

CANADIEN

MODEL	Bore	Stroke	Displacement	Drive
175	2 1/4	1 3/8	5.45	Direct
270	2 5/8	1 3/8	5.8	Direct
271	2 5/8	1 3/8	5.8	Gear
275	2 3/8	1 3/8	7.5	Direct

MAINTENANCE

SPARK PLUG. Use Champion J6J, Autolite A3X, AC M44C or equivalent. Electrode gap is 0.025.

CARBURETOR. All models are equipped with Tillotson series HL diaphragm type carburetors with integral fuel pump. Refer to Fig. CA1 for exploded view of typical carburetor used.

Initial adjustment of high speed (load) fuel needle is 3/4 to 1-turn open on all models. Initial adjustment of idle fuel needle is 1/2 to 3/4-turn open on models 270 and 271; 3/4 to 1-turn open on models 175 and 275. Be sure that idle speed adjustment is not set too fast. Carburetor adjustment points are shown in Fig. CA2.

After engine has warmed up, adjust low speed jet and idle speed adjustment screw until engine runs smoothly at desired idle speed. (Below speed at which clutch disengages.) Engine should accelerate without faltering. If not, turn high speed jet screw counter-clockwise slightly to provide a richer fuel mixture. Do not race engine at full throttle if not under load.

MAGNETO AND TIMING. Wico flywheel type magnetos are used on all models. Refer to Fig. CA3 for exploded view of magneto used on Models 175, 270 and 271, and to Fig. CA5 for exploded view of magneto used on Model 275.

Set breaker point gap to 0.015 on Model 275 and to 0.020 on all other models. Con-

denser capacity on all models is 0.16-0.20 mfd.

Ignition timing on all models is 35 degrees BTDC. Timing is adjustable by moving magneto assembly in elongated mounting holes in the magneto stator plate. Original magneto stator plate is punch marked to align with the 35° mark on stator backing plate. Timing will be correct if stator plate is reinstalled with punch mark aligned with timing mark on backing plate as shown in Figs. CA4 and CA6. However, if new stator plate is installed, timing may be set by using a degree wheel to locate crankshaft at 35 degrees BTDC, or by using a dial indicator to locate piston at 0.128 inch BTDC. Points should just start to open with engine at 35° or 0.128 inch BTDC.

LUBRICATION. Engine is lubricated by mixing 1 part SAE 30 or SAE 40 motor oil with 16 parts regular gasoline.

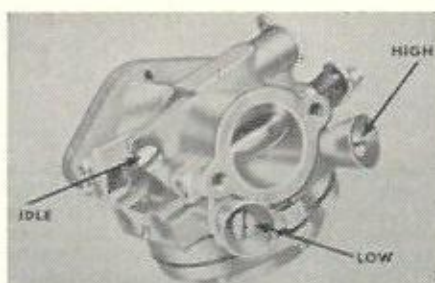


Fig. CA2 — View of carburetor showing adjustment points.

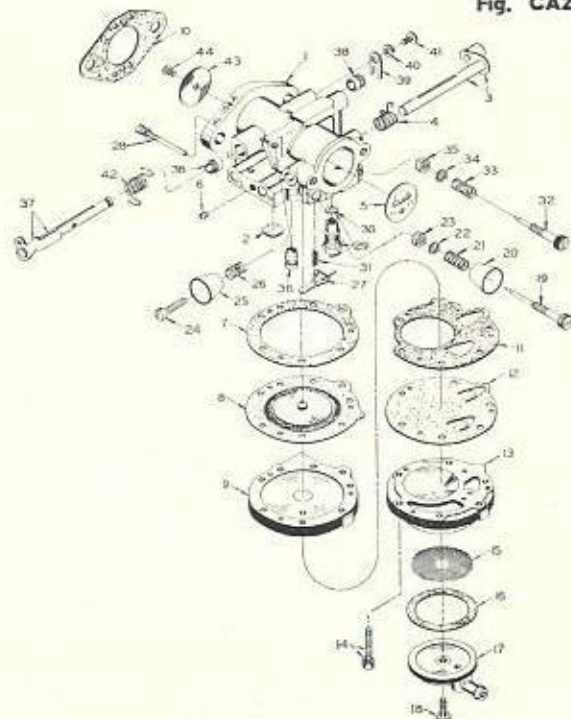


Fig. CA1—Exploded view of typical Tillotson carburetor used on Canadian chain saws. Screw cups (20 and 25) are not used on all models.

1. Body
3. Choke shaft
5. Choke shutter
8. Carburetor diaphragm
12. Fuel pump diaphragm
13. Fuel pump body
15. Fuel strainer screen
19. Idle jet adj. screw
24. Idle speed adj. screw
27. Inlet control lever
29. Inlet needle & seat
32. Main jet adj. screw
36. Nozzle check valve
37. Throttle shaft
38. Throttle shaft bushing
43. Throttle shutter

POWER MACHINERY
A Division of
Bristol Aero-Industries Limited
Vancouver Airport
Vancouver, B.C., Canada

POWER MACHINERY
A Division of
Bristol Aeroplane Co. (U.S.A.) Inc.
923 Westlake Avenue N.
Seattle, Washington 98109

Fill chain oil tank with SAE 10 or SAE 20 motor oil. In cold weather, chain oil can be diluted up to 50% with diesel fuel or kerosene. (Do not dilute chain oil beyond 50%.)

Fill transmission to oil level plug on gear drive models with SAE 10-20 lubricating oil. SAE 30 lubricating oil can be used in unusually warm or hot weather.

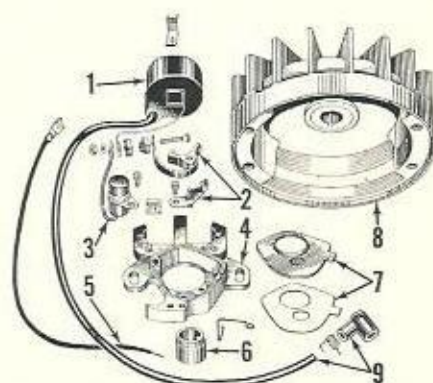


Fig. CA3 — Exploded view of Wico magneto used on all models except model 275. Refer to Fig. CA5 for exploded view of model 275 magneto.

1. Ignition coil
2. Breaker points
3. Condenser
4. Stator plate
5. Switch wire
6. Breaker cam
7. Breaker cover & gasket
8. Flywheel & magneto rotor
9. High tension lead

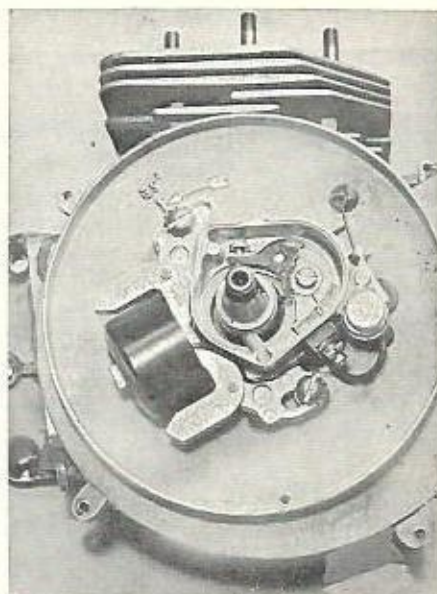
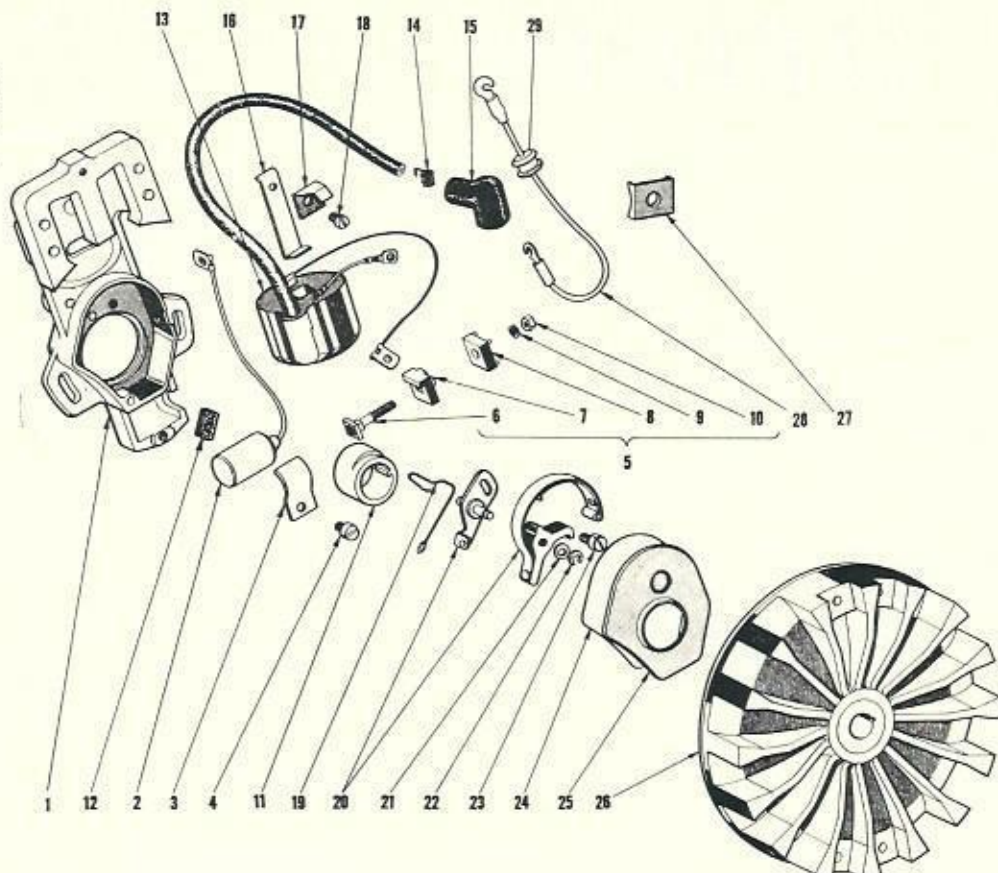


Fig. CA4 — Timing ignition on models 175, 270 and 271. Punch mark on stator near upper mounting screw should align with 35° mark on stator backing plate.

Fig. CA5 — Exploded view of Wico magneto used on Model 275 Canadien chain saw. Refer to Fig. CA6 for view of magneto and backing plate showing timing marks.

1. Stator & armature core assy.
2. Condenser
3. Condenser clamp
4. Terminal connection unit
5. Terminal stud
6. Insulator
7. Insulator
8. Insulator
9. Breaker cam
10. Cam wiper felt
11. Ignition coil
12. Terminal spring
13. Terminal cover
14. Coil wedge spring
15. Ignition wire clip
16. Breaker box cover spring
17. Breaker point set
18. Thrust washer
19. Retaining ring
20. Gasket
21. Breaker box cover
22. Flywheel



CARBON. Carbon should be removed from the exhaust ports periodically. Remove spark plug and turn engine until piston is at bottom of cylinder. Remove exhaust manifold cover, turn engine on end to keep carbon from falling inside cylinder, and scrape excess carbon away with a blunt edge tool.

REPAIRS

TIGHTENING TORQUES. Recommended tightening torques are as follows:

Connecting Rod	55 Inch-Lbs.
Stator to Stator Plate.....	75 Inch-Lbs.
Stator Plate to Crankcase.....	75 Inch-Lbs.
Blower Cover to Stator.....	25 Inch-Lbs.
Starter Cord Roller.....	35 Inch-Lbs.
Starter Cover to Blower Cover..	35 Inch-Lbs.
Exhaust Body to Cylinder Block..	75 Inch-Lbs.
Exhaust Cover to Exhaust Body	25 Inch-Lbs.
Fuel Tank to Crankcase.....	110 Inch-Lbs.
Air Cleaner Bracket	
to Carburetor	25 Inch-Lbs.
Cylinder Block to Crankcase...	75 Inch-Lbs.
Cylinder Head	75 Inch-Lbs.
Crankshaft Drive Nut.....	25 Foot-Lbs.
Crankshaft Flywheel Nut.....	25 Foot-Lbs.
Carburetor to Crankcase.....	75 Inch-Lbs.
Bar to Crankcase.....	20 Foot-Lbs.

CONNECTING ROD. Rod is removed from above after first removing cylinder head, cylinder block and piston. Parting faces of steel rod and cap are not machined, but are fractured to provide the dowling effect of the meshing of the consequent uneven surfaces. Cap is retained to connecting rod by heat treated socket head cap screws entered from above through rod and threaded into cap. Cap and rod are punch-marked on one side. Punch-marked side is assembled towards back (handle end) of engine. Piston pin bearing in rod is a caged roller bearing assembly. Crankpin bearing is also a caged roller bearing, but cage is split with each half retaining six rollers. See Fig. CA7. The rim of each bearing cage half is notched at the dividing point for identification. Notches should be aligned with punch marks on connecting rod and to the back of the engine.

RINGS, PIN, PISTON AND CYLINDER. Aluminum alloy piston is equipped with two compression rings. Ring end gap should be .007 to .017 and groove clearance should be .0020 to .0035. Piston clearance should be .005 to .006 measured at right angles to piston pin on skirt below pin and immediately below exhaust ports of cylinder wall. Pistons and rings are available in standard size only.

Floating type piston pin is retained in piston by a snap ring at each end. Pin is tight fit to piston making it necessary to

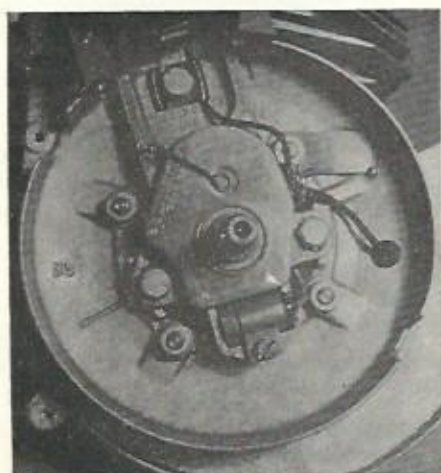


Fig. CA6 — View of Model 275 magneto showing timing mark. Punch mark near center of slot for lower left retaining cap screw should be aligned with raised line on backing plate.

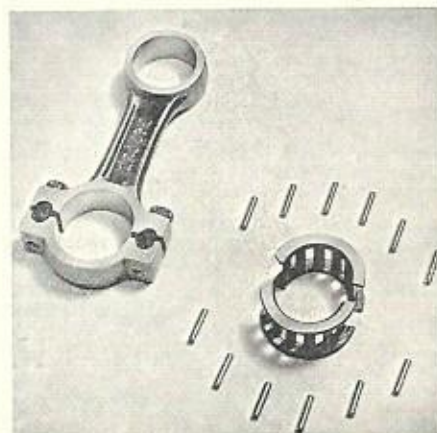


Fig. CA7 — Connecting rod and crankpin bearing. Note notched corners on bearing cage flanges.

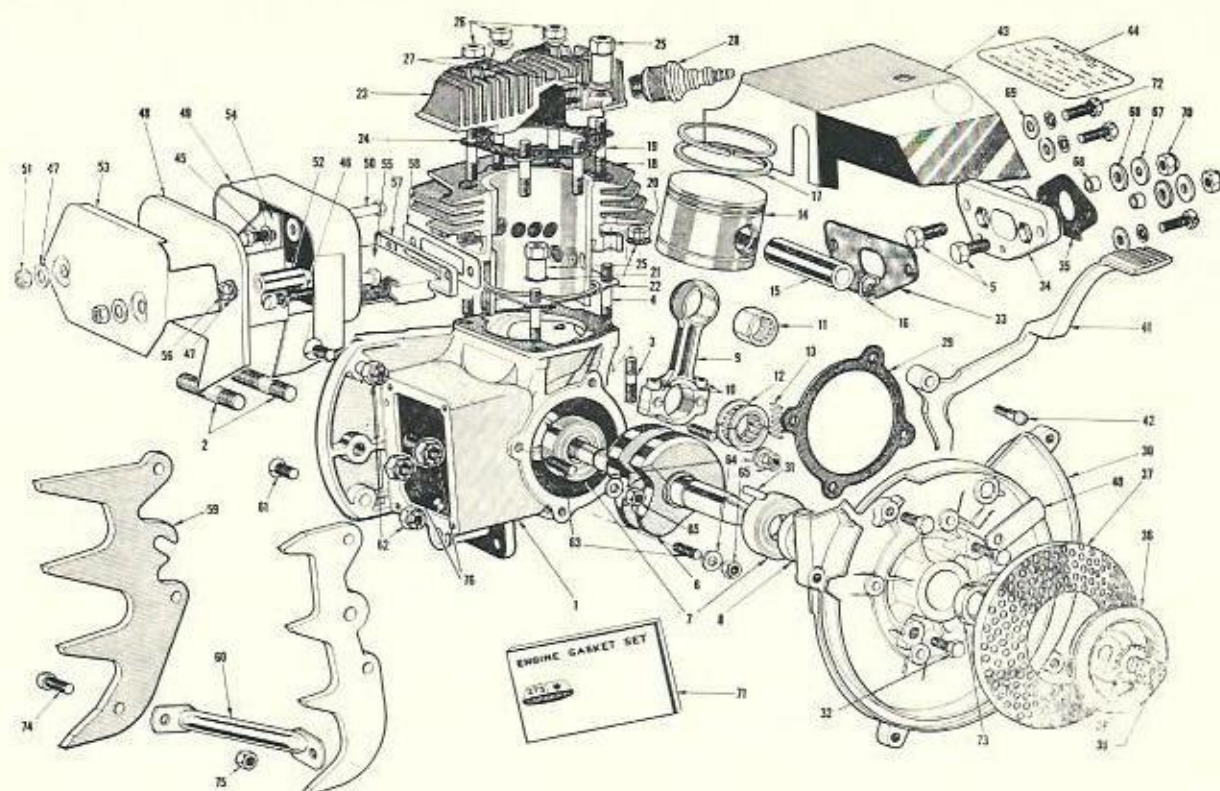
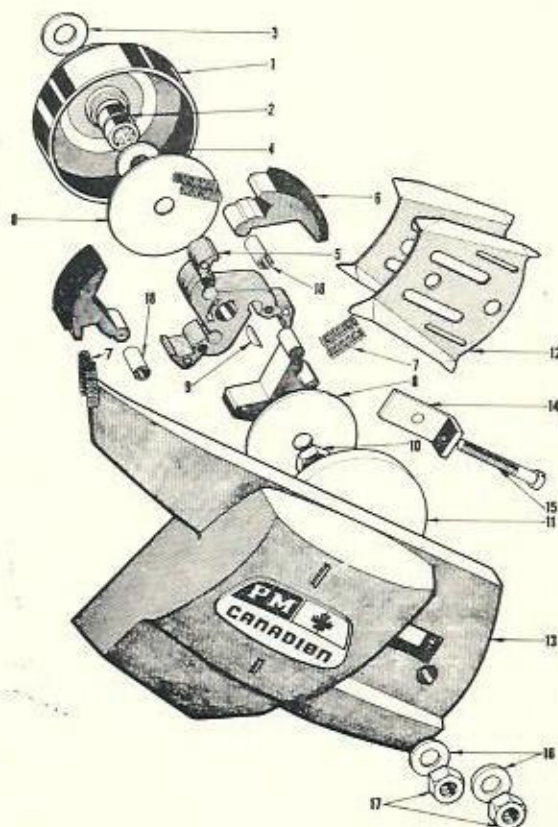


Fig. CA8 — Exploded view of Model 275 chain saw engine. Other models are similar except for muffler design.

- | | |
|---------------------------|----------------------------|
| 1. Crankcase assembly | 33. Gasket |
| 2. Crankshaft | 34. Heat damper |
| 3. Main bearings | 35. Gasket |
| 4. Crankshaft seals | 36. Starter cup |
| 5. Connecting rod | 37. Screen |
| 6. Cap screws | 41. Oiler lever |
| 7. Needle bearing | 43. Shroud |
| 8. Bearing cage | 48. Exhaust manifold cover |
| 9. Bearing rollers (12) | 49. Exhaust manifold |
| 10. Piston | 52. Spacer tube |
| 11. Piston pin | 53. Exhaust cover |
| 12. Snap rings | 54. Exhaust baffle |
| 13. Piston rings | 55. Exhaust tube |
| 14. Cylinder block assy. | 57. Exhaust face plate |
| 15. Gasket | 58. Gasket |
| 16. Cylinder head | 59. Spike |
| 17. Head gasket | 66. Insulating sleeve |
| 18. Gasket | 68. Fiber washer |
| 19. Magneto backing plate | 69. Spacer washer |
| 20. Key | 73. Crankshaft seal |

Fig. CA9 — Exploded view of the direct drive clutch assembly used on Model 275 chain saw. Clutches used on other models are similar.



1. Sprocket, drum & bearing assy.
2. Sprocket bearings
3. Thrust washer
4. Thrust washer
5. Clutch driver
6. Clutch shoe assys. (3)
7. Springs (6)
8. Side plates (2)
9. Clutch key
10. Crankshaft nut
11. Clutch cover
12. Guide plates (2)
13. Cover assembly
14. Chain tensioner
15. Clutch sleeves (3)

heat piston with blow torch to remove or install pin. After removing snap rings, heat each side of piston around pin, support piston with asbestos glove or rag, and push pin out with suitable tool. Piston pin is available in standard size only.

If cylinder block is worn beyond specified clearance when measured with new piston, or if cylinder wall is scored, install new block as oversize pistons and rings are not available.

CRANKSHAFT AND SEALS. Crankshaft is carried in ball bearings at each end. To remove crankshaft, remove all screws from stator backing plate, heat crankcase around clutch side main bearing with a blowtorch, then drive crankshaft and stator backing plate from crankcase by tapping on clutch end of crankshaft with soft hammer. Heat stator backing plate around main bearing with torch and drive crankshaft from plate with soft hammer.

Remove main bearings from crankshaft using a standard bearing puller. Expand

1. Blower housing
2. Roller
3. Air filter adapter
4. Air filter element
5. Shroud
6. Ignition switch
7. Fuel cap
8. Gasket
9. Fuel tank assembly
10. Fuel pickup hose
11. Fuel pickup assy.
12. Screen
13. Filter element
14. Fuel line
15. Connector
16. Tank vent kit
17. Throttle trigger
18. Throttle link
19. Hinge pin
20. Choke spring
21. Choke lever
22. Front handle
23. Oiler pushrod

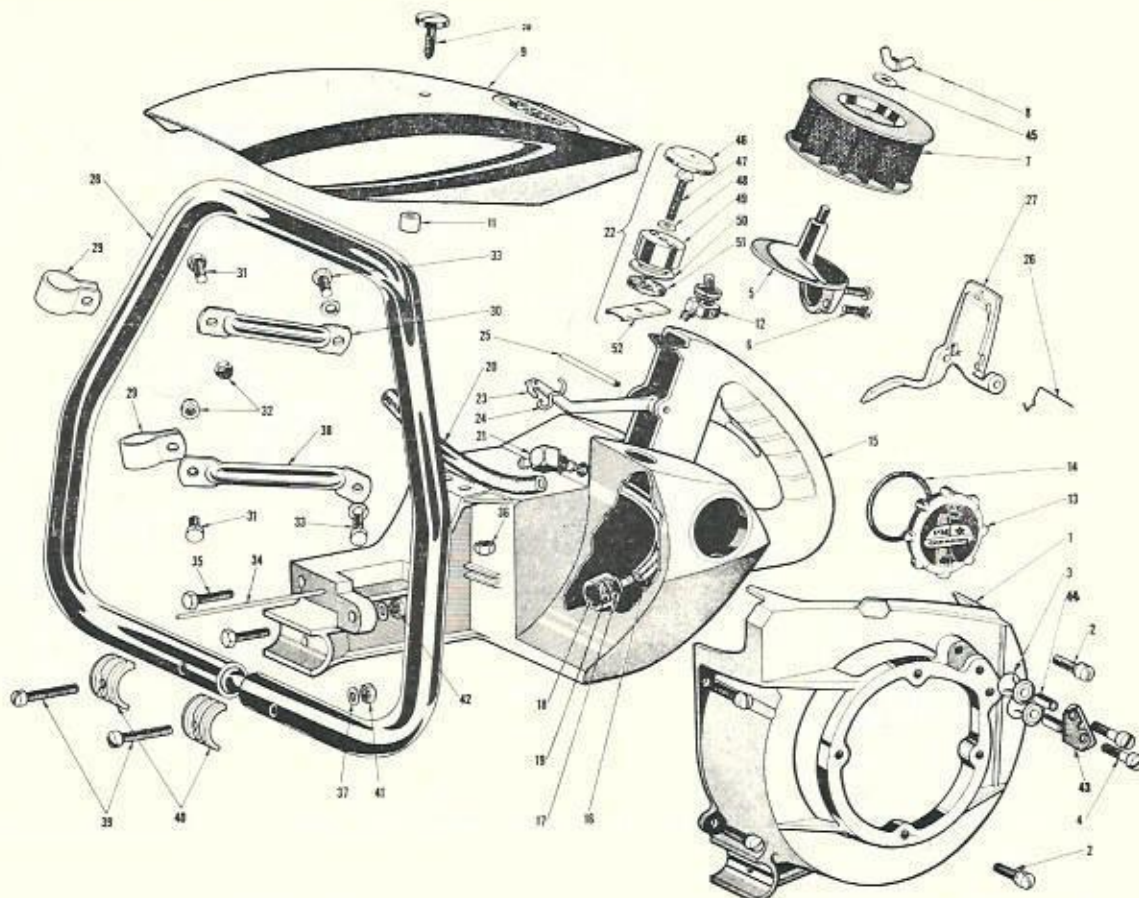


Fig. CA10 — Exploded view of fuel tank, blower housing and air cleaner assemblies for Model 275 chain saw. Components of other model chain saws are similar.

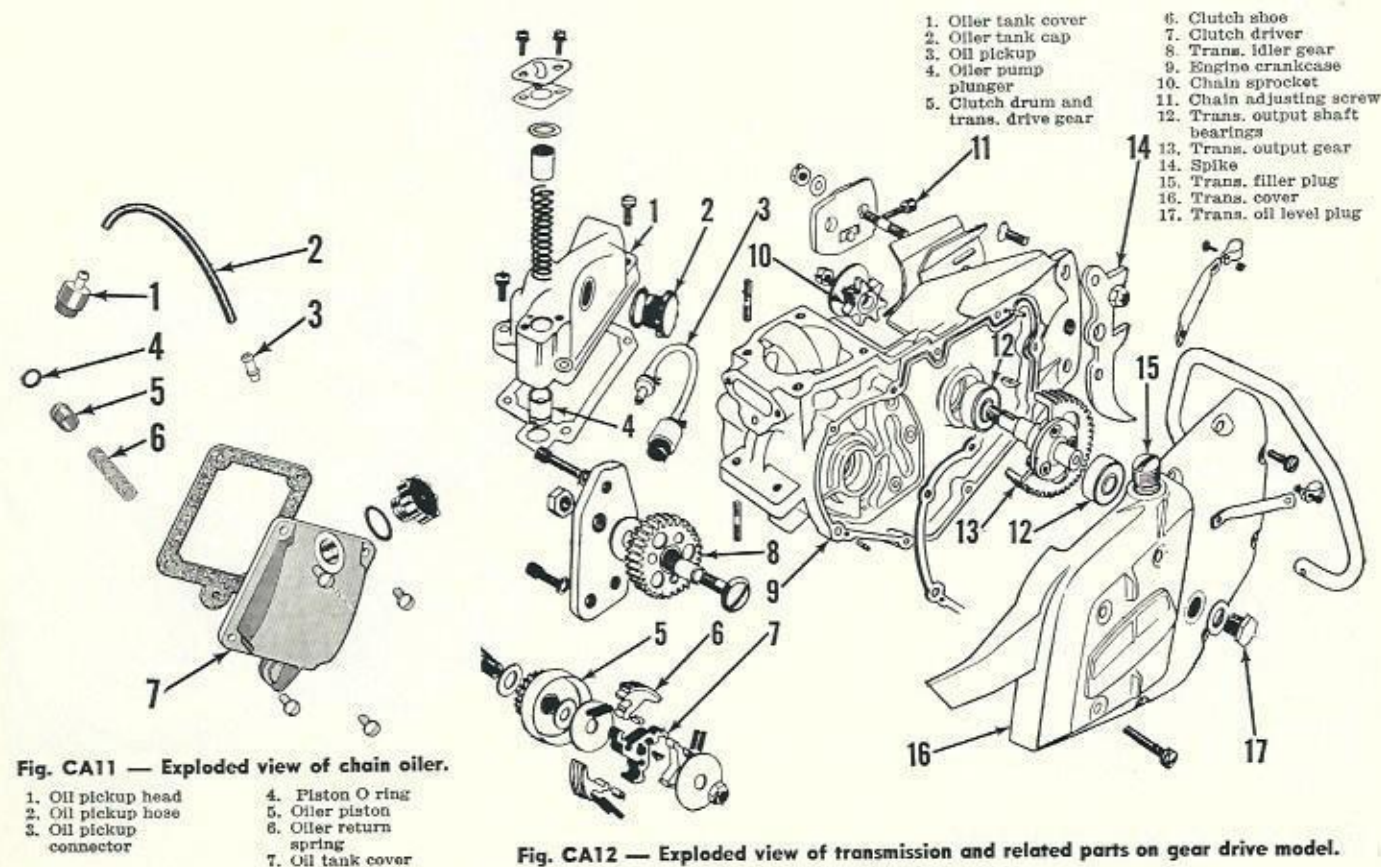


Fig. CA11 — Exploded view of chain oiler.

Fig. CA12 — Exploded view of transmission and related parts on gear drive model.

CHAIN SAWS

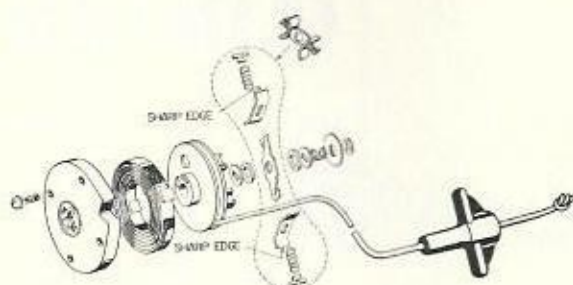
Canadien

new bearings by heating them in oil or support crankshaft below counterweight and drive cold bearing on crankshaft with piece of tubing against inner race of bearing.

Heat stator backing plate and crankcase with torch to facilitate assembly. Install new oil seals after assembly of crankcase and crankshaft using a seal driver and a protective sleeve over the crankshaft ends. Seals should be inserted 1/16-inch below surface of crankcase and stator backing plate with lip of seal facing in.

INTAKE VALVING. Carburetor to crankcase valving is through third port in cylinder wall utilizing piston as a sliding valve. No reed valve is used.

Fig. CA13 — Exploded view of Fairbanks-Morse rewind starter used on Canadien chain saws.



CANADIEN CENTRAL DISTRIBUTORS

These franchised firms carry extensive stocks of repair parts. Contact them for name and address of nearest service distributor who may have the parts you need.

Poulan Saw Service
Thomasville, Alabama

Reynolds Equipment Company
5th Ave. & Merrill Field
Box 1099
Anchorage, Alaska

J. Sherman Tanner
79 Willoughby Avenue
Juneau, Alaska

Everett M. Moore
Denton Route
Powhatan, Arkansas

Holmes Mobil Station
Highway 167-79 North
Thornton, Arkansas

Trinity Supply Company
3408 Jacobs Avenue
Eureka, California

Franklin Saw Service
150 Russel Avenue
Susanville, California

Hub Supply
Durango, Colorado

Howe's Canadian Chainsaw
Sales & Service
407 Nellsville Road
Houghton Lake, Michigan

Tones Garden Center
Box 883
International Falls, Minnesota

Elliott Enterprises
Box 146
Superior, Montana

Carl R. Kenyon
Box 126
Warrensburgh, New York

Smith Saw Sales
Route 1, Box 250
Denton, North Carolina

Gross Logging Supply
1991 West 6th
Eugene, Oregon

Hunt's Chain Saw Sales & Service
P. O. Box 1164
1395 N. E. Stephens
Roseburg, Oregon

Industrial Supply Company
554 Ferry Street
Salem, Oregon

Long Motors
Emlenton, Pennsylvania

General Chain Saw Supply
1209 East Sunset Drive
Bellingham, Washington

B & H Supply
Route 1, Box 60A
Chehalis, Washington

Whidbey Marina
Freeland, Washington

Steve Graves
Star Route No. 302
Lyle, Washington 98635

Walt's Power Saw Sales & Serv.
10th & Hendricks
Port Townsend, Washington

Delmar E. Schenk
Schenk Service Station
Bowler, Wisconsin

Rene's Power Equipment
Irasburg, Vermont

Vanisle Equipment Ltd.
P. O. Box 910
Campbell River, British Columbia

Steele's Sales Ltd.
1255 - 5th Avenue
Prince George, British Columbia

Russell Equipment Sales
Box 1026
Smithers, British Columbia

Equipment Sales & Service
Box 508
Terrace, British Columbia

Sells Brothers Sales
221 Carrall Street
Vancouver, British Columbia

Bolt's Chain Saw Supplies
Pennell's Lane
Deer Lake, Newfoundland

Goodspeed-Millard Equipment Ltd.
46 Elm Street
Truro, Nova Scotia

8-Chain Saw 35531-1-30-64
DeGagne Brothers Ltd.
Kenora, Ontario

Timberline Saw & Marine
Trout Lake Road
North Bay, Ontario

Superior Motors
127 S. Algoma Street
Port Arthur, Ontario

Gordon Bannerman Limited
41 Kelfield Street
Rexdale, Ontario

Power Machinery, A Div. of
Bristol Aero-Industries Ltd.
255 Boulevard des Capusins
Quebec, Quebec

CANADA

Renn Sales (Edmonton) Ltd.
8620 - 126th Avenue
Edmonton, Alberta

pressurize oil tank and force oil to bar. A one-way valve (V) prevents oil from entering crankcase.

RECOIL STARTER. Refer to Fig. SK5 for exploded view of pawl type starter used on all models. Care should be taken if necessary to remove rewind spring (12) to prevent spring from uncoiling uncontrolled.

Rewind spring (12) should be wound in clockwise direction in housing. Wind starter rope in clockwise direction around rope pulley (11) as viewed in starter housing (14).

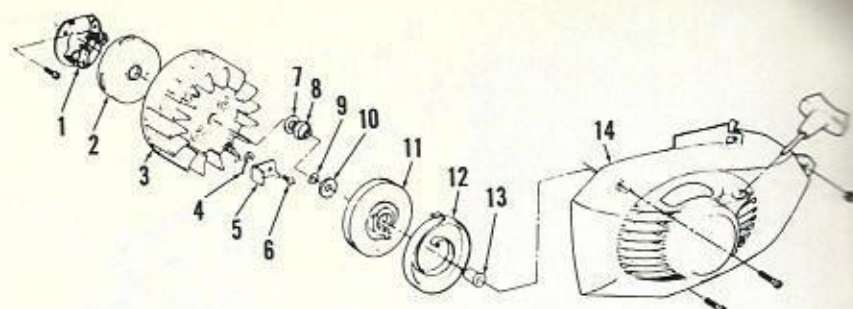


Fig. SK5—Exploded view of ignition and rewind starter used on models 944, 947, 1610 and 1612.

- | | | | |
|-----------------|--------------|-------------------|---------------------|
| 1. Stator plate | 4. Spring | 8. Nut | 12. Rewind spring |
| 2. Cover | 5. Pawl | 9. Snap ring | 13. Bushing |
| 3. Flywheel | 6. Pivot pin | 10. Thrust washer | 14. Starter housing |
| | 7. Washer | 11. Rope pulley | |

SKIL (FORMERLY CANADIEN)

SKIL CORPORATION
5033 Elston Ave.
Chicago, Illinois 60630

Model	Bore Inches	Stroke Inches	Displ. Cu. In.	Drive Type
175	2 1/4	1 3/8	5.45	Direct
177, 187, 270, 350, 360, 370	2 5/16	1 3/8	5.8	Direct
271, 371	2 5/16	1 3/8	5.8	Gear
275, 380, 1680, 1690	2 5/8	1 3/8	7.5	Direct
276, 385, 1685	2 5/8	1 3/8	7.5	Gear
340, 945, 1630, 1631, 1644, 1645	2 1/16	1 1/4	4.2	Direct
1660, 1661, 1670	2 5/16	1 3/8	5.8	Direct

MAINTENANCE

SPARK PLUG. All models should use a Champion J6J, Autolite A3X, AC M44C or equivalent. Spark plug electrode gap should be 0.025 inch.

CARBURETOR. All models are equipped with Tillotson model HL or HS diaphragm type carburetors. Refer to Tillotson section of FUNDAMENTALS section for service procedures and exploded views.

Initial adjustment of idle mixture screw is 1/2-3/4 turns open on models 270 and 271, and 1 turn open on all other models. Initial adjustment of high speed mixture screw is 1 turn open on all models. Final adjustment of high speed screw should be made with engine warm and engine under cutting load. High speed mixture must not be adjusted too lean as engine may be damaged due to inadequate lubrication.

MAGNETO AND TIMING. All models are equipped with a conventional flywheel magneto ignition

system. Refer to Fig. SK10, SK11 or SK13 for exploded view of ignition assembly.

Breaker point gap should be 0.020 inch on models 175, 270, 271, 370, 371 and 1670. Breaker point gap for all other models should be 0.015 inch. Ignition timing is 30° BTDC on models 175, 270, 271, 370, 371 and 1670. Ignition should occur at 35° BTDC on models 177, 187, 275, 276, 350, 360, 380, 385, 1660, 1661, 1680 and 1685. Ignition timing on all other models is fixed but breaker point gap will affect ignition timing and should be set correctly.

Ignition timing is adjusted on models without fixed timing by loosening stator plate mounting screws and rotating stator plate. Some models are correctly timed if punch mark on stator plate is aligned with timing mark on stator backing plate as shown in Figs. SK12 or SK14. It will be necessary to make new marks if a new stator plate is used or old marks are incorrect.

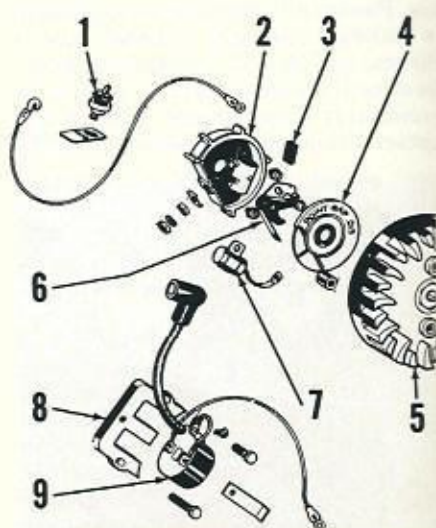


Fig. SK10—Exploded view of magneto used on models 340, 945, 1630, 1631, 1644 and 1645. Ignition timing is fixed.

- | | |
|------------------|-------------------|
| 1. Switch | 6. Breaker points |
| 2. Stator plate | 7. Condenser |
| 3. Cam felt | 8. Core |
| 4. Housing cover | 9. Ignition coil |
| 5. Flywheel | |

LUB
cated b
stroke
gasolin
Fill
motor o
be dilut
kerosen
yond 50
Fill t
gear dr
bricatin
can be
weather
CAR
moved
cally. R
engine u

Fig. SK12—
271, 370, 3
near upper
m

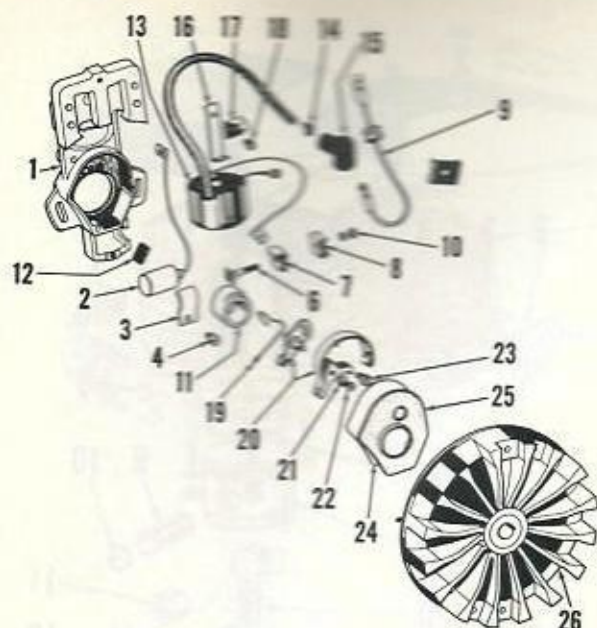


Fig. SK11—Exploded view of magneto with adjustable ignition timing as used on some later models. Refer to Fig. SK12 for view of magneto and backing plate showing timing marks.

1. Stator & armature core assy.
2. Condenser
3. Condenser clamp
5. Terminal connection unit
6. Terminal stud
7. Insulator
8. Insulator
9. Switch wire
11. Breaker cam
12. Cam wiper felt
13. Ignition coil
14. Terminal spring
15. Terminal cover
16. Coil wedge spring
17. Ignition wire clip
19. Breaker box cover spring
20. Breaker point set
21. Thrust washer
22. Retaining ring
24. Gasket
25. Breaker box cover
26. Flywheel

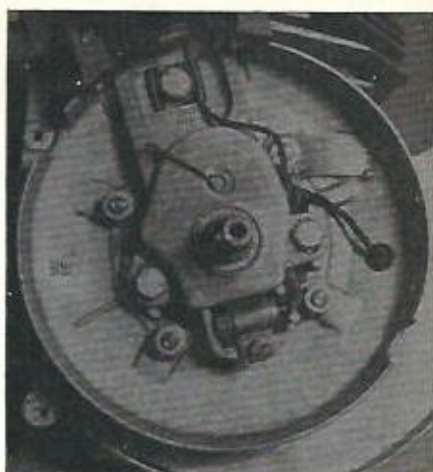


Fig. SK14—View of model 275, 276, 380, 385, 1680 and 1685 magneto showing timing mark. Punch mark near center of slot for lower left retaining cap screw should be aligned with raised line on backing plate. Models 177, 187, 350, 360, 1660 and 1661 are similar.

LUBRICATION. Engine is lubricated by mixing 1 part SAE 30 two-stroke engine oil with 16 parts regular gasoline.

Fill chain oil tank with SAE 30 motor oil. In cold weather, chain oil can be diluted up to 50% with diesel fuel or kerosene. (Do not dilute chain oil beyond 50%).

Fill transmission to oil level plug on gear drive models with SAE 10-20 lubricating oil. SAE 30 lubricating oil can be used in unusually warm or hot weather.

CARBON. Carbon should be removed from the exhaust ports periodically. Remove spark plug and turn engine until piston is at bottom of

cylinder. Remove exhaust manifold cover, turn engine on end to keep carbon from falling inside cylinder, and scrape excess carbon away with a blunt edge tool.

REPAIRS

TIGHTENING TORQUES. Recommended tightening torques are as follows:

Connecting Rod	 50-55 Inch-Lbs.
Stator to Stator Plate	. 65-70 Inch-Lbs.
Stator Plate to Crankcase	. 75-80 Inch-Lbs.
Blower Cover to Stator	25-30 Inch-Lbs.
Starter Cord Roller	... 25-30 Inch-Lbs.
Exhaust Body to Cylinder Block	65-70 Inch-Lbs.
Exhaust Cover to Exhaust Body	65-70 Inch-Lbs.
Fuel Tank to Crankcase	.. 75-80 Inch-Lbs.
Cylinder Block to Crankcase	
340	 65 Inch-Lbs.
All Other Models	... 75-80 Inch-Lbs.
Cylinder Head	 75-80 Inch-Lbs.
Crankshaft Drive Nut	25-30 Foot-Lbs.

Crankshaft Flywheel Nut . 25-30 Foot-Lbs.

Bar to Crankcase 20-25 Foot-Lbs.

RINGS, PIN, PISTON AND CYLINDER. Aluminum alloy piston is equipped with two compression rings. Ring end gap should be .007 to .017 and groove clearance should be .0020 to .0035. Piston clearance should be .005 to .006 measured at right angles to piston pin on skirt below pin and immediately below exhaust ports of cylinder wall. Note: Piston and ring clearances are not available from manufacturer on models with 4.2 cu. in. engine.

Floating type piston pin is retained in piston by a snap ring at each end. Pin is tight fit to piston making it necessary to heat piston to remove or install pin. After removing snap rings, heat each side of piston around pin, support piston with asbestos glove or rag, and push pin out with suitable tool. Piston pin is available in standard size only.

If cylinder block is worn beyond specified clearance when measured with

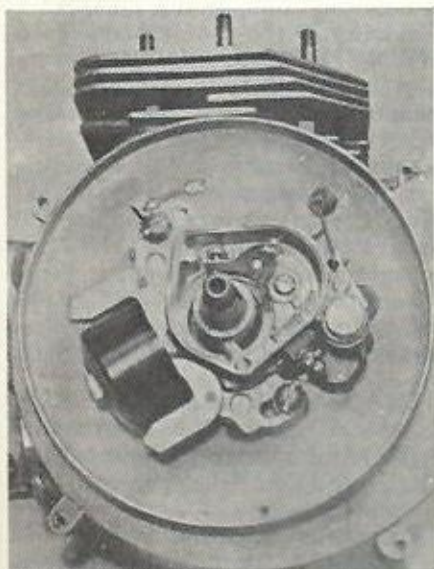


Fig. SK12—Timing ignition on models 175, 270, 271, 370, 371 and 1670. Punch mark on stator near upper mounting screw should align with mark on stator backing plate.

Fig. SK13—Exploded view of the magneto used on model 1690 chain saw. Ignition timing is fixed.

1. Felt
2. Stator/coil assembly
3. Felt
4. Dust cover spring
5. Switch lead
6. Condenser
7. Flywheel
8. Dust cover & gasket
9. Fixed contact screw
10. Breaker assembly

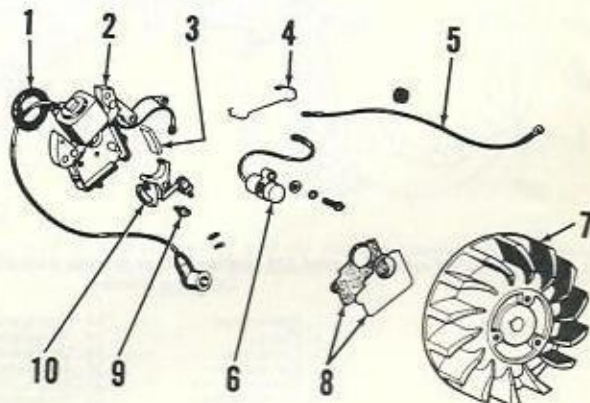




Fig. SK15—Connecting rod and crankpin bearing typical of those used in some models. Note matched notched corners on bearing cage flanges.

new piston, or if cylinder wall is scored, install a new cylinder and piston.

CONNECTING ROD. On all models except models 340, 945, 1631, 1644 and 1645, rod is removed from above after first removing cylinder head, cylinder block and piston. On models 177, 187, 350, 360, 1660 and 1661 the cylinder block and cylinder head are one piece and are removed as a unit. Piston can then be removed from connecting rod and connecting rod removed from crankshaft. Parting faces of steel rod and cap are not machined, but are fractured to provide a dowing effect by the meshing of the uneven surfaces. Cap is retained to connecting rod by heat treated socket

head cap screws entered from above through rod and threaded into cap. Cap and rod are punch-marked on one side. Punch-marked side is assembled toward back (handle end) of engine.

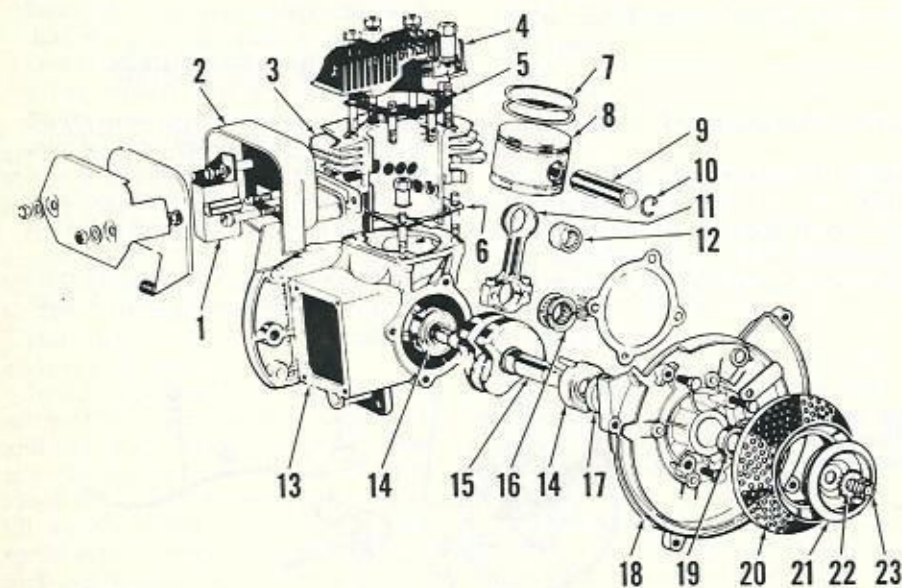
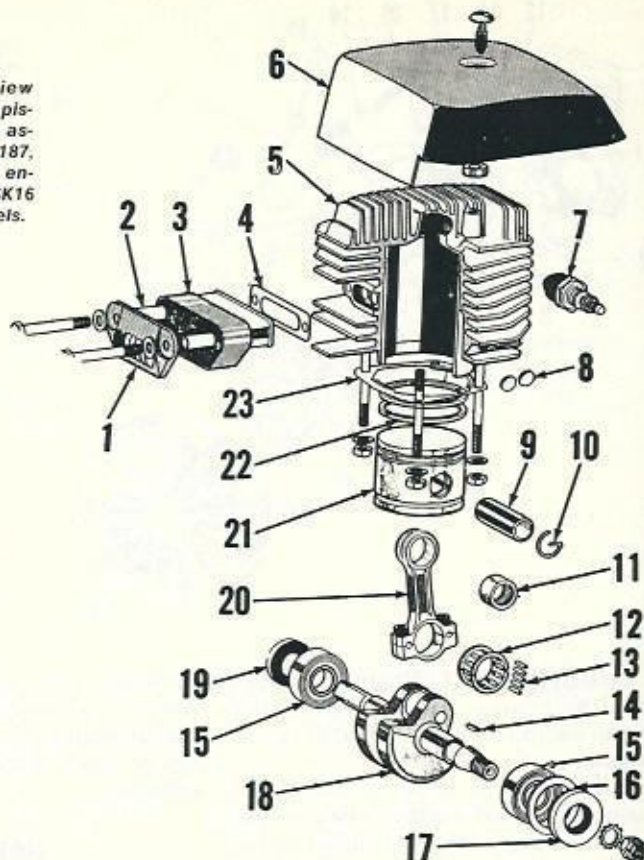


Fig. SK16—Exploded view of model 275 engine. Other models except models shown in Figs. SK17 or SK18 are similar.

- | | | | |
|---------------------|--------------------|--------------------------|-----------------|
| 1. Exhaust baffle | 7. Piston rings | 13. Crankcase | 19. Seal |
| 2. Exhaust manifold | 8. Piston | 14. Main bearings | 20. Screen |
| 3. Cylinder | 9. Piston pin | 15. Crankshaft | 21. Starter cup |
| 4. Cylinder head | 10. Pin retainer | 16. Roller bearing | 22. Lockwasher |
| 5. Gasket | 11. Connecting rod | 17. Seal | 23. Nut |
| 6. Gasket | 12. Needle bearing | 18. Stator backing plate | |

Fig. SK17—Exploded view showing cylinder block, piston, rod and crankshaft assemblies of models 177, 187, 350, 360, 1660 and 1661 engines. Refer to Figs. SK16 and SK18 for other models.



Crankpin bearing is a split caged roller bearing with each half retaining six rollers. See Fig. SK15. The rim of each bearing cage half is notched at the dividing point for identification. Notches should be aligned with punch marks on connecting rod and to the back of the engine.

To remove connecting rod of models 340, 945, 1630, 1631, 1644 and 1645, it is necessary to split crankcase after removing cylinder block and main bearing (18—Fig. SK18). Refer to **CRANKSHAFT AND SEALS** section for splitting crankcase. The connecting rod is one piece and uses roller bearings at crankshaft end. The connecting rod (10) is separated from the crankshaft (17) by first removing plug (22) and withdrawing rollers (11). With rollers removed, move connecting rod towards crankshaft end being careful not to scrape bearing surfaces. Reassemble by reversing procedure.

CRANKSHAFT AND SEALS. Crankshaft on all models is carried by ball bearings at each end. Refer to Figs. SK16, SK17 or SK18 for exploded views of engines.

To remove crankshaft from models 175, 270, 271, 275, 276, 370, 371, 380, 385, 1670, 1680, 1685 and 1690, remove all screws from stator backing plate, heat crankcase around the clutch side main bearing, then drive crank-

shaft
by t
with
back
and
state
ham
mov
stand
To
187,
1644,
clutch
ton,
screw
crank
rod, c
assem
seals
can b
using
When
cranks
them
cranks
drive c
a piece
bearing
On r
370, 3
and 16
case to
seals a
cranks

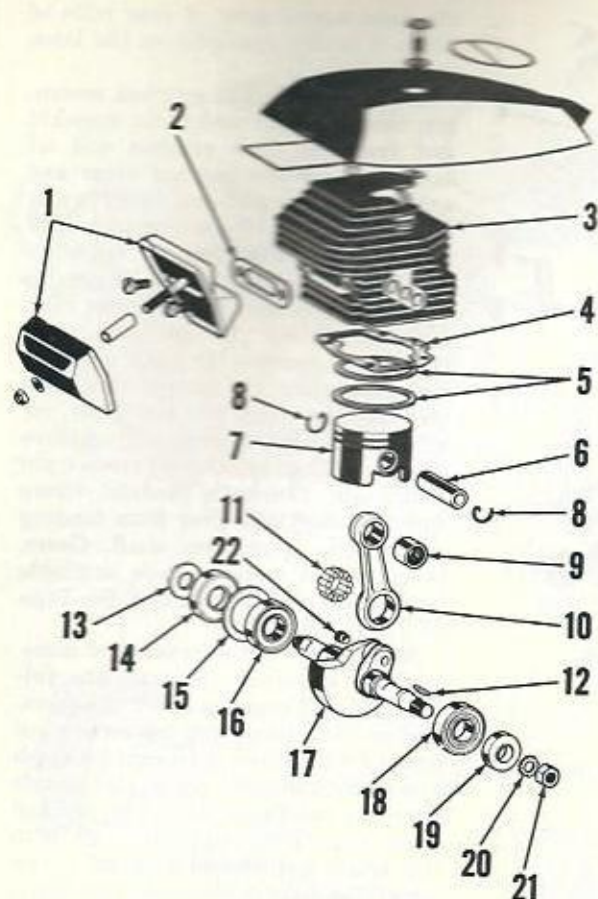


Fig. SK18—Exploded view of cylinder block, piston, rod and crankshaft assemblies used in engines of models 340, 945, 1630, 1631, 1644, and 1645. Plug (22) can only be purchased with crankshaft (17) as an assembly to retain engine balance.

1. Muffler
2. Gasket
3. Cylinder block
4. Gasket
5. Piston rings
6. Piston pin
7. Piston
8. Retainers
9. Needle bearing
10. Connecting rod
11. Rollers
12. Key
13. Thrust washer
14. Seal
15. Retaining ring
16. Main bearing
17. Crankshaft
18. Main bearing
19. Seal
20. Lockwasher
21. Nut
22. Plug

shaft and stator plate from crankcase by tapping on clutch end of crankshaft with a soft hammer. Heat stator backing plate around main bearing and drive crankshaft and bearing from stator backing plate with a soft hammer. Main bearings can be removed from crankshaft by using a standard bearing puller.

To remove crankshaft on models 177, 187, 340, 350, 360, 945, 1630, 1631, 1644, 1645, 1660 and 1661, remove clutch, flywheel, stator plate and piston, then remove the remaining cap screws from crankcase and separate crankcase which will free connecting rod, crankshaft, bearings and seals assembly. Remove connecting rod and seals from crankshaft. Main bearings can be removed from crankshaft by using a standard bearing puller.

When installing ball bearings on crankshaft of the above models, expand them by heating in oil, or support crankshaft below counterweight and drive cold bearings on crankshaft using a piece of pipe that contacts only the bearing innerliner race.

On models 175, 270, 271, 275, 276, 370, 371, 380, 385, 1670, 1680, 1685 and 1690 heat stator plate and crankcase to facilitate assembly. Install new seals after assembly of crankcase and crankshaft using a seal driver and a

protective sleeve over ends of crankshaft. Seals should be installed 1/16-inch below surface of crankcase and stator backing plate with lips of seals facing inward.

On models 177, 187, 340, 350, 360, 945, 1630, 1631, 1644, 1645, 1660 and 1661 install crankshaft oil seals on crankshaft before installing crankshaft in the crankcase halves. Install the magneto side oil seal so that it is touching the bearing retainer. Install the sprocket side oil seal so that it is 1/16-inch below the surface of the crankcase half and be sure it DOES NOT touch the bearing.

GEARBOX. Models 271, 276, 371, 385 and 1685 are gear drive type chain saws and the gear train and gearbox of all models is similar. Models 271 (before 1966) and early models 276 (prior to serial number 01434) are equipped with an idler gear pin and plate which are separate pieces. Model 276 saws (after serial number 01434) and models 271 (after 1965) are equipped with an idler gear pin and plate which is a welded, one-piece unit. The late one-piece unit can be used in place of the earlier two-piece unit. Models 371, 385 and 1685 also use the one-piece unit.

In addition, two gearbox ratios 3 to 1, or 2 to 1 are possible and can be accomplished by switching the position of the

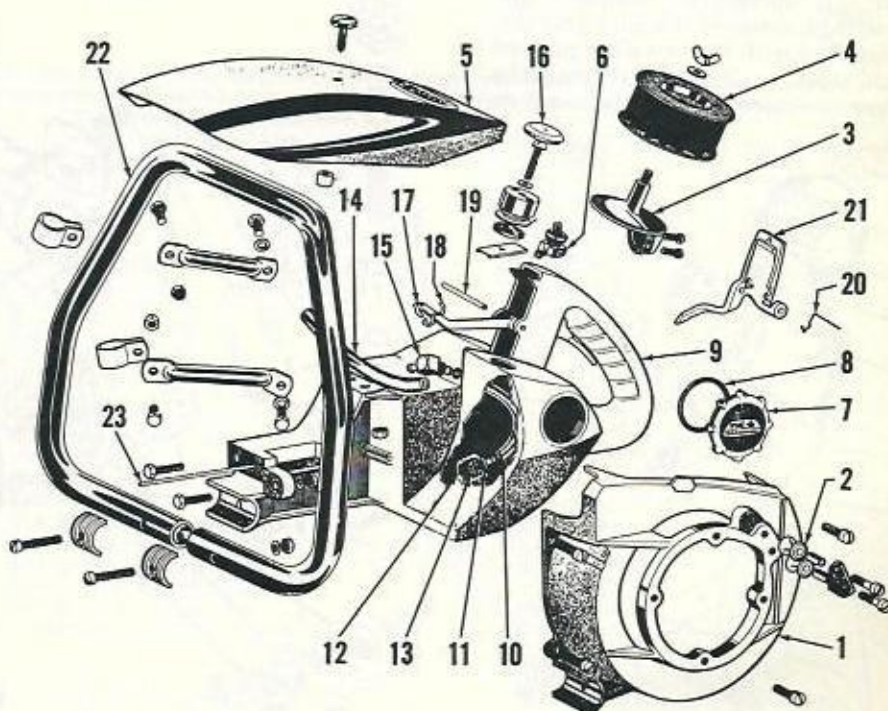
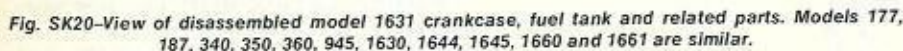


Fig. SK19—Exploded view of fuel tank, blower housing and air cleaner assemblies for model 275 chain saw. Components of other model chain saws are similar except for models shown in Fig. SK20.

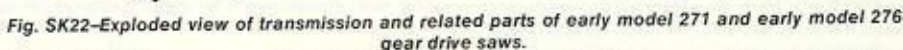
- | | | | |
|-----------------------|--------------------------|----------------------|-------------------|
| 1. Blower housing | 7. Fuel cap | 13. Filter element | 19. Hinge pin |
| 2. Roller | 8. Gasket | 14. Fuel line | 20. Choke spring |
| 3. Air filter adapter | 9. Fuel tank assembly | 15. Connector | 21. Choke lever |
| 4. Air filter element | 10. Fuel pickup hose | 16. Tank vent kit | 22. Front handle |
| 5. Shroud | 11. Fuel pickup assembly | 17. Throttle trigger | 23. Oiler pushrod |
| 6. Ignition switch | 12. Screen | 18. Throttle link | |



1. Crankcase half
2. Oilier push rod
3. Idle spring adjusting screw
4. Oilier lever
5. Tank vent
6. Grummet
7. Fuel pickup
8. Fuel cap
9. "O" ring
10. Tank damper
11. Tank damper
12. Crankcase bolts
13. Oil pickup
14. Hose
15. Handle
16. Hose fitting
17. Bar pad gasket
18. Chain cover
19. Oil cap
20. Gasket
21. Gasket

This diagram shows the exploded view of a car stereo unit. The components are numbered as follows: 1. Top cover with a circular knob; 2. Top cover gasket; 3. Mounting bracket; 4. Mounting bracket gasket; 5. Mounting bracket gasket; 6. Mounting bracket gasket; 7. Mounting bracket gasket; 8. Mounting bracket gasket; 9. Mounting bracket gasket; 10. Mounting bracket gasket; 11. Mounting bracket gasket; 12. Mounting bracket gasket.

1. Thrust washer
2. Clutch drum & bearing
3. Thrust washer
4. Washer
5. Clutch shoe
6. Clutch hub
7. Key
8. Clutch springs (6)
9. Washer
10. Nut
11. Cover



- | | | | |
|---------------------|----------------------|----------------------------------|---------------------------|
| 1. Oiler tank cover | trans. drive gear | 10. Chain sprocket | 13. Trans. output gear |
| 2. Oiler tank cap | 6. Clutch shoe | 11. Chain adjusting screw | 14. Spike |
| 3. Oil pickup | 7. Clutch driver | | 15. Trans. filler plug |
| 4. Oil pump plunger | 8. Trans. idler gear | 12. Trans. output shaft bearings | 16. Trans. cover |
| 5. Clutch drum and | 9. Engine crankcase | | 17. Trans. oil level plug |

To disassemble the gearbox assembly, remove chain and chain sprocket and drain oil from gearbox and oil tank. Remove the gearbox cover and using suitable pullers, remove the clutch assembly. On early models with the two-piece idler gear pin and plate unit, remove the oil tank cover, remove idler gear pin lock nut, unscrew idler pin and remove pin and gear, then unbolt and remove the idler gear pin mounting plate. On later models with the one-piece idler pin and plate, remove (and discard) snap ring, remove idler gear, then unbolt and remove pin and plate. On both models, bump sprocket shaft and gear from housing and remove gear from shaft. Gears, bearings and seals are now available for inspection and/or service. See Figs. SK22 and SK23.

Reassembly is the reverse of disassembly, however, observe the following: Use Permatex No. 2 or equivalent on plate mounting cap screws but do not final tighten until gear backlash has been adjusted. On early models with the two-piece idler gear pin and plate, the pin is an interference fit in the plate and should require a fair amount of drag to screw pin into plate.

Fig. 5.
plate:

1. Cru
2. Gen
3. Gas
4. Bea
5. Idl
6. Idl
7. Bea
8. Spr
9. Idl
10. Idl

If pin
pin, or
ferenc
lbs., u
lock n

On gear p during

After
gear be
pin pla

backlash
sprockets
gear a

plate m
and red

CLU
with the
compre
models.

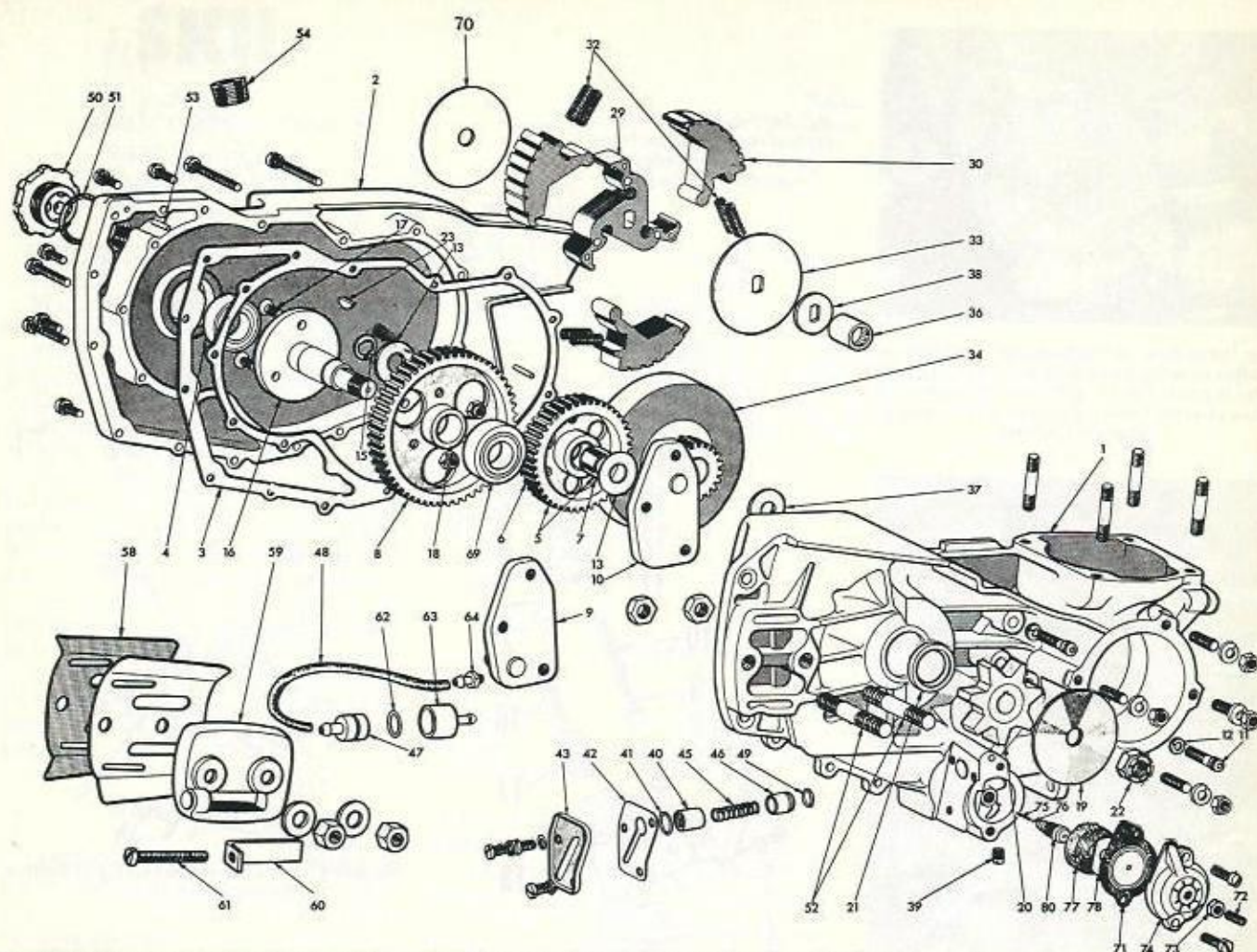


Fig. SK23—Exploded view of gearbox assembly used in later models showing component parts and their relative positions. Note the two one-piece idler plate assemblies (9 and 10) used on late model saws. Idler plate (9) is used for 3:1 reduction and idler plate (10) is used for 2:1 reduction. An idler plate for 3½:1 reduction is also available.

- | | | | | | |
|------------------------|-------------------------|-----------------------------|----------------------|-------------------------|------------------------|
| 1. Crankcase | 13. Thrust washer | 32. Clutch spring (6) | 42. Gasket | 54. Filler plug | 71. Diaphragm & piston |
| 2. Gearbox cover | 15. Snap ring (Truearc) | 33. Clutch side plate | 43. Cover plate | 58. Guide plate | 72. Adjusting screw |
| 3. Gasket | 16. Sprocket shaft | 34. Clutch drum | 45. Piston spring | 59. Bar pad | 73. Lock nut |
| 4. Bearing | 19. Side plate | 36. Bearing | 46. Piston | 60. Chain adjuster | 74. Cover |
| 5. Idler gear assy. | 20. Sprocket | 37. Thrust washer (inside) | 47. Oil pick-up head | 61. Adjuster screw | 75. Spring |
| 6. Idler gear | 21. Seal | 38. Thrust washer (outside) | 48. Pick-up hose | 62. "O" ring | 76. Ball |
| 7. Bearing | 22. Nut | 39. Set screw | 49. "O" ring | 63. Oil pick-up (outer) | 77. Filter |
| 8. Sprocket shaft gear | 23. Woodruff key | 40. Oiler cartridge | 50. Filler cap | 64. Connector | 78. Filter retainer |
| 9. Idler plate | 29. Clutch driver | 41. "O" ring | 51. Gasket | 69. Bearing | 80. Sleeve |
| 10. Idler plate | 30. Clutch shoe | | 52. Bar stud | 70. Side plate (outer) | |

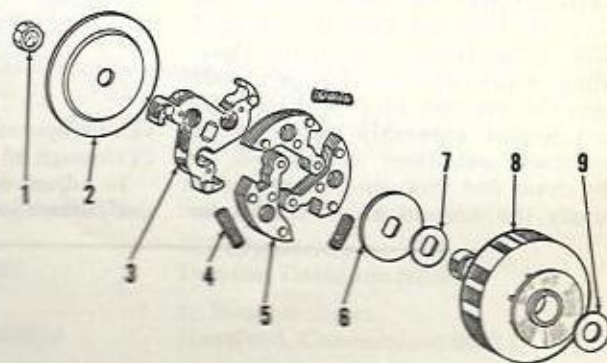
If pin can be turned in by hand, select a pin, or plate, which will give the interference fit. Tighten pin to 40-45 in.-lbs., use a new tab washer and install lock nut.

On models with the one-piece idler gear pin and plate, use a new snap ring during assembly.

After gears are assembled, adjust gear backlash by tapping the idler gear pin plate until there is slightly more backlash between idler gear and sprocket shaft gear than between idler gear and clutch drum gear. Tighten plate mounting allen screws securely and recheck gear backlash.

CLUTCH. All models are equipped with three clutch shoes acting against compression springs. Clutch used on models 177, 187, 340, 350, 360, 380,

Fig. SK24—Exploded view of the late type clutch used on models indicated in text. Note that unit is driven by flats on crankshaft instead of a Woodruff key. Clutches on all other models use six springs (4) instead of the three shown. Clutch (shoe) sleeves are no longer used. Refer also to Fig. SK21.



1. Crankshaft nut
2. Side plate (outer)
3. Driver
4. Compression spring
5. Clutch shoe
6. Clutch shoe sleeve
7. Thrust washer
8. Clutch drum
9. Thrust washer

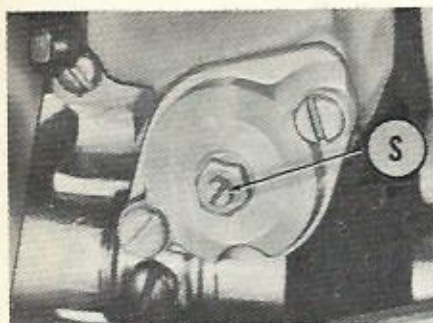


Fig. SK25-View of "Lube-Assist" assembly installed showing location of adjusting screw (S). Unit is located in oil tank cover on direct drive saws or at left lower side of gearbox housing on gear drive models.

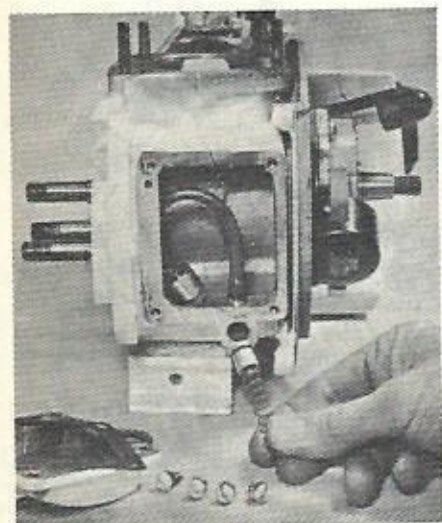


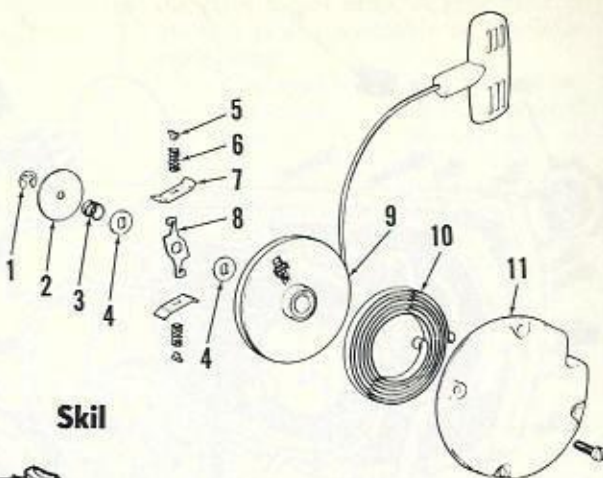
Fig. SK26-Manual oiler piston and return spring can be removed as shown after oil tank cover assembly is off.

1631, 1644, 1645, 1660 and 1661 has three springs while clutch used on all other models has six springs. Early clutch hubs were keyed to crankshaft while later models have two flats which fit over corresponding flats on crankshaft.

OIL PUMP. All models except 177, 271, 371, 1630 and 1631 are equipped with "Lube-Assist" (automatic) chain oiling which operates independently from the manual oiler. A diaphragm and piston assembly actuated by crankcase pulsations supplies oil for the chain and unit can be adjusted to supply the amount of oil needed for

Fig. SK27-Exploded view of typical recoil starter. Note location of sharp edges (S) on friction shoes (7).

1. "E" ring
2. Washer
3. Spring
4. Slotted washer
5. Retainer
6. Spring
7. Friction shoe
8. Actuating lever
9. Rope pulley
10. Rewind spring
11. Cover



Skil

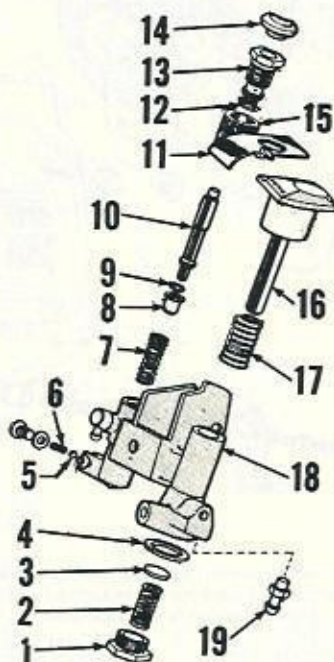


Fig. SK28-Exploded view of model 177 manual oil pump and fuel primer assembly. Refer to Fig. SK26 for a view of the manual oil pump typical of those used on other models.

- | | |
|-------------------|--------------------|
| 1. End cap | 11. Stop |
| 2. Valve spring | 12. "O" ring |
| 3. Valve disc | 13. Primer end cap |
| 4. Washer | 14. Push button |
| 5. Steel ball | 15. Dust seal |
| 6. Spring | 16. Oiler piston |
| 7. Return spring | 17. Return spring |
| 8. Piston cap | 18. Body |
| 9. "O" ring | 19. Connector |
| 10. Primer piston | |

various operating conditions. See items 71 through 80 in Fig. SK23.

To adjust delivery of the "Lube-Assist", loosen jam nut and turn adjusting



Fig. SK29-View showing assembly of friction shoe components.

screw out to increase oil supply, or in to decrease oil supply. Turn adjusting screw in increments of $\frac{1}{8}$ -turn. See Fig. SK25.

Refer to Figs. SK25, SK26 and SK28 for views showing construction of manual chain oiler pumps. Disassembly and service of the oil pumps will be obvious after an examination of the unit.

REWIND STARTER. All models are equipped with a friction shoe type starter as shown in Fig. SK27. Starter components should be inspected for wear and damage. Care should be taken not to allow rewind spring (10) to uncoil uncontrolled. Friction shoe edges (S) must be sharp to properly engage starter cup. Install friction shoes on lever (8) as shown in Fig. SK29. Renew slotted fiber washers (4—Fig. SK27) if oil soaked.