CHRYSLER 6 and 9.2 HP

Year Produced	6 hp.	9.2 hp.
1966	6601, 6602, 6603	9601, 9602, *9641, *9642
1967	6701, 6702	9701, 9702, *9741, *9742

*Electric starting models.

CONDENSED SERVICE DATA

TUNE-UP

Hp @ RPM	6 @ 4500	9.2 @ 4750
Bore-Inches	2 1 1/16	2 1/8 1 1/16
Number of Cylinders	2	2
Displacement-Cu. In.	10.60	11.97
Compression @ Cranking Speed (average, with recoil starter).	55-65 psi.	75-90 psi.
Spark Plug—		
Champion	H10J	J4J
Electrode gap	0.030	0.030
Magneto—		
Breaker point gap	0.020	0.020
Carburetor—		
Make	Tillotson	Tillotson
Model	MT-91B	MT-97A
Fuel-Oil Ratio	24:1	24:1

SIZES — CLEARANCES

Piston Rings—		
End Gap	0.006-0.011	0.006-0.011
Side Clearance	0.0015-0.004	0.0015-0.004
Piston to Cylinder Clearance	0.002-0.003	0.002-0.003
Piston Pin—		
Diameter	0.500	0.500
Clearance (Rod)	Roller Brng.	Roller Brng.
Clearance (Piston)	0.00005-0.0005	0.00005-0.0005
Crankshaft Journal Diameters—		
Upper Main	0.8711-0.8715	0.8711-0.8715
Center Main	0.8120-0.8125	0.8120-0.8125
Lower Main	0.7495-0.750	0.7495-0.750
Crankpin	0.7497-0.750	0.7497-0.750

SIZES-CLEARANCES (Cont.)

Crankshaft Bearing Clearance—		
Upper Main	Roller Brng.	Roller Brng.
Center Main	0.0025-0.0035	0.0025-0.0035
Lower Main	0.0015-0.0025	Roller Brng.
Crankpin	Roller Brng.	Roller Brng.
Crankshaft End Play	0.002-0.006	0.002-0.006
Rod Side Clearance	0.015-0.025	0.015-0.025
Lower Unit		
Driveshaft Brng. Clr.	0.0009-0.0023	0.0009-0.0023
Propeller shaft end play	0.003-0.028	0.003-0.028

TIGHTENING TORQUES (All Values in Inch-Pounds)

Connecting Rod—		
Aluminum	70	.....
Steel	80	80
Cylinder Head	65	65
Flywheel nut	480	**480
Spark Plug	120-180	120-180
Standard Screws—		
6-32	9	9
10-24	30	30
10-32	35	35
12-24	45	45
1/4-20	70	70
5/16-18	160	160
3/8-16	270	270

**Armature screw for electric starting motors should be tightened to 240-300 inch pounds torque.

LUBRICATION

The power head is lubricated by oil mixed with the fuel. One-half (½) pint of two-cycle engine oil should be mixed with each gallon of gasoline. Marine white or automotive white gasoline is recommended; if not available, use a good grade of regular gasoline. Gasoline and oil should be thoroughly mixed.

The lower unit gears and bearings are lubricated by oil contained in the gear case. Only a non-corrosive, leaded, EP90, outboard gear oil such as "Texaco EP90 Outboard Gear Oil" should be used. The gear case should be drained and refilled every 100 hours or once each year, and fluid maintained at the level of the upper (vent) plug hole.

To fill the gear case, have the motor in upright position and fill through the lower plug hole (F—Fig. C2-13) in the side of gear case until fluid reaches level of upper vent plug hole (V). Have both plugs removed while filling. Reinstall and tighten both plugs securely, using new gaskets if necessary, to assure a water tight seal.

FUEL SYSTEM

CARBURETOR. Tillotson, MT, float type carburetor shown in Fig. C2-1 is used. Normal initial setting is one turn open from the closed position for both the high speed adjustment needle (11) and the idle mixture adjustment needle (15). Carburetor must be readjusted under load, after motor is warm, for best high speed and low speed performance.

After idle mixture needle (15) is set correctly, position the arm (13) on needle in

horizontal position. Idle adjusting knob on instrument panel should be in center of travel.

To adjust the float, remove float bowl cover (1) with float attached. Invert the cover and adjust the float by bending tang (T) until farthest edge of float measures 1 7/64-inch from gasket surface of bowl cover.

It may be necessary to remove welch plug (P) and blow out idle passages if carburetor is badly plugged.

SPEED CONTROL LINKAGE. The speed control lever or grip is connected to the magneto stator plate to advance or retard the ignition timing. Throttle linkage is synchronized to open the throttle as magneto timing is advanced. It is very important that the throttle linkage be properly synchronized for best performance.

To check the linkage, turn the speed control grip until the mark (M—Fig. C2-2) is aligned with center line of roller (20). The carburetor throttle valve should just start to open. To adjust, align mark (M) with center of roller (20), loosen nut (N) and position roller stud so that roller is against cam with throttle still closed. Retighten nut (N) and recheck. Make certain that roller is against cam when mark (M) is aligned, but throttle must not be partially open.

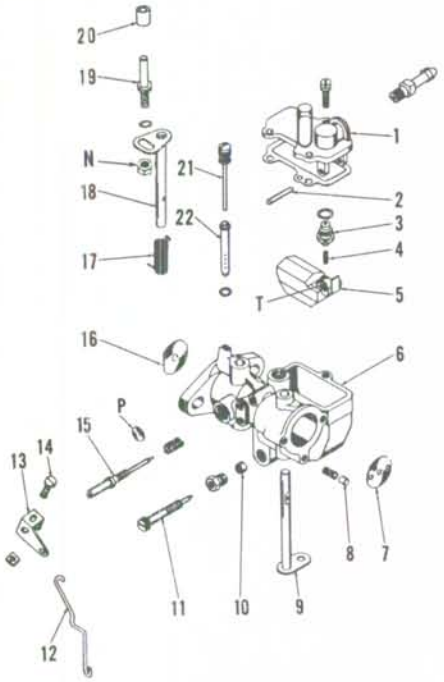


Fig. C2-1—Exploded view of Tillotson MT carburetor used on 6 and 9.2 hp motors. Knob on instrument panel moves idle mixture needle (15) via link (12) and arm (13).

P. Plug
T. Tang
1. Bowl cover
2. Float shaft
3. Inlet seat
4. Inlet needle
5. Float
6. Throttle body
7. Choke plate
9. Choke shaft
10. Packing
11. Main adjustment needle
12. Link
13. Arm
14. Screw
15. Idle adjustment needle
16. Throttle plate
17. Spring
18. Throttle shaft
19. Follower stud
20. Follwer roller
21. Idle tube
22. Main nozzle

The speed control grip should require 18-30 inch pounds torque to turn. Friction is adjusted by tightening the inside nut (1—Fig. C2-3). After adjusting, tighten lock nut (2) to maintain correct friction on lever.

REED VALVES. The inlet reed valves are located on reed plate between inlet manifold and crankcase. Reed petals should seat very lightly against the reed plate throughout their entire length, with the least possible tension. Check seating visually. Reed stop setting should be $\frac{3}{16}$-inch when measured from free end of reed stop to seating surface on reed plate as shown in Fig. C2-4. Renew reeds if petals are broken, cracked, warped, rusted or bent. Never attempt to bend a reed petal or to straighten a damaged reed. Broken petals are sometimes caused by a bent or damaged reed stop. Seating surface of reed plate should be smooth and flat.

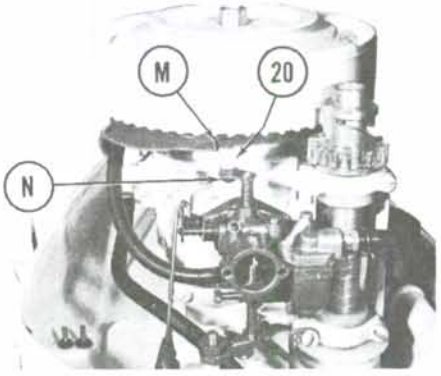


Fig. C2-2—The carburetor throttle valve should just begin to open when mark (M) on cam is aligned with center of roller (20).

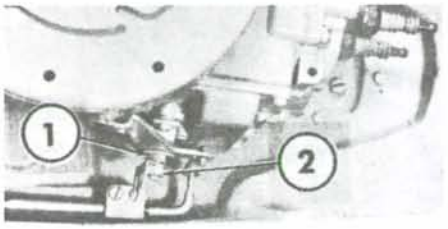


Fig. C2-3—The speed control grip should require 18-30 inch pounds torque to turn. Refer to text for adjusting friction.

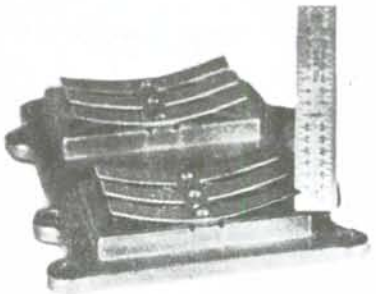


Fig. C2-4—Reed stops should be 3/16 inch from seating surface of reed plate.

