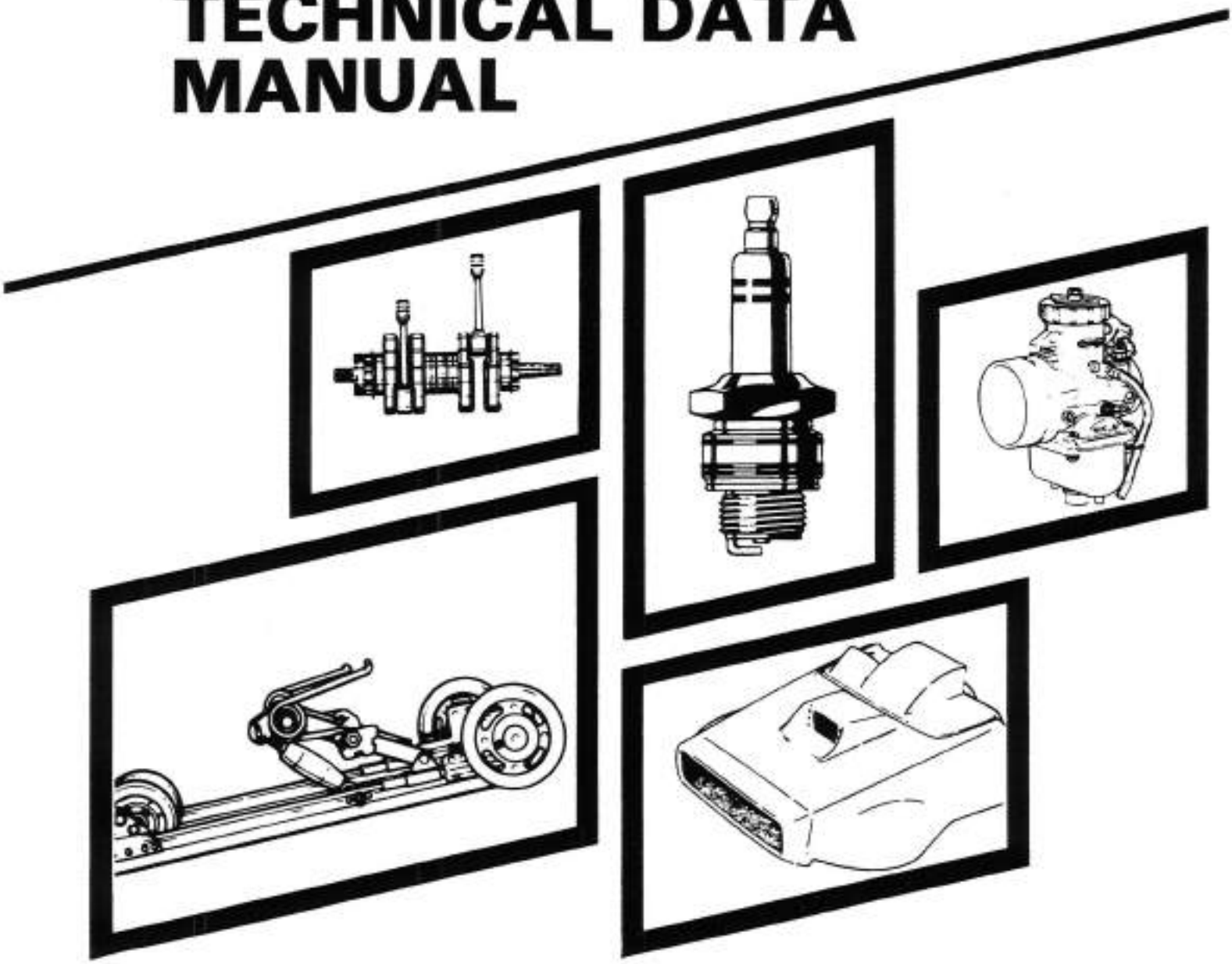
1974 / 75 / 76 / 77

BOMBARDIER ski-doo®

TECHNICAL DATA MANUAL



Litho'd in Canada

484 0385 00

I N D E X

SKI-DOO 1977	MODEL
Elan 250 M	3017
Elan 250 T	3018
Elan (Europe) 250 M	3019
Elan (Europe) 250 T	3020
Elan Stretch (Europe) 250 M	3021
Elan Stretch 250 M	3022
Olympique 300 M	3131
O.ympique 300 T	3132
Olympique 340	3133
Olympique 340 E	3134
Olympique (Europe) 340	3137
Olympique 440	3138
Everest 440	3434
Everest 440 E	3435
Everest 340	3442
Everest 340 E	3443
Everest 444 L/C	3444
Everest (Europe) 340	3445
Everest (Europe) 440	3446
T'NT FA 340	3439
T'NT FA 440	3440
RV 340	3441
T'NT FC 440	3447
Cross Country 340 LC	3559
Blizzard 440 LC	3560
Blizzard X 254	3560-01
Blizzard X 354	3560-02
Blizzard X 454	3560-03
Alpine 640 ER	3313
Alpine (Europe) 640 ER	3314
Alpine (White) 640 ER	3315

SKI-DOO 1976	MODEL
Elan 250	3013
Elan 250 T	3014
Elan 250 M	3015
Elan Europe 250 M	3016
Olympique 300	3122
Olympique 300 T	3123
Olympique 300 T E	3124
Olympique 340	3125
Olympique 340 E	3126
Olympique 440	3127
Olympique Europe 300	3128
Olympique Europe 300 T	3129
Olympique Europe 340	3130
T'NT FC 340	3428
T'NT FC 340 E	3429
Everest 440	3430
Everest 440 E	3431
Everest LC	3436
RV 250	3432
RV 340	3433
Alpine 640 ER	3311
Alpine Europe 640 ER	3312

SKI-DOO 1975	MODEL
Elan 250	3010
Elan 250 T	3011
Elan 300	3012
Olympique 300	3112
Olympique 300E	3113
Olympique 340	3119
Olympique 340E	3120
TNT F.C. 340	3418
TNT F.C. 340E	3419
TNT F.C. 440	3420
TNT F.C. 440E	3421
Everest 440	3422
Everest 440E	3423
TNT F.A. 340	3426
TNT F.A. 440	3427
Alpine 640 ER (1st run)	3307
Alpine 640 ER (2nd run)	3308
Alpine 640 ER (3rd run)	3309
Alpine 640 ER (4th run)	3310
Stock Racer 245	3554

SKI-DOO 1974	MODEL
Elan 250	3005
Elan 250 E	3006
Elan 250 T	3007
Elan 250 Deluxe	3008
Elan 294 SS	3009
Olympique 300	4101
Olympique 340	3107-09
Olympique 340 S	3117
Olympique 340 E	3108
Olympique 340 ES	3118
Olympique 400	3104-10
Olympique 400 S	3114
Olympique 400 E	3105
Olympique 400 ES	3115
Olympique 440	3106
Olympique 440 S	3116
TNT 295	3409
TNT 340	3404
TNT 340 E	3405
TNT 440	3406
TNT 440 E	3407
TNT 440 Everest	3408
TNT F.A. 340	3414
TNT F.A. 400	3415
TNT F.A. 440	3416
Nordic 640 ER	3205
Alpine 440 ER	3304
Alpine 640 ER	3305
Elite 440 ER	3701

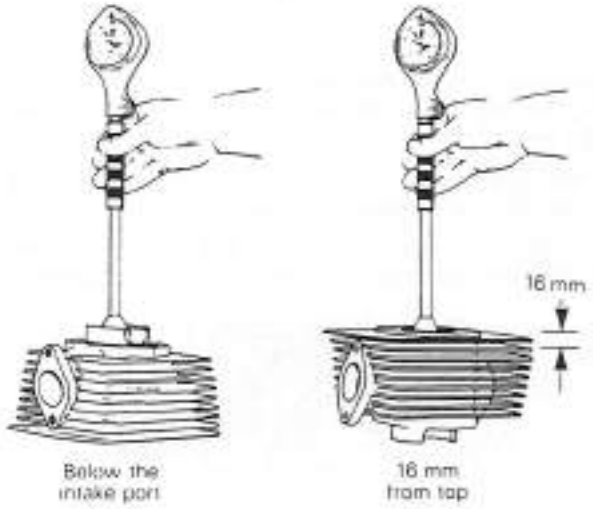
ENGINE TOLERANCES MEASUREMENT

CYLINDER TAPER

Maximum: 0.08 mm (.003")

Compare cylinder diameter 16 mm (5/8") from top of cylinder with down to just below the intake port.

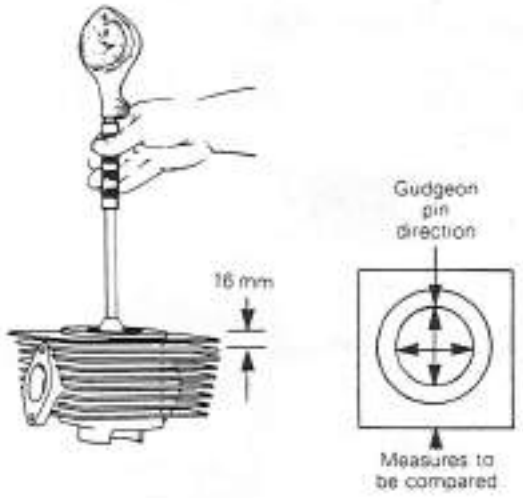
On rotary valve engines, measure just below auxiliary transfer port, facing exhaust port. If the difference exceeds 0.08 mm (.003") the cylinder should be rebored and honed or should be replaced.



CYLINDER OUT OF ROUND

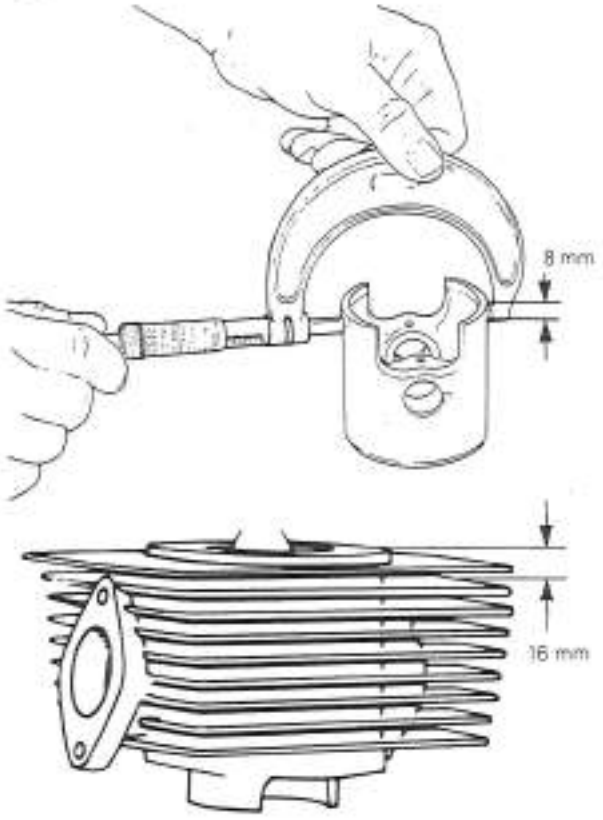
Maximum: 0.05 mm (.002")

Measuring 16 mm (5/8") from top of cylinder with a cylinder gauge, check if the cylinder out of round is more than 0.05 mm (.002"). If larger, cylinder should be rebored and honed or should be replaced.



Accurate measurement

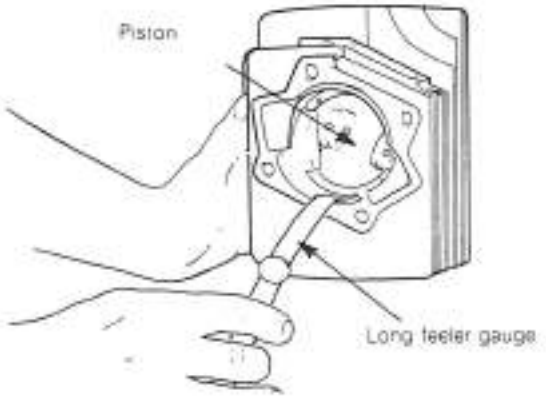
To determine piston to wall clearance, the piston should be measured 8 mm (5/16") above its bottom edge and the cylinder should be measured 16 mm (5/8") below its top edge.



The difference between these two measurements should be within specified tolerance.

Quick measurement

Place cylinder upside down on a work-bench and press a feeler gauge against the cylinder wall (intake side) while trying to insert the piston without any ring in its usual position.



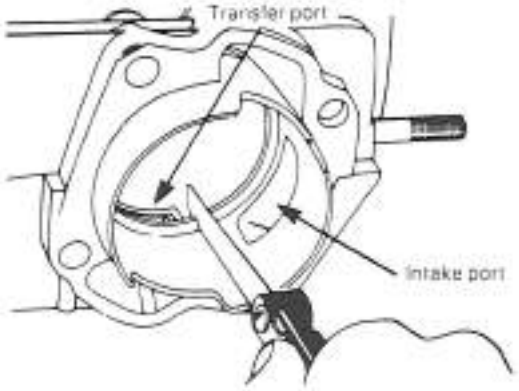
The thickest possible to use feeler gauge will determine the piston to wall clearance.

RING END GAP

Position ring half way between transfer ports and intake port. On rotary valve engines, position ring just below transfer ports.

NOTE: In order to correctly position the ring in the cylinder, use piston as a pusher.

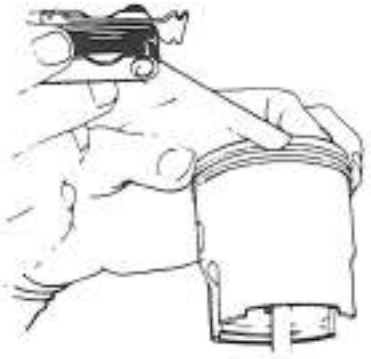
Using a feeler gauge, check ring end gap. If gap exceeds specified tolerance the ring should be replaced.



PISTON RING/GROOVE CLEARANCE

Maximum: 0.20 mm (.008")

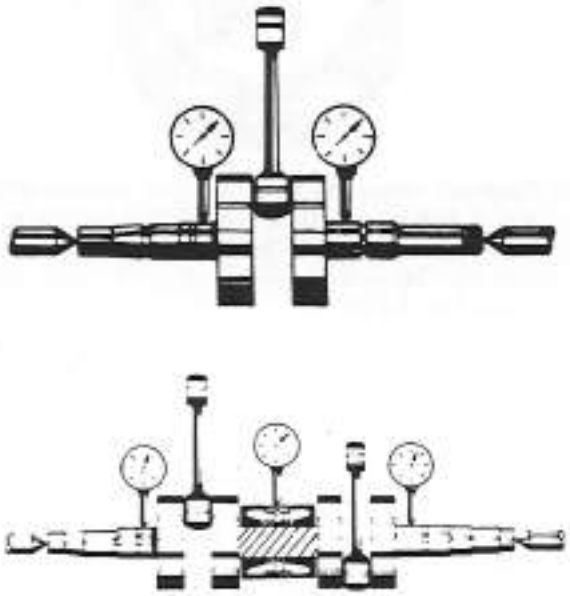
Using a feeler gauge check clearance between rectangular ring and groove. If clearance exceeds 0.20 mm (.008"), replace piston.



CRANKSHAFT DEFLECTION

Maximum: 0.06 mm (.0024")

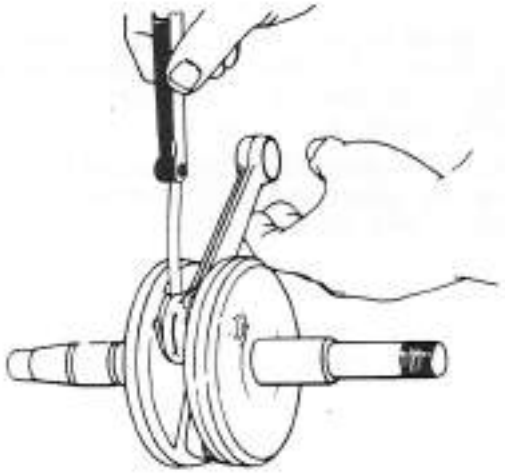
With the crankshaft positioned between a center lathe, install a dial indicator as close as possible to crankshaft blade then measure deflection on each side. If deflection exceeds 0.06 mm (.0024") the crankshaft should be repaired by a specialized shop or it should be replaced.



CONNECTING ROD BIG END AXIAL PLAY

Maximum: 0.5 mm (.020")

Using a feeler gauge measure distance between connecting rod and thrust washer. If axial play exceeds 0.5 mm (.020"), the crankshaft should be replaced.



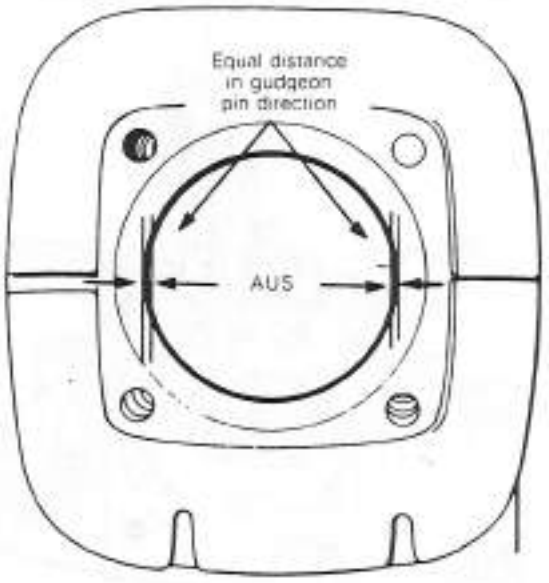
CONNECTING ROD ALIGNMENT

Check if connecting rod is bent as follows:

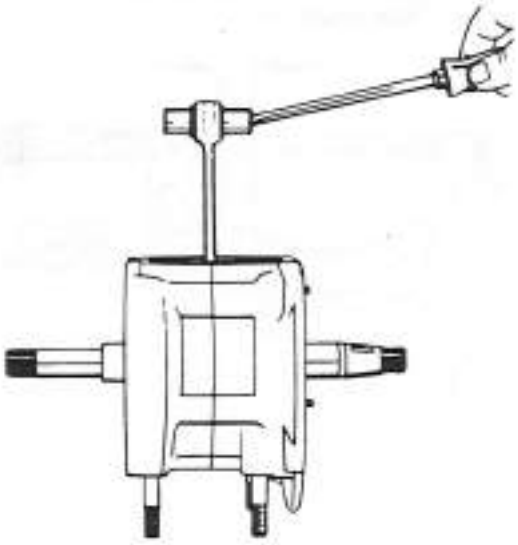
- Once engine crankcase is assembled with the piston mounted on connecting rod without its piston rings, position cylinder on piston.

NOTE: The cylinder/crankcase gasket must not be installed.

- Rotate crankshaft slowly and at the same time observe piston movement within the cylinder. If piston bear against one side (PTO or mag. side), the connecting rod is bent.



- To correct, position needle bearing and gudgeon pin on connecting rod then pry connecting rod as illustrated.



CRANKSHAFT END-PLAY

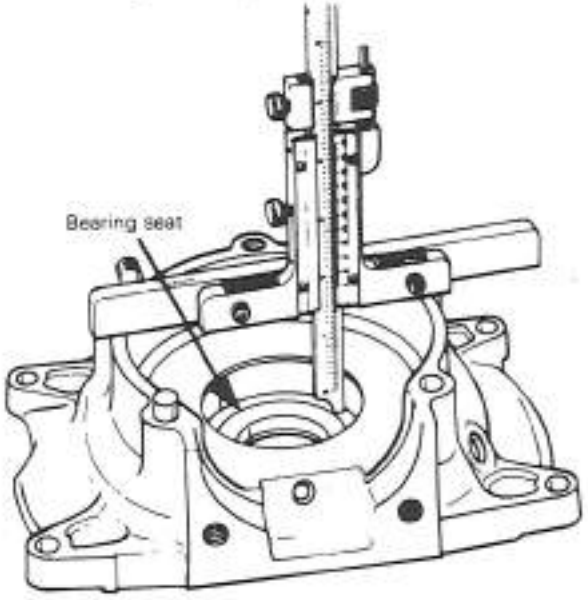
Maximum: 0.10 mm (.004")

NOTE: Crankshaft end-play is adjusted only when crankshaft and/or crankcase is replaced.

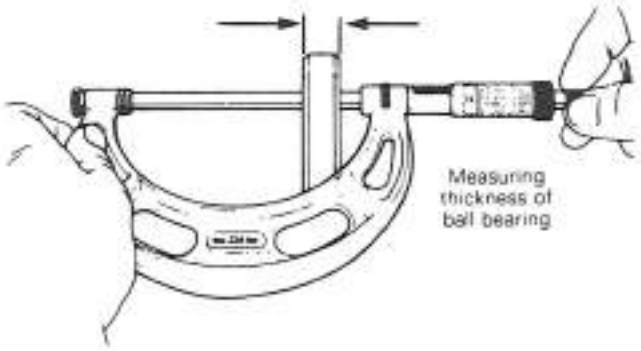
One cylinder engine (247)

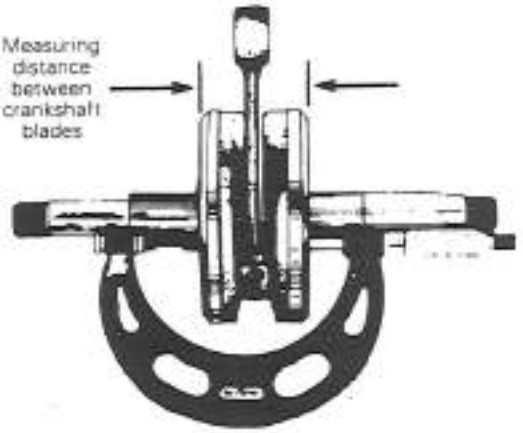
Maximum crankshaft end-play should be 0.10 mm (.004"). To determine necessary correction:

a) Measure crankcase. To do this first measure each half from mating surface to bottom of bearing seat. Add measurements of both halves then add 0.15 mm (.006") for gasket displacement. **Equals A.**



b) Measure thickness of each ball bearing. Measure distance between crankshaft blades. Add measurements. **Total equals B.**





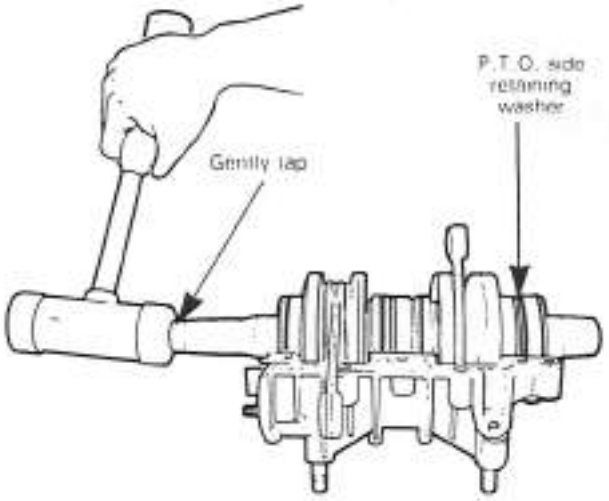
c) **Subtract measurement B from measurement A** minus tolerance of 0.10 mm (.004") maximum. Total balance is distance to be shimmed. Shim(s) must be located between magneto side bearing and crankshaft blade.

Crankshaft end-play (0.1 mm (.004") maximum) is adjusted with a shim(s) located between crankshaft and magneto side bearing. To determine correct amount of shims, proceed as follows:

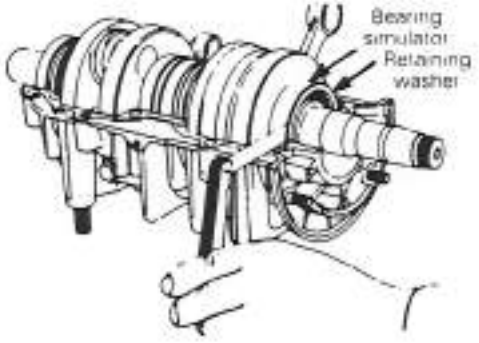
Remove magneto side bearing(s) and existing shim(s). Slide the appropriate bearing simulator and retaining washers onto the crankshaft.

Position crankshaft assembly into crankcase lower half, making sure that retaining washers are correctly seated into the grooves.

Gently tap crankshaft mag. side blade until P.T.O. side bearing bears against retaining washer.



Any free-play between the bearing simulator and magneto side retaining washer, minus 0.1 mm (.004") maximum end-play is the distance to be covered by shim(s). Shims are available in variable thickness according to engine type.



LIST OF ENGINE SECTIONS

247, 302

248, 294

248 (FROM 1975)

245 (UP TO SERIAL NO. 2 762 210)

245, 345 (FROM 1976)

305, 338, 343 401

305, 343 (FROM 1976)

346, 396, 436

346, 436 (FROM 1977)

434, 440

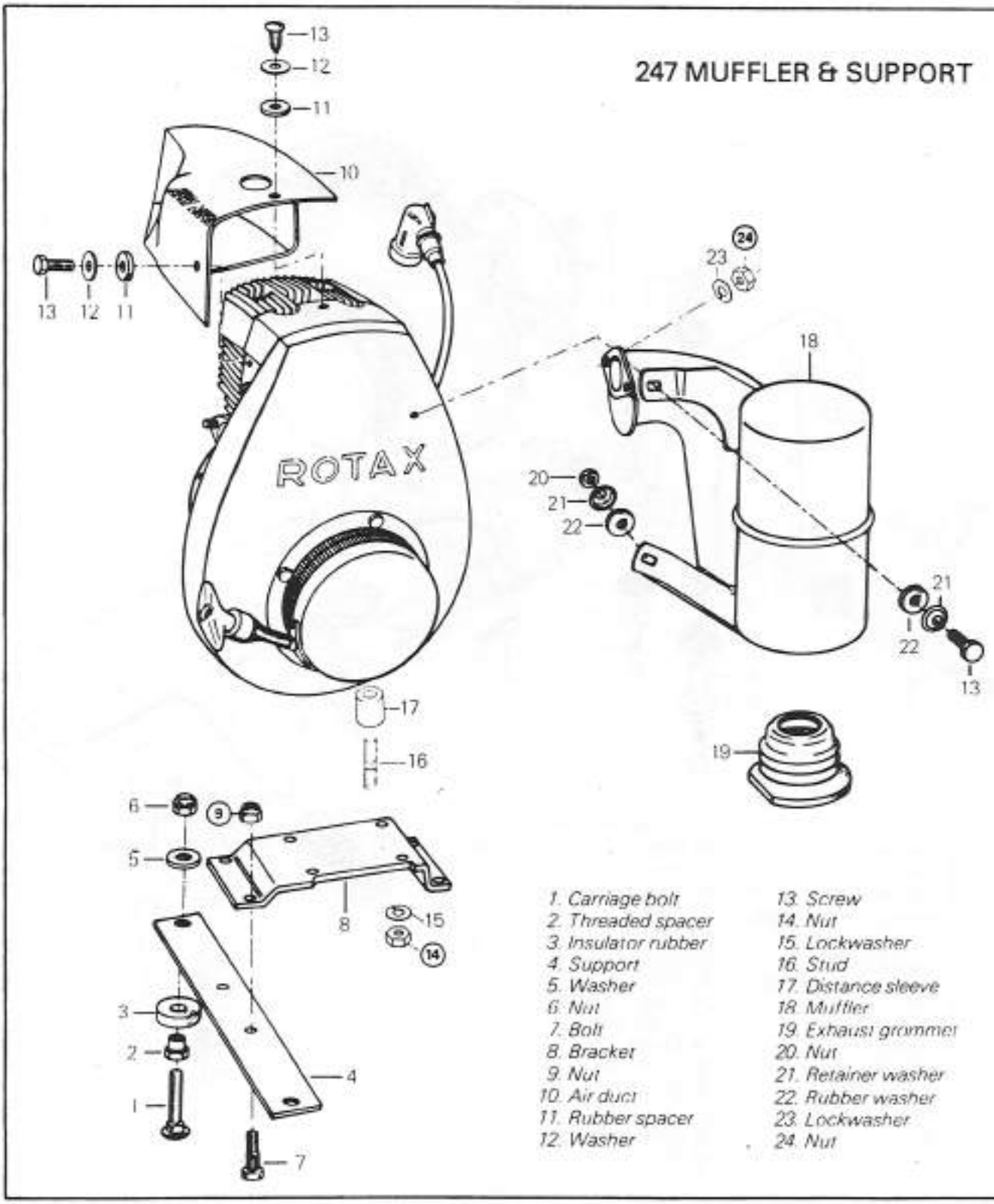
440 (FROM 1976)

640

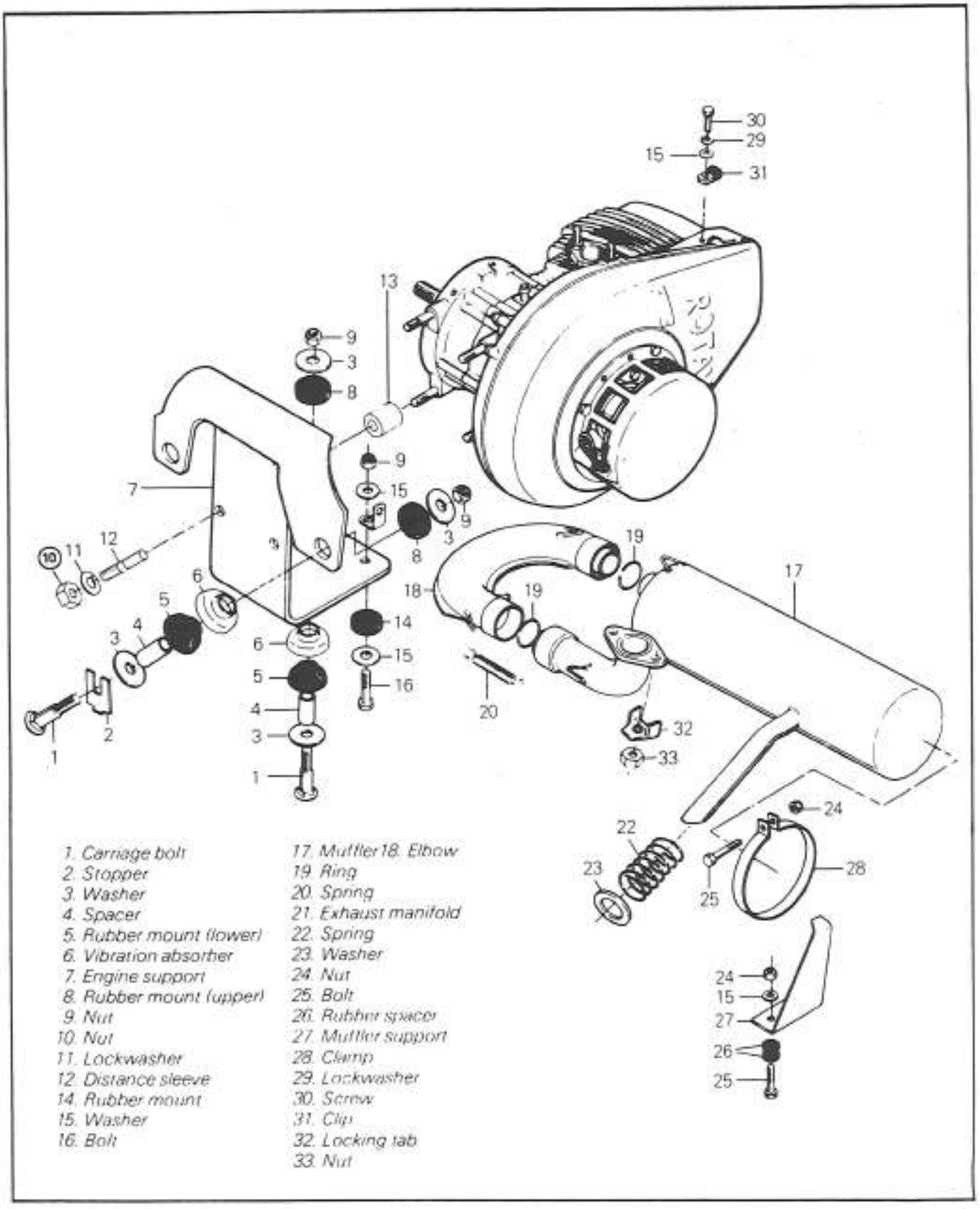
640 (FROM 1976)

247, 302 ENGINE TYPE

247 MUFFLER & SUPPORT



1. Carriage bolt
2. Threaded spacer
3. Insulator rubber
4. Support
5. Washer
6. Nut
7. Bolt
8. Bracket
9. Nut
10. Air duct
11. Rubber spacer
12. Washer
13. Screw
14. Nut
15. Lockwasher
16. Stud
17. Distance sleeve
18. Muffler
19. Exhaust grommet
20. Nut
21. Retainer washer
22. Rubber washer
23. Lockwasher
24. Nut



1. Carriage bolt
2. Stopper
3. Washer
4. Spacer
5. Rubber mount (lower)
6. Vibration absorber
7. Engine support
8. Rubber mount (upper)
9. Nut
10. Nut
11. Lockwasher
12. Distance sleeve
14. Rubber mount
15. Washer
16. Bolt
17. Muffler 18. Elbow
19. Ring
20. Spring
21. Exhaust manifold
22. Spring
23. Washer
24. Nut
25. Bolt
26. Rubber spacer
27. Muffler support
28. Clamp
29. Lockwasher
30. Screw
31. Clip
32. Locking tab
33. Nut

MUFFLER & SUPPORT

247 TYPE

REMOVAL FROM VEHICLE

Remove or disconnect the following then lift engine from vehicle.

- Pulley guard.
- Drive belt.
- Muffler.
- Choke knob.
- Decompressor (if applicable).
- Throttle cable.
- Fuel lines.
- Electrical connector.

CAUTION: On electric start model, disconnect negative cable (ground) from battery post before disconnecting other wires.

- Separate steering column support at upper column.
- Engine mount nuts.

DISASSEMBLY & ASSEMBLY

(9) Torque to 3.2 kg-m (23 ft-lbs).

(14) Torque to 3.6 kg-m (26 ft-lbs).

(24) Torque to 2.2 kg-m (16 ft-lbs).

INSTALLATION ON VEHICLE

To install engine on vehicle, inverse removal procedure. However, pay attention to the following.

- Check ignition timing prior to installation in vehicle.
- Check tightness of engine mount nuts, and drive pulley bolt.
- After throttle cable installation, check carburetor maximum throttle opening.
- Check pulley alignment.

302 TYPE

REMOVAL FROM VEHICLE

Remove or disconnect the following then lift engine from vehicle.

- Pulley guard.
- Drive belt.
- Air silencer box.
- Throttle cable.
- Fuel lines.
- Muffler.
- Electrical connector.
- Engine mount nuts.

DISASSEMBLY & ASSEMBLY

(10) Torque to 3.6 kg-m (26 ft-lbs).

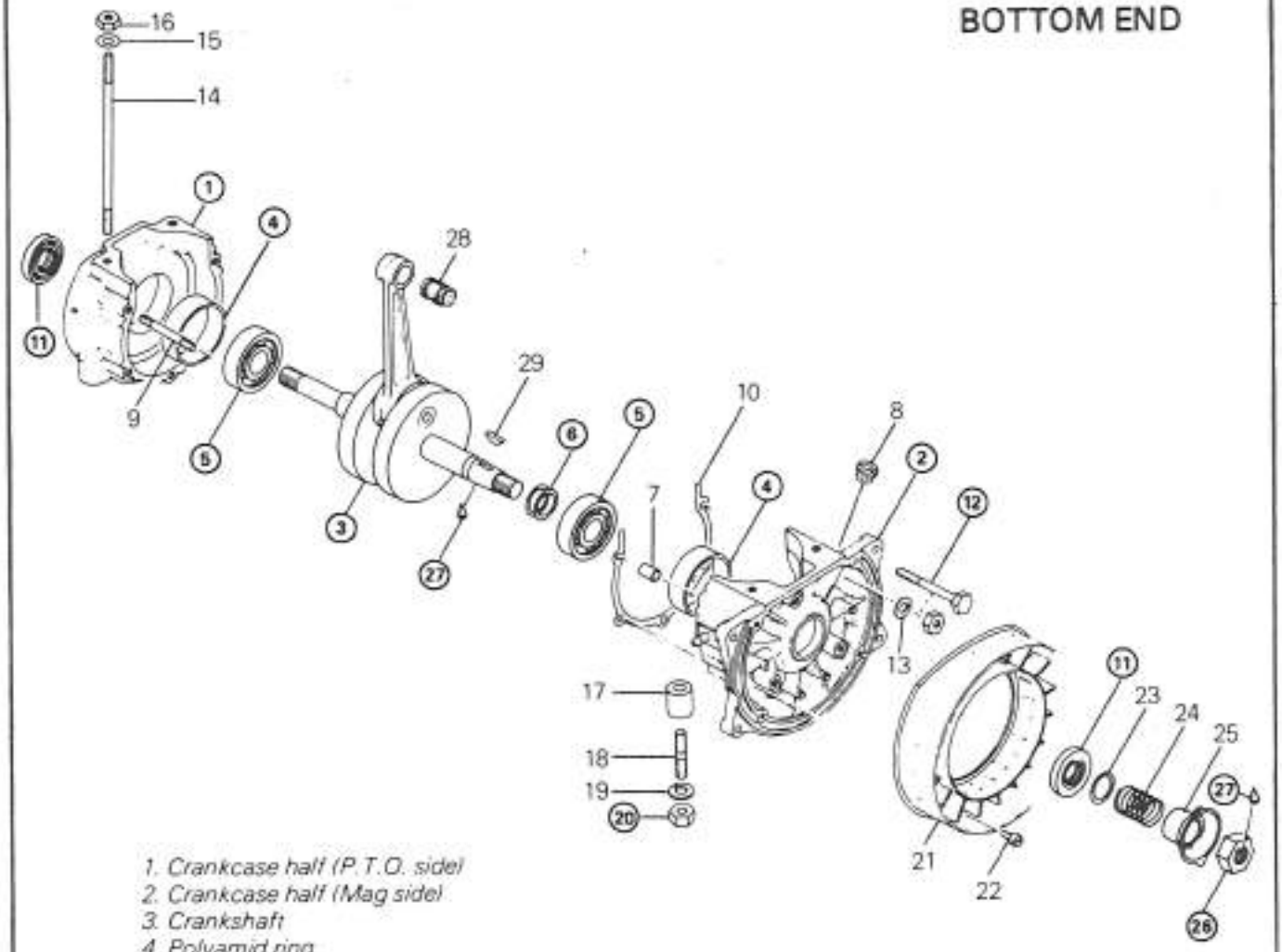
(23) Torque to 2.2 kg-m (16 ft-lbs).

INSTALLATION

To install engine on vehicle, inverse removal procedure. However, pay attention to the following.

- Check ignition timing prior to installation in vehicle.
- Check tightness of engine mount nuts, and drive pulley bolt.
- After throttle cable installation, check carburetor maximum throttle opening.
- Check pulley alignment.

BOTTOM END



1. Crankcase half (P.T.O. side)
2. Crankcase half (Mag side)
3. Crankshaft
4. Polyamid ring
5. Bearing
6. Shim
7. Dowel tube
8. Wires grommet
9. Stud
10. Gasket
11. Oil seal
12. Bolt or nut
13. Lockwasher
14. Stud (cylinder)
15. Washer (head)
16. Nut (head)
17. Distance sleeve
18. Stud
19. Lockwasher
20. Nut
21. Labyrinth ring (fan)
22. Screw
23. Shim
24. Spring
25. Breaker point cam
26. Nut
27. Loctite Lock'n Seal (no 242)
28. Needle bearing
29. Woodruff key

BOTTOM END

CLEANING

Discard all oil seals and gaskets.

Clean all metal components in a non-ferrous metal cleaner.

DISASSEMBLY & ASSEMBLY

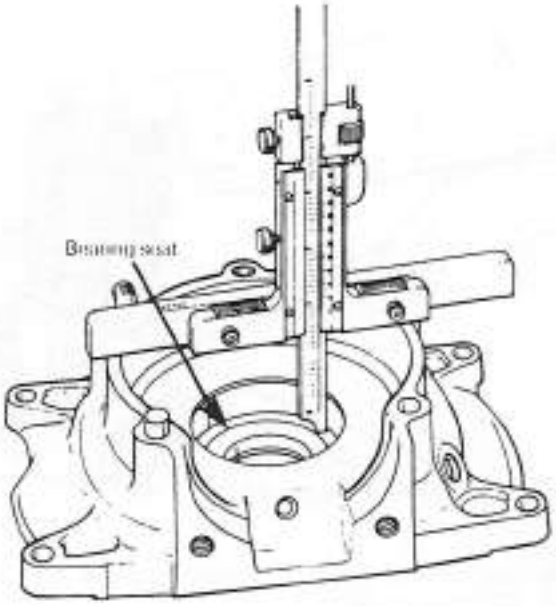
General

Refer to Technical Data Section for component fitted tolerance and wear limit. If necessary, refer to Drive Pulley Section to remove drive pulley.

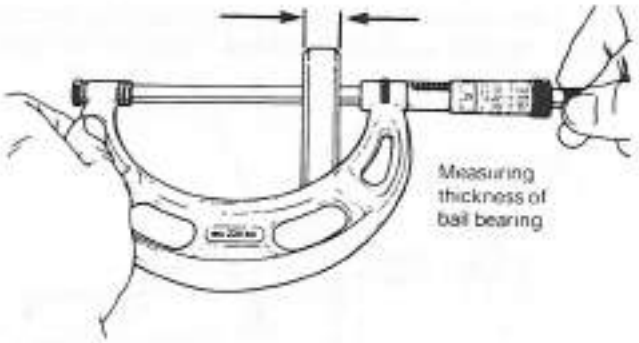
①② When disassembling / assembling crankcase halves, do not use heat the crankcase. If heat is necessary, temperature must not exceed 55° C (130° F).

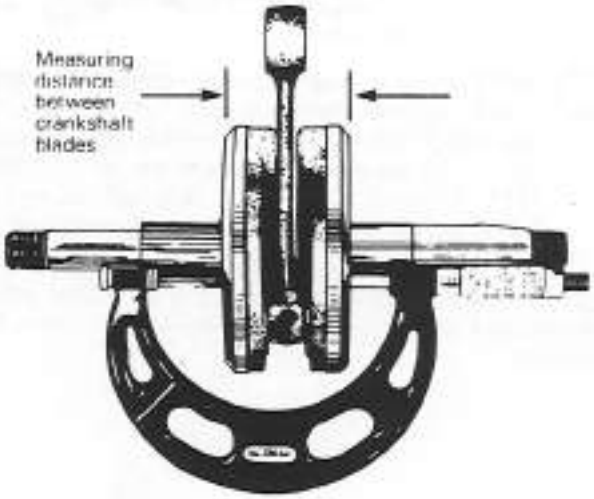
③④ Crankshaft end-play should be between 0.10 0.40 mm (.004-.016"). To determine necessary correction:

a) Measure crankcase. To do this first measure each half from mating surface to bottom of bearing seat. Add measurements of both halves then add 0.15 mm (.006") for gasket displacement. **Equals A.**



b) Measure thickness of each ball bearing. Measure distance between crankshaft blades. Add measurements. **Total equals B.**





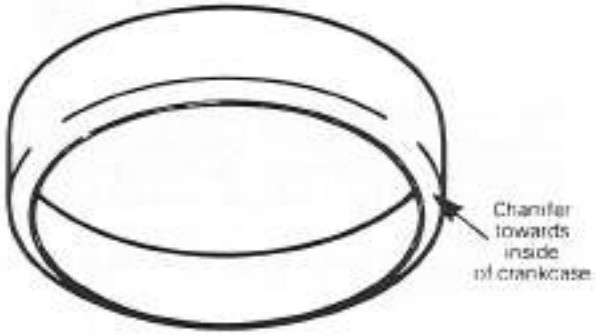
c) Subtract measurement B from measurement A minus tolerance of 0.10-0.40 mm (.004"-.016"). Total balance is distance to be shimed. Shim(s) must be located between magneto side bearing and crankshaft blade.

NOTE: Crankshaft end-play is adjusted only when crankshaft and / or crankcase is replaced.

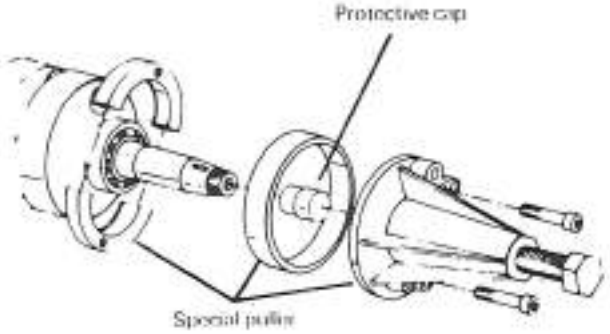
④ Do not remove unless necessary.

To remove, heat slightly with a butane torch then pry out using a screwdriver.

To install, apply oil on outside diameter then use a suitable pusher.

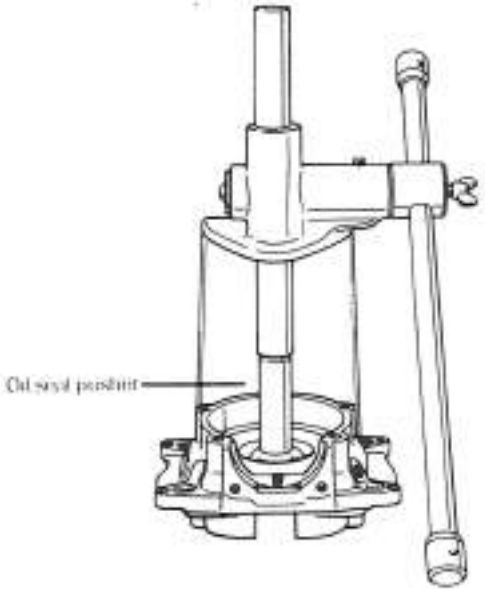


⑨ To remove bearing from crankshaft use a protective cap and special puller as illustrated. (See Tool Section).



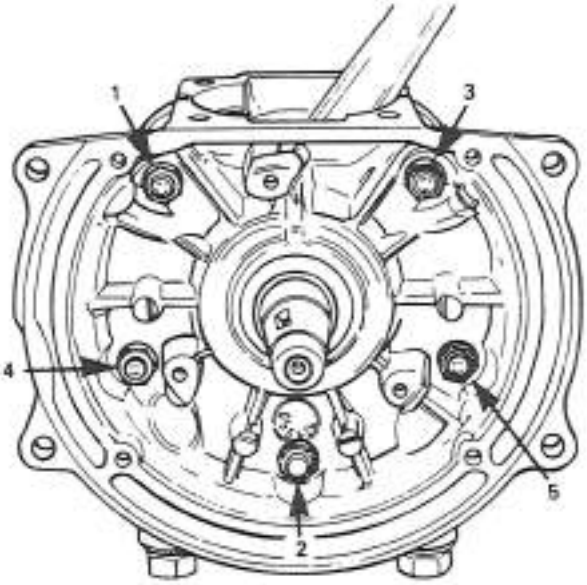
NOTE: Prior to magneto side bearing installation, install required shim(s) (crankshaft end play) on crankshaft extension. At assembly, place bearings into an oil container and heat the oil to 100° C (210° F) for 5 to 10 min. This will expand the bearings and permit them to slide easily on the shaft.

⑪ To remove or install new seal into crankcase use an appropriate oil seal pusher as illustrated. (See Tool Section).



Also, prior to crankcase adjoining, install a protector sleeve on each crankshaft extension to prevent oil seal damage (See Tool Section). Apply a light coat of lithium grease on seal lip. Seal outer surface should be flush with crankcase.

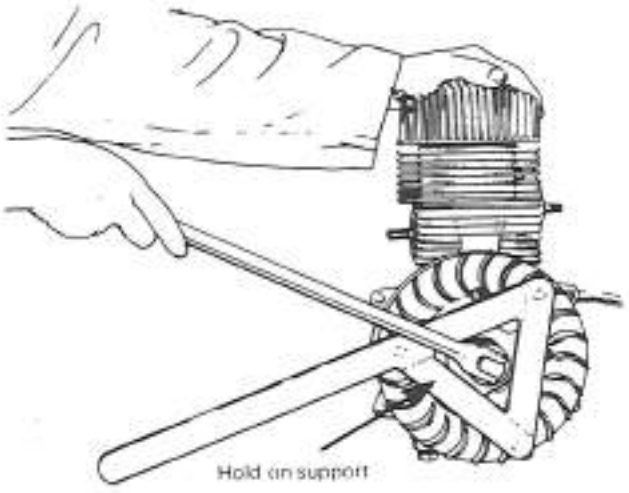
⑫ At assembly, torque to 2.2 kg-m (16 ft-lbs) following illustrated sequence.



㉕ Torque to 3.6 kg-m (26 ft-lbs).

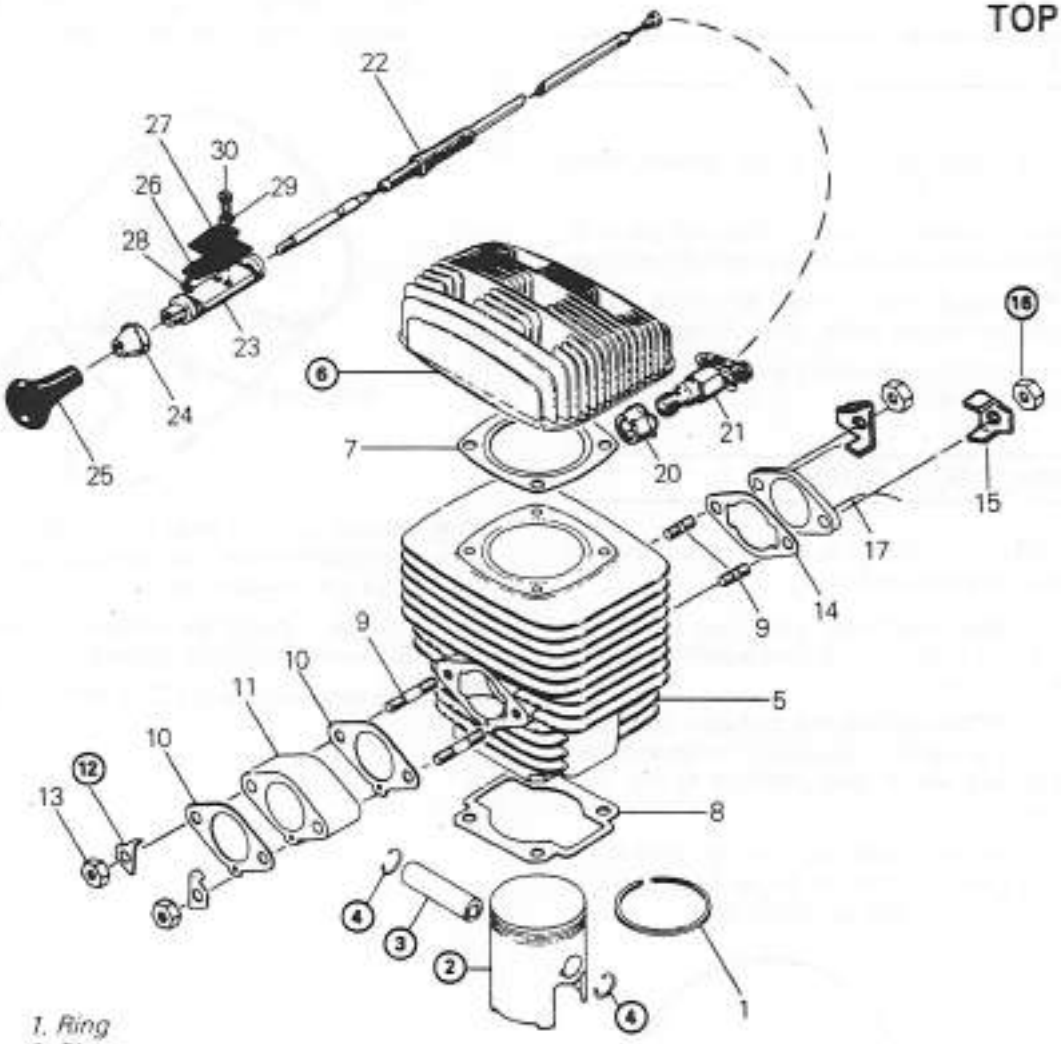
㉖ To remove or install magneto retaining nut, lock crankshaft in position with special hold-on support. (See Tool Section).

At assembly apply Loctite Lock'n Seal 242 on threads then torque retaining nut to 7.5 kg-m (54 ft-lbs).



㉗ Clean thoroughly then apply Loctite Lock'n Seal no. 242 or equivalent.

TOP END



1. *Ring*
2. *Piston*
3. *Gudgeon pin*
4. *Circlip*
5. *Cylinder*
6. *Cylinder head*
7. *Gasket (head / cylinder)*
8. *Gasket (cylinder / crankcase)*
9. *Stud*
10. *Gasket*
11. *Isolating flange*
12. *Locking tab*
13. *Nut*
14. *Exhaust gasket*
15. *Locking tab (Olympique)*
16. *Nut*
17. *Muffler*
18. *Flat washer*
19. *Nut (head)*

247 ONLY

20. *Locking sleeve*
21. *Decompressor*
22. *Cable*
23. *Switch housing*
24. *Cap nut*
25. *Knob*
26. *Spring plate*
27. *Spring plate reinforcement*
28. *Spring lock*
29. *Lockwasher*
30. *Screw*

TOP END

CLEANING

Discard all gaskets.

Clean all metal components in a non-ferrous metal cleaner.

Scrape off carbon formation from cylinder exhaust port, cylinder head and piston dome using a wooden spatula.

NOTE: The letter "AUS" (over an arrow on the piston dome) must be visible after cleaning.

Clean the piston ring grooves with a groove cleaner tool, or with a piece of broken ring.

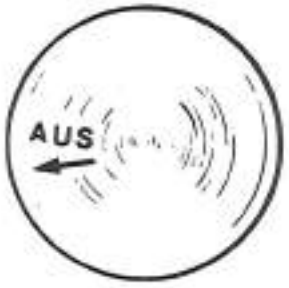
DISASSEMBLY & ASSEMBLY

NOTE: Refer to Technical Data for component fitted tolerance and wear limit.

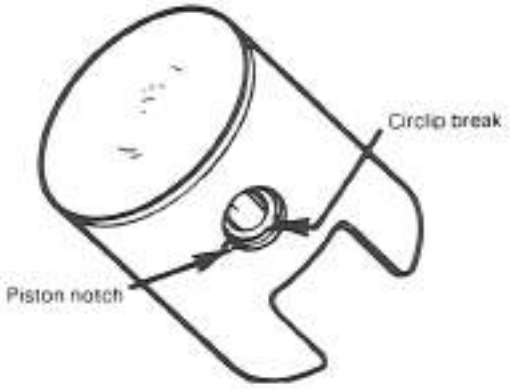
②③④ Place a clean cloth over crankcase to prevent circlip from falling into crankcase. Use a pointed tool to remove circlips from piston.

CAUTION: When tapping out gudgeon pins, hold piston firmly in place to eliminate the possibilities of transmitting shock and pressure to the connecting rod.

At assembly, place the piston over the connecting rod with the letters "AUS" (over an arrow on the piston dome) facing in direction of the exhaust port.



NOTE: Once the circlips are installed turn each circlip so the circlip break is not directly on piston notch. Remove any burrs on piston caused through circlip installation with very fine emery cloth.

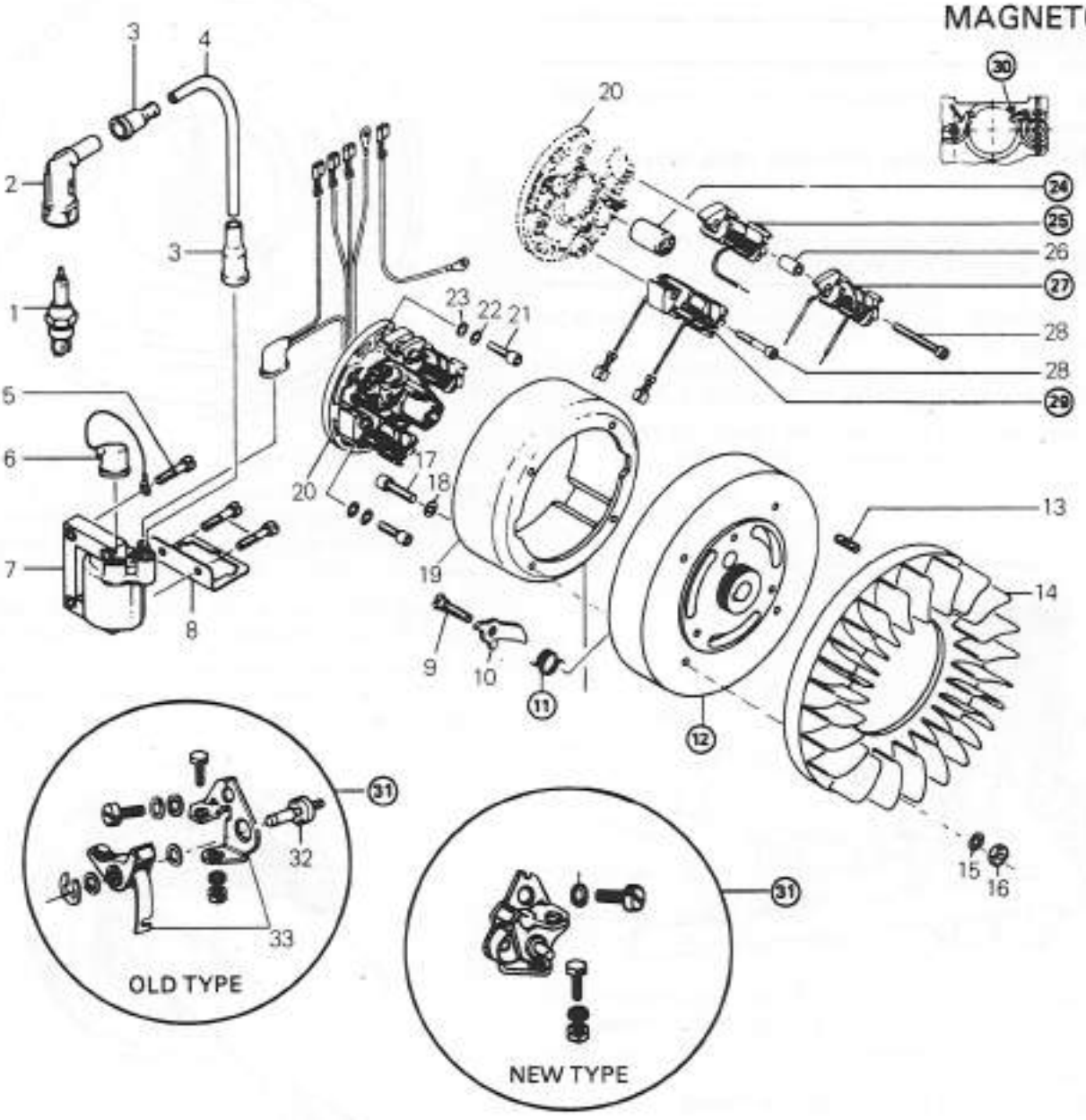


⑥⑯ Position cylinder head on cylinder with fins in line with crankshaft center line. Cross torque retaining nut to 1.9-2.2 kg-m (14-16 ft-lbs.)

⑫ Tab washer should be replaced if bent more than three (3) times. If in doubt, replace.

⑯ At assembly, torque to 2.2 kg-m (16 ft-lbs).

MAGNETO



1. Spark plug
2. Protector
3. Protection cap
4. H.T. cable
5. Screw
6. Ground connector
7. Ignition coil
8. Junction block bracket
9. Screw
10. Centrifugal weight
11. Return spring
12. Magneto housing
13. Stud
14. Fan
15. Lockwasher
16. Nut
17. Screw
18. Lockwasher
19. Magneto ring
20. Armature plate
21. Screw
22. Lockwasher
23. Flat washer
24. Condenser
25. Ignition generator coil
26. Distance sleeve
27. Brake light coil
28. Screw
29. Lighting coil
30. Lubricating wick
31. Breaker point set ass'y
32. Pivot pin
33. Breaker point set

MAGNETO

CLEANING

Clean all metal components in a non-ferrous metal cleaner.

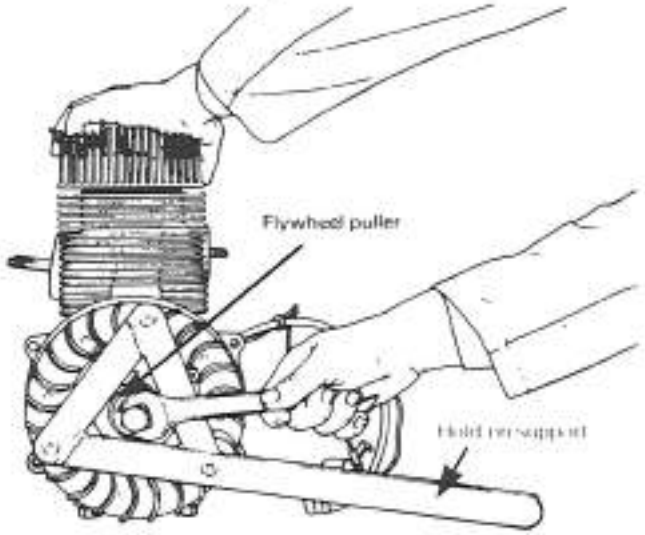
▼ CAUTION: Clean armature using only a clean cloth.

DISASSEMBLY & ASSEMBLY

⑪ At assembly, apply a small amount of grease into spring seating.

⑫ With magneto retaining nut removed and hold on support in place, install special puller onto hub.

Tighten puller nut at same time, tap on nut head using a hammer to release magneto from its taper.



At assembly, clean crankshaft extension (taper) then apply Loctite Lock'n Seal 242, position magneto on crankshaft with the keyway and the cam notch position as illustrated.

Apply Loctite Lock'n Seal 242 on threads of retaining nut then torque to 7.5 kg m (54 ft-lbs).

⑰ Apply Loctite Lock'n Seal 242 on threads.

㉔ To replace a capacitor, it is first necessary to disconnect the two (2) black leads using a soldering iron. The capacitor can then be driven out of the armature plate using a suitable drift. To reinstall, inverse procedure.

㉕ ㉗ ㉘ Whenever a coil is replaced, the air gap (distance between magnet and coil end) must be adjusted.

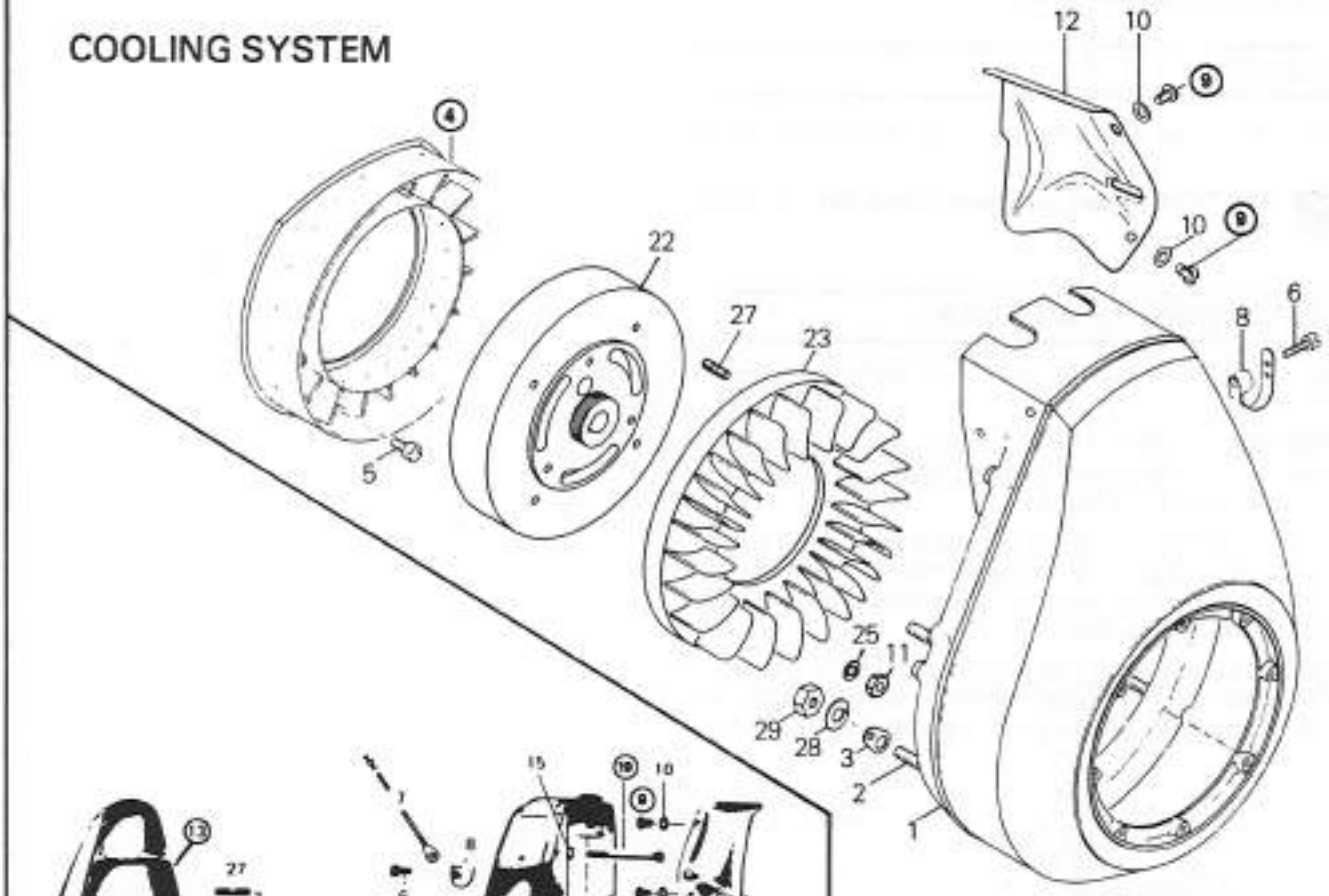
To check air gap, insert a feeler gauge of 0.25-0.38 mm (.010"-.015") between magnet and coil ends. If necessary to adjust, slacken retaining screws and relocate coil.

㉚ When replacing breaker point set, apply a light coat of grease on lubricating wick.

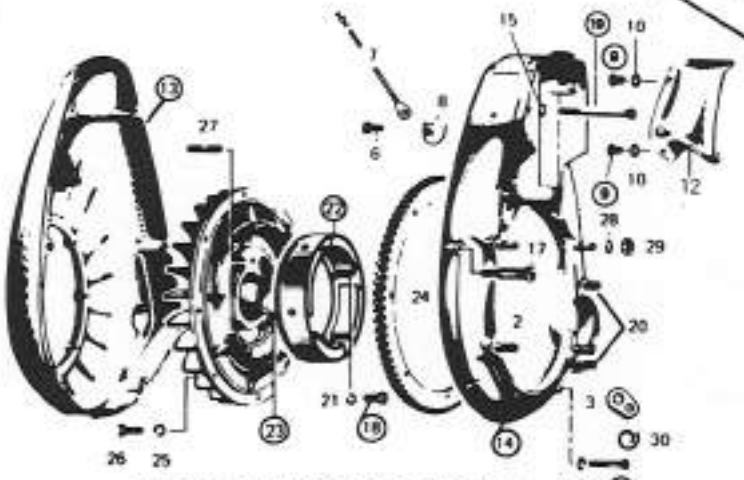
㉛ Do not remove pivot pin unless replacement is needed, if removed reinstall with Loctite Lock'n Seal on threads.

Old type breaker point set can be replaced by new type if pivot pin is removed. When installing new breaker point type it is advisable to fill the pivot pin cavity of the armature plate with Loctite 277 (thick red solution).

COOLING SYSTEM



MANUAL START ENGINE



ELECTRIC START ENGINE

1. Fan cowl ass'y
2. Fan cowl stud (4)
3. Spring bracket
4. Labyrinth ring (manual start only)
5. Screw (4)
6. Screw
7. Ground cable
8. Cable clamp
9. Flat head screw
10. Spring washer
11. Nut
12. Air deflector
13. Fan cowl cover
14. Fan cowl
15. Lock washer
16. Cylindrical head screw (2)
17. Dowel screw (2)
18. Allen screw (4)
19. Cylindrical head screw (long)
20. Starter stud
21. Lock washer (4)
22. Magneto ring
23. Fan ass'y
24. Starter ring gear
25. Lock washer (8)
26. Hex. cap screw (8)
27. Stud
28. Lock washer (4)
29. Nut (4)
30. Spring retainer

COOLING SYSTEM

CLEANING

Clean all metal components in a non-ferrous metal cleaner.

CAUTION: Clean armature using only a clean cloth.

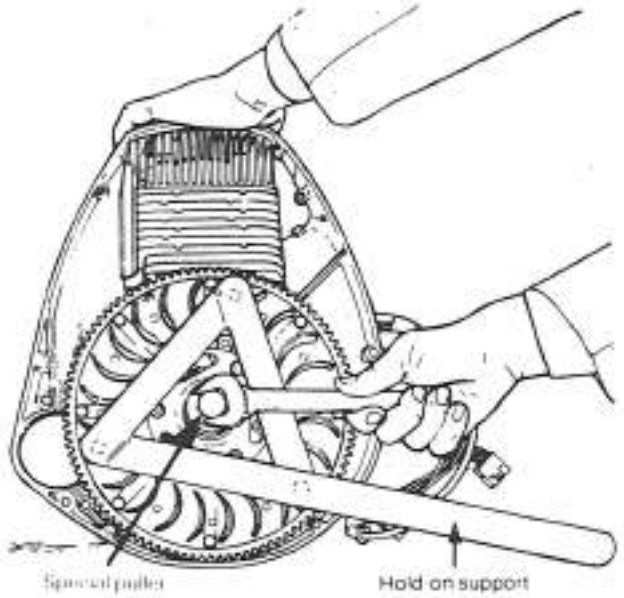
DISASSEMBLY & ASSEMBLY

④ At assembly, position labyrinth ring with bevelled side on top.

⑬⑭㉒㉓ To remove fan cowl ass'y and / or magneto from electric start engine, it is first necessary to separate fan cowl cover from fan cowl.

To remove magneto ring / fan ass'y from engine, lock crankshaft in position with special hold-on support. Remove magneto retaining nut, then install special puller onto hub (See Tool Section).

Tighten puller nut and at same time, tap on nut head with a hammer to release magneto from its taper. At assembly, torque retaining nut to 7.5 kg-m (54 ft-lbs.)

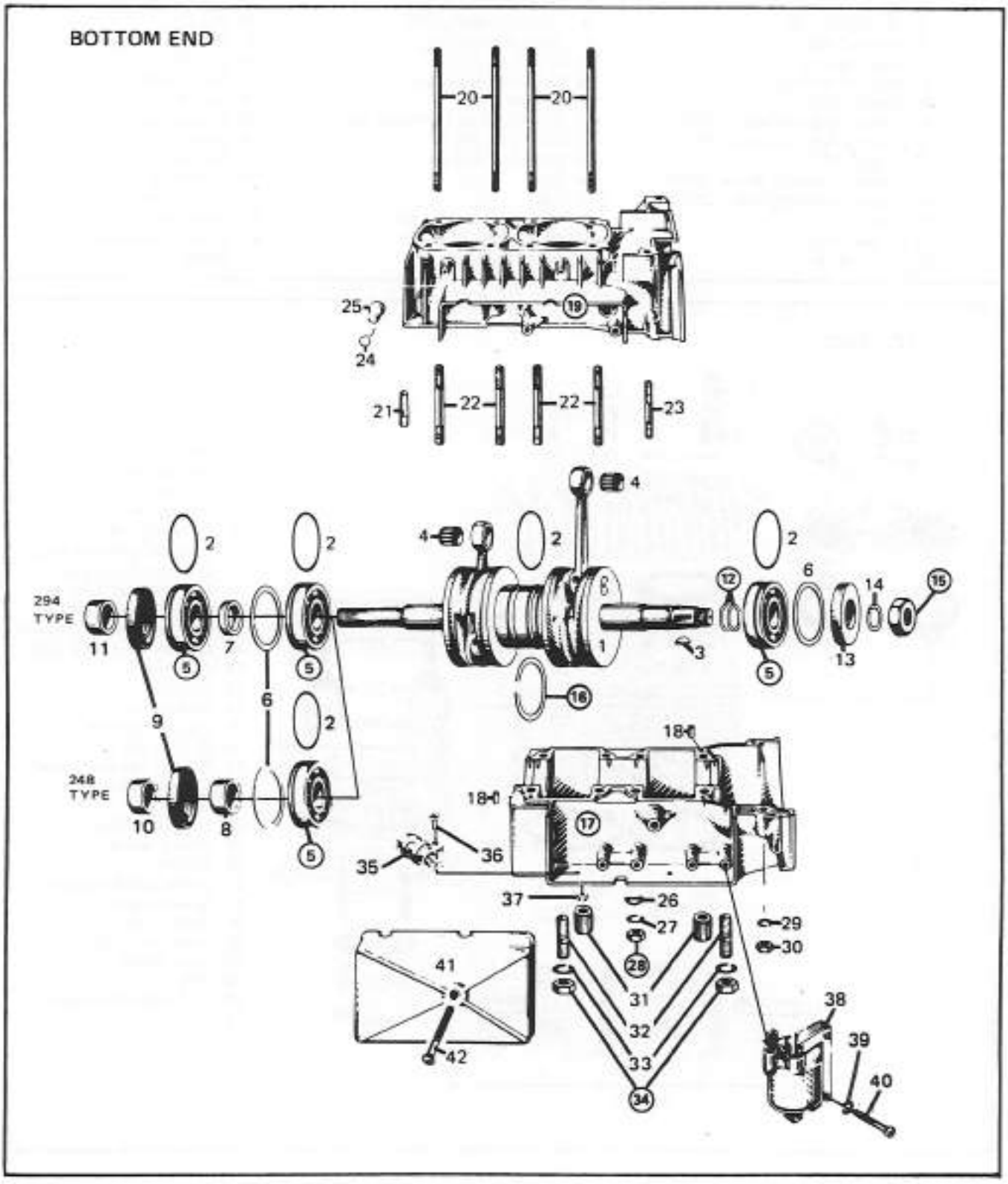


⑨⑯⑱⑲ At assembly, apply Loctite "Lock'n Seal 242" on screws threads.

NOTE: It should be noted that to correctly remove a Loctite locked screw, it is first necessary to tap on head of screw to break Loctite bond. This will eliminate the possibility of screw breakage.

248, 294 ENGINE TYPE

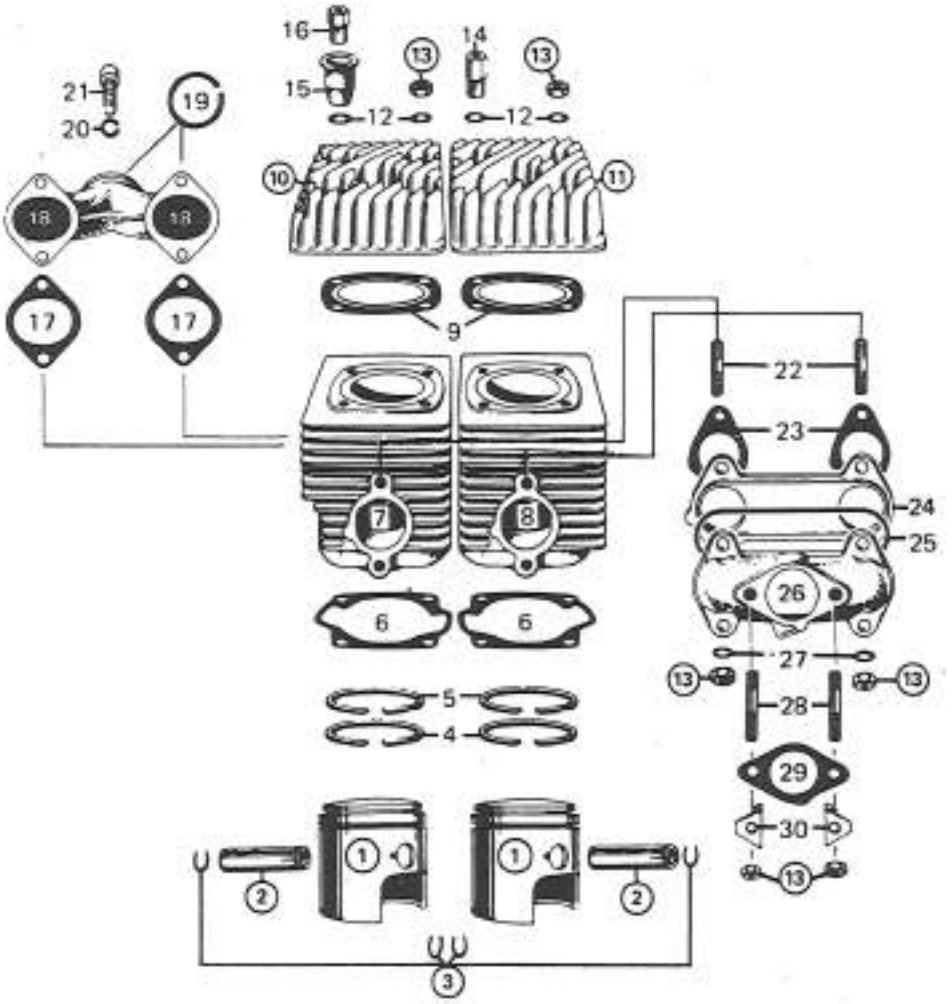
BOTTOM END



BOTTOM END

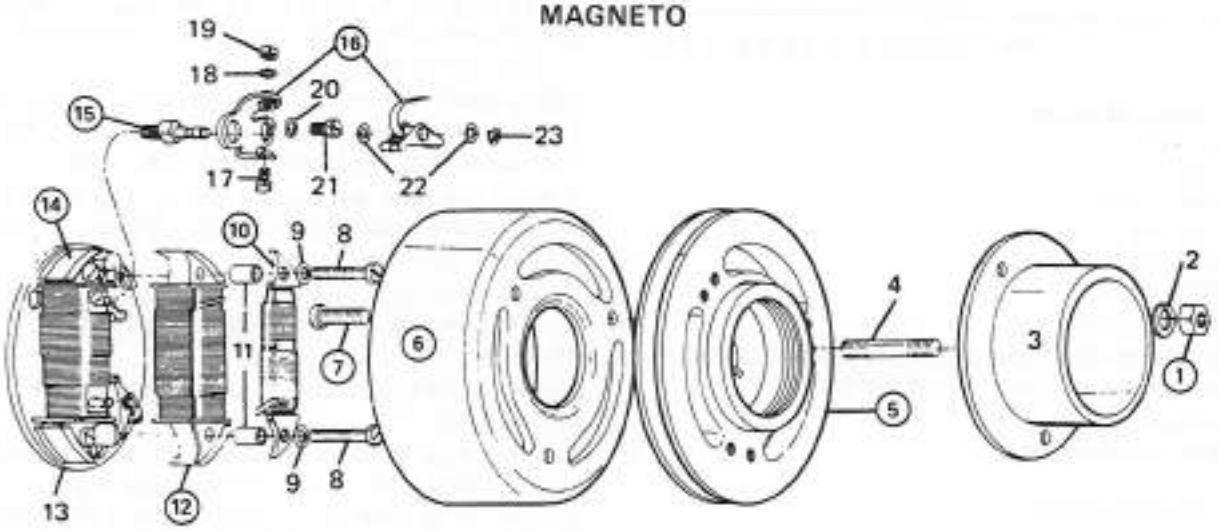
1. Crankshaft
2. "O" ring (4 or 6)
3. Woodruff key
4. Needle bearing
5. Ball bearing (2 or 3)
6. Retaining disc
7. Distance sleeve (6 mm - .232")
8. Distance sleeve (12 mm - .0472")
9. Oil seal (P.T.O.)
10. Distance sleeve (17.7 mm - .697")
11. Distance sleeve (9.7 mm - .382")
12. Shim(s)
13. Oil seal (Mag)
14. Lock washer
15. Magneto retaining nut
16. Labyrinth sealing ring
17. Crankcase lower half
18. Dowel pin
19. Crankcase upper half
20. Cylinder stud
21. Crankcase stud (294 only) (2)
22. Crankcase stud (8)
23. Crankcase stud (2)
24. Clamp
25. Cap
26. Spring washer (8 or 10)
27. Lock washer (8 or 10)
28. Nut (8 or 10)
29. Lock washer (2)
30. Nut (2)
31. Spacer (4, if applicable)
32. Stud (4)
33. Lock washer (4)
34. Nut (4)
35. Capacitor (2)
36. Screw (2)
37. Nut (2)
38. Ignition coil
39. Lock washer (6)
40. Screw (6)
41. Ignition box cover
42. Screw

TOP END



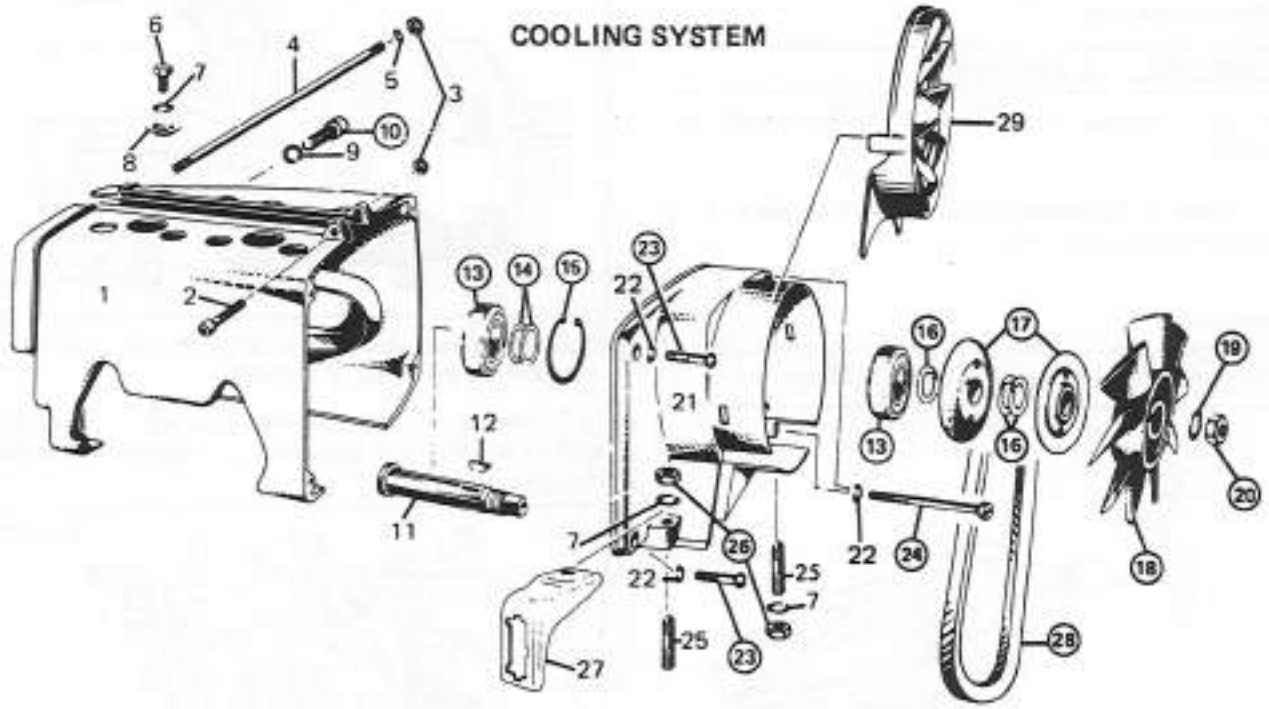
1. Piston
2. Gudgeon pin
3. Circlip
4. Rectangular ring
5. L-Trapeze ring
6. Cylinder/crankcase gasket
7. Cylinder (P.T.O. side)
8. Cylinder (Mag. side)
9. Cylinder head gasket
10. Cylinder head (P.T.O. side)
11. Cylinder head (Mag. side)
12. Plain washer
13. Nut (12 or 14)
14. Distance nut
15. Supporting sleeve
16. Distance nut
17. Exhaust manifold gasket
18. Exhaust manifold
19. Sealing ring
20. Lock washer (4)
21. Allen screw (4)
22. Stud (4)
23. Intake manifold gasket
24. Isolating flange
25. Rubber ring
26. Intake manifold
27. Lock washer
28. Stud
29. Carburetor flange gasket
30. Tab lock

MAGNETO



1. Nut (3)
2. Lock washer (3)
3. Starting pulley
4. Stud (3)
5. Magneto housing
6. Magneto ring
7. Screw (3)
8. Screw (4)
9. Spring washer (4)
10. Brake light coil
11. Spacer
12. Ignition generator coil
13. Armature plate
14. Lighting coil
15. Pivot pin
16. Breaker point set
17. Bolt
18. Lock washer
19. Nut
20. Washer
21. Screw
22. Washer
23. Retaining clip

COOLING SYSTEM



1. Cylinder cowl
2. Allen screw
3. Elastic stop nut (3)
4. Stud (2)
5. Washer (2)
6. Bolt
7. Lock washer
8. Cowl retainer washer
9. Spring washer
10. Allen screw
11. Fan shaft
12. Woodruff key
13. Ball bearing
14. Shim (1 mm/.040")
15. Locking ring
16. Shim (as required)
17. Pulley half
18. Fan
19. Lock washer
20. Fan nut
21. Fan housing
22. Lock washer (4)
23. Screw
24. Screw (2)
25. Stud
26. Nut
27. Junction block bracket
28. Fan belt
29. Fan cover

REMOVAL

Remove or disconnect the following, then lift engine from vehicle.

Front - mounted engine

- Drive belt
- Muffler
- Rewind starter
- Air silencer
- Choke cable
- Throttle cable
- Fuel lines at carburetor

  Note: Secure fuel lines to steering support so that the opened ends are higher than the fuel tank.

- Electrical connector
- Engine mount nuts

Center mounted engine

- Drive belt
- Muffler
- Choke knob
- Throttle cable
- Fuel lines
- Electrical connectors
- Steering column support at upper column
- Engine mount nuts

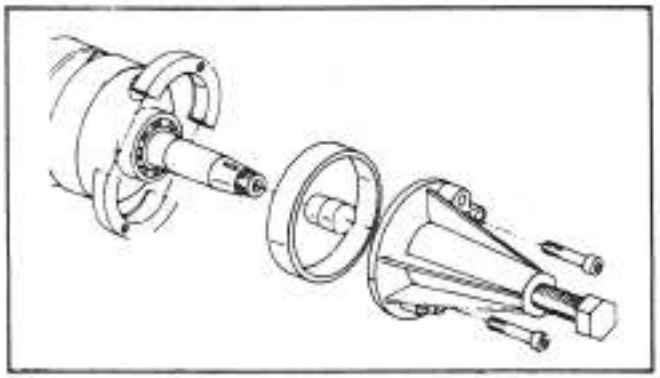
DISASSEMBLY & ASSEMBLY

If necessary, remove drive pulley as described in drive pulley section.

Note: Refer to Technical Data Section for component fitted tolerance and wear limit.

Bottom end

⑤ To remove bearing from crankshaft use a protective cap and special puller as illustrated. (See Tool Section).



Note: Prior to magneto side bearing installation, determine crankshaft end-play and install required shim (s) on crankshaft extension.

At assembly, place bearings into an oil container and heat the oil to 200° F. for 5 to 10 min. This will expand the bearings and permit them to slide easily on the shaft. Install bearings with groove outward.

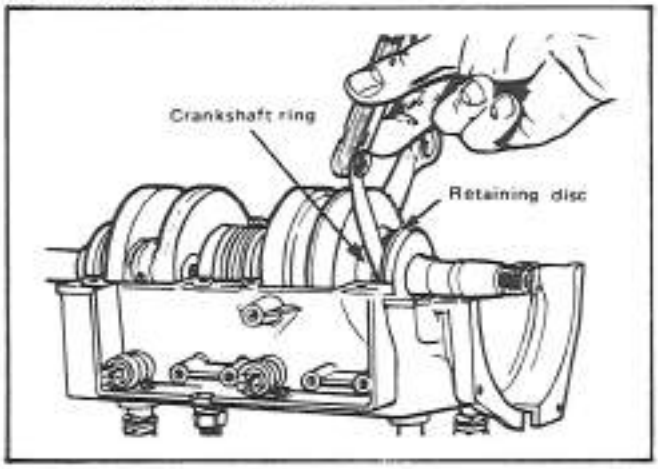
⑫ Crankshaft end-play is adjusted with a shim(s) located between crankshaft and magneto side bearing. To determine correct amount of shim, proceed as follows.

Remove magneto side bearing and existing shim(s). Slide the appropriate crankshaft ring and retaining disc onto the crankshaft. (See Tool Section).

Position crankshaft assembly into crankcase lower half, making sure that retaining discs are correctly seated into the grooves.

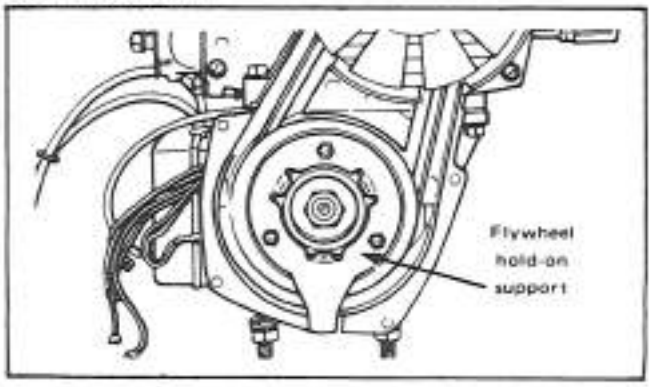
Gently tap crankshaft until P.T.O. side bearing bears against retaining disc.

Any free-play between the crankshaft ring and magneto side retaining disc, minus recommended end-play, is the distance to be covered by shim(s). Shims are available in thickness of 0.1 mm/.004", 0.2 mm/.008", 0.3 mm/.012", 0.5 mm/.020", 1 mm/.039".



Note: Crankshaft end-play is adjusted only when crankshaft and/or crankcase is replaced.

⑮ To remove or install magneto retaining nut, lock crankshaft in position with special hold-on support as illustrated. (See Tool Section).

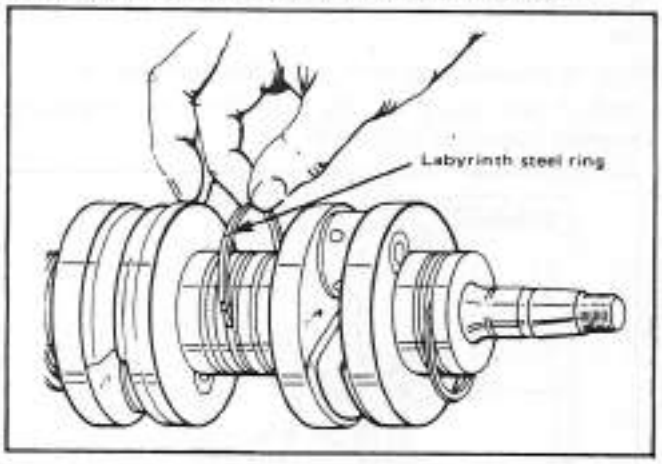


At assembly torque retaining nut to 42-50 ft-lb.

⑯ To increase sealing between left and right crankcase halves, on engine equipped with an external labyrinth seal, a steel ring is available, (part no. 414-2072).

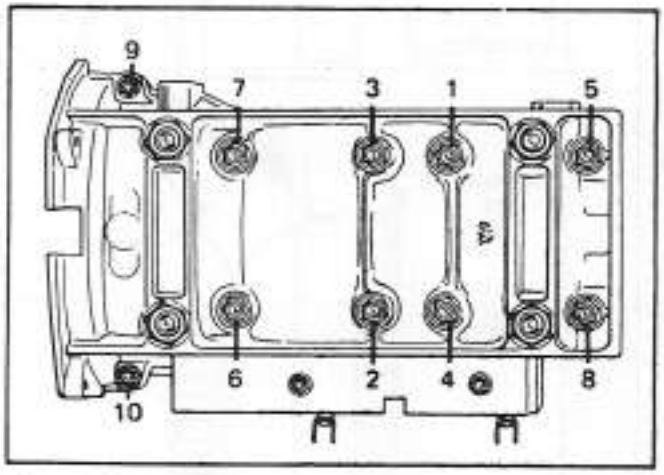
Prior to installation, the steel ring must be stretched open. To do this, slide the ring onto the neck of a soft drink bottle (2 1/2" outside diameter).

Install steel ring on crankshaft labyrinth as illustrated.



⑰ ⑲ ㉘ Crankcase halves are factory matched and therefore, are not interchangeable or available as single halves.

Prior to joining of crankcase halves, apply a light coat of "Loctite" crankcase sealant to mating surfaces of bottom half. Position spring washers, lock washers and nuts on crankcase studs then torque nuts to 14-16 ft-lb following illustrated sequence.



Note: Torque the two smaller nuts on magneto side to 9 ft-lb.

㉔ At assembly torque crankcase/support nut to 23-29 ft.-lb.

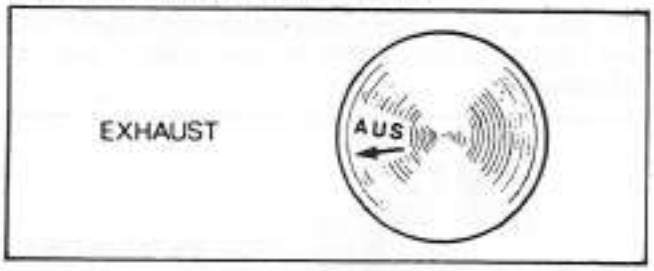
Top end

① ② ③ Place a clean cloth over crankcase to prevent circlip from falling into crankcase. Use a pointed tool to remove circlip from piston.

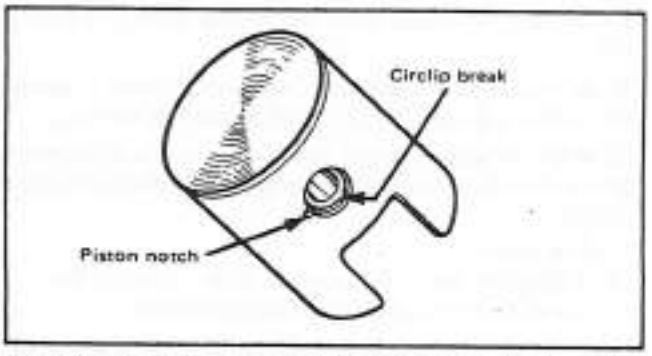
Drive the gudgeon pins in or out using a suitable drive punch and hammer.

Caution: When tapping gudgeon pin in or out of piston, hold piston firmly in place to eliminate the possibilitites of transmitting shock and pressure to the connecting rod.

At assembly, place the pistons over the connecting rods with the letters "AUS", over an arrow on the piston dome, facing in direction of the exhaust port.



Note: Once circlips are installed, turn each circlip so that the circlip break is not directly on piston notch. Remove any burrs on piston caused through circlip installation with very fine emery cloth.



⑩ ⑪ To insure correct cylinder alignment, install and secure intake and exhaust manifolds on cylinder prior to cylinder head tightening. Cross torque cylinder head nuts to 14-16 ft-lb.

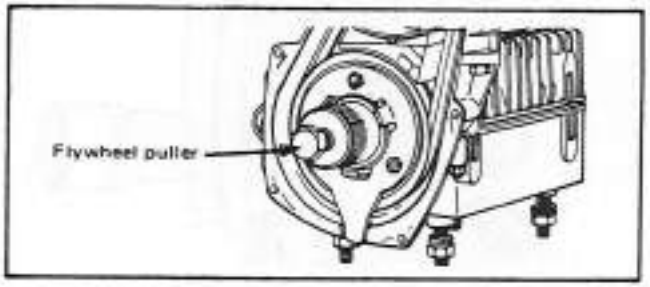
Note: Torque each head individually.

⑬ At assembly, torque to 14-16 ft-lb.

Magneto

① At assembly torque to 9 ft-lb.

⑤ ⑥ ⑦ With magneto retaining nut removed and hold-on



support in place, install special puller onto hub. Tighten puller bolt and at same time, tap bolt head using a hammer to release magneto from its taper. (See Tool Section)

Note: Do not separate magneto housing from magneto ring unless necessary. At assembly, apply Loctite. "Lock'n Seal" on magneto housing hub where magneto ring center bore sits.

⑩⑫⑭When a coil is replaced, the air gap between magnet and armature must be adjusted.

To check air gap insert a feeler of correct thickness (.025 mm/.010"-0.39 mm/.015") between magnet and each armature end.

CHECKING THE AIR GAP

If necessary to adjust, slacken retaining screw and relocate coil.

⑮Do not remove pivot pin unless replacement is needed. At assembly, apply Loctite "Lock'n Seal" on threads.

⑯When replacing breaker point set, apply a light coat of grease on pivot pin and rubbing block. Recheck engine timing.

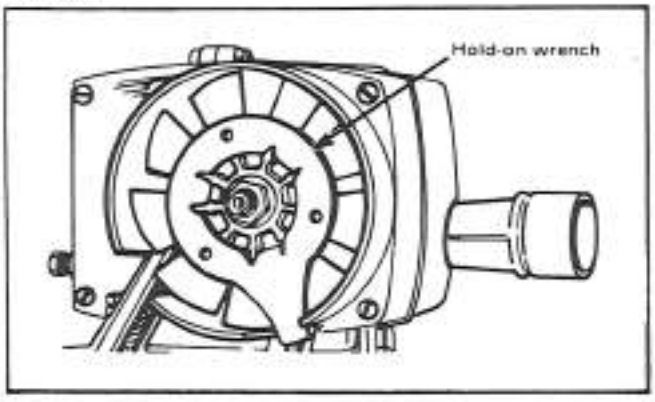
Cooling system

⑩㉓㉔㉖At assembly, apply Loctite "Lock'n Seal" on threads to prevent loosening through vibration.

Note: To correctly remove a "Loctite" locked screw, it is necessary to slightly tap on head of screwdriver to break bond.

⑬⑭⑮To remove or install bearing, heat bearing housing to 140°-160° F.

⑯⑰⑱⑲⑳㉑To remove or install fan retaining nut, lock fan in position with fan holder wrench. (See Tool Section).



At assembly, torque retaining nut to 42-50 ft-lb. Make sure that belt is not squeezed between pulley halves.

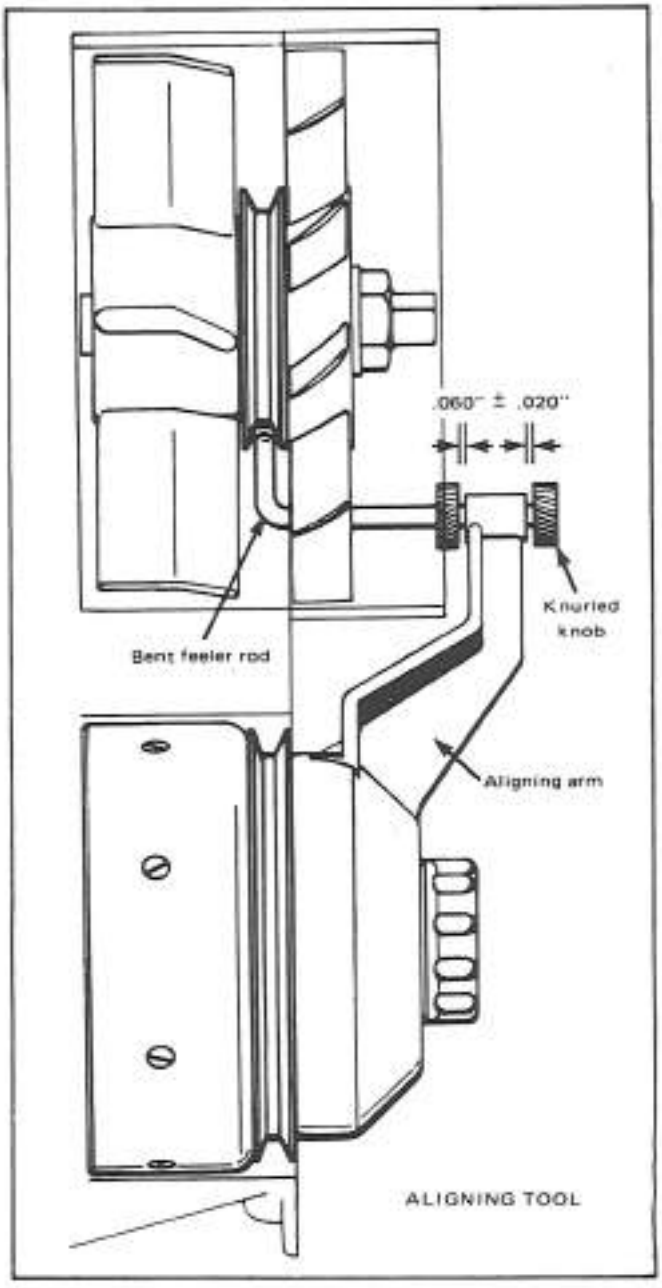
Correct fan belt free-play is 1/4". To adjust, add or remove shim(s) between inner and outer pulley halves. Excess shim(s) must be positioned between outer pulley half and fan.

Fan belt alignment

For reliable fan belt operation, the two fan belt pulleys must lie within .020" of either side of the pulley center line.

Prior to checking alignment, check fan belt free-play.

Position and secure aligning tool (See Tool Section) on magneto housing as illustrated.



ALIGNING TOOL

Turn knurled knob to center bent feeler rod between pulley halves. Insert a .040" feeler gauge between tool arm and knurled knobs. If gauge fits between both sides of the arms, the setting lies within tolerance.

If clearance is smaller than .040" on one side, shim(s) must be added or removed between bearing and inner pulley half to bring both gaps within tolerance of .060" ±.020".

Excess shim(s) should be stored between outer pulley half and fan.

CLEANING

Discard all oil seals, gaskets and "O" rings.

Clean all metal components in a non-ferrous metal cleaner.

Caution: Clean armature with a clean cloth only.

Scrape carbon formation from cylinder exhaust ports, cylinder heads and piston domes.

Note: The letter "AUS" over an arrow on the piston dome must be visible after cleaning.

Clean the piston ring grooves with a groove cleaner tool, and/or a piece of broken ring.

Remove old sealant from mating surfaces of crankcase with a scraper blade.

Caution: Never use a sharp object to scrape away old sealant as score marks incurred are detrimental to crankcase sealing.

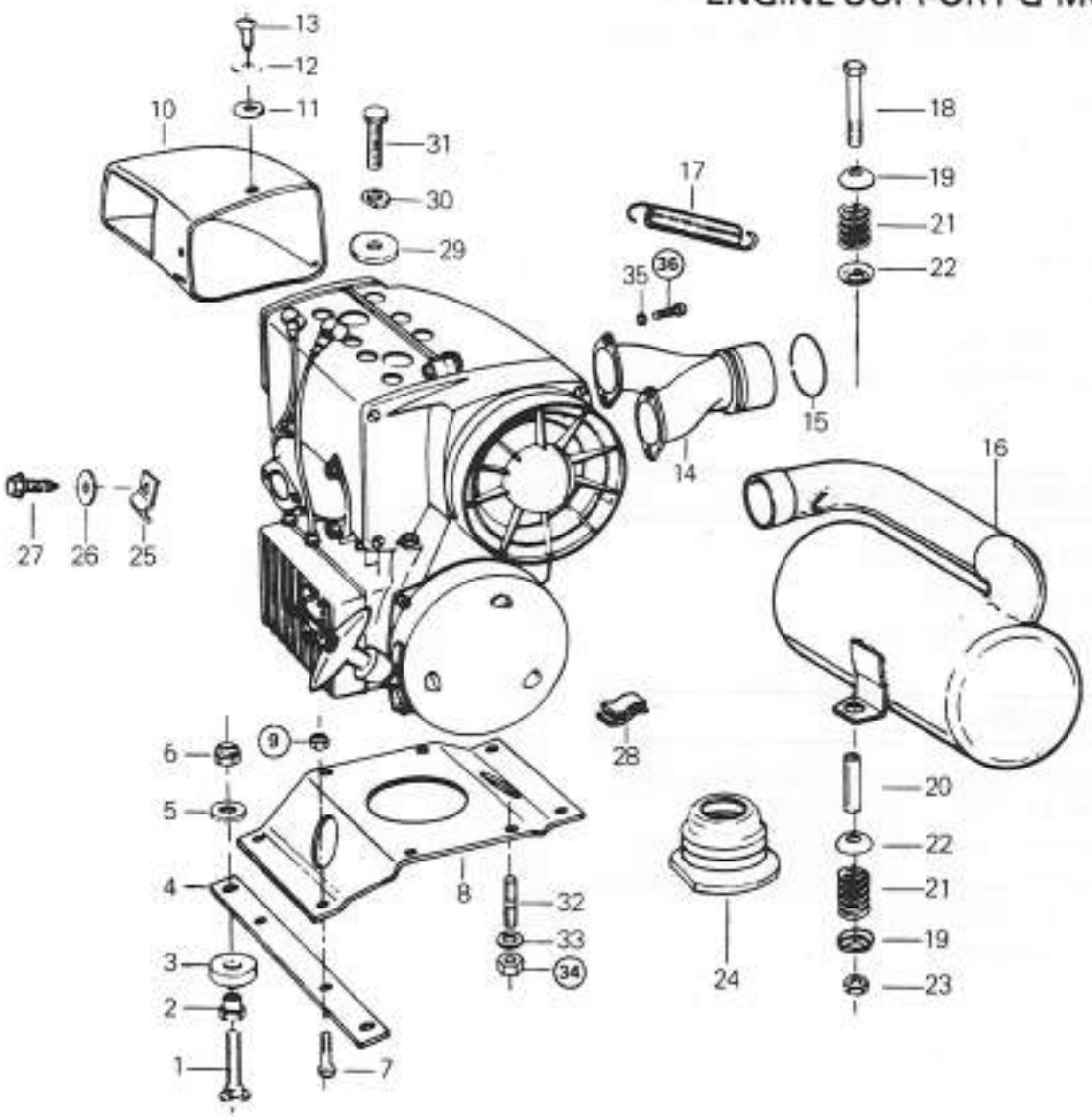
INSTALLATION

To install engine on vehicle, inverse removal procedure. However, pay attention to the following:

- Torque engine mount nuts to 18-23 ft-lb.
- After throttle cable installation, check carburetor maximum throttle opening.
- Check pulley alignment.
- Check ignition timing.

248 ENGINE TYPE (FROM 1975)

ENGINE SUPPORT & MUFFLER



1. *Carriage bolt*
2. *Threaded spacer bushing*
3. *Rubber insulator*
4. *Engine support*
5. *Washer*
6. *Nut*
7. *Bolt*
8. *Engine bracket*
9. *Nut*
10. *Air duct*
11. *Rubber spacer*
12. *Washer*
13. *Screw*
14. *Exhaust manifold*
15. *Aluminum ring*
16. *Muffler*
17. *Spring*
18. *Bolt*
19. *Cup*
20. *Bushing*
21. *Spring*
22. *Cup*
23. *Nut*
24. *Exhaust grommet*
25. *Clip*
26. *Washer*
27. *Screw*
28. *Plug*
29. *Rubber washer*
30. *Washer*
31. *Screw*
32. *Stud*
33. *Lockwasher*
34. *Nut*
35. *Lockwasher*
36. *Screw*

ENGINE SUPPORT & MUFFLER

REMOVAL FROM VEHICLE

Remove or disconnect the following, then lift engine from vehicle.

- Pulley guard
- Drive belt
- Muffler
- Choke knob
- Throttle cable
- Fuel lines
- Electrical connectors
- Steering column support at upper column
- Engine mount nuts

DISASSEMBLY & ASSEMBLY


Torque to 3.2 kg-m (23 ft-lbs).

Torque to 3.6 kg-m (26 ft-lbs)

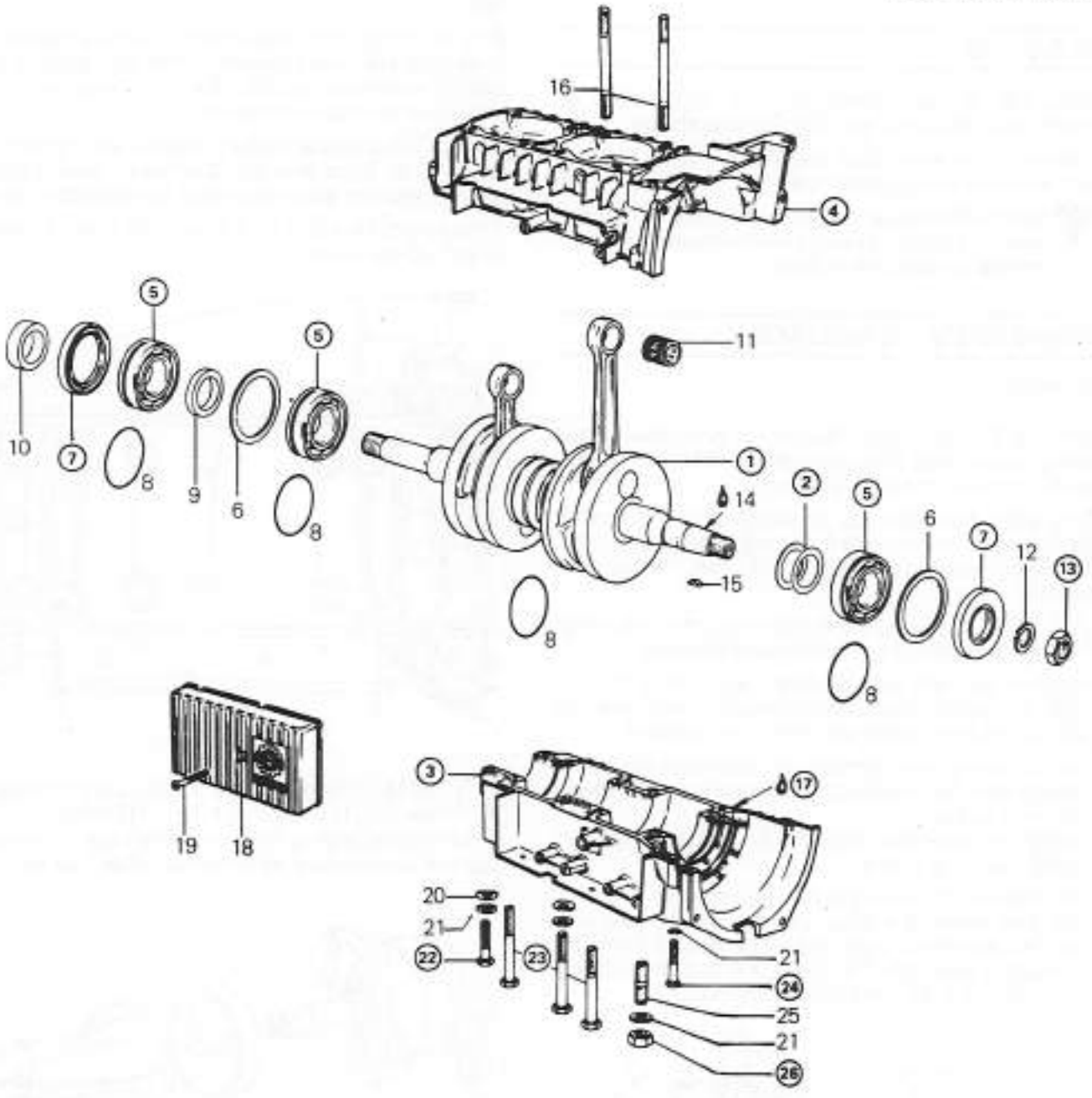

Torque to 2.2 kg-m (16 ft-lbs)

INSTALLATION

To install engine on vehicle, inverse removal procedure. However, pay attention to the following:

- Torque engine mount nuts to 2.7 kg-m (20 ft-lbs).
- After throttle cable installation, check carburetor maximum throttle opening.
- Check pulley alignment.

BOTTOM END



1. Crankshaft
2. Shim
3. Crankcase lower half
4. Crankcase upper half
5. Bearing
6. Retaining washer
7. Oil seal
8. "O" ring
9. Distance ring 6 mm
10. Distance ring 9.7 mm
11. Needle cage bearing
12. Lockwasher
13. Magneto ring nut
14. Loctite 242
15. Woodruff key
16. Stud (cylinder)
17. Crankcase sealant
18. Ignition coil cover
19. Screw
20. Spring washer
21. Lockwasher
22. Bolt or stud with nut
23. Bolt or stud with nut
24. Bolt or stud with nut
25. Stud
26. Nut

BOTTOM END

CLEANING

Discard all oil seals gaskets and "O" rings. Clean all metal components in a non-ferrous metal cleaner.

Remove old sealant from crankcase mating surfaces with Bombardier sealant stripper.

CAUTION: Never use a sharp object to scrape away old sealant as score marks incurred are detrimental to crankcase sealing.

DISASSEMBLY & ASSEMBLY

General

Refer to Technical Data Section for component fitted tolerance and wear limit. If necessary, refer to Drive Pulley Section to remove drive pulley.

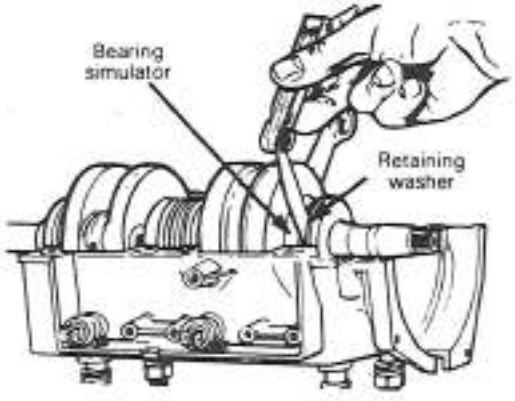
①② Crankshaft end-play is adjusted with a shim(s) located between crankshaft and magneto side bearing. To determine correct amount of shim, proceed as follows.

NOTE: Crankshaft end-play is adjusted only when crankshaft and / or crankcase is replaced.

Remove magneto side bearing and existing shim(s). Slide the appropriate bearing simulator and retaining washer onto the crankshaft. (See Tools Section).

Position crankshaft assembly into crankcase lower half, making sure that retaining washers are correctly seated into the grooves.
Gently tap crankshaft until P.T.O. side bearing bears against retaining washer.

Any free-play between the bearing simulator and magneto side retaining washer, minus recommended end-play, is the distance to be covered by shim(s). Shims are available in thickness of 0.1 mm (.004"), 0.2 mm (.008"), 0.3 mm (.012"), 0.5 mm (.020"), 1 mm (.039").

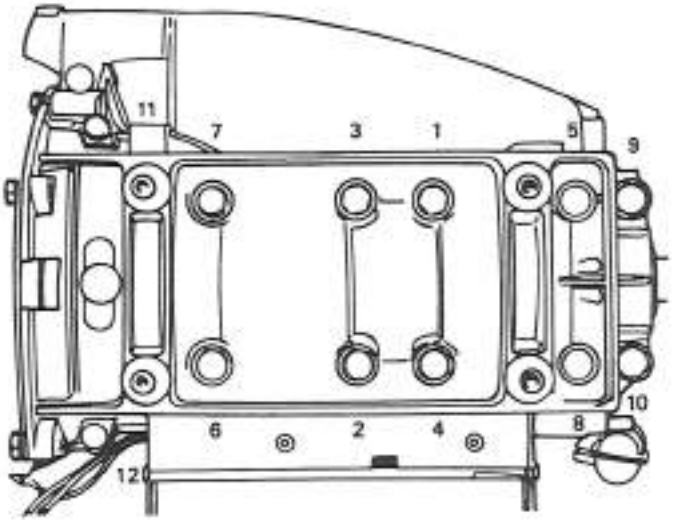


③④⑰ Crankcase halves are factory matched and therefore, are not interchangeable or available single halves.

Prior to joining of crankcase halves, prepare mating surfaces with crankcase sealant primer then apply a light coat of crankcase sealant (See Tool Section) as per instruction printed on container.

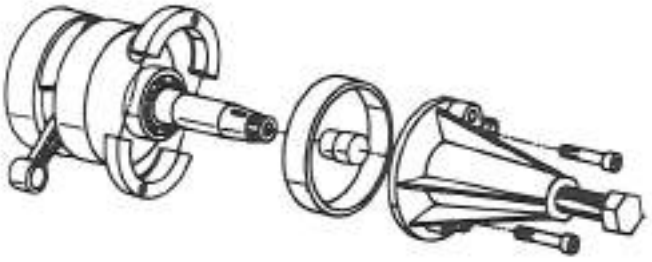
Position the crankcase halves together and tighten nuts (or bolts) by hand then install armature plate (tighten) on magneto side to correctly align the crankcase halves.

Torque nuts (or bolts) to 2.2 kg-m (15 ft-lbs) following illustrated sequence.



NOTE: Torque the two smaller nuts on magneto side (no. 11 and 12) to 1.2 kg-m (9 ft-lbs).

⑧ To remove bearing from crankshaft use a protective cap and special puller as illustrated. (See Tool Section).

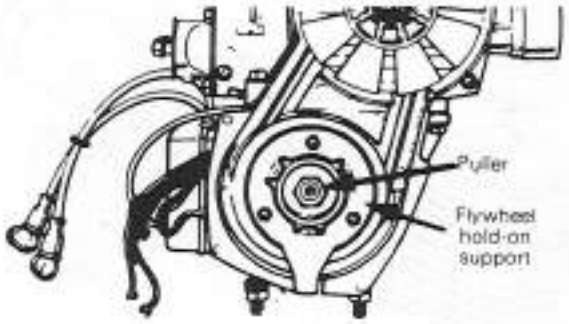


NOTE: Prior to magneto side bearing installation, determine crankshaft end-play and install required shim(s) on crankshaft extension.

At assembly, place bearings into an oil container and heat the oil to 100° C (210° F) for 5 to 10 min. This will expand the bearings and permit them to slide easily on the shaft. Install bearings with groove outward.

⑦ At assembly apply a light coat of lithium grease on seal lips then position oil seal with outer surface flush with crankcase.

⑬ To remove or install magneto retaining nut, lock crankshaft in position with special hold-on support as illustrated. (See Tool Section).



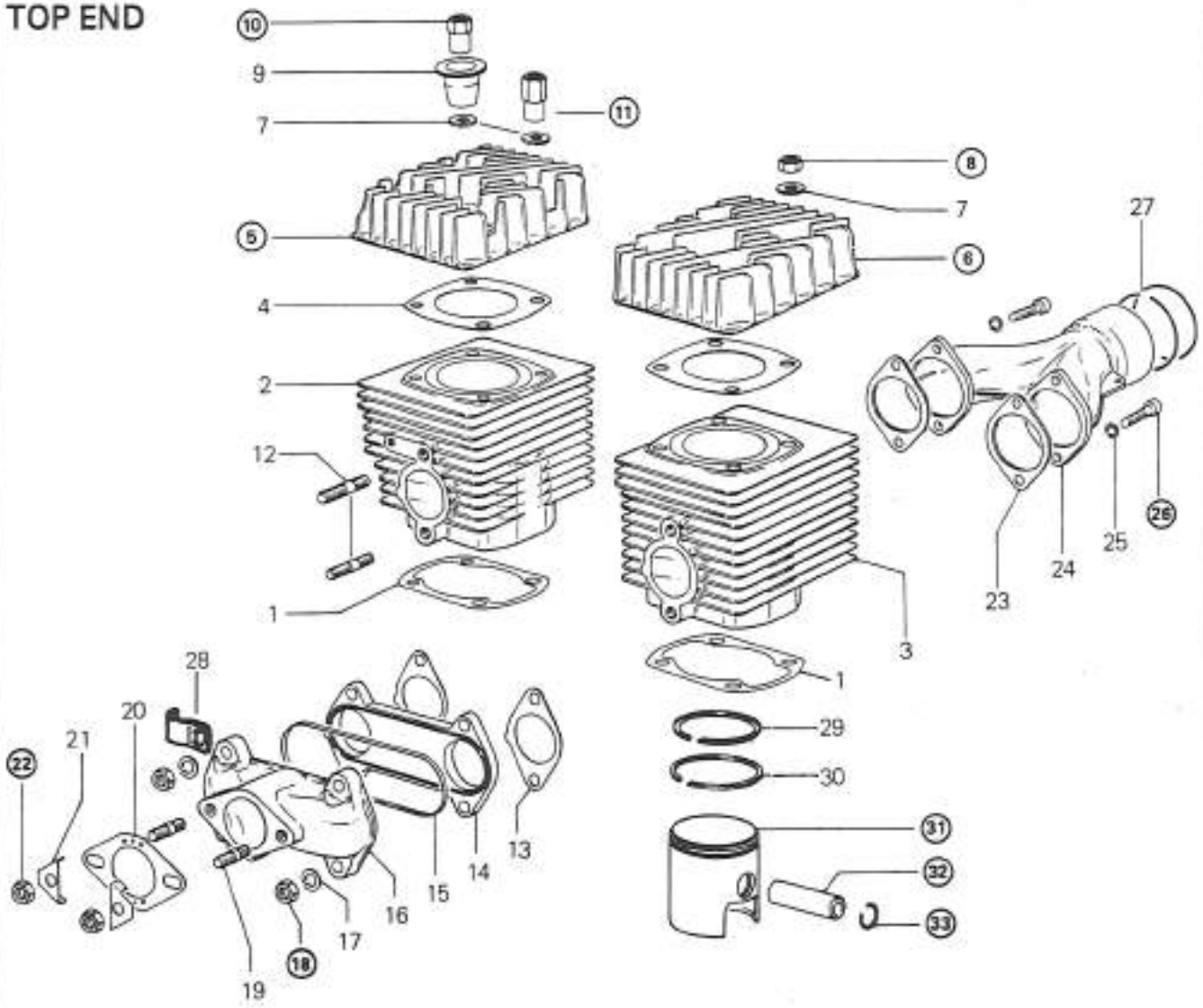
At assembly torque retaining nut to 6.4 kg-m (46 ft-lbs).

㉒ ㉓ Torque to 2.2 kg-m (16 ft-lbs).

㉔ Torque to 1.2 kg-m (9 ft-lbs).

㉘ Torque to 3.6 kg-m (26 ft-lbs).

TOP END



1. Gasket (cylinder/crankcase)
2. Cylinder (P.T.O.)
3. Cylinder (MAG)
4. Cylinder head gasket
5. Cylinder head (PTO)
6. Cylinder head (MAG)
7. Flat washer
8. Nut (head)
9. Support sleeve
10. Distance nut
11. Distance nut
12. Stud
13. Gasket
14. Isolating flange
15. Rubber ring
16. Intake manifold
17. Lockwasher
18. Nut
19. Stud
20. Gasket
21. Locking tab
22. Nut
23. Exhaust gasket
24. Exhaust manifold
25. Lockwasher
26. Allen capscrew
27. Sealing ring
28. Clip
29. "L" ring
30. Rectangular ring
31. Piston
32. Gudgeon pin
33. Circlip

TOP END

CLEANING

Discard all gaskets.

Clean all metal components in a non-ferrous metal cleaner.

Scrape off carbon formation from cylinder exhaust port, cylinder head and piston dome using a wooden spatula.

NOTE: The letter "AUS" (over an arrow on the piston dome) must be visible after cleaning.

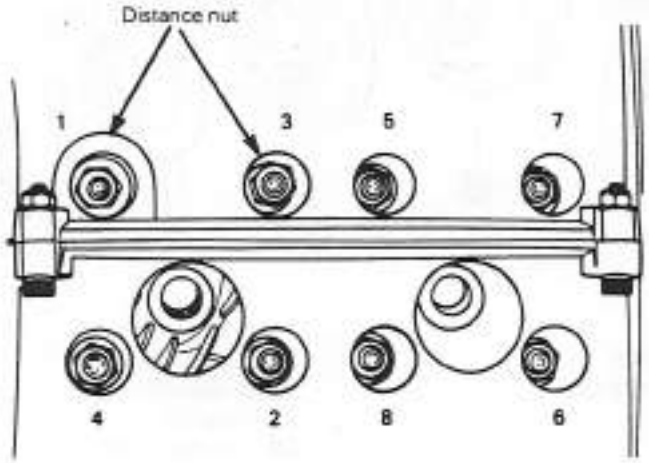
Clean the piston ring grooves with a groove cleaner tool, or with a piece of broken ring.

DISASSEMBLY & ASSEMBLY

NOTE: Refer to Technical Data for components fitted tolerance and wear limit.

⑤ ⑥ To insure correct cylinder alignment, install and secure intake and exhaust manifolds on cylinder prior to cylinder head tightening. Cross torque cylinder head nuts to 2.1 kg-m (15 ft-lbs).

⑧ ⑩ ⑪ Torque nuts and distance nuts to 2.1 kg-m (15 ft-lbs). Correct position for distance nuts is as following illustration.



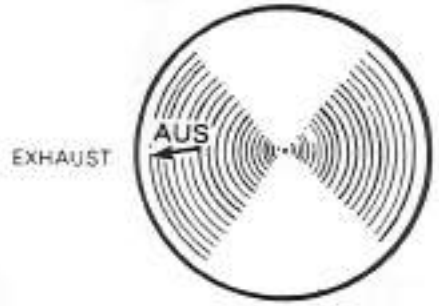
⑱ ㉒ ㉘ Torque to 2.1 kg-m (15 ft-lbs).

㉛ ㉜ ㉝ Place a clean cloth over crankcase to prevent circlip from falling into crankcase. Use apointed tool to remove circlip from piston.

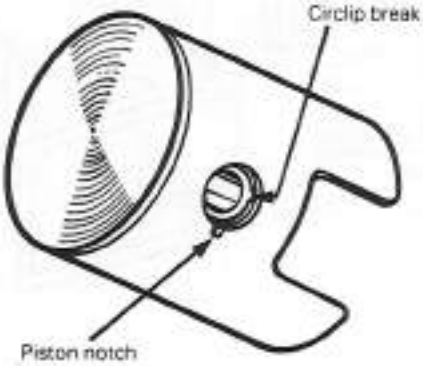
Drive the gudgeon pins in or out using a suitable drive punch and hammer.

CAUTION: When tapping gudgeon pin in or out of piston, hold piston firmly in place to eliminate the possibilities of transmitting shock and pressure to the connecting rod.

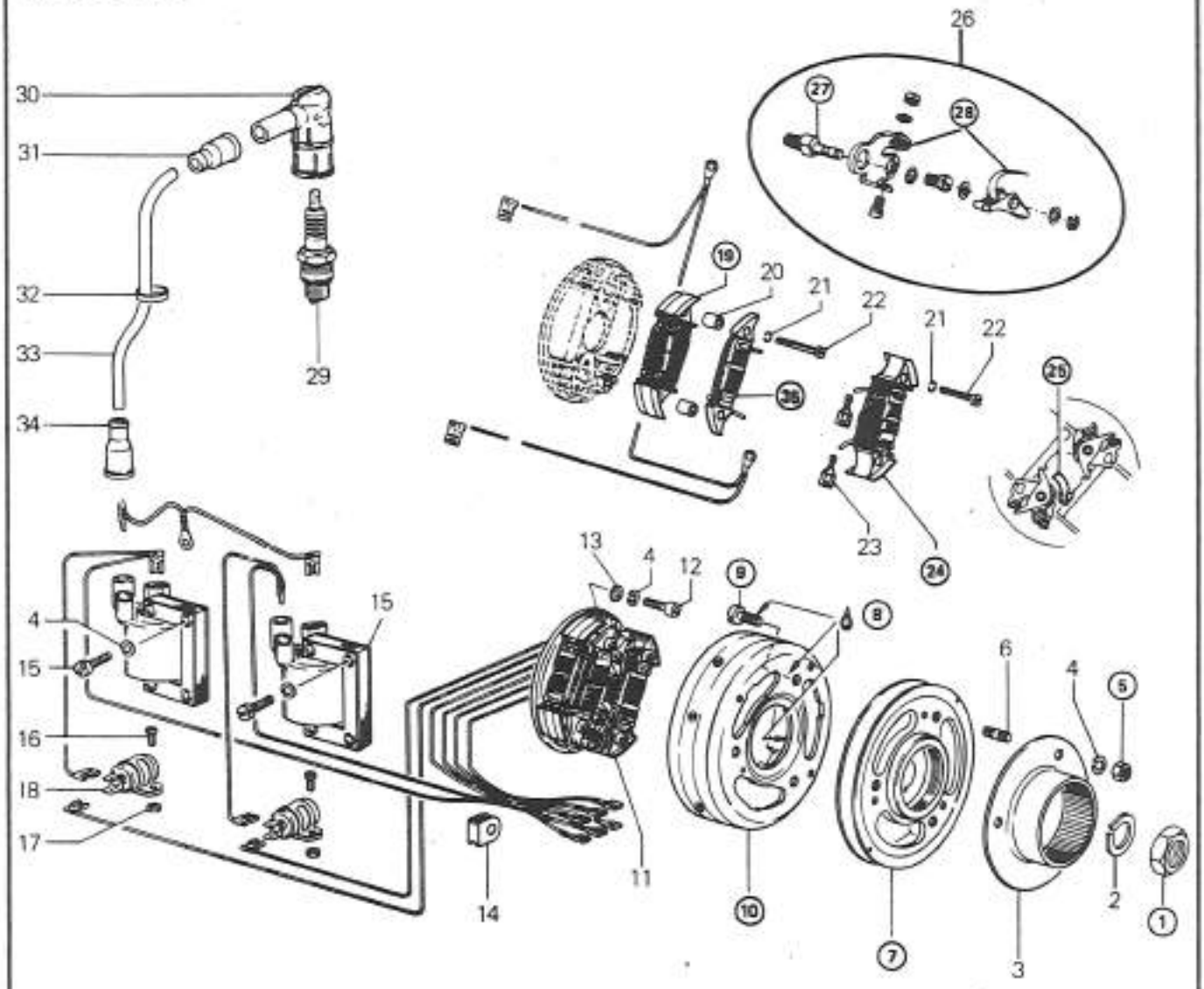
At assembly, place the pistons over the connecting rods with the letters "AUS" (over an arrow on the piston dome) facing in direction of the exhaust port.



NOTE: Once circlips are installed, turn each circlip so that the circlip break is not directly on piston notch. Remove any burrs on piston caused through circlip installation with very fine emery cloth.



MAGNETO



1. Nut
2. Lockwasher
3. Starting pulley
4. Lockwasher
5. Nut
6. Stud
7. Magneto housing
8. Loctite 242
9. Screw
10. Magneto ring
11. Armature plate ass'y
12. Allen capscrew
13. Flat washer
14. Wires grommet
15. Coil
16. Screw
17. Nut
18. Condenser with clamp
19. Lighting coil
20. Distance sleeve
21. Lockwasher
22. Screw
23. Female connector
24. Ignition generator coil
25. Lubricating wick
26. Breaker point set
27. Pivot pin
28. Breaker point
29. Spark plug
30. Protector
31. Protection cap
32. Rubber ring
33. H.T. Cable
34. Protection cap
35. Brake light coil

MAGNETO

CLEANING

Clean all metal components in a non-ferrous metal cleaner.

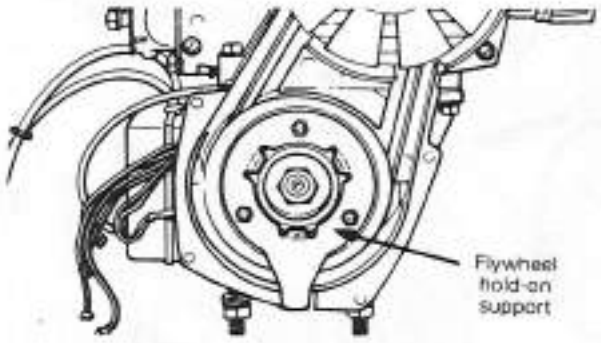
CAUTION: Clean armature ass'y using only a clean cloth.

DISASSEMBLY & ASSSEMBLY

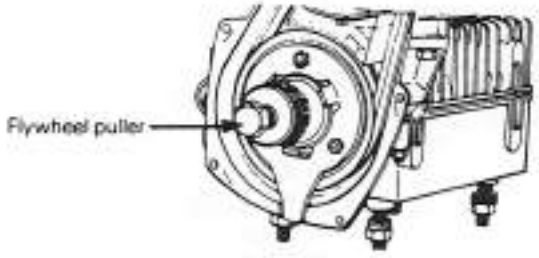
①Torque to 6.4 kg-m (46 ft lbs).

⑤Torque to 1.2 kg-m (9 ft-lbs)

⑦⑧⑨⑩To remove or install magneto retaining nut, lock crankshaft in position with special hold-on support as illustrated. (See Tool Section).



With magneto retaining nut removed and hold-on support in place, install special puller onto hub. Tighten puller bolt and at same time, tap bolt head using a hammer to release magneto from its taper. (See Tool Section).



NOTE: Do not separate magneto housing from magneto ring unless necessary. At assembly, apply Loctite "Lock'n Seal" on magneto housing hub (where magneto ring center bore sits) and on retaining screws.

Prior to magneto installation, clean crankshaft extension (taper) then apply Loctite Lock'n Seal 242.

Install magneto retaining nut with lockwasher then torque to 6.4 kg-m (46 ft-lbs).

⑱㉔㉖Whenever a coil is replaced, the air gap (distance between magnet and coil end) must be adjusted.

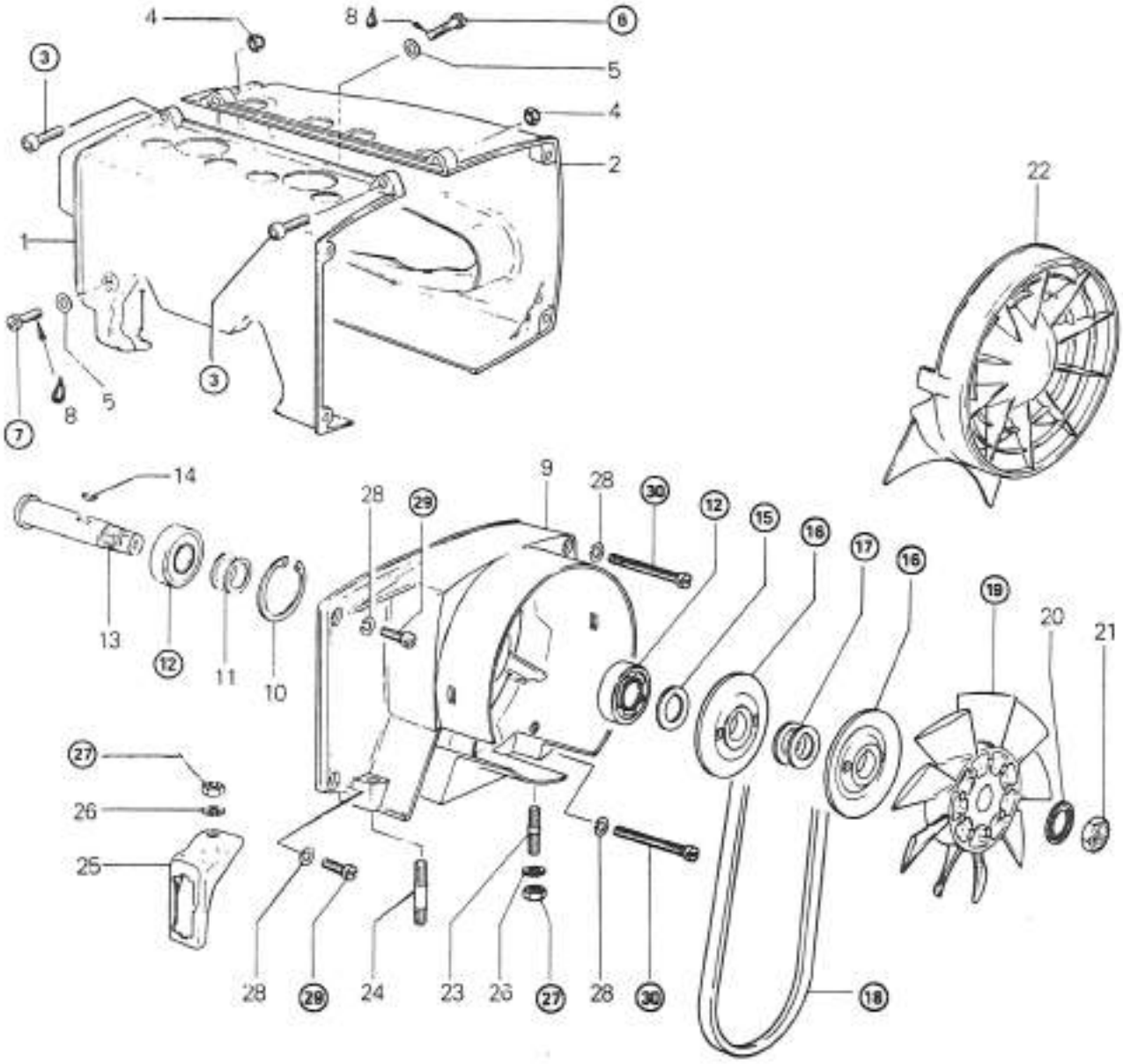
Checking the air gap

To check air gap, insert a feeler gauge of 0.25-0.39 mm (.010-.015") between magnet and coil ends. If necessary to adjust, slacken retaining screws and relocate coil.

㉗Do not remove pivot pin unless replacement is needed. At assembly, apply Loctite "Lock'n Seal" on threads.

㉕㉘When replacing breaker point set, apply a light coat of grease on pivot pin and lubricating wick.

COOLING SYSTEM



1. Cylinder cowl (intake)
2. Cylinder cowl (exhaust)
3. Screw
4. Nut
5. Spring washer
6. Screw
7. Screw
8. Loctite no. 242
9. Fan housing
10. Circlip
11. Shim
12. Bearing
13. Fan shaft
14. Woodruff key
15. Shim
16. Pulley half
17. Shim
18. Belt
19. Fan
20. Locking washer
21. Nut
22. Fan cover
23. Stud
24. Stud
25. Junction block bracket
26. Lockwasher
27. Nut
28. Lockwasher
29. Screw
30. Screw

COOLING SYSTEM

CLEANING

Clean all metal components in a non-ferrous metal cleaner.

DISASSEMBLY & ASSEMBLY

③⑤⑦㉗㉙㉚ At assembly, apply Loctite Lock'n seal or equivalent on threads to prevent loosening through vibration.

NOTE: To correctly remove a "Loctite" locked screw, it is necessary to slightly tap on head of screwdriver to break bond.

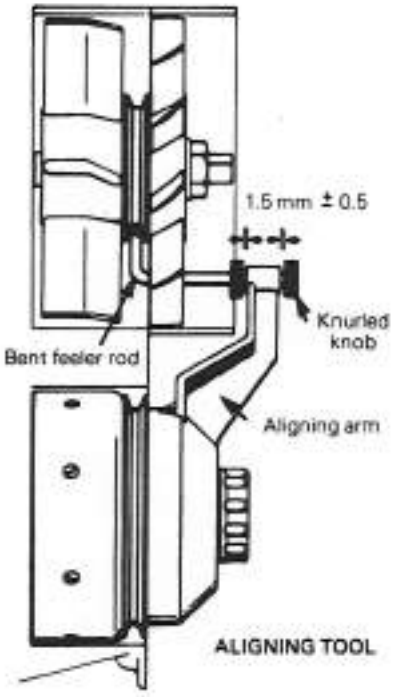
⑫ To remove or install bearing, heat bearing housing to 65° C (150° F).

⑯ Fan belt pulleys alignment

For reliable fan belt operation, the two fan belt pulleys must lie within 0.5 mm (.020") of either side of the pulley center line.

Prior to checking alignment, check fan belt free-play.

Position and secure aligning tool (See Tool Section) on magneto housing as illustrated.



ALIGNING TOOL

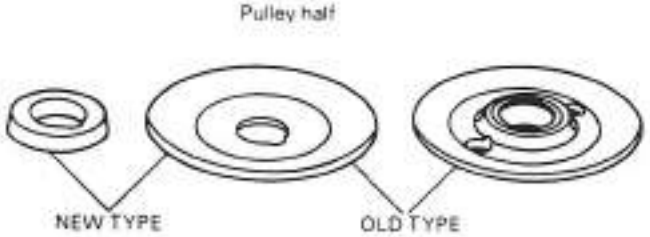
Turn knurled knob to center bent feeler rod between pulley halves. Insert a 1 mm (.040") feeler gauge between tool arm and knurled knobs. If gauge fits between both sides of the arms, the setting lies within tolerance.

If clearance is smaller than 1 mm (.040") on one side, shim(s) must be added or removed between bearing and inner pulley half to bring both gaps within tolerance of 1.5 mm ± 0.5 (.060" ± .020").

Excess shim(s) should be stored between outer pulley half and fan.

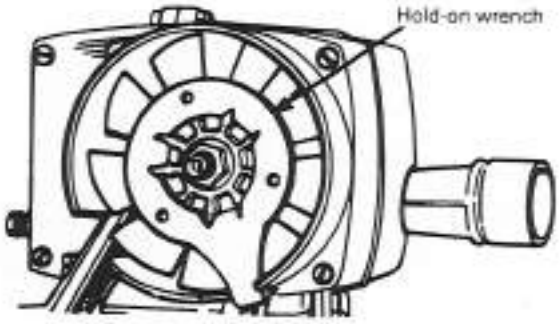
⑰⑱ Correct fan belt free-play is 6 mm (¼"). To adjust, add or remove shim(s) (no. 17) between inner and outer pulley halves. Excess shim(s) must be positioned between outer pulley half and fan.

⑯⑲㉑ Newer pulley half does not have a shoulder on its inner face so it is installed with a 6 mm (0.236") spacer.



There are two types of fan interchangeable. The first type utilizes two pulley halves and the second type utilizes one pulley half (the second half being part of the fan itself).

To remove or install fan retaining nut, lock fan in position with fan holder wrench. (See Tool Section).

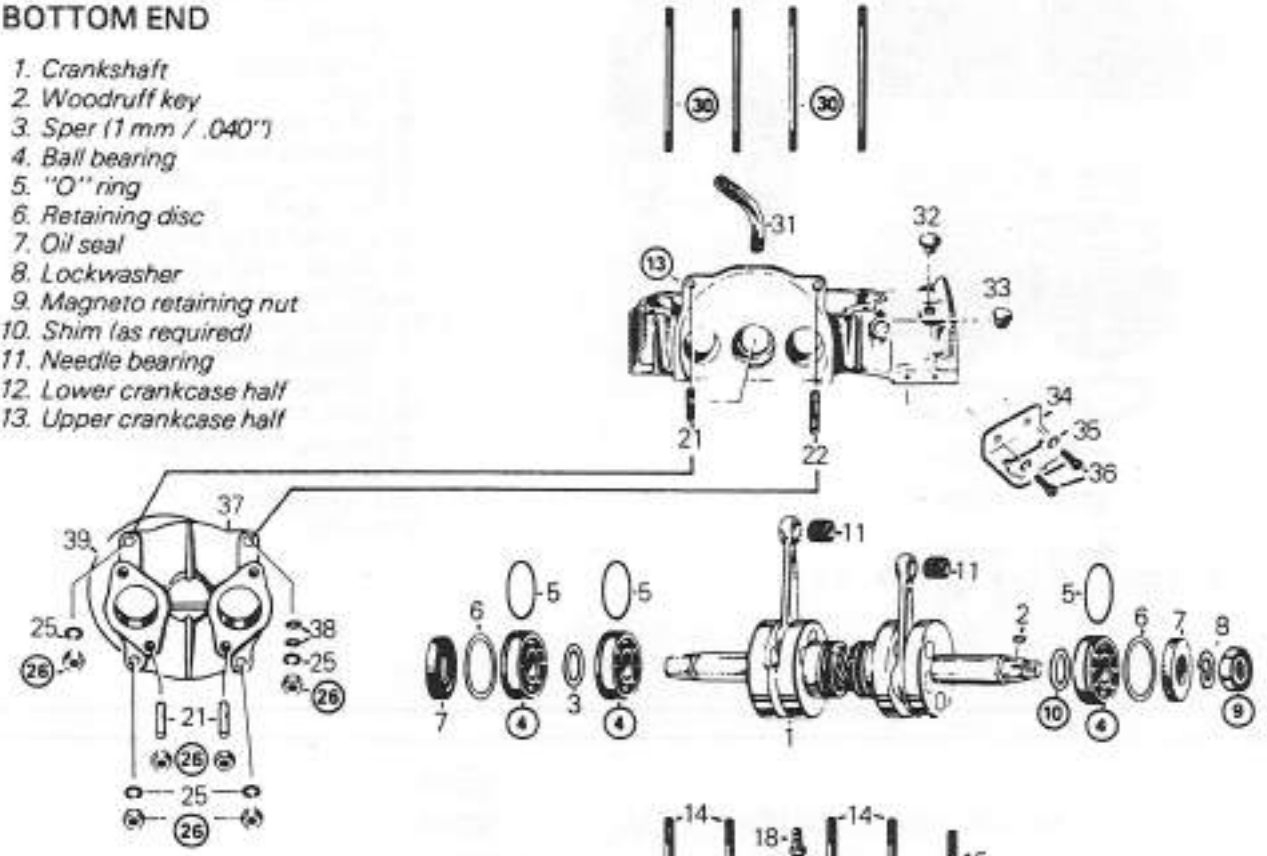


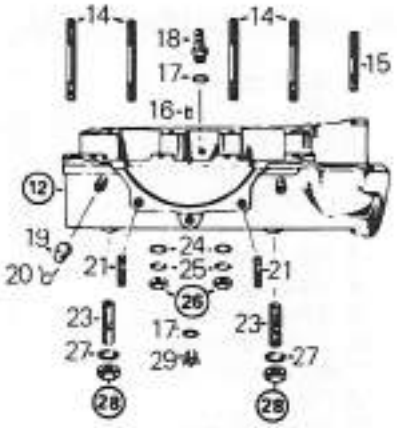
At assembly, torque retaining nut to 6.4 kg-m (46 ft-lbs). Make sure that belt is not squeezed between pulley halves.

245 ENGINE TYPE *

BOTTOM END

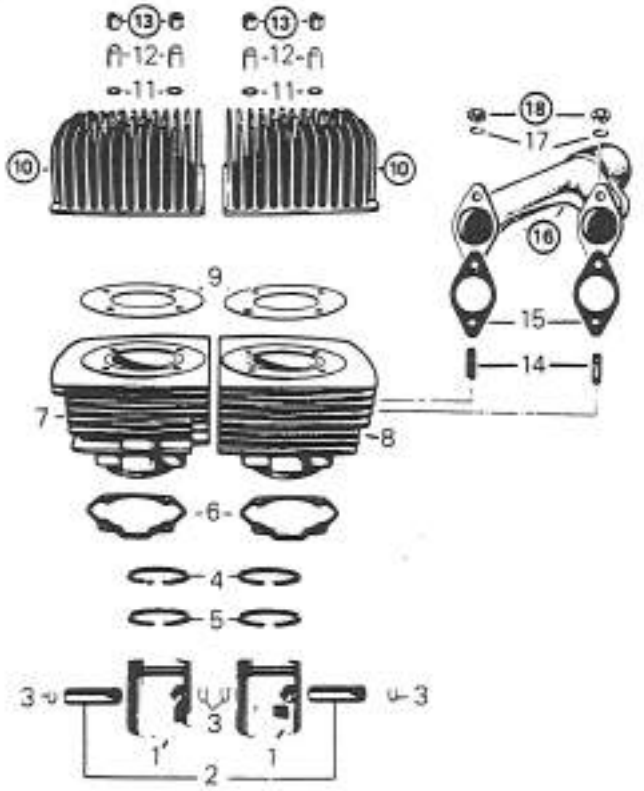
1. Crankshaft
2. Woodruff key
3. Sper (1 mm / .040")
4. Ball bearing
5. "O" ring
6. Retaining disc
7. Oil seal
8. Lockwasher
9. Magneto retaining nut
10. Shim (as required)
11. Needle bearing
12. Lower crankcase half
13. Upper crankcase half





14. Crankcase stud (8) (57 mm)
15. Crankcase stud (2) (37 mm)
16. Dowel pin
17. Sealing ring
18. Oil inlet nipple
19. Cap
20. Spring clip
21. Valve cover stud (18 mm)
22. Valve cover stud (25 mm)
23. Crankcase support stud (4)
24. Flat washer (10)
25. Lock washer (14)
26. Nut (18)
27. Lock washer (4)
28. Nut (4)
29. Drain screw
30. Cylinder stud (8)
31. Vent elbow
32. Rubber cap
33. Rubber grommet
34. Junction block bracket
35. Lock washer
36. Screw
37. Rotary valve cover
38. Plain washer
39. "O" ring

*Applies to engine up to serial no 2,762,210

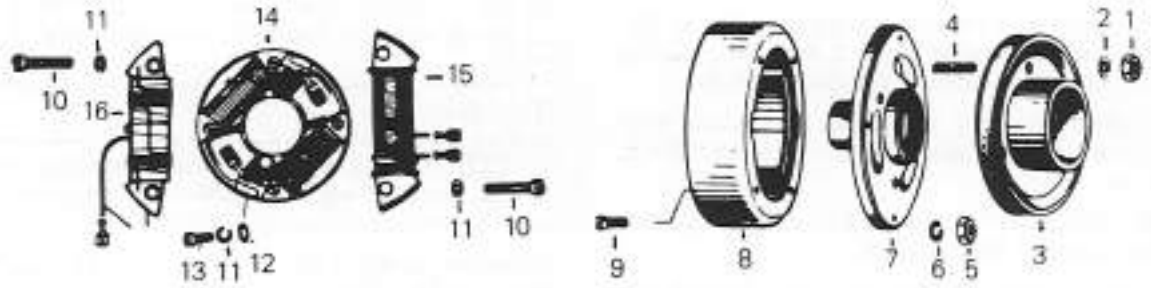


TOP END

1. *Piston*
2. *Gudgeon pin*
3. *Circlip*
4. *L-Trapez ring*
5. *Rectangular ring*
6. *Cylinder / crankcase gasket*
7. *Cylinder (P.T.O. side)*
8. *Cylinder (Mag. side)*
9. *Cylinder head gasket*
10. *Cylinder head*
11. *Plain washer (8)*
12. *Expansion sleeve (8)*
13. *Cylinder head nut (8)*
14. *Exhaust manifold stud (4)*
15. *Exhaust manifold gasket*
16. *Exhaust manifold*
17. *Lock washer (4)*
18. *Nut (4)*

ROTARY VALVE MECHANISM

1. *Allen screw*
2. *Washer*
3. *Rotary valve gear*
4. *Rotary valve disc*
5. *Locking ring*
6. *Oil seal*
7. *Ball bearing*
8. *Woodruff key*
9. *Rotary valve shaft*
10. *Distance sleeve*
11. *Rubber "O" ring*
12. *Pinion*
13. *Spring sleeve*
14. *Spring*
15. *Washer (1 mm)*
16. *Locking ring*
17. *Ball bearing*
18. *Locking ring*
19. *End cap*



MAGNETO

1. *Nut (3)*
2. *Lockwahser (3)*
3. *Starting pulley*
4. *Starting pulley stud*
5. *Nut (4)*
6. *Washer (4)*
7. *Magneto housing*
8. *Magneto ring*
9. *Allen screw (4)*
10. *Coil retaining screw (4)*
11. *Lockwasher (6)*
12. *Washer (2)*
13. *Allen screw (2)*
14. *Armature plate ass'y*
15. *Lighting coil*
16. *Capacitor charging coil*

REMOVAL

Disconnect or remove the following from vehicle, if applicable:

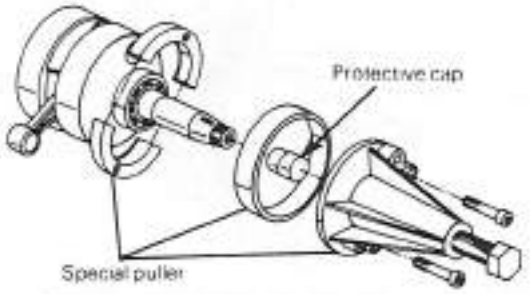
- Drive belt
- Air silencer
- Unscrew slide chamber cover from carburetors then withdraw throttle slide ass'y from carburetor.
- Rotary valve mechanism vent tube
- Fuel lines, primer lines and impulse line
- Electrical wires
- Muffler
- Rewind starter
- Engine mount nuts and front air deflector
- Drive pulley (as described in Drive Pulley Section).

DISASSEMBLY & ASSEMBLY

NOTE: Refer to Technical Data Section for component fitted tolerance and wear limit.

Bottom End

④To remove bearing from crankshaft, use a protective cap and special puller as illustrated.

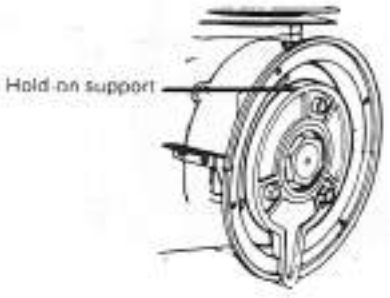


Prior to installation, place bearings into an oil container and heat the oil to 93° C (200° F) for 5 to 10 min. This will expand bearing and ease installation.

Install bearings with groove outward.

⑨To remove or install magneto retaining nut, lock crankshaft in position with special hold-on support, as illustrated. (See Tool Section).

At assembly, torque magneto retaining nut to 8.0-8.6 kg-m (58-62 ft-lbs).



⑩Whenever the crankshaft and / or the crankcase is replaced, the crankshaft end-play must be adjusted. To adjust proceed as follows:

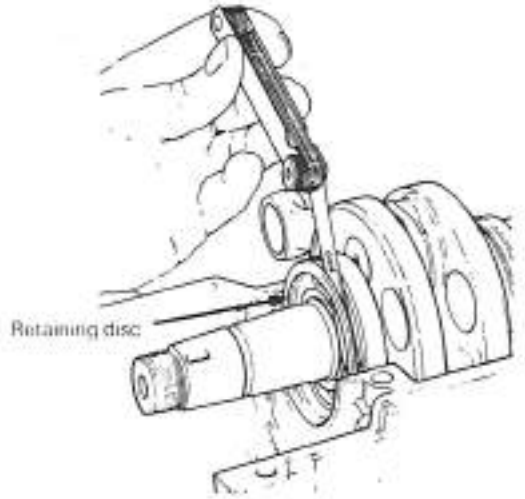
Remove magneto side bearing and existing shims. Re-install magneto side bearing without the shims making sure bearing sits flush against crankshaft shoulder.

Position crankshaft ass'y into lower crankcase half. Make sure that retaining discs are correctly seated into their grooves.

Gently tap crankshaft counterweight unto P.T.O. side bearing bears against retaining disc.

Any free-play between the magneto side bearing and retaining disc minus recommended end-play is the distance to be covered by shim(s).

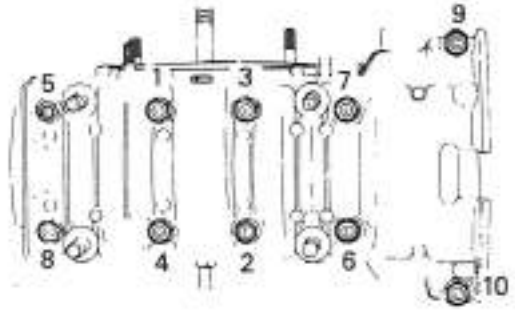
Shims are available in thickness of 0.15 mm (.006"), 0.2 mm (.008"), 0.3 mm (.012") and 1.0 mm (.039").



⑫⑬㉙ Prior to joining of crankcase halves prepare mating surfaces with crankcase sealant primer then apply a light coat of crankcase sealant as per instructions printed on containers.

Position spring washers, lock washers and nuts on crankcase studs then torque nuts to 1.9-2.2 kg-m (14-16 ft-lbs) following illustrated sequence.

NOTE: There is no spring washer on the last two (2) magneto side studs.



㉙ At assembly, torque to 1.9-2.2 kg-m (14-16 ft-lbs).

㉘ At assembly, torque to 4.0-4.8 kg-m (29-35 ft-lbs).

㉚ Apply Loctite Lock'n Seal on the threads of the two (2) studs, screwed into the crankcase, above the intake ports.

Top End

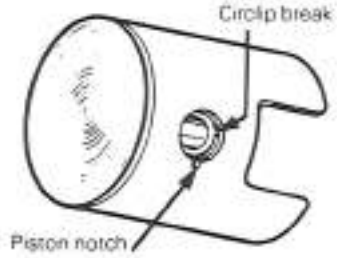
①②③Place a clean cloth over crankcase to prevent circlips from falling into crankcase then use a pointed tool to remove circlips from piston.

Drive the gudgeon pins in or out using a suitable drive punch and hammer.

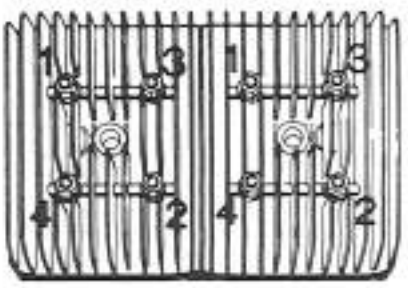
CAUTION: When tapping gudgeon pin in or out of piston, hold piston firmly in place to eliminate the possibilities of transmitting shock and pressure to the connecting rod.

At assembly, place the pistons over the connecting rods with the letters AUS, over an arrow on the piston dome, facing direction of the exhaust port.

Once the circlips are installed, turn each circlip so that the circlip break is not directly in line with piston notch. Using very fine emery cloth, remove any burrs on piston caused through circlip installation.



⑩⑬⑯At assembly, torque to 2.2-2.5 kg-m (16-18 ft-lbs) following illustrated sequence.

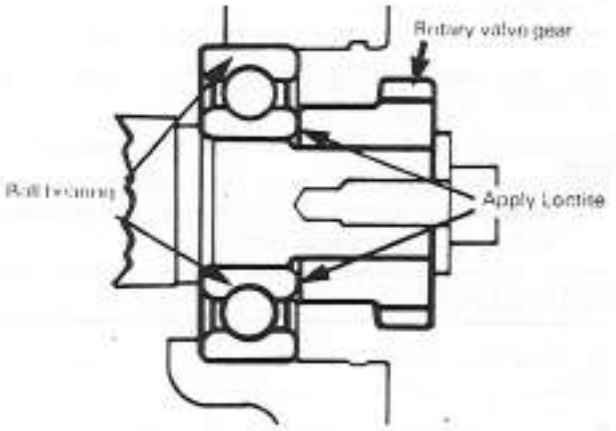


NOTE: To prevent leakage, install exhaust manifold prior to cylinder head tightening.

⑱ At assembly, torque to 1.9-2.2 kg-m (14-16 ft-lbs).

Rotary Valve Mechanism

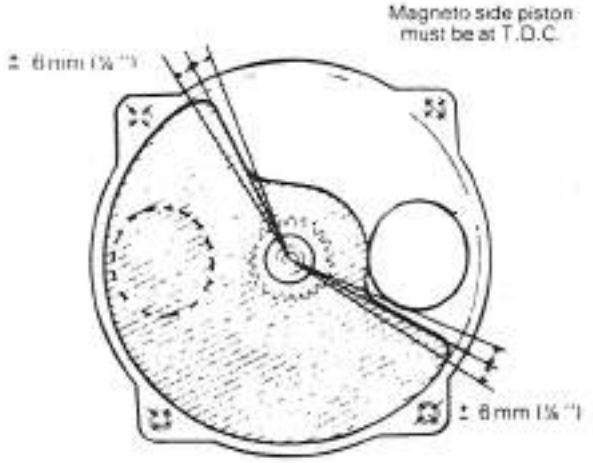
③⑦ At assembly, apply Loctite crankcase sealant on rotary valve gear and bearing mating surfaces.



④ To correctly install the rotary valve disc proceed as follows:

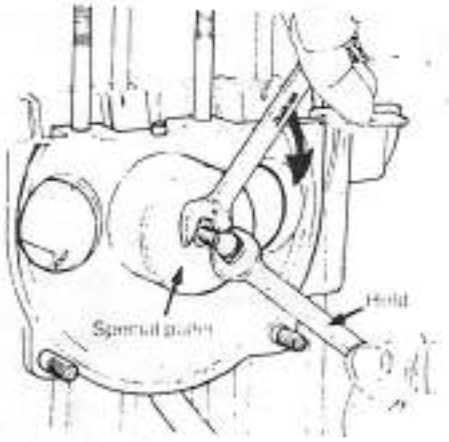
- Bring magneto side piston to Top Dead center using a Top Dead Center gauge (See Tools Section).
- Position the rotary valve disc on gear so that both edges fall within range of 6 mm (¼") on either side of timing marks.

NOTE: The rotary valve disc is asymetrical. Therefore, at assembly try positioning each side of disc on gear to determine best installation position.

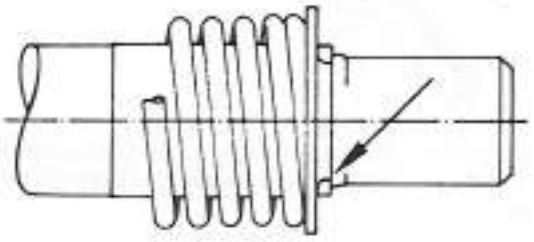


⑥ to ⑯ To remove rotary valve shaft assembly from crankcase a special puller is needed. (See Tools Section).

Place special puller over shaft bore and screw puller bolt into rotary valve shaft. While holding puller bolt, turn puller nut clockwise until shaft comes out.



⑯ At assembly, position square edge of locking ring against shaft shoulder as illustrated.



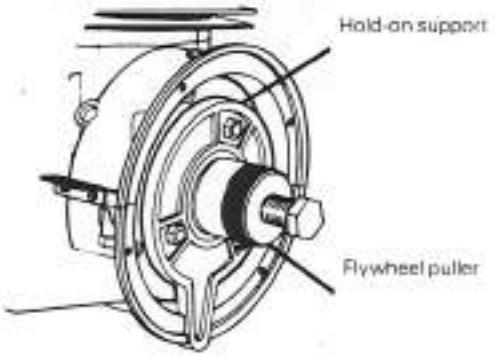
⑲ At assembly, apply a light coat of Loctite crankcase sealant on end cap sealing surface.

Magneto

① At assembly, torque to 1.9 - 2.2 Kg-m (14-16 ft-lbs).

⑤ At assembly, torque to 1.3 kg-m (9 ft-lbs).

⑦ With magneto retaining nut removed and hold-on support in place, install special puller onto hub. Tighten puller bolt and at same time, tap on bolt head using a hammer to release magneto from its taper. (See Special Tool).



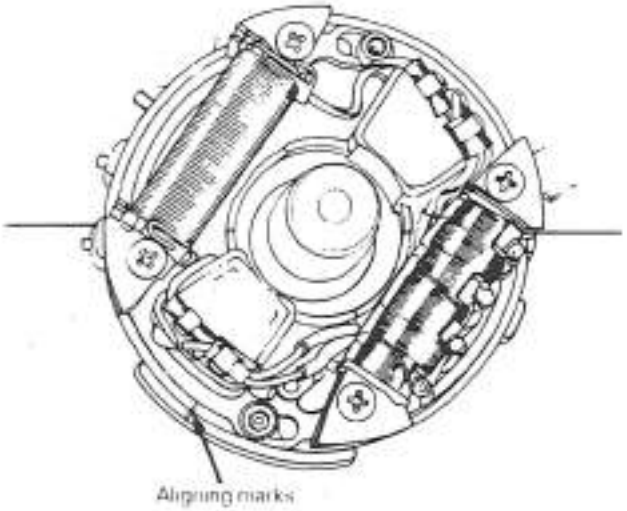
⑨At assembly, apply Loctite Lock'n Seal on screw threads.

⑮⑯Whenever a coil is replaced, the air gap (distance between magnet and armature end) must be adjusted.

To check air gap, insert a feeler gauge of correct thickness (0.31 mm / .012"-0.45 mm / .018") between magnet and armature ends.

To adjust, slacken retaining screw and relocate armature.

⑭To facilitate timing procedure, perform primary adjustment by matching crankcase and armature plate marks.



CLEANING

Discard all oil seals, gaskets and "O" rings. Clean all metal components in a non ferrous metal cleaner.

▼ **CAUTION: Clean armature using only a clean cloth.**

Scrape off carbon formation from cylinder exhaust ports, cylinder heads and piston domes.

◯ **NOTE:** The letter "AUS" over an arrow on the piston dome must be visible after cleaning.

Clean the piston ring grooves with a groove cleaner tool, or with a piece of broken ring.

Remove old sealant from crankcase mating surfaces.

▼ **CAUTION: Never use a sharp object to scrape away old sealant as score marks incurred are detrimental to crankcase sealing.**

INSTALLATION

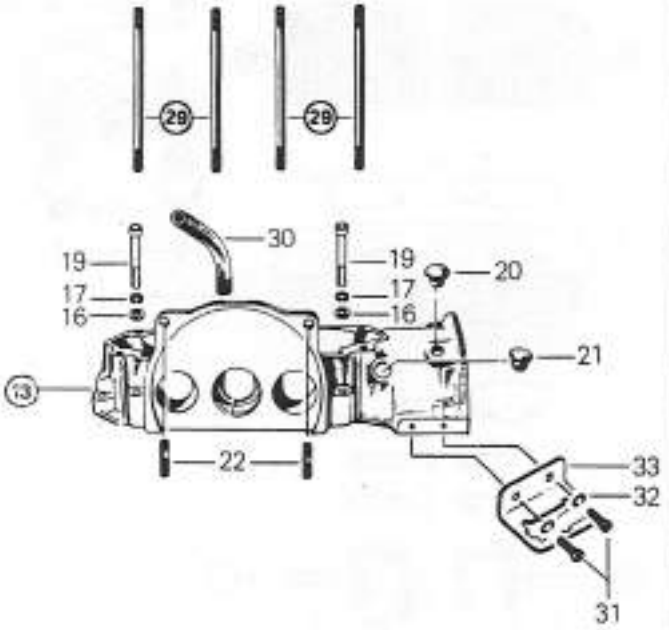
To install engine on vehicle, inverse removal procedure. However, pay attention to the following:

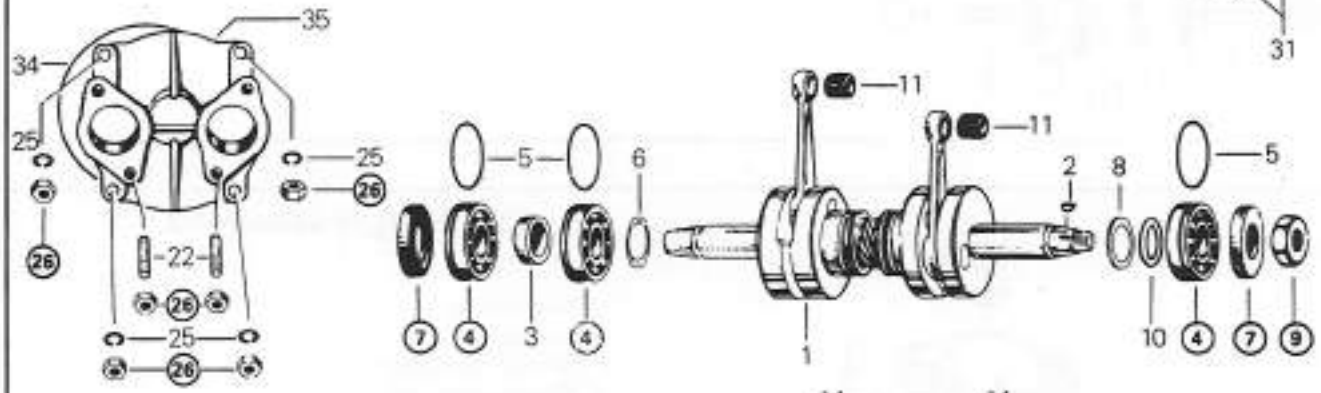
- Check tightness of engine mount nuts.
- After throttle cable installation, check carburetor maximum throttle opening.
- Check pulley alignment.

245*, 345 ENGINE TYPE

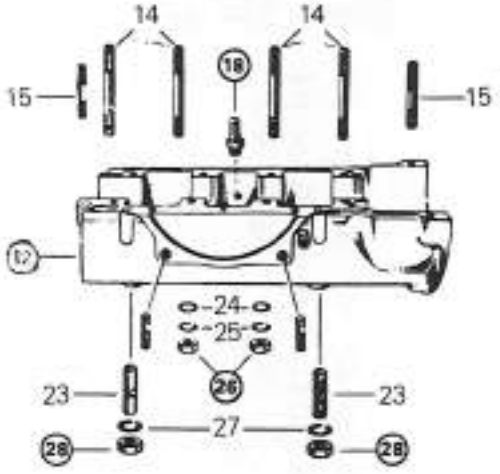
BOTTOM END

1. Crankshaft
2. Woodruff key
3. Distance sleeve
4. Ball bearing
5. "O" ring
6. Spacer, 1 mm (.039")
7. Oil seal
8. Spacer, 2 mm (.078")
9. Magneto retaining nut
10. Shim, 0.50 mm (.020")
11. Needle bearing
12. Lower crankcase half
13. Upper crankcase half
14. Crankcase stud (8) (57 mm)
15. Crankcase stud (4) (37 mm)
16. Plain washer
17. Lock washer
18. Oil inlet nipple
19. Allen screw (4)

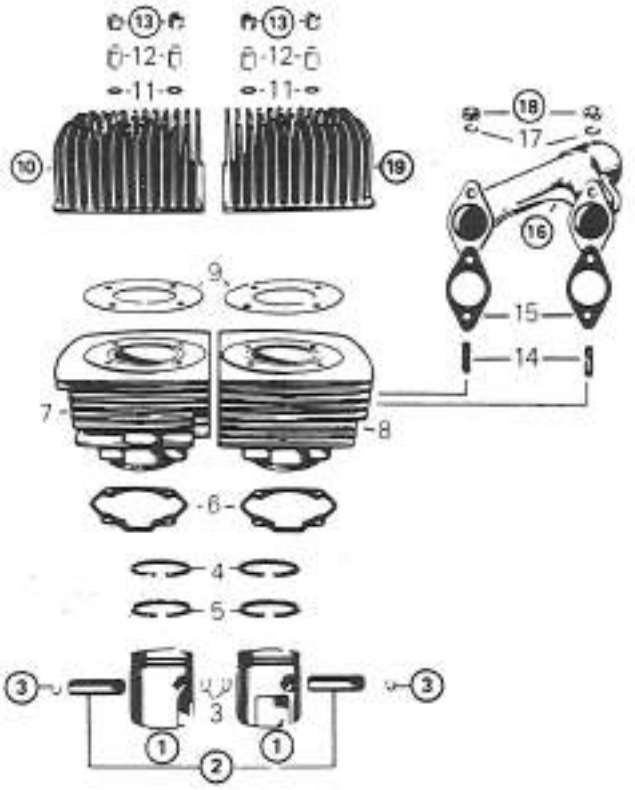




20. Rubber cap
21. Rubber grommet
22. Valve cover stud (18 mm)
23. Crankcase support stud (4)
24. Flat washer (10)
25. Lock washer (14)
26. Nut (18)
27. Lock washer (4)
28. Nut (4)
29. Cylinder stud (8)
30. Vent elbow
31. Screw
32. Lock washer
33. Junction block bracket
34. "O" ring
35. Rotary valve cover

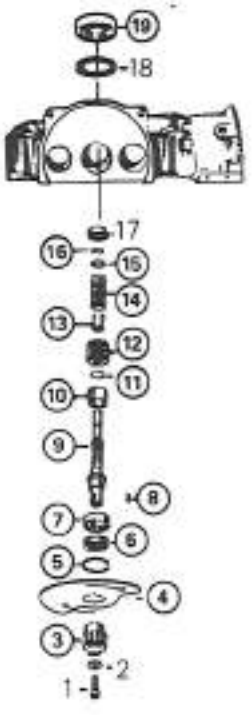


* From engine serial no 2,762,211



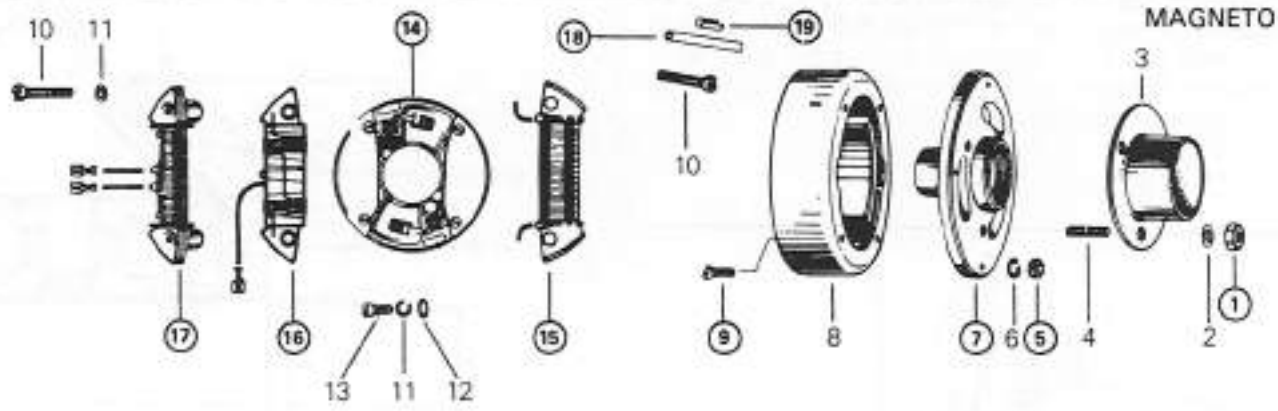
TOP END

1. *Piston*
2. *Gudgeon pin*
3. *Circlip*
4. *L-Trapez ring*
5. *Rectangular ring*
6. *Cylinder / crankcase gasket*
7. *Cylinder (P.T.O. side)*
8. *Cylinder (Mag. side)*
9. *Cylinder head gasket*
10. *Cylinder head (P.T.O. side)*
11. *Plain washer (8)*
12. *Expansion sleeve (8)*
13. *Cylinder head nut (8)*
14. *Exhaust manifold stud (4)*
15. *Exhaust manifold gasket*
16. *Exhaust manifold*
17. *Lock washer (4)*
18. *Nut (4)*
19. *Cylinder head (Mag. side)*



ROTARY VALVE MECHANISM

1. *Allen screw*
2. *Washer*
3. *Rotary valve gear*
4. *Rotary valve disc*
5. *Locking ring*
6. *Oil seal*
7. *Ball bearing*
8. *Woodruff key*
9. *Rotary valve shaft*
10. *Distance sleeve*
11. *Rubber "O" ring*
12. *Pinion*
13. *Spring sleeve*
14. *Spring*
15. *Washer (1 mm)*
16. *Locking ring*
17. *Ball bearing*
18. *Locking ring*
19. *End cap*



1. Nut (3)
2. Lock washer
3. Starting pulley
4. Starting pulley stud
5. Nut (4)
6. Washer (4)
7. Magneto housing
8. Magneto ring
9. Allen screw (4)
10. Coil retaining screw (4)
11. Lock washer (6)
12. Washer (2)
13. Allen screw (2)
14. Armature plate ass'y
15. Lighting coil
16. Capacitor charging coil
17. Additional lighting coil
18. Heat shrinkable rubber sleeve
19. Cable connector

REMOVAL

Disconnect or remove the following from vehicle:

- Pulley guard and drive belt
- Air silencer
- Throttle cable and housing at handlebar
- Fuel lines, primer lines and impulse line
- Electrical wires
- Muffler
- Rewind starter

Disconnect oil line from bottom of oil reservoir then drain oil from reservoir and crankcase. Disconnect upper oil line from vent elbow.

Remove engine mount nuts then lift engine from vehicle.

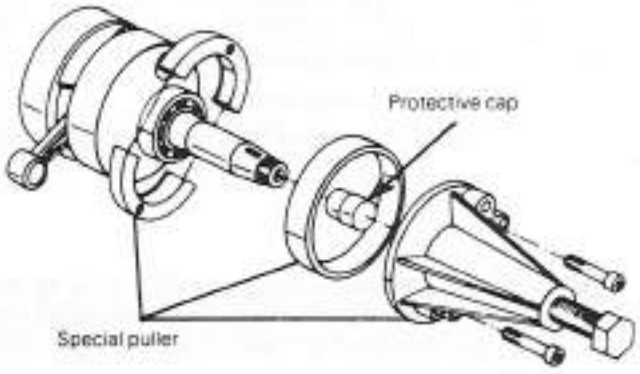
NOTE: If necessary, remove drive pulley as detailled in Drive Pulley Section.

DISASSEMBLY & ASSEMBLY

NOTE: Refer to Technical Data Section for component fitted tolerance and wear limit.

Bottom End

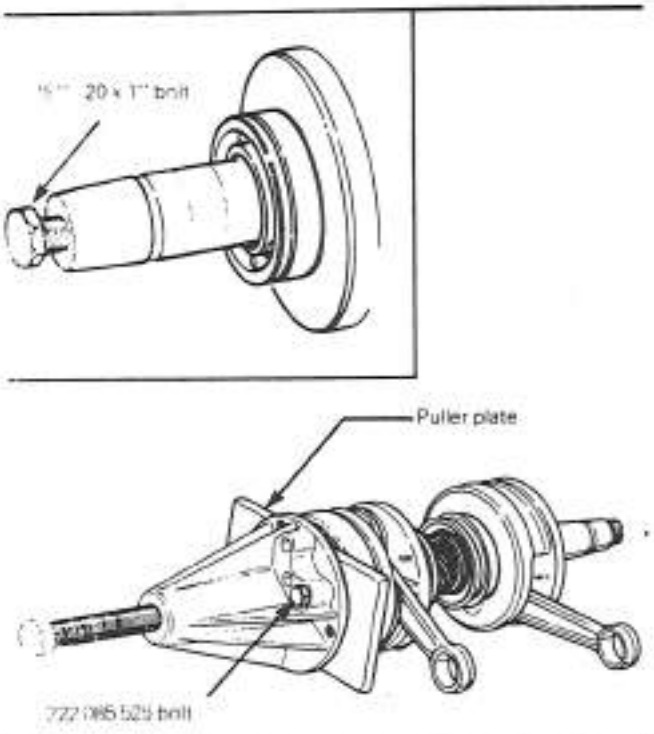
④ To remove magneto side bearing from crankshaft, use a protective cap and special puller as illustrated. (See Tools Section).



To remove PTO side bearings from crankshaft proceed as follows:

- Install a ½" - 20 X 1" bolt into crankshaft to protect shaft end and threads.
- Install puller on outer bearing as illustrated above then remove bearing from crankshaft.

– A puller plate (from puller no 420 977 415) and two (2) longer bolts (part no 222 085 525) are needed to remove the inner bearing. Install puller plate as a spacer between puller ring halves and puller, as illustrated. (See Tools Section).

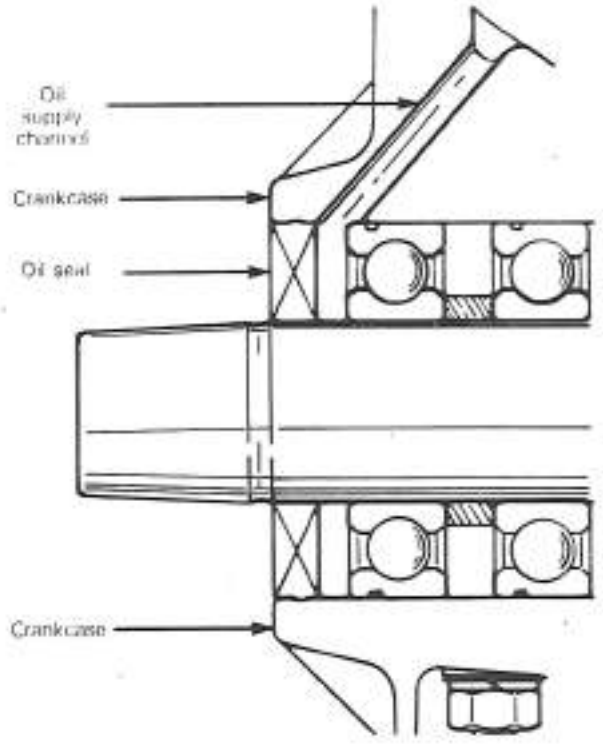


Prior to installation, place bearings into an oil container and heat the oil to 93° C (200° F) for 5 to 10 min. This will expand bearing and ease installation.

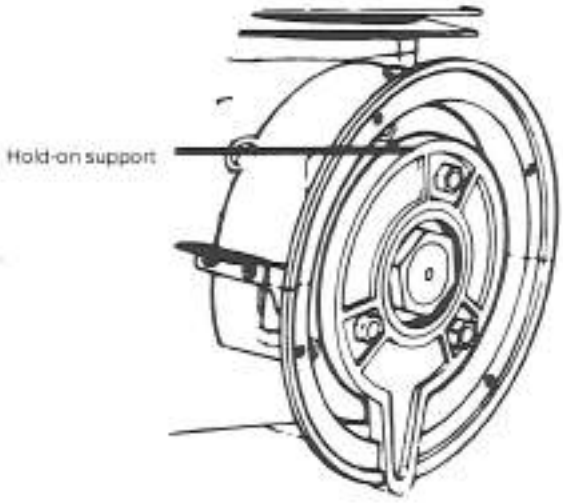
Install bearings with groove outward.

② At assembly apply a light coat of lithium grease on seal lips.

CAUTION: To insure adequate oil supply to the outer PTO bearing it is imperative that the oil seal outer surface be flush with crankcase as illustrated.



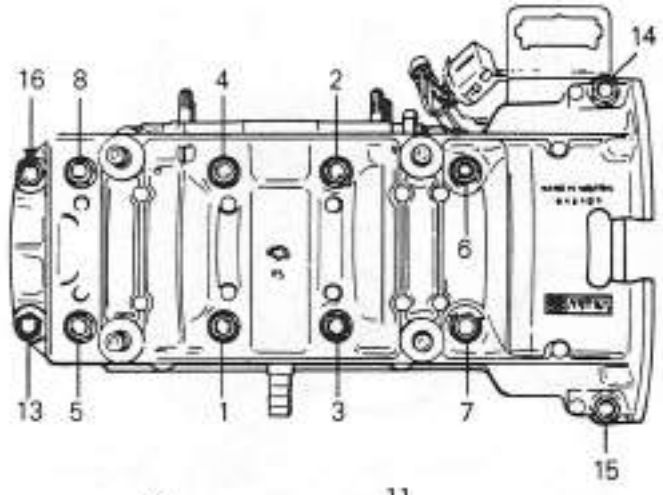
⑨ To remove or install magneto retaining nut, lock crankshaft in position with special hold-on support, as illustrated. (See Tool Section). At assembly, torque magneto retaining nut to 8.0 - 8.6 kg-m (58 to 62 ft-lbs).

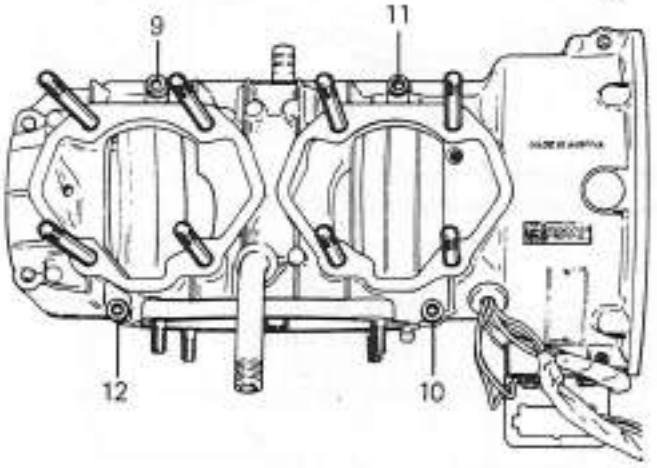


⑫⑬ Prior to joining of crankcase halves, prepare mating surfaces with crankcase sealant primer then apply a light coat of crankcase sealant as per instructions printed on container.

Position spring washers, lock washers, nuts or Allen screws on crankcase. Torque nuts to 1.9-2.2 kg-m (14-16 ft-lbs(, and Allen screws to 0.8-1.1 kg-m (6-8 ft-lbs) following illustrated sequence.

NOTE: There is no spring washer installed on the last two (2) magneto side studs.





⑱Apply Loctite Lock'n Seal on threads prior to assembly.

㉘At assembly, torque to 1.9-2.2 kg-m (14-16 ft-lbs).
㉔At assembly, torque to 4.0-4.8 kg-m (29-35 ft-lbs).

㉘Apply Loctite Lock'n Seal on the threads of the two studs, screwed into the crankcase, above the intake ports.

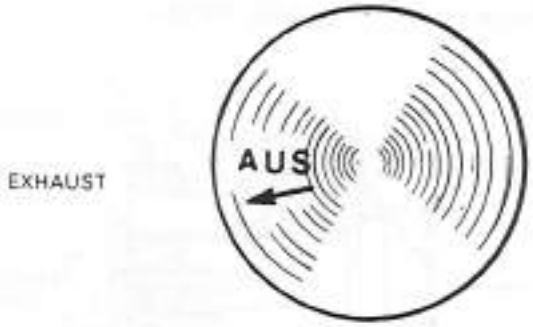
Top End

①②③ Place a clean cloth over crankcase to prevent circlips from falling into crankcase then use a pointed tool to remove circlips from piston.

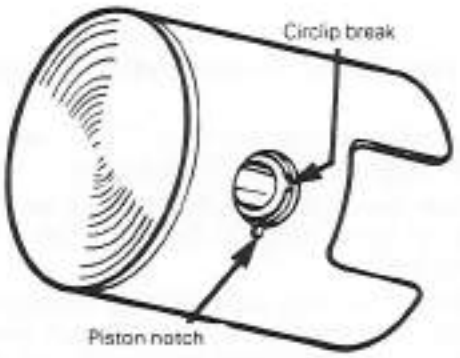
Drive the gudgeon pins in or out using a suitable drive punch and hammer.

CAUTION: When tapping gudgeon pin in or out of piston, hold piston firmly in place to eliminate the possibilitites of transmitting shock and pressure to the connecting rod.

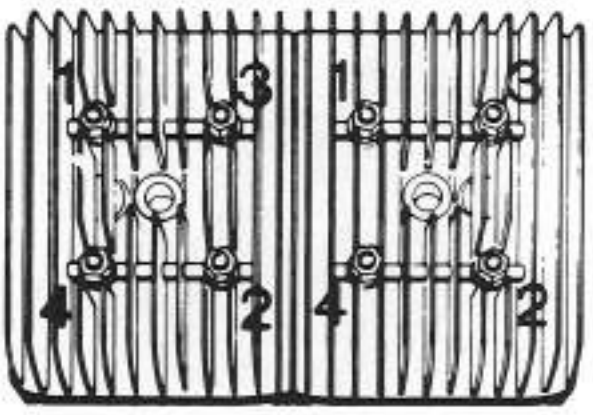
At assembly, place the pistons over the connecting rods with the letters AUS, over an arrow on the piston dome, facing direction of the exhaust port.



Once the circlips are installed, turn each circlip so that the circlip break is not directly in line with piston notch. Using very fine emery cloth, remove any burrs on piston caused through circlip installation.



⑩⑬⑯⑲ At assembly, torque to 1.5-1.8 kg-m (11-13 ft-lbs) following illustrated sequence.

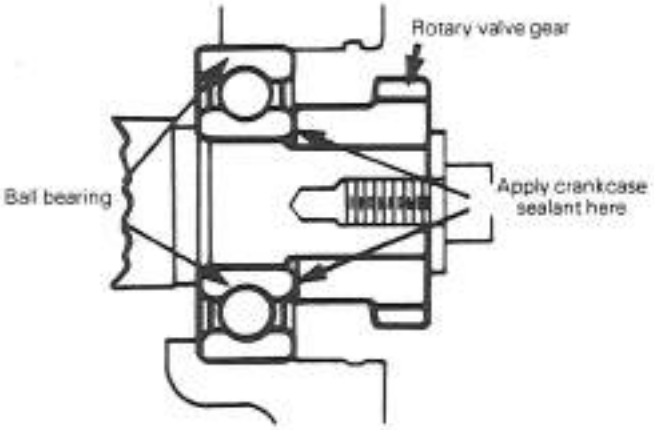


NOTE: To prevent leakage, install exhaust manifold prior to cylinder head tightening.

⑱ At assembly, torque to 1.9-2.2 kg-m (14-16 ft-lbs).

Rotary Valve Mechanism

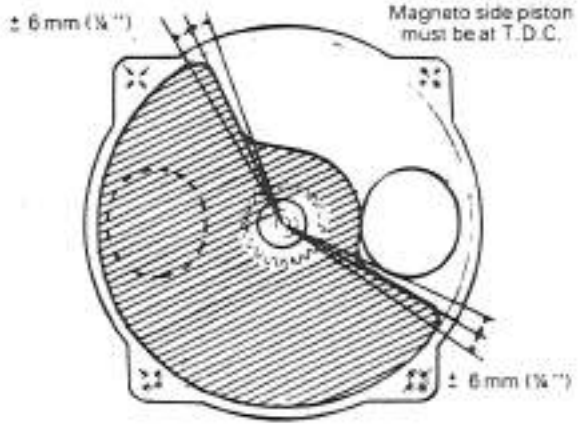
③ ⑦At assembly, apply crankcase sealant on rotary valve gear and bearing mating surfaces.



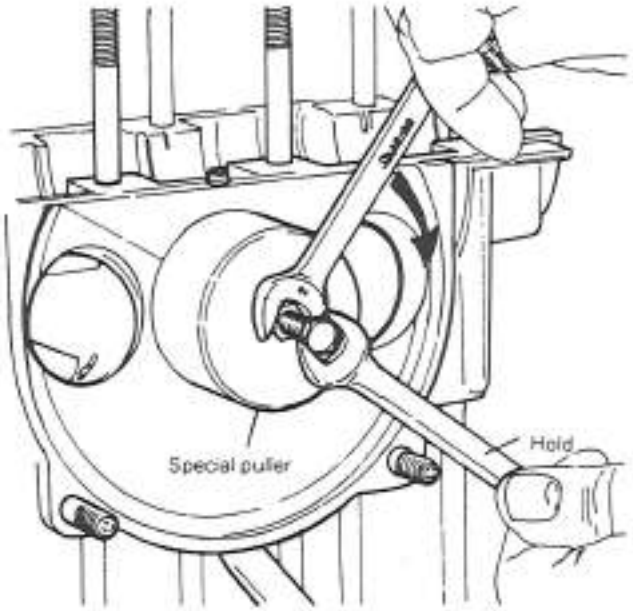
④ To correctly install the rotary valve disc proceed as follows:

- Bring magneto side piston to T.D.C. using a Top Dead Center Gauge (See Tools Section).
- Position the rotary valve disc on gear so that both edges fall within range of 6 mm (¼") on either side of timing marks.

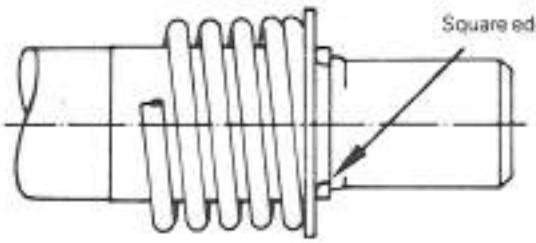
NOTE: The rotary valve disc is asymetrical. Therefore, at assembly try positioning each side of disc on gear to determine best installation position.



⑤ to ⑯ To remove rotary valve shaft assembly from crankcase a special puller is needed. (See Tools Section). First remove locking ring then position special puller over shaft bore and screw puller bolt into rotary valve shaft. While holding puller bolt, turn puller nut clockwise until shaft comes out.



⑯ At assembly, position square edge of locking ring against shaft shoulder as illustrated.



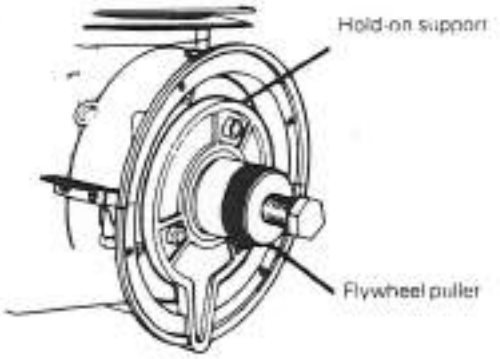
⑲ At assembly, apply a light coat of Loctite crankcase sealant on end cap sealing surface.

Magneto

① At assembly torque to 1.9-2.2 kg-m (14-16 ft-lbs).

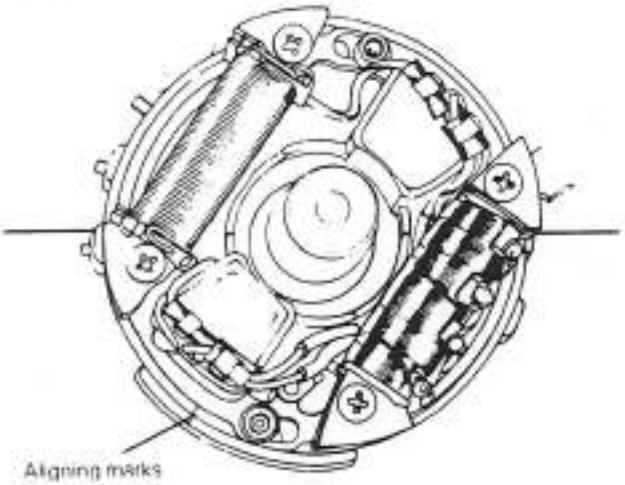
⑧ At assembly torque to 1.3 kg-m (9 ft-lbs).

⑦ With magneto retaining nut removed and hold-on support in place, install special puller onto hub. Tighten puller bolt and at same time, tap on bolt head using a hammer to release magneto from its taper. (See Special Tools).



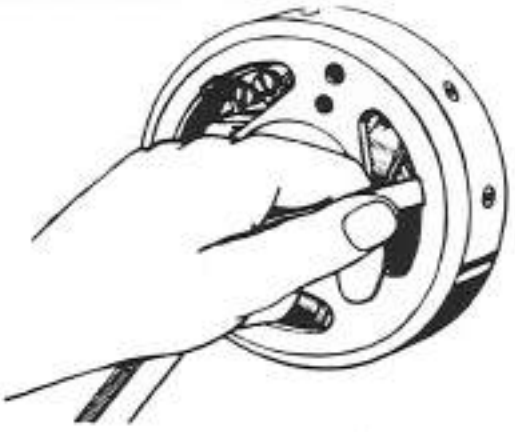
③ At assembly, apply Loctite Lock'n Seal on screw threads.

⑭ To facilitate timing procedure, perform primary adjustment by matching crankcase and armature plate marks.



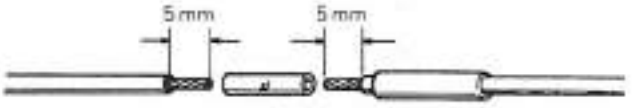
⑮ ⑯ ⑰ Whenever a coil is replaces, the air gap (distance between magnet and armature end) must be adjusted.

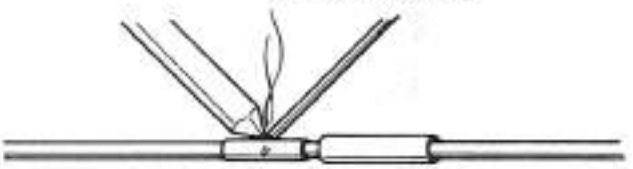
To check air gap, insert a feeler gauge of correct thickness (0.31 mm / .012"-0.45 mm / .018") between magnet and armature ends. To adjust, slacken retaining screws and relocate armature.



⑱ ⑲ Use a cable connector and rubber sleeve as illustrated, whenever a coil or cable is replaced.

1. Strip 5 mm of insulation from each end





2. Solder wires into connector with resin core type solder.

3. Slide rubber sleeve over connector then heat with a match to shrink sleeve.

CLEANING

Discard all oil seals, gaskets and "O" rings. Clean all metal components in a non-ferrous metal cleaner.

CAUTION: Clean armature using only a clean cloth.

Scrape off carbon formation from cylinder exhaust ports, cylinder heads and piston domes.

NOTE: The letter "AUS" over an arrow on the piston dome must be visible after cleaning.

Clean the piston ring grooves with a groove cleaner tool, or with a piece of broken ring.

Remove old sealant from crankcase mating surfaces with Bombardier sealant stripper.

CAUTION: Never use a sharp object to scrape away old sealant as score marks incurred are detrimental to crankcase sealing.

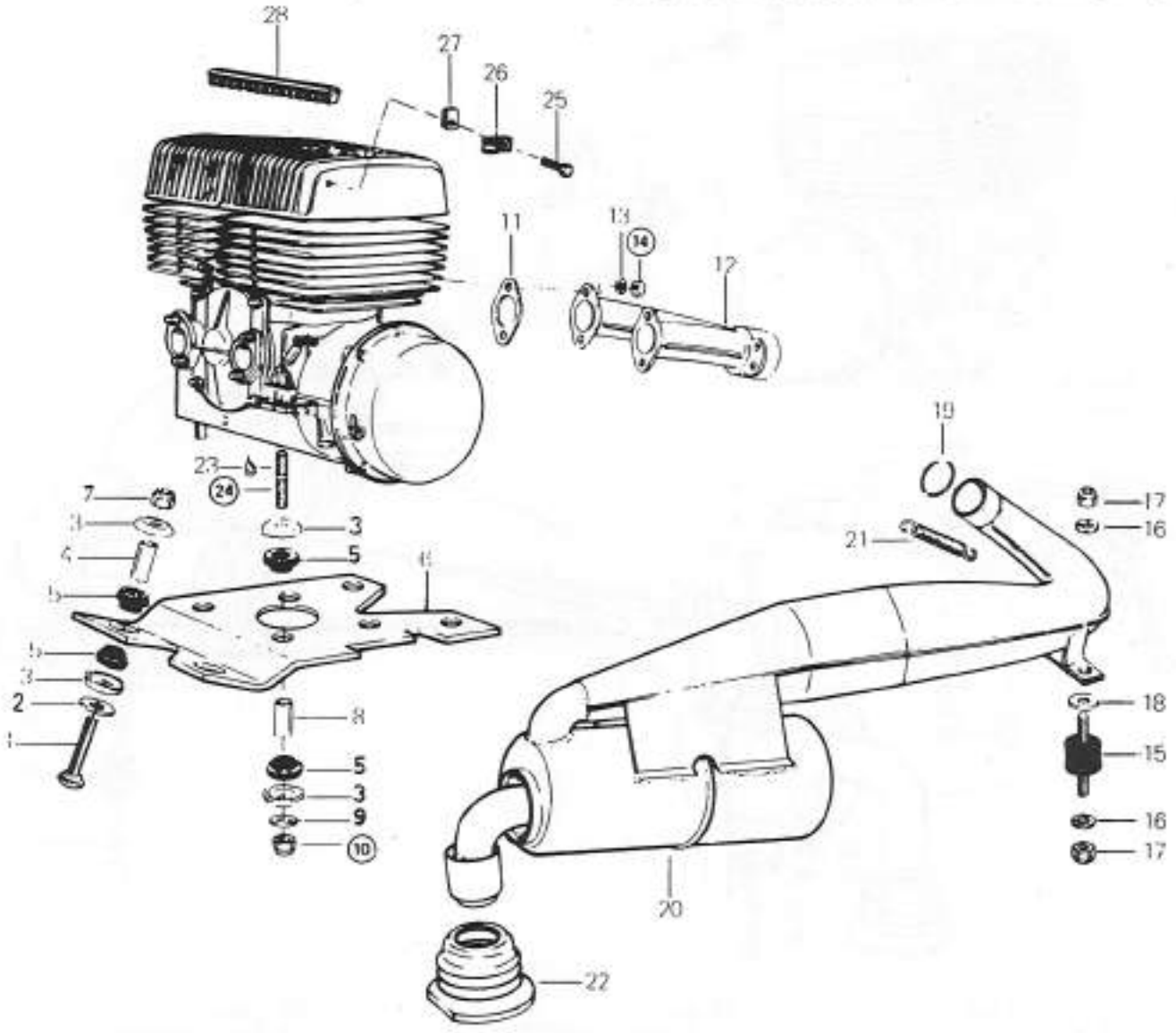
INSTALLATION

To install engine on vehicle, inverse removal procedure. However, pay attention to the following:

- Check tightness of engine mount nuts.
- After throttle cable installation, check carburetor maximum throttle opening.
- Check pulley alignment.

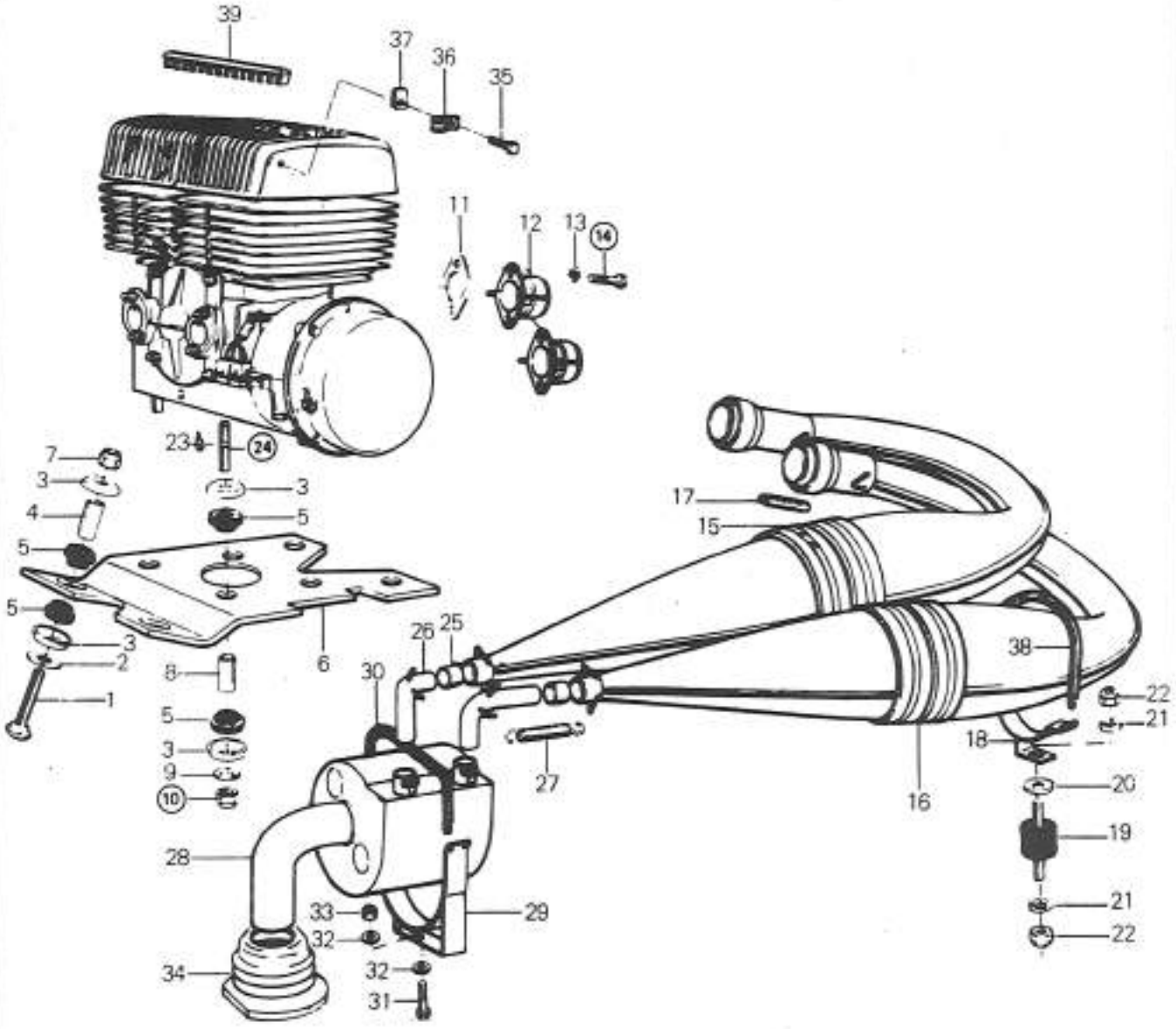
245, 345 ENGINE TYPE (FROM 1976)

ENGINE SUPPORT & MUFFLER (1976)



1. Carriage bolt
2. Washer
3. Cup washer
4. Spacer bushing
5. Rubber damper
6. Engine support
7. Nut
8. Spacer bushing
9. Washer
10. Nut
11. Exhaust gasket
12. Exhaust manifold
13. Lockwasher
14. Nut
15. Rubber shear mount
16. Washer
17. Nut
18. Washer
19. Aluminum ring
20. Muffler
21. Spring
22. Exhaust grommet
23. Loctite 242
24. Stud
25. Bolt
26. High tension cable clip
27. Clip nut
28. Noise damper

ENGINE SUPPORT & MUFFLER (1977)



1. Carriage bolt
2. Washer
3. Cup washer
4. Spacer bushing
5. Rubber damper
6. Engine support
7. Nut
8. Spacer bushing
9. Washer
10. Nut
11. Exhaust gasket
12. Exhaust socket
13. Lockwasher
14. Bolt
15. Tuned pipe (P.T.O.)
16. Tuned pipe (mag.)
17. Spring
18. Support
19. Rubber shear mount
20. Washer
21. Washer
22. Nut
23. Loctite 242
24. Stud
25. Coupler
26. Tail pipe
27. Spring
28. Swirl chamber
29. Support
30. Spring
31. Bolt
32. Washer
33. Nut
34. Exhaust grommet
35. Bolt
36. High tension cable clip
37. Clip nut
38. Spring
39. Noise damper

ENGINE SUPPORT & MUFFLER

REMOVAL FROM VEHICLE

Disconnect or remove the following from vehicle:

- Pulley guard and drive belt.
- Air silencer.
- Throttle cable and housing at handlebar.
- Fuel lines, primer lines and impulse line.
- Electrical wires.
- Muffler.
- Rewind starter.

Disconnect oil line from bottom of oil reservoir then drain oil from reservoir and crankcase. Disconnect upper oil line from vent elbow.

Remove engine mount nuts then lift engine from vehicle.

DISASSEMBLY & ASSEMBLY

⑯ Torque to 3.6 kg-m (26 ft-lbs).

⑭ Torque to 2.1 kg-m (15 ft-lbs).

㉔ At assembly on crankcase apply Loctite Lock'n Seal 242 on threads.

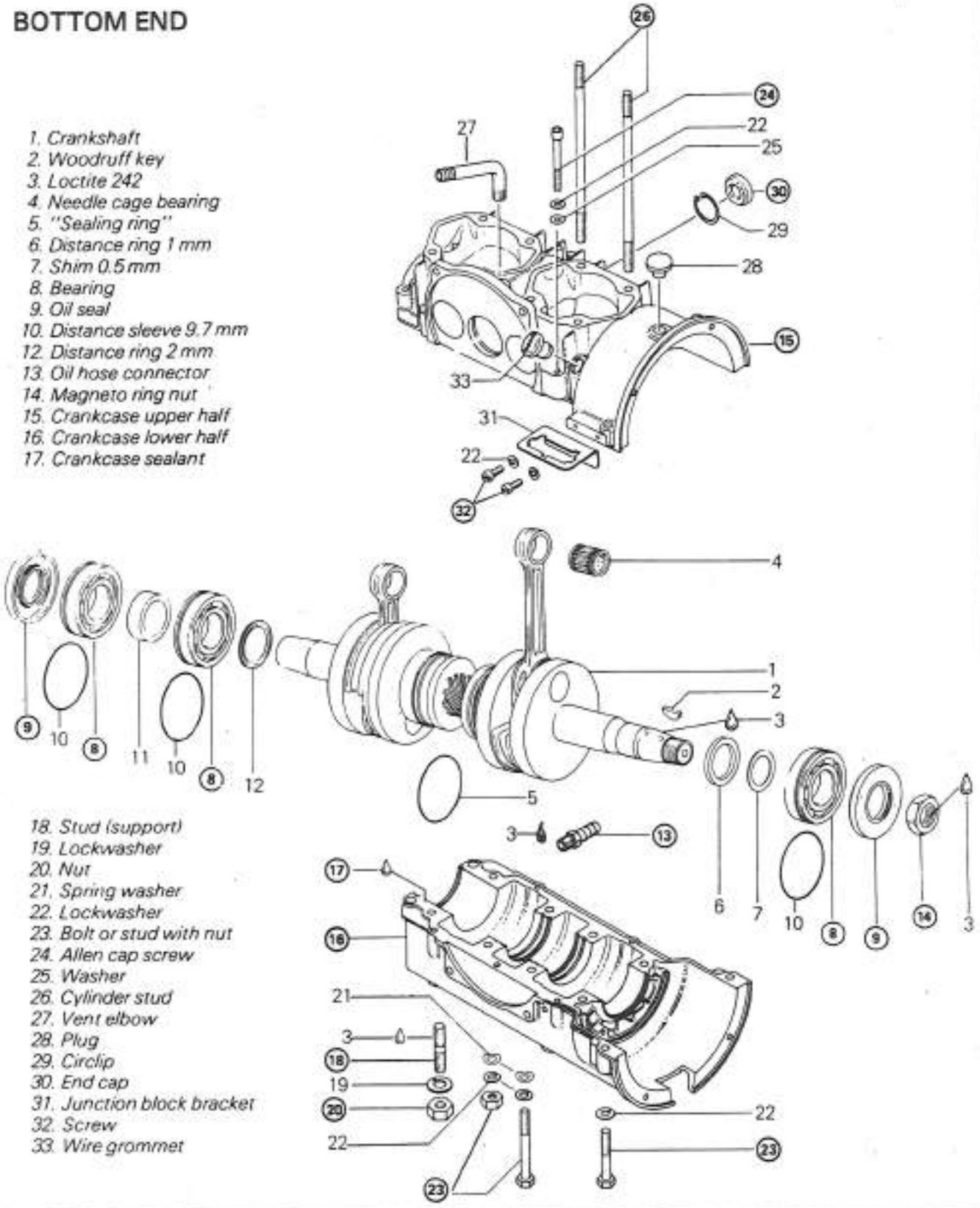
INSTALLATION ON VEHICLE

To install engine on vehicle, inverse removal procedure. However, pay attention to the following:

- Check tightness of engine mount nuts.
- After throttle cable installation, check carburetor maximum throttle opening.
- Check pulley alignment.

BOTTOM END

1. Crankshaft
2. Woodruff key
3. Loctite 242
4. Needle cage bearing
5. "Sealing ring"
6. Distance ring 1 mm
7. Shim 0.5 mm
8. Bearing
9. Oil seal
10. Distance sleeve 9.7 mm
12. Distance ring 2 mm
13. Oil hose connector
14. Magneto ring nut
15. Crankcase upper half
16. Crankcase lower half
17. Crankcase sealant



18. Stud (support)
19. Lockwasher
20. Nut
21. Spring washer
22. Lockwasher
23. Bolt or stud with nut
24. Allen cap screw
25. Washer
26. Cylinder stud
27. Vent elbow
28. Plug
29. Circlip
30. End cap
31. Junction block bracket
32. Screw
33. Wire grommet

BOTTOM END

CLEANING

Discard all oil **seals**, gaskets, "O" rings and sealing rings.

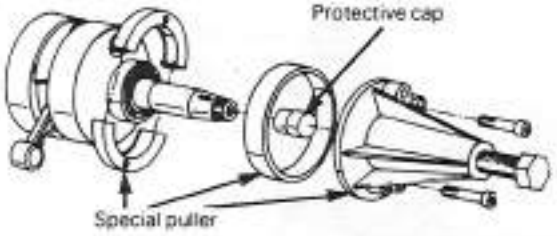
Clean all metal components in a non-ferrous metal cleaner.

Remove old sealant from crankcase mating surfaces with Bombardier sealant stripper.

CAUTION: Never use a sharp object to scrape away old sealant as score marks incurred are detrimental to crankcase sealing.

DISASSEMBLY & ASSEMBLY

⑧ To remove magneto side bearing from crankshaft, use a protective cap and special puller as illustrated. (See Tools Section).



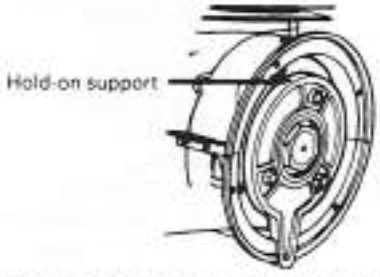
Prior to installation, place bearings into an oil container and heat the oil to 100° C (210° F) for 10 min. This will expand bearing and ease installation.

Install bearings with groove outward.

⑨ At assembly apply a light coat of lithium grease on seal lips. To insure adequate oil supply to the bearings it is imperative that the oil seals outer surface be flush with crankcase.

⑬ Apply Loctite Lock'n Seal 242 on threads prior to assembly.

⑭ To remove or install magneto retaining nut, lock crankshaft in position with special hold-on support, as illustrated. (See Tool Section).



⑮ ⑯ ⑰ Crankcase halves are factory matched and therefore, are not interchangeable or available as single halves.

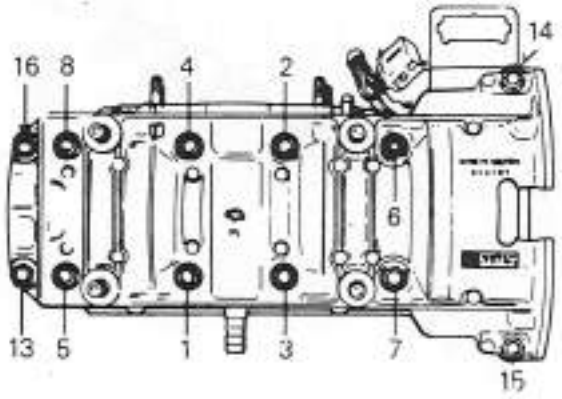
Prior to joining of crankcase halves, prepare mating surfaces with crankcase sealant primer then apply a light coat of crankcase sealant (See Tool Section) as per instructions printed on container.

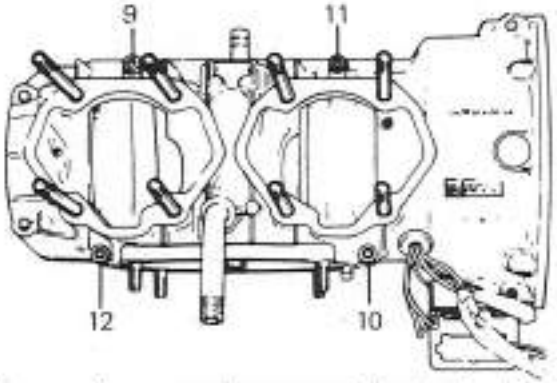
CAUTION: Before joining of crankcase halves be sure that crankshaft rotary valve gear is well engage with rotary valve shaft gear.

Position the crankcase halves together and tighten nut (or bolts) by hand then install armature plate (tighten) on magneto side to correctly align the crankcase halves.

Torque nuts (or bolts) to 2.2 kg-m (16 ft-lbs) and Allen cap screws to 1 kg-m (7 ft-lbs) following illustrated sequence.

NOTE: There is no spring washer installed on the last two (2) magneto side studs (or bolts).





⑱ At assembly on crankcase, apply Loctite Lock'n Seal 242 on threads.

㉒ Torque to 3.6 kg-m (26 ft-lbs).

㉓ Torque to 2.2 kg-m (16 ft-lbs).

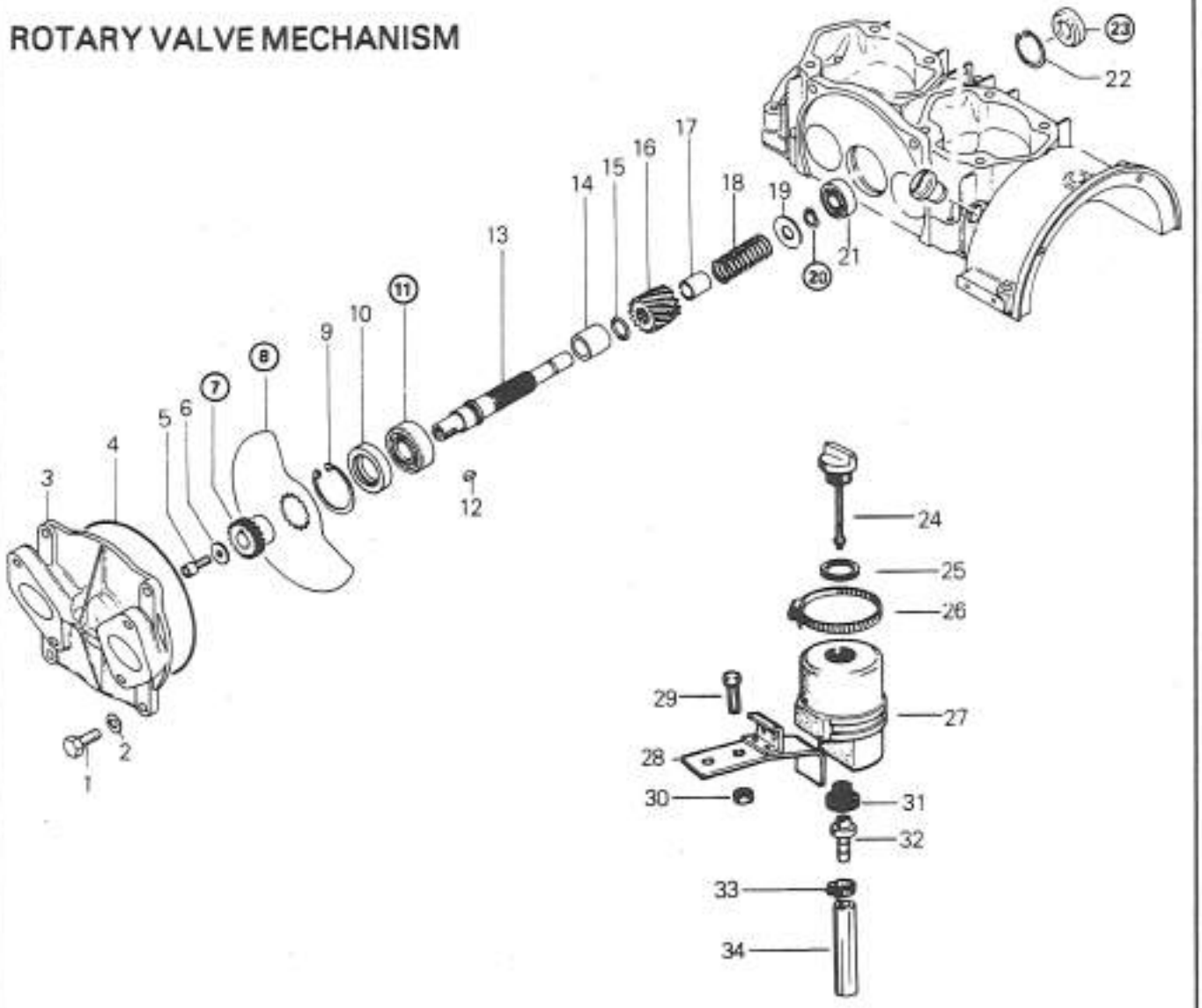
㉔ Torque to 1 kg-m (7 ft-lbs).

㉖ Apply Loctite Lock'n Seal on the threads of the two studs, screwed into the crankcase, above the intake ports.

㉘ At assembly, apply a light coat of crankcase sealant on end cap sealing surface.

㉙ Apply Loctite Lock'n Seal 242 on threads.

ROTARY VALVE MECHANISM



1. Bolt (or nut with stud)
2. Lockwasher
3. Rotary valve cover
4. "O" ring
5. Allen cap screw
6. Washer
7. Rotary valve gear
8. Rotary valve disc
9. Locking ring
10. Oil seal
11. Bearing
12. Woodruff key
13. Rotary valve shaft
14. Distance sleeve
15. "O" ring
16. Pinion
17. Spring sleeve
18. Spring
19. Shim 1 mm
20. Locking ring
21. Bearing
22. Locking ring
23. End cap
24. Oil tank cap
25. Gasket
26. Clamp
27. Oil tank
28. Support
29. Bolt
30. Nut
31. Grommet
32. Male connector
33. Clam (hose)
34. Oil line

ROTARY VALVE MECHANISM

CLEANING

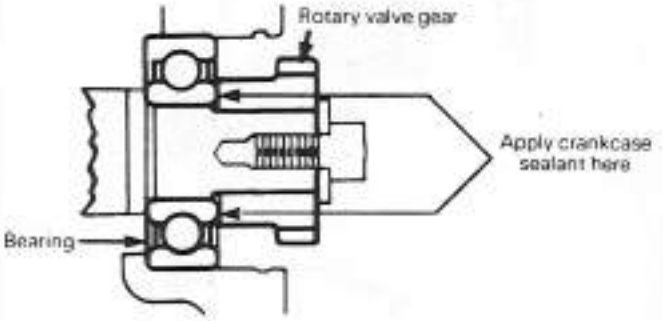
Discard all oil seals and "O" rings.

Remove crankcase sealant traces on rotary valve gear, adjacent bearing and on end cap sealing surface.

Clean all metal components in a non-ferrous metal cleaner.

DISASSEMBLY & ASSEMBLY

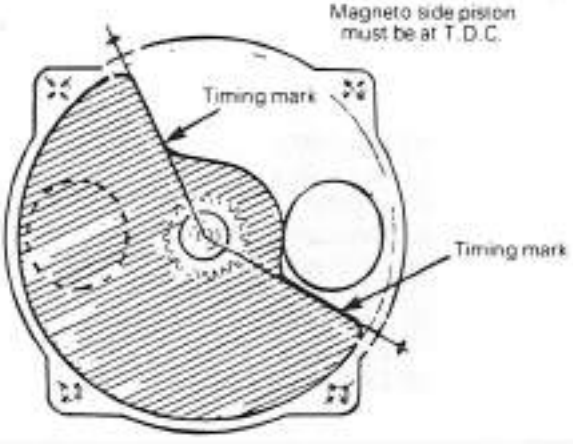
⑦ ⑪ At assembly, apply crankcase sealant on rotary valve gear and bearing mating surfaces.



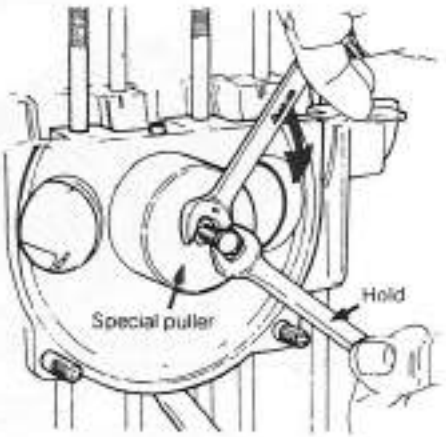
⑧ To correctly install the rotary valve disc proceed as follows:

- Turning crankshaft counter-clockwise, (drive pulley side) bring magneto side piston to Top Dead Center using a T.D.C. gauge.
- Position the rotary valve disc on gear to have edges as close as possible to the marks.

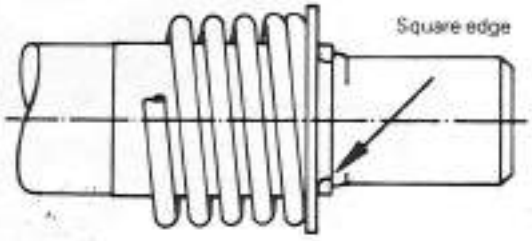
NOTE: The rotary valve disc is asymetrical, there fore, at assembly try positioning each side of disc on gear to determine best installation position.



⑨ to ⑳ To remove rotary valve shaft assembly from crankcase a special puller is needed. (See Tools Section). First remove locking ring then position special puller over shaft bore and screw puller bolt into rotary valve shaft. While holding puller bolt, turn puller nut clockwise until shaft comes out.

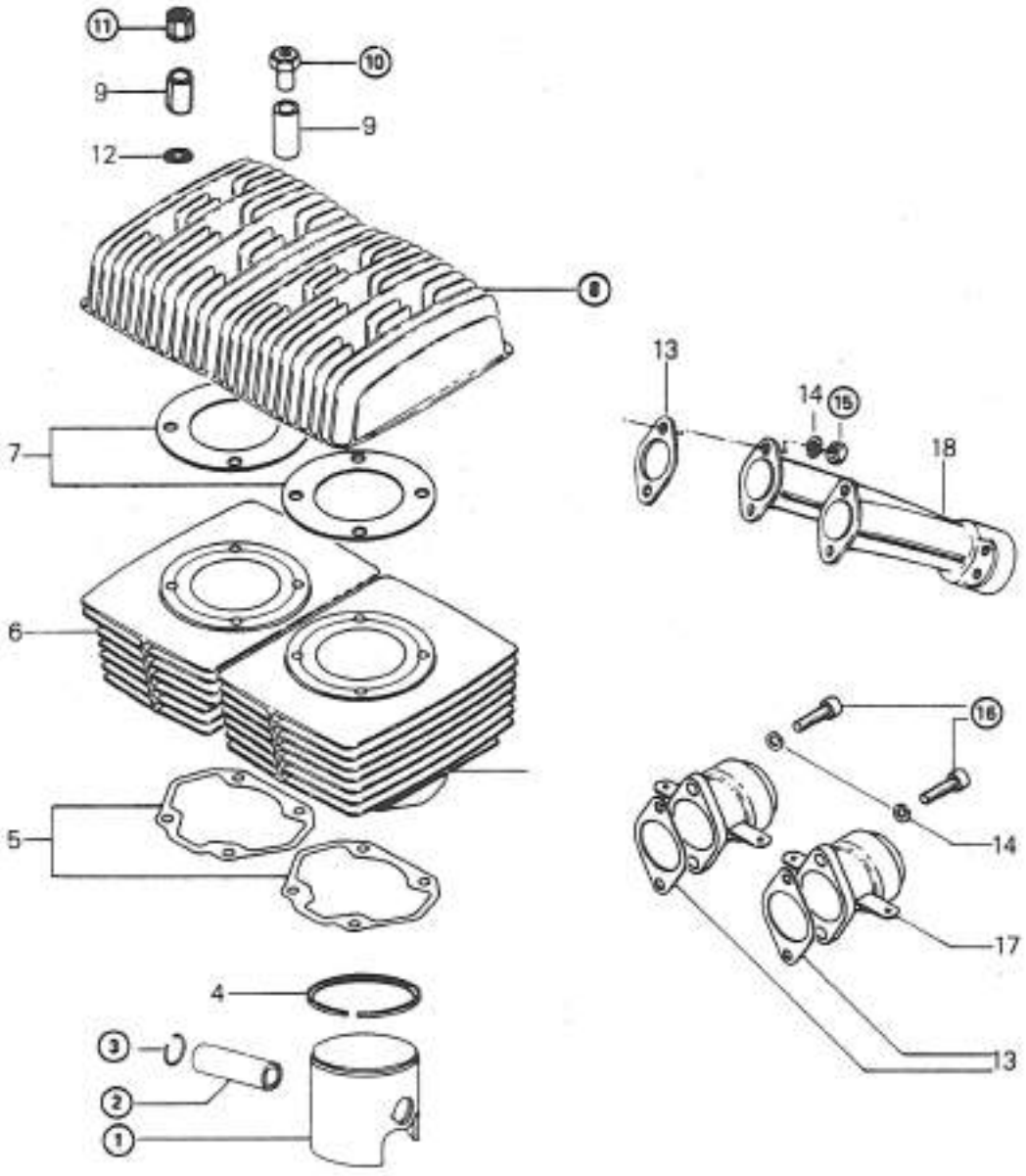


㉙ At assembly, position square edge of locking ring against shaft shoulder as illustrated.



㉓ At assembly, apply a light coat of Loctite crankcase sealant on end cap sealing surface.

TOP END



1. Piston
2. Gudgeon pin
3. Circlip
4. Ring
5. Gasket (cylinder / crankcase)
6. Cylinder
7. Gasket (Cylinder head)
8. Cylinder head
9. Expansion sleeve
10. Nut (1977)
11. Nut (1976)
12. Washer
13. Exhaust gasket
14. Lockwasher
15. Nut
16. Cap screw
17. Exhaust socket
18. Exhaust manifold

TOP END

Discard all gaskets.

Clean all metal components in a non-ferrous metal cleaner.

Scrape off carbon formation from cylinder exhaust port, cylinder head and piston dome using a wooden spatula.

NOTE: The letter "AUS" (over an arrow on the piston dome) must be visible after cleaning.

Clean the piston ring grooves with a groove cleaner tool, or with a piece of broken ring.

DISASSEMBLY & ASSEMBLY

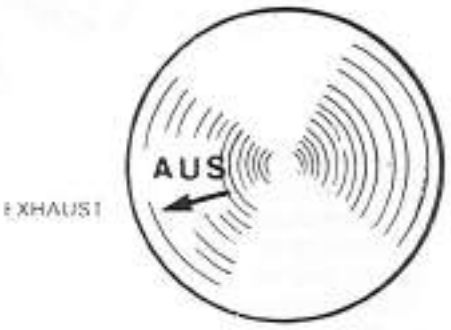
NOTE: Refer to Technical Data Section for component fitted tolerance and wear limit.

①②③ Place a clean cloth over crankcase to prevent circlips from falling into crankcase then use a pointed tool to remove circlips from piston.

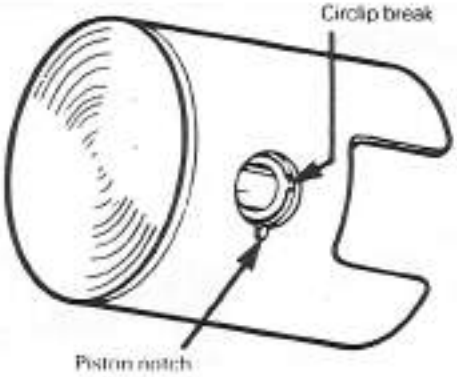
Drive the gudgeon pins in or out using a suitable drive punch and hammer.

CAUTION: When tapping gudgeon pin in or out of piston, hold piston firmly in place to eliminate the possibilities of transmitting shock and pressure to the connecting rod.

At assembly, place the pistons over the connecting rods with the letters AUS (over an arrow on the piston dome) facing direction of the exhast port.

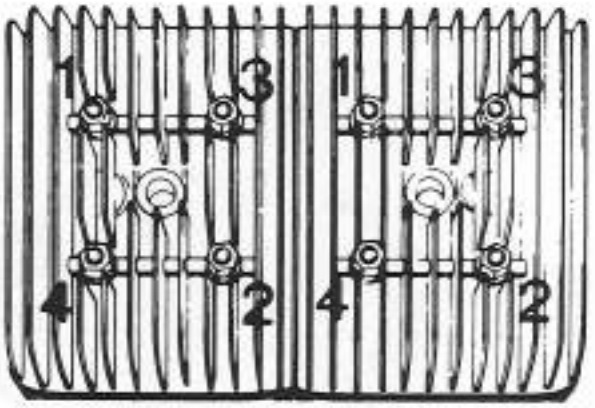


Once the circlips are installed, turn each circlip so that the circlip break is not directly in line with piston notch. Using very fine emery cloth, remove any burrs on piston caused through circlip installation.



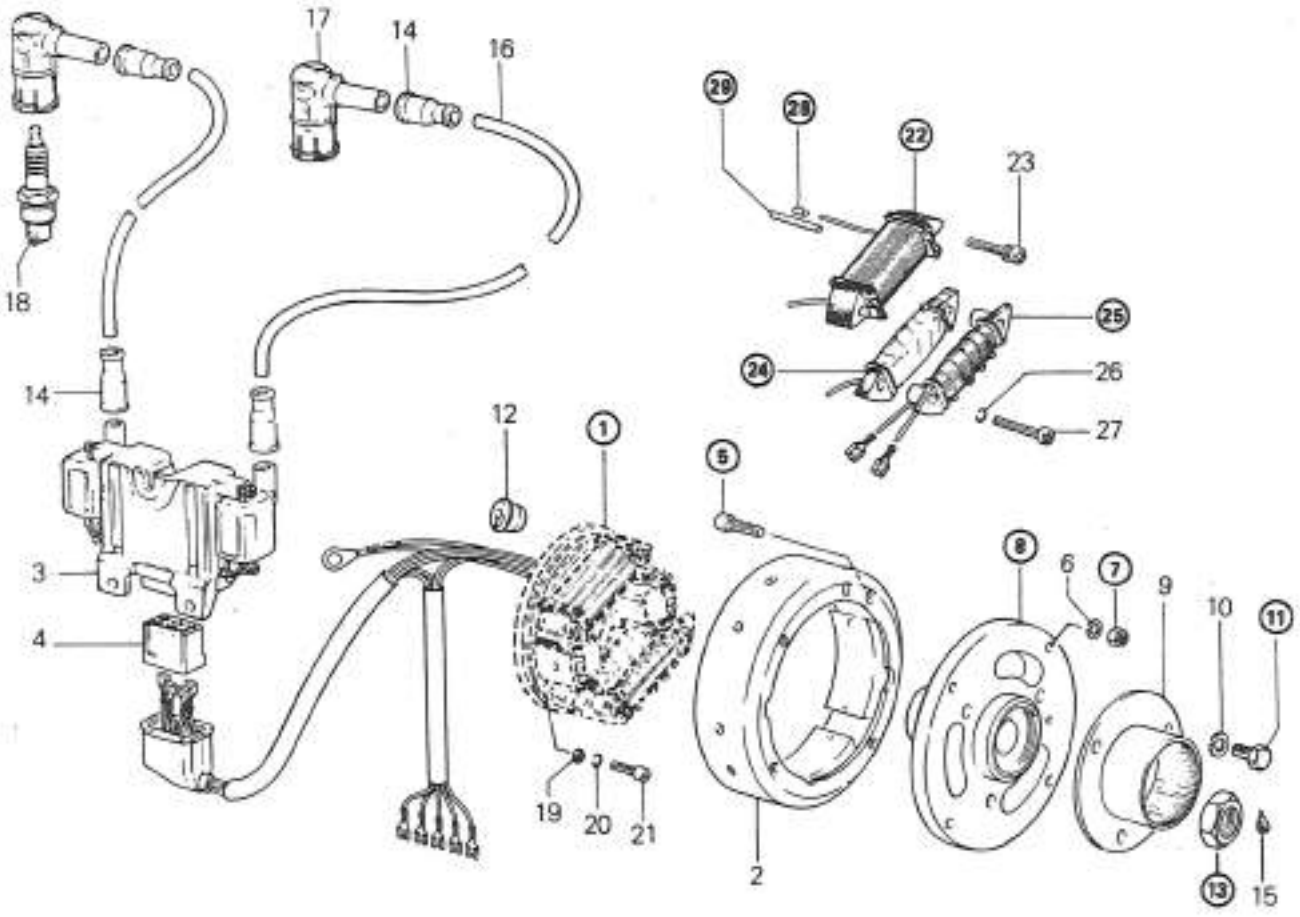
NOTE: To prevent leakage, install exhaust manifold prior to cylinder head tightening.

⑧⑨⑪ Torque cylinder head nuts to 1.6 kg-m (12 ft-lbs) following illustrated sequence.



⑩⑯ Torque to 2.2 kg-m (16 ft-lbs).

MAGNETO



1. *Armature plate*
2. *Magneto ring*
3. *Electronic box*
4. *Junction block*
5. *Screw*
6. *Lockwasher*
7. *Nut*
8. *Magneto housing*
9. *Starting pulley*
10. *Lockwasher*
11. *Screw (or nut with sutd)*
12. *Wire grommet*
13. *Magneto nut*
14. *Protection cap*
15. *Loctite Lock'n Seal 242*
16. *H.T. wire*
17. *Spark plug protector*
18. *Spark plug*
19. *Flat washer*
20. *Lockwasher*
21. *Screw*
22. *Lighting coil 110 W*
23. *Screw*
24. *Charging coil*
25. *Lighting coil 30W*
26. *Lockwasher*
27. *Screw*
28. *Wire function terminal*
29. *Protection hose*

MAGNETO

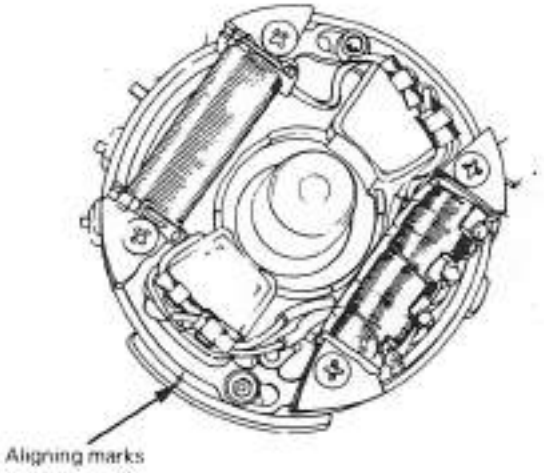
CLEANING

Clean all metal components in a non-ferrous metal cleaner.

CAUTION: Clean armature and magneto using only a clean cloth.

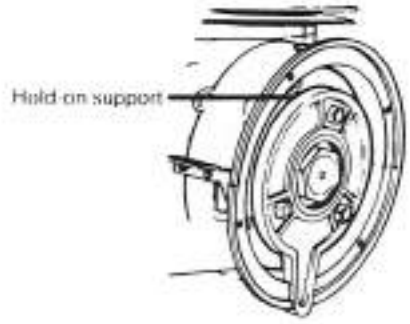
DISASSEMBLY & ASSEMBLY

① To facilitate timing procedure, perform primary adjustment by matching crankcase and armature plate marks.

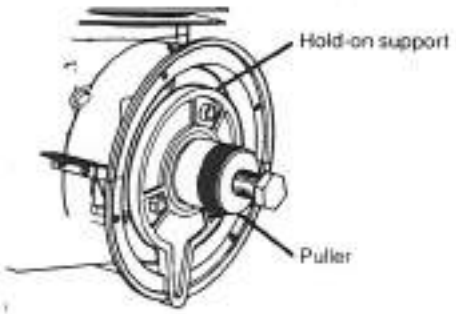


⑤ ⑦ Apply Loctite Lock'n Seal 242 on threads then torque to 1.2 kg-m (9 ft-lbs).

⑧ ⑱ To remove or install magneto retaining nut, lock crankshaft in position with special hold-on support, as illustrated (See Tool Section).



With magneto retaining nut removed and hold-on support in place, install special puller onto hub. Tighten puller bolt and at same time, tap on bolt head using a hammer to release magneto from its taper.



Prior to assembly, clean crankshaft extension (taper) then apply Loctite Lock'n Seal 242 on taper.

Install magneto retaining nut (with Loctite Lock'n Seal 242 on threads) and torque to 7.5 kg-m (54 ft-lbs).

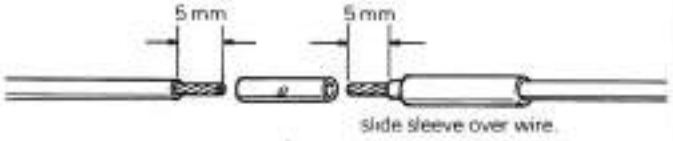
⑲ Torque to 2.2 kg-m (16 ft-lbs).

㉒ ㉔ ㉕ Whenever a coil is replaced, the air gap (distance between coil end and magnet) must be adjusted.

To check air gap, insert a feeler gauge of 0.30-0.45 mm (.012"-.018") between magnet and coil ends. If necessary to adjust, slacken coil retaining screws and relocate coil.

Use a cable connector and rubber sleeve as illustrated, whenever a coil or cable is replaced.

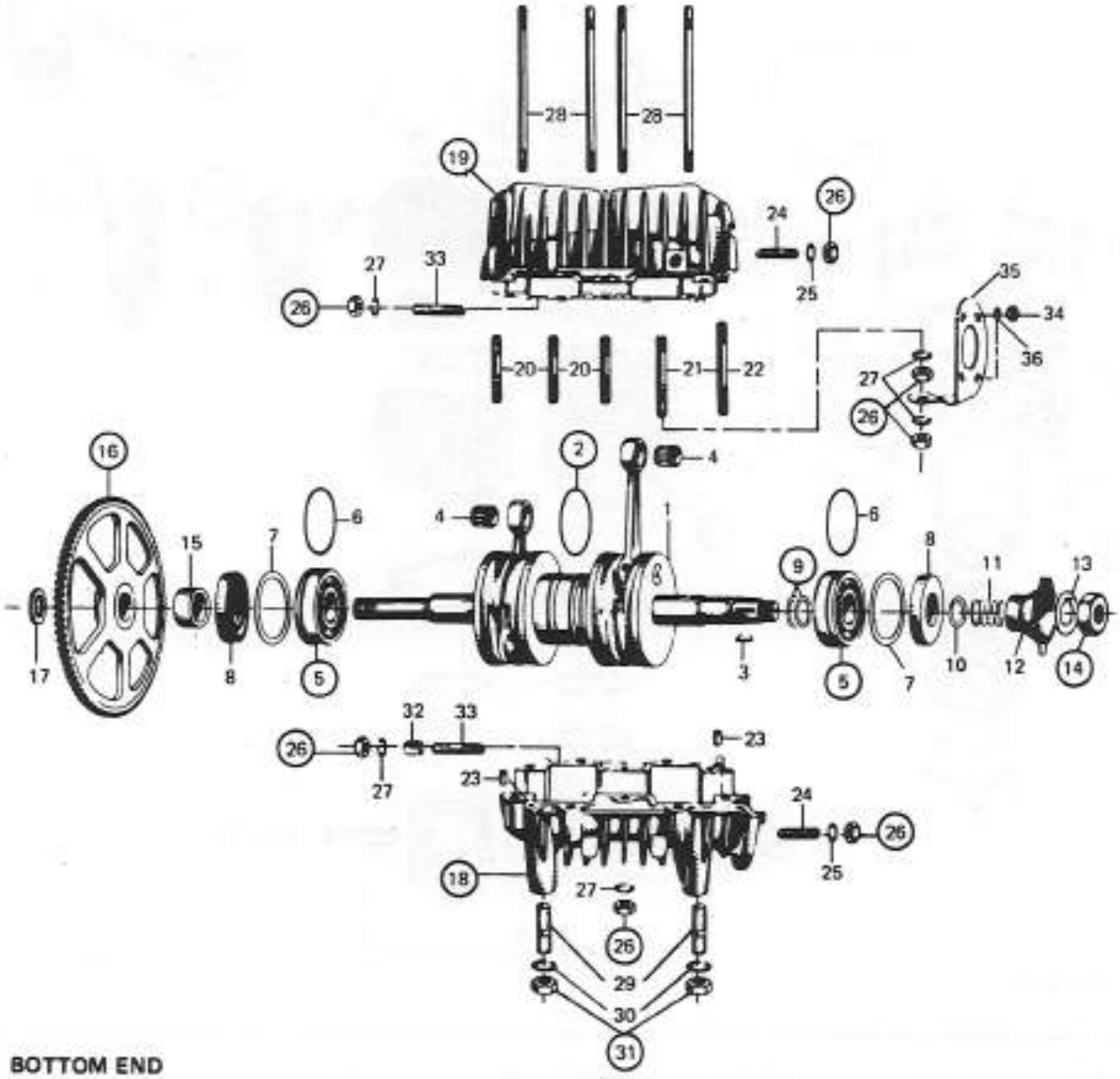
1. Strip 5 mm of insulation from each end



2. Solder wires into connector with resin core type solder.

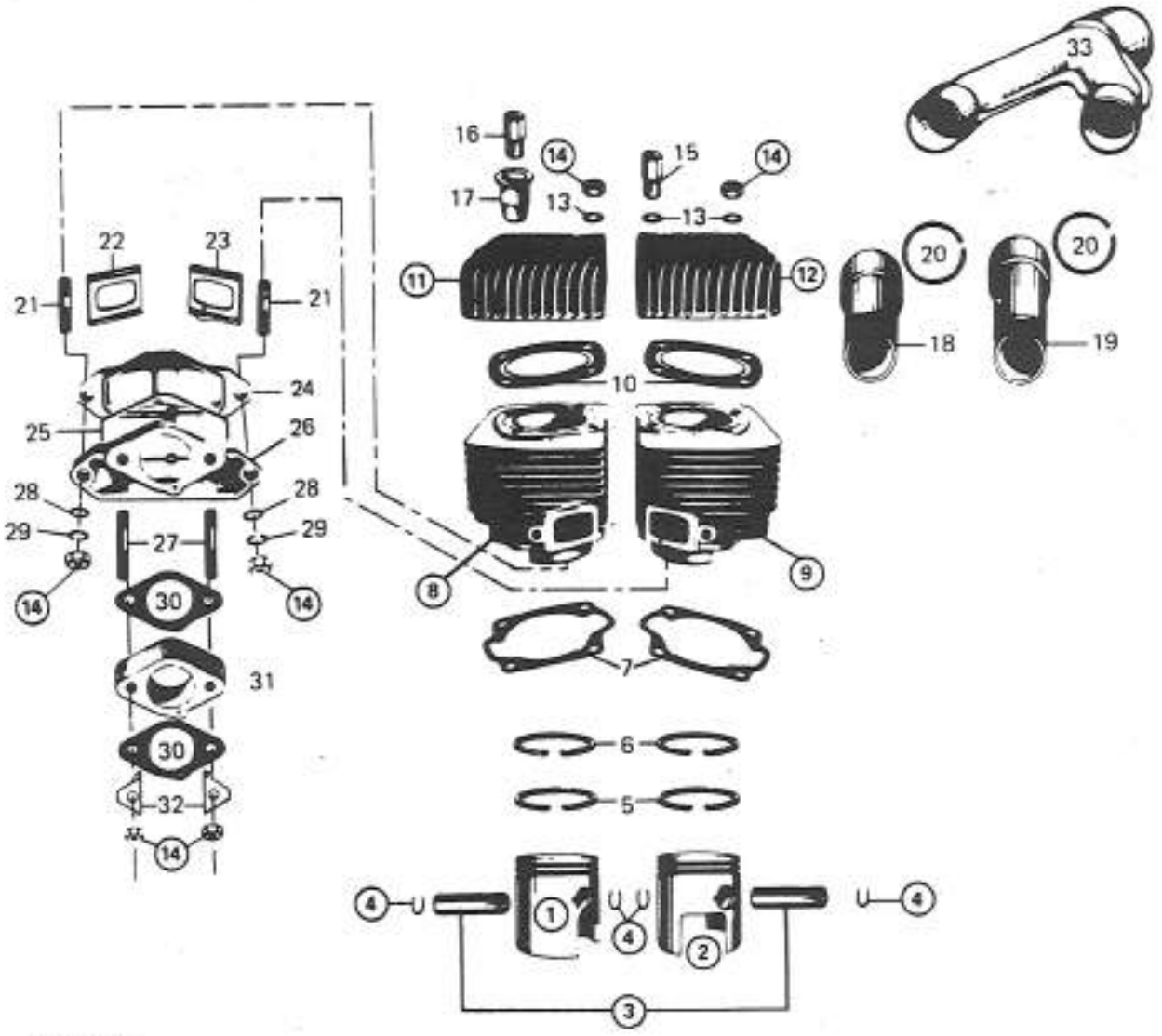
3. Slide rubber sleeve over connector then heat with a match to shrink sleeve.

305, 338, 343, 401 ENGINE TYPE



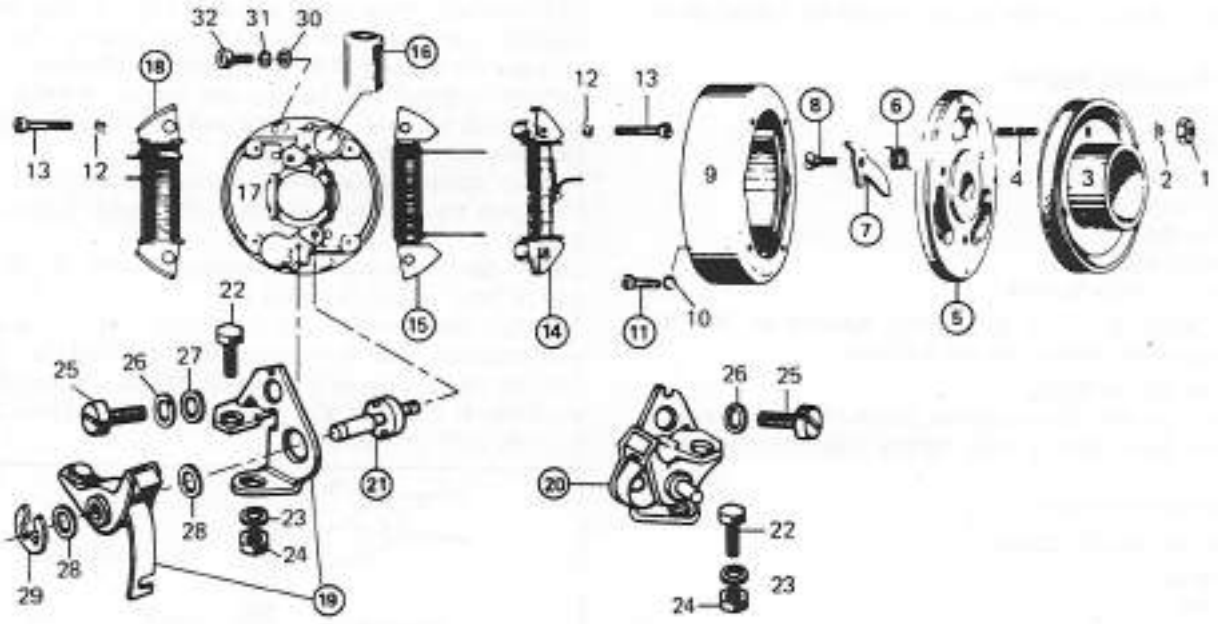
BOTTOM END

1. *Crankshaft*
2. *"O" ring (3)*
3. *Woodruff Key*
4. *Needle bearing*
5. *Ball bearing*
6. *"O" ring*
7. *Retaining disc*
8. *Oil seal*
9. *Shim (as required)*
10. *Washer*
11. *Spring*
12. *Breaker point cam*
13. *Tab washer*
14. *Magneto retaining nut*
15. *Distance sleeve*
16. *Starter gear*
17. *Washer (3 mm/0.118")*
18. *Lower crankcase half*
19. *Upper crankcase half*
20. *Crankcase stud (7)*
21. *Crankcase stud*
22. *Crankcase stud (2)*
23. *Dowel pin*
24. *Stud (4)*
25. *Lock washer (4)*
26. *Nut (17)*
27. *Lock washer (13)*
28. *Cylinder head stud (8)*
29. *Crankcase/support stud (4)*
30. *Lock washer (4)*
31. *Nut (4)*
32. *Dowel tube*
33. *Crankcase/starter stud*
34. *Nut (2)*
35. *Starter bracket*
36. *Washer (2)*



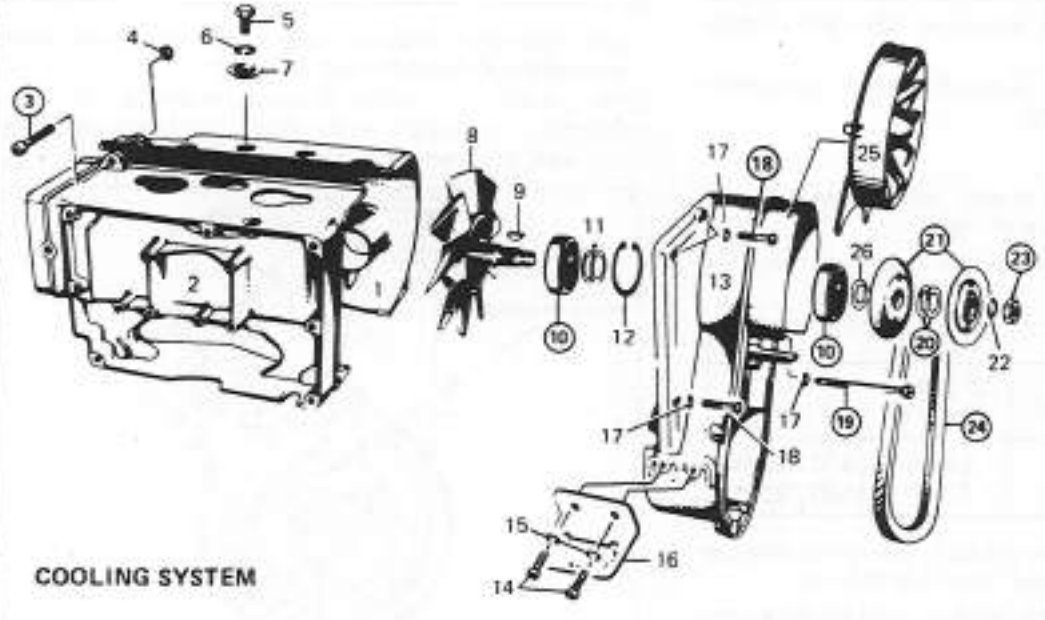
TOP END

1. *Piston (P.T.O. side)*
2. *Piston (Mag. side)*
3. *Gudgeon pin*
4. *Circlip*
5. *Rectangular ring*
6. *"L" or rectangular ring*
7. *Crankcase/cylinder gasket*
8. *Cylinder (P.T.O. side)*
9. *Cylinder (Mag side)*
10. *Cylinder head gasket*
11. *Cylinder head (P.T.O. side)*
12. *Cylinder head (Mag. side)*
13. *Plain washer (7)*
14. *Nut (10)*
15. *Distance nut (long)*
16. *Distance nut (short)*
17. *Support sleeve*
18. *Exhaust socket (P.T.O. side-short)*
19. *Exhaust socket (Mag. side-long)*
20. *Aluminium ring*
21. *Intake manifold stud*
22. *Intake manifold gasket (P.T.O. side)*
23. *Intake manifold gasket (Mag side)*
24. *Intake manifold*
25. *Ring gasket*
26. *Intake cover*
27. *Carburetor stud*
28. *Plain washer*
29. *Lock washer*
30. *Flange gasket*
31. *Isolating flange*
32. *Tab washer*
33. *Exhaust manifold*



MAGNETO

1. Nut (3)
2. Lock washer (3)
3. Fan belt pulley
4. Stud (3)
5. Magneto housing
6. Spring
7. Centrifugal lever
8. Bearing screw
9. Magneto ring
10. Lock washer (4)
11. Allen screw (4)
12. Lock washer (4)
13. Coil retaining screw (4)
14. Brake light coil (23W)
15. Ignition generator coil
16. Capacitor (2)
17. Armature plate
18. Lighting coil (75W or 100W)
19. Breaker point set
20. Beaker point (unit construction)
21. Pivