. You should not feel any difference when rotating engine by hand. If you experience any resistance, remove any excess material from the bottom of the timing cover with a Dremel tool. Retighten and rotate crankshaft again. Repeat if necessary.
3. Remove brass water fittings from bag 3. Screw in one on each side of the block (towards the rear of engine), one in each hole in the front of the block and one in the rear of the right head.
4. As you are looking at the front of the engine, point the two ports from the water pump down and put a short length of silicone fuel line tubing (available at most hobby shops) from the right side of the pump to the right water fitting on the front of the block. Do the same with the other left side of the

pump. The pump intakes water from the left rear brass fitting and transfers water from the left bank of cylinders to the right bank of cylinders and exits through the right rear water fitting. If you are planning to run the engine only for a short time, a small holding tank can be used to recirculate the water. If you plan to run the engine for an extended period of time, then a radiator must be made or a larger holding tank can be used.

5. Connect a short length of fuel line tubing from the brass fitting on the right head, to the fitting on the BACK of the carburator. The other fitting on the side of the carburator goes to the fuel tank.

6. Remove the four rubber motor mounts from bag 5. Screw two into the rear of the transmission housing. Before screwing the other two into the side of the block, put a small drop of Loctite 510 on the base of the threads and the top of the rubber.

AIR CLEANER:

1. Remove all parts from bag 2.

2. Attach large aluminum disc to top of carburator with two 1/4" button head screws. Slide two aluminum spacers into air cleaner element. Put two 4-40 socket head cap screws through finned aluminum top, down through aluminum spacers and screw into aluminum base. Do not overtighten.

HEADERS:

1. Decide on a shape of the exhaust system. This is left up to each individual.

2. Silver solder each piece of tubing to the header flange.

3. The eight pieces of copper tubing can be bent into some very complicated shapes. The only thing that you must remember is to anneal the piece of tubing before you try to bend it. This is easily accomplished by heating (with a propane torch) until dull red and immediately dipping in water. This process makes the tubing very soft and easy to bend. You may need to repeat this step numerous times, depending on the complexity of the bend.

IGNITION WIREING:

1. Remove eight glow plugs, eight small springs, distributor cap and base from bag 5.

2. Carefully screw all eight glow plugs into head.

3. Push a spring onto the top of each plug.

4. Remove the screw in the center of the distributor cap and screw the base into the rear of the intake manifold.

5. From the wire supplied cut four lengths, eight inches long and four lengths, six inches long. Remove approximately 1/8" of insulation from one end of each wire. Solder the eight inch wires to the front two glow plug springs on each side of the engine. Do the same with the other four wires to the remaining springs.

6. With header exhaust attached (4-40 x 1/4"-bag 3) to the head route the wire so it does not rest against the exhaust pipes. A 1/4" piece of heat shrink tubing spaced at different positions will help to align the wire in a pleasing shape.

7. For a more authentic look the wire can be placed into the distributor cap in the proper firing order. The firing order in

a Chevrolet engine is 1.8.4.3.6.5.7.2 and the distributor rotates counter clockwise. Once you have decided on a how the top of the cap should look, slide the wires through the top and down through the base. Place four wires to each side of the base as they exit.

STARTER MOTOR-ELECTRICAL HOOK-UP

1. The starter motor requires 8.4 volt at 1800 milliamp and should be fused.
2. A switch must be installed in the circuit. This can be operated manually or activated by the remote control.
3. It is recommended that a two pin plug (available at most hobby shops or electronic supply shops) be placed between the starter motor and battery pack.

STARTING:

1. Before trying to start the engine make sure the entire valve train is well oiled and all batteries are well charged.
2. If you have the engine in a model it is advisable to bench, test run the engine and make any adjustments before trying to power you model. Try to mount the fuel tank as close to the engine as possible.
3. The fuel required for operation should be a 4 cycle blend with 15% to 20% nitro-methane. This fuel is available at most hobby shops. DO NOT ATTEMPT TO USE GASOLINE.
4. It is also helpful to remove the air cleaner for the initial starting. Depending on the position of your fuel tank, in relationship to the height of the carburetor, it may be necessary to place your finger over the carb and "choke" the engine, while activating the starter motor.
5. If you are trying to start the motor with the valve covers off, it is necessary to put a short 4-40 screw into each of the threaded holes in the head, where the valve cover screws would normally be. The screws need only to be place in the upper two holes on each head.
6. If you are using a radio control make sure the throttle is set for low motor.
7. Turn on ignition and activate starter motor. Make sure small red light is on at the glow plug driver. DO NOT RUN STARTER MOTOR FOR MORE THAN FIVE SECONDS AT A TIME. A GOOD RULE TO FOLLOW IS TO ACTIVATE STARTER FOR 3 TO 5 SECONDS AND ALLOW TO COOL OR 20 SECONDS.
8. If the engine does not try to start, briefly choke while activating stater motor. You should see fuel moving through the fuel line.
9. If you "flood" the engine, remove the glow plugs and activate the starter motor for ten seconds.
10. There will be a noticeable increase in the compression after the engine has run for a short period of time and will continue to increase until the rings have seated. Because of this increased compression it may be necessary to activate the starter motor before turning on the glow plugs.
11. When you are finished running the engine, remove the fuel line and allow the engine to drain any fuel which may still be in the carburetor. This should be done while the engine is still running. After the engine has stopped, place a few drops of oil

(Marvel Mystery Oil is good for this purpose and can be found at most automotive or hobby stores) down through the carburetor, while activating the starter motor. This dilutes any unburned fuel and reduces the amount of rust that can build-up on steel parts. Using a small squeeze bulb remove any oil that has accumulated in the pan. Inject three to four ounces of parts cleaner, solvent or equivalent, through the pressure fitting on the pan and shake the engine. This process will also remove any unburned fuel. It is also a good idea to lubricate the rocker arm assembly after periodically.

PARTS LIST

Block.....	1
Heads.....	2
Intake & Carb.....	1
Transmission.....	1
Transmission Backplate.....	1
Pan.....	1
Timing Cover.....	1
Valve Covers.....	1
Starter Ring Gear.....	1
Exhaust Flange.....	2
Exhaust Pipes.....	8
Glow Plug Driver.....	1
Bag 1	
Valves (8 intake 8 exhaust).....	16
Valve Springs.....	16
Valve Collets (keepers).....	16
Valve "E" Clips.....	16
Bag 2	
Air Cleaner Element.....	1
Air Cleaner Top.....	1
Air Cleaner Base.....	1
Aluminum Spacers.....	2
1/4 - 20 x 3/8" Button Head Screws.....	2
4-40 x 3/4" Socket Head Cap Screws.....	2
Brass Washers.....	2
Bag 3 (Screws)	
Backplate, 4-40 x 1/4" Socket Head Cap Screws.....	4
Header Flange, 4-40 x 1/4" Socket Head Cap Screws.....	14
Valve Cover, 4-40 x 3/4" Socket Head Cap Screws.....	8
Transmission, 4-40 x 3/8" Socket Head Cap Screws.....	4
Pan, 4-40 x 3/8" Socket Head Cap Screws.....	4
Intake "O" Rings.....	4
Intake Screws, 4-40 x 3/8" Socket Head Cap Screws.....	4
Head Bolts, 4-40 x 5/8" Socket Head Cap Screws.....	10
Head Bolts, 4-0- x 3/8" Socket Head Cap Screws.....	10
Timing Gear (Idler) 5-40 x 1/2" Socket Head Cap Screw.....	1
Pressure Fittings (brass).....	5
Brass Washers.....	15
Front Bearing Stop, 4-40 x 3/8" Button Head Cap Screws.....	2

Bag 4	
Rocker Arms.....	16
Rocker Arm Support.....	8
Rocker Arm Support Screws 2-56 x 1/2" Socket Head Cap Screws.....	8
5-40 x 3/8" Set Screws.....	16
5-40 Jam Nuts.....	16
"E" Clips.....	4
Rocker Arm Shafts.....	2
Springs.....	6
Brass Washers (3/32" I.D.).....	16

Bag 5	
Distributor Cap & Base.....	1
Glow Plugs.....	8
Glow Plug Springs.....	8
Water Pump.....	1
Motor Mounts.....	4
Lapping Powder	
Plastic Tubing with 2-56 threaded stud	

Bag 6	
28 Tooth (upper timing gear).....	1
14 Tooth (lower timing gear).....	1
22 Tooth (idler gear).....	1
0-80 x 1/8" Button Head Cap Screws.....	4
1/8" I.D. Ball Bearing.....	1
Allen Wrench.....	1

Bag 7	
Lifters.....	16
Pushrods.....	16

Bag 8	
Pistons.....	8
Piston Rings.....	8
Wrist Pins.....	8
Teflon Buttons.....	16

Bag 9	
Camshaft.....	1
Ball Bearings (3/16" I.D. x 1/2" O.D.).....	2

Bag 10	
Clutch Assembly.....	1
Large Washer.....	1
Thrust Washer.....	1

Bag 11	
Loctite 271 (RED).....	1
Loctite 510 (Orange).....	1

Bag 12	
Starter motor.....	1
Gear (8 tooth).....	1

Bag 13	
Connecting Rods.....	8