FUEL PUMP. A diaphragm type fuel pump is attached to the transfer port cover for the upper crankcase. Pressure and vacuum pulsations from the crankcase are directed through the port (1—Fig. C2-5) to the rear of diaphragm (2). When the powerhead piston moves upward in its cylinder, vacuum in the crankcase draws the diaphragm inward and fuel enters the fuel chamber through filter (6) and the inlet reed valve (4) in reed plate (3). As power head piston moves downward, pressure forces the diaphragm outward into fuel chamber and fuel passes through the outlet reed valve to carburetor line (7).

Defective or questionable parts should be renewed. Reeds (26—Fig. C2-7) should seat lightly and squarely on reed plate (27). Diaphragm should be renewed if air leaks or cracks are found, or if deterioration is evident.

IGNITION

Breaker point gap should be 0.020 for each set of points, and can be adjusted after the flywheel is removed. Both sets of points should be adjusted exactly alike. NOTE: High point of breaker cam coincides with location of flywheel key. Align key with rub block when adjusting each set of points.

The tapered bore in flywheel and end of crankshaft must be clean, dry and smooth before installing flywheel. Flywheel nut for manual start motors should be torqued to 480 inch pounds. Armature screw for electric starting motors should be tightened to 240-300 inch pounds torque. Spark plug electrode gap should be 0.030.

COOLING SYSTEM

WATER PUMP. All motors are equipped with a rubber impeller water pump. When cooling system problems are encountered, first check the water inlet for plugging or partial stoppage, then if not corrected, remove the lower unit gearcase and check the condition of water pump, water passages and sealing surfaces.

To detach the upper gearcase from the exhaust housing, proceed as follows: Shift to Reverse gear, then remove the four nuts (1—Fig. C2-13) and screws (2). Lower the

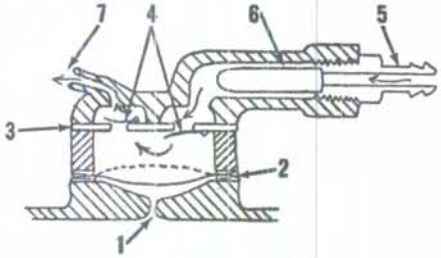


Fig. C2-5—Schematic view of the diaphragm type fuel pump used on all models. Check valves are of the reed type.

1. Pressure port
2. Diaphragm
3. Reed plate
4. Check valves
5. Inlet fitting
6. Filter
7. Outlet

gearcase and remove the two screws (8—Fig. C2-14) that attach the two sections of shift rod (7 & 9) together. The water pump can be removed after removing screws (31 & 32). Drive shaft seal (29) should be installed with spring loaded lip down.

When reassembling, notice that screw (31) is 1⅛ inches long and the two front screws (32) are 1 inch long. Drive shaft spline seal (24) should be renewed if hard or cracked. Lubricate water tube seal (21) and splines on upper end of drive shaft (22). Position gearcase assembly so that shift rods (7 & 9) can be connected with screws (8). Carefully slide the housings together making certain that water tube (18) enters seal (21) and install the four retaining screws (2—Fig. C2-13) and nuts (1).

POWER HEAD

R&R AND OVERHAUL. To remove power head, clamp the motor on a stand or support, and remove the engine cover. The power head can be lifted oft after removing the eight retaining screws (Fig. C2-6) and disconnecting the interfering wires, speed control linkage and fuel lines. If power head is to be serviced, it is usually easier to remove carburetor, magneto and starter before detaching power head from lower unit.

The crankshaft and pistons can be removed after removing cylinder head (1—Fig. C2-7), inlet manifold (18), reed plate (17), bearing cage (21) and crankcase front half (14). Parts, (5, 6, 7, 8, 9 & 12) should be identified for correct assembly to the cylinder from which they were removed. The exhaust covers (2 & 3), transfer port cover (24) and drain cover (23) should be removed for cleaning and inspection if major repairs are to be performed. Pry lugs are provided adjacent to the retaining dowels, for removing the crankcase front half.

Engine components are now accessible for removal and overhaul as outlined in the appropriate following paragraphs. Assemble as outlined in the ASSEMBLY paragraph.

ASSEMBLY. When reassembling, make sure all joint and gasket surfaces are clean, free from nicks and burrs and hardened cement or carbon. The crankcase and inlet manifold must be completely sealed against water leakage and pressure. Mating surfaces of water intake, and exhaust areas between power head and lower unit must form a tight seal.

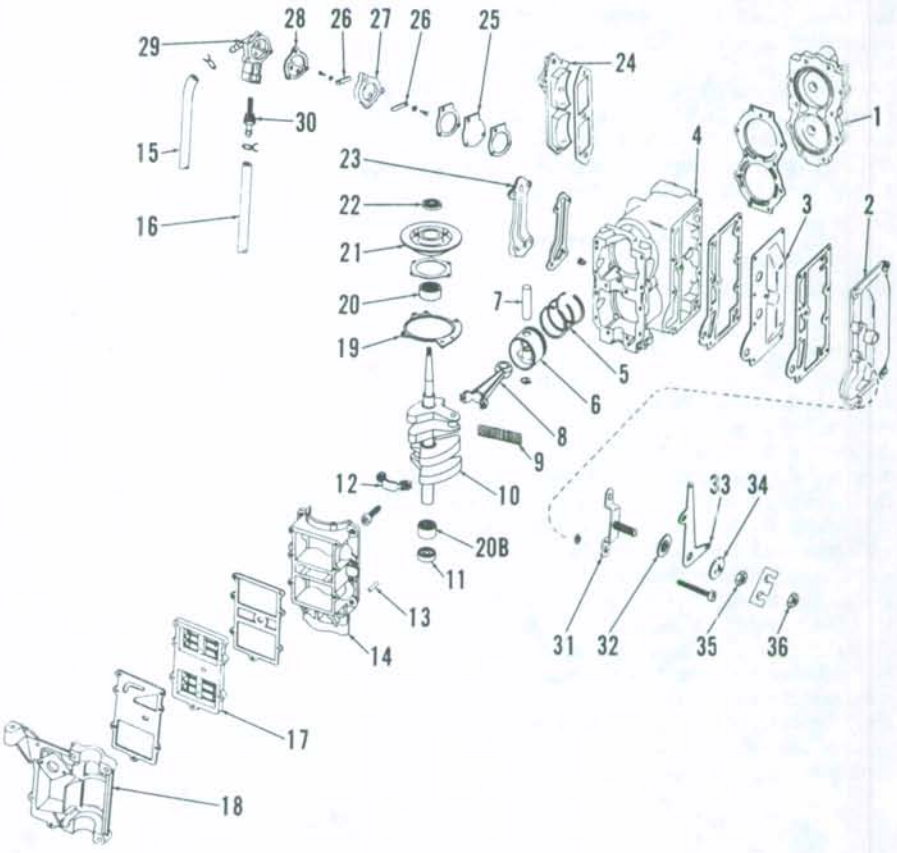


Fig. C2-7—Exploded view of power head and associated parts. Bearing (20B) is used on 9.2 hp motors.

1. Cylinder head
2. Exhaust cover
3. Exhaust cover
4. Cylinder half
5. Piston rings
6. Piston
7. Piston pin
8. Connecting rod
9. Needle rollers
10. Crankshaft
11. Seal
12. Cap
13. Dowel
14. Crankcase half
15. Pressure line to carburetor
16. Inlet line
17. Reed plate
18. Intake manifold
19. Stator ring
20. Needle bearing
20B. Needle bearing (9.2 hp motors)
21. Bearing cage
22. Seal
23. Drain cover
24. Transfer port cover
25. Pump diaphragm
26. Reed valve
27. Reed plate
28. Gasket
29. Pump cover
30. Inlet screen
31. Bracket
32. Bearing
33. Magneto control lever
34. Washer
35. Friction adj. nut
36. Lock nut

Fig. C2-6—The power head is retained to lower unit with eight screws. Other four are similarly located on starboard side.

Whenever power head is disassembled, it is recommended that all gasket surfaces and mating surfaces without gaskets be carefully checked for nicks and burrs and warped surfaces which might interfere with a tight seal. The cylinder head, head end of cylinder block, and some mating surfaces of manifolds and crankcase may be checked, and lapped if necessary, to provide a smooth surface. Do not remove any more metal than is necessary.

Mating surfaces of crankcase may be checked on the lapping block, and high spots or nicks removed, but the surface must not be lowered. If extreme care is used, a slightly damaged crankcase may be salvaged in this manner.

A heavy, non-fibrous grease should be used to hold loose needle bearings in position during assembly. All friction surfaces should be lubricated with new engine oil. Check frequently as power head is being assembled, for binding of the working parts. If binding or locking is encountered, remove the cause before proceeding with the assembly.

Gasket and sealing surfaces should be lightly and carefully coated with a non-hardening gasket cement. Make sure entire surface is coated, but avoid letting excess cement squeeze out into crankcase, bearing or other passages. When installing the crankcase screws, tighten screws next to the main bearings and dowels first. Crankshaft seals (11 & 22—Fig. C2-7) should be renewed each time crankshaft is removed. Refer to CONDENSED SERVICE DATA table for clearances and tightening torques.

Before attaching power head to lower unit, renew the drive shaft spline seal (24—Fig. C2-14) and coat splines with grease.

PISTONS, PINS, RINGS AND CYLINDERS. Piston is fitted with three rings which should be installed with the beveled inner edge toward closed end of piston. Recommended ring end gap is 0.006-0.011, with a maximum wear limit of 0.016. Piston rings should have 0.0015-0.004 side clearance in piston grooves, with a wear limit of 0.005.

Piston skirt clearance should be 0.002-0.003 when measured at widest part of skirt at right angles to piston pin. Renew the piston if skirt clearance exceeds 0.005

When installing piston on connecting rod and the rod and piston in cylinder, observe the following: The long, tapering side of piston head should be installed toward the exhaust ports and the oil hole (H—Fig. C2-8) in connecting rod should be toward top of motor. All friction surfaces should be lubricated with new engine oil when assembling.

CONNECTING RODS, BEARINGS AND CRANKSHAFT. Before detaching connecting rods from crankshaft, make certain that rod and cap are properly marked for correct assembly to each other and in the correct cylinder. The loose needle bearings at crankpin end of connecting rod should be kept with each assembly and not intermixed if reused.

The forged steel connecting rods contain 28 loose needle rollers at crankpin end of rod and a caged needle bearing at piston end. Parting faces of rod and cap are not machined, but are fractured, to provide positive location. When installing cap, make sure the correlation marks (M—Fig. C2-8) are aligned; then shift cap back and forth slightly while tightening, until fractured sections are in perfect mesh. When properly installed, the fractured parting line is practically invisible as shown. Rod side play on crankpin should be 0.015-0.025, with a wear limit of 0.035.

The crankshaft upper main needle bearing (20—Fig. C2-7) is contained in the end cap (21) and the center main bearing is a bronze bushing cast into the crankcase halves. The lower main bearing is a cast in bronze bushing for 6 hp motors and renewable needle bearing (20B) for 9.2 hp motors. On all models, recommended diametral clearance is 0.0025-0.0035 for the center bearing and 0.0015-0.0025 for the lower bushing on 6 hp motors. Recommended crankshaft end play is 0.002-0.006. Oversize and undersize parts are not available.

When assembling, follow the procedures outlined in the ASSEMBLY paragraph. Tightening torques are listed in the CONDENSED SERVICE DATA table.

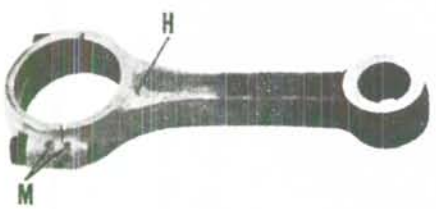


Fig. C2-8—Connecting rod and cap are perfectly mated parts and the fractured joint should be invisible when correctly assembled. Marks (M) should be aligned and oil hole (H) and marks should be toward top of motor when connecting rod assembly is installed.

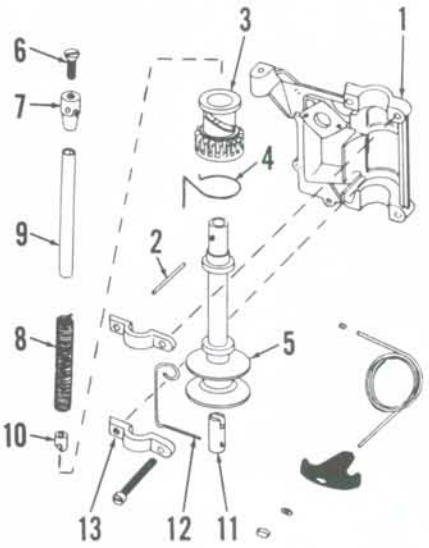


Fig. C2-9—Exploded view of recoil starter assembly.

1. Inlet manifold
2. Drive pin
3. Drive pinion
4. Pinion spring
5. Starter spool
6. Locking screw
7. Spring drive
8. Recoil spring
9. Guide post
10. Retainer
11. Retainer extension
12. Rope guide
13. Bearing caps

MANUAL STARTER

Fig. C2-9 shows an exploded view of the recoil starter assembly. Starter pinion (3) engages a starter ring gear on the flywheel.

To disassemble the starter assembly, first remove the engine cover, then remove screw (6). NOTE: This screw locks pin (2) in place in starter shaft. Thread the special "T" handle tool (T3139) in threaded hole from which screw (6) was removed. Tighten the tool securely, then carefully push the pin (2) out of pinion and starter spool. Allow the tool and starter drive (7) to turn clockwise until recoil spring (8) is unwound; then use the tool to withdraw the recoil spring (8) and drive (7) from center of starter spool (5). Guide post (9) and spring retainer (10) can be lifted out after recoil spring is removed.

Recoil spring, pinion (3) or associated parts can be renewed at this time. To renew the starter rope, remove the bearing caps (13) retaining spool (5) to inlet manifold (1) and remove the spool. NOTE: Bearing caps (13) should be reinstalled in the original location. Thread the new rope through hole in end of spool (5) and install the retainer link approximately ½-inch from end. Pull secured end of rope into spool, then wind rope on spool and install spool. Rope guide (12) should be installed with end through hole in retainer extension (11) and attached by screw retaining the lower bearing cap. Install the recoil spring assembly, and drive pinion (3). Use the "T" handle tool to wind the recoil spring counterclockwise eight turns as shown in Fig. C2-10. Align the holes in pinion (3—Fig. C2-9), spool (5) and spring drive (7); then insert the drive pin (2). Remove the tool and reinstall the locking screw (6). Recoil spring cavity of starter spool (5) should be filled with lubriplate or a similar grease when reassembling.

If tension of pinion spring (4) is incorrect, the pinion (3) may prevent full throttle operation.

ELECTRIC STARTER-GENERATOR

The combination starter and generator unit shown in Fig. C2-11 is used on "Autolectric" 9.2 hp motors. The armature (7) is mounted directly on upper end of crankshaft. The 12 volt battery should be connected with negative terminal grounded. The positive terminal should be connected to the red battery cable (18). If battery is connected with wrong terminal grounded or if motor is operated without battery, the rectifier (14) or armature (7) may be damaged. Circuit breaker (13) will normally protect the electric components.

The housing and field assembly (6) can be removed after disconnecting necessary wires and removing the six mounting screws. Housing (6) must be removed before armature (7) can be removed from crankshaft. Armature screw (2) should be tightened to 240-300 inch pounds torque.

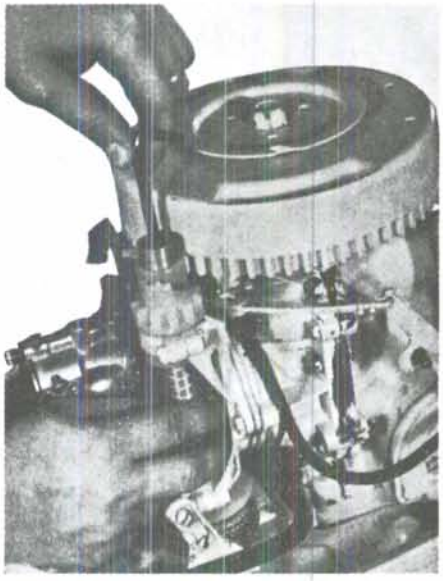


Fig. C2-10—View of special "Tee" handle tool (No. T-3139) for removing and installing starter recoil spring assembly.

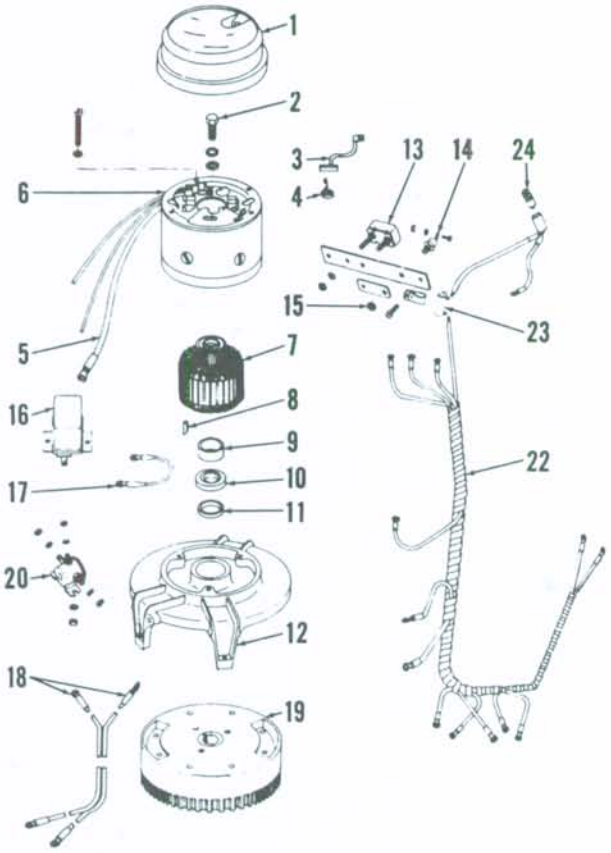


Fig. C2-11—Exploded view of electric starter-generator assembly for 9 hp "Autoelectric" models.

1. Cover
2. Armature screw
3. Brushes (2 used)
4. Brush spring
5. Starter lead wire
6. Housing and field assembly
7. Armature
8. Key
9. Spacer
10. Bearing
11. Spacer
12. Support housing
13. Circuit breaker
14. Rectifier
15. Nut
16. Voltage regulator
17. Regulator ground
18. Battery cables
19. Flywheel
20. Starter relay
22. Wiring harness
23. Resistor
24. Dome light

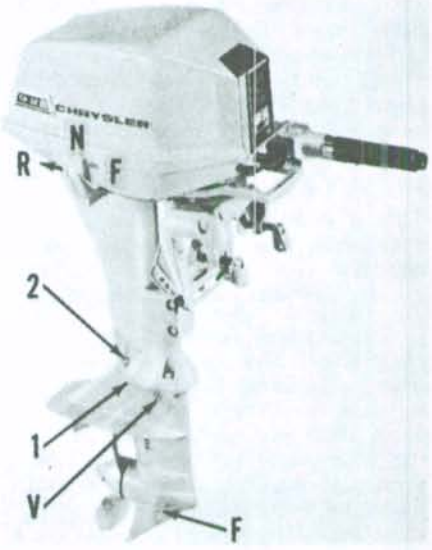


Fig. C2-13—View of 9.2 hp motor showing two of the screws (2) and nuts (1) that attach upper gearcase housing to motor leg (exhaust housing).

LOWER UNIT

PROPELLER AND DRIVE PIN. Shear pin protection is carefully engineered for each unit. Protection depends on shear pin material as well as size. Although, in an emergency, the shear pin may be replaced by one of any available material, the correct shear pin should be installed as soon as possible to insure maximum performance and protection. Spare shear pins should always be carried.

All models use a $\frac{3}{32}$ X $1\frac{3}{16}$ inch stainless steel shear pin. Six (6) hp motors use 7½ inch diameter, 7½ inch pitch propeller. Propeller used on 9.2 hp motors is 8 inch diameter, 8 inch pitch. Right hand rotating (clockwise), two bladed, aluminum propeller is standard for all models.

R&R AND OVERHAUL. To detach the upper gearcase from the exhaust housing, shift to Reverse gear, then remove the four nuts (1—Fig. C2-13) and screws (2). Lower the gearcase and remove the two screws (8—Fig. C2-14) that attach the two sections of shift rod (7 & 9) together.

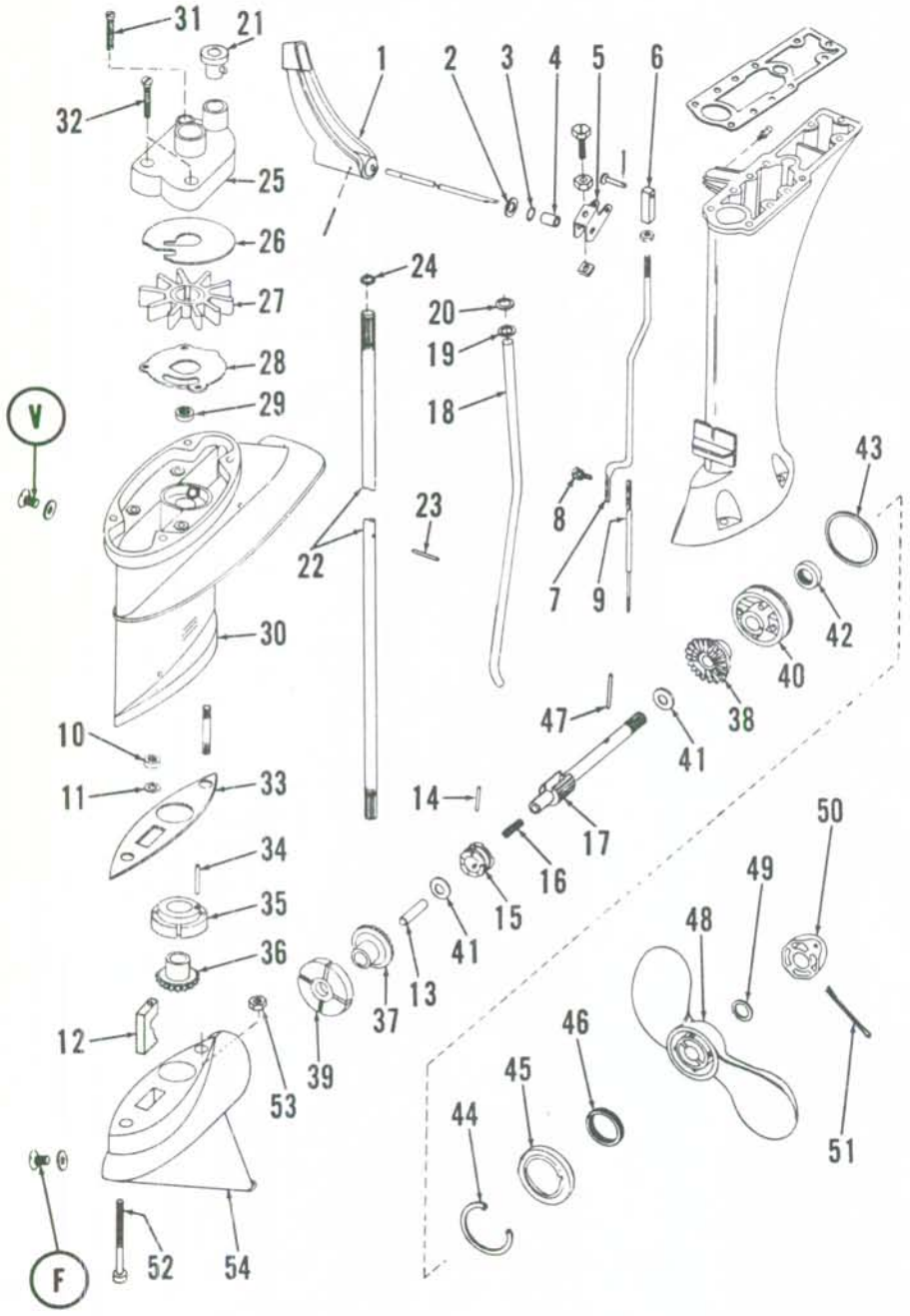
Remove the propeller and shear pin. Remove any burrs or rust from exposed end of propeller shaft. Remove snap ring (44), thread two screws in threaded holes of propeller shaft bearing cage (40); and remove the cage, using a puller.

To detach lower gearcase (54) from drive shaft housing (30), unscrew and remove shift rod (9) from cam (12). Housings are secured by screw (52) at forward end and stud nut (53) INSIDE the case shown by arrow, Fig. C2-15.

Propeller shaft, gears, bearings and shift mechanism can be removed after housings are separated. Front gear and bearing (37 & 39—Fig. C2-14) can usually be dislodged from housing by jarring open end of housing on a block of wood. If trouble is encountered, heat gearcase to loosen bearing. When installing front gear (37) and bearing (39) in housing, assemble bearing cage (40), without the "O" ring (43) over rear of propeller shaft; install thrust washer (41), and gear assembly (37) on front of shaft; and use the shaft as a piloted driver.

Spring loaded lip of drive shaft seal (29) should be down. Spring loaded lip of propeller shaft seal (42) should be toward outside (rear). Grooved side of bearing (39) should be toward front (away from gear). With unit assembled, propeller shaft end play should be 0.003-0.028. Backlash and mesh position of gears are not adjustable.

Before installing the assembled gearcase to the drive shaft housing, renew drive shaft spline seal (24) and coat splines and lower end of water tube (18) with grease. Make certain that water tube correctly enters seal (21).



F. Filler plug
V. Vent (oil level) plug
1. Shift handle
2. Nylon washer
3. Seal
4. Spacer
5. Lever arm
6. Coupling
7. Upper shift rod
8. Screws
9. Lower shift rod
10. Shift rod seal
11. Seal retainer
12. Shift cam
13. Shift plunger
14. Pin
15. Coupling (clutch)
16. Spring
17. Propeller shaft
18. Water tube
19. Stainless steel washer
20. Seal
21. Seal
22. Drive shaft
23. Water pump drive pin
24. Spline seal
25. Water pump body
26. Top plate
27. Impeller
28. Bottom plate
29. Drive shaft seal
30. Upper gearcase (drive shaft) housing
31. Screw (1⅛ inch)
32. Screws (1 inch)
33. Gasket
34. Spring pin
35. Bevel pinion thrust bearing
36. Bevel pinion
37. Bevel gear
38. Bevel gear
39. Bearing
40. Bearing and end cap
41. Thrust washers
42. Seal
43. Seal
44. Snap ring
45. Weed guard
46. Retaining ring
47. Shear pin
48. Propeller
49. Seal
50. Nut
51. Stainless steel cotter pin
52. Socket head screw
53. Nut

Fig. C2-14—Exploded view of lower unit assembly. Spring (16) should be compressed in propeller shaft (17) while driving pin (14) through coupling (15) and shaft.

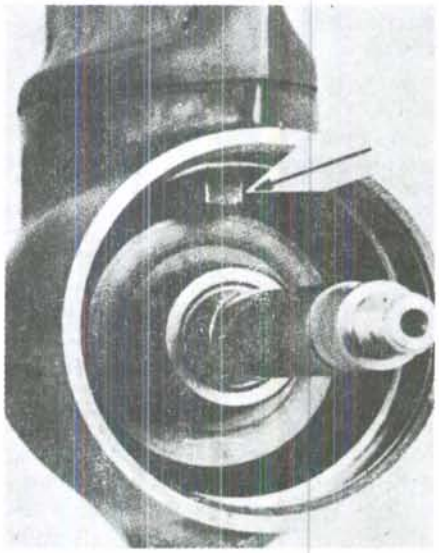


Fig. C2-15—Lower unit gearcase with propeller shaft bearing cage removed, showing location of rear stud nut (53—Fig. C2-14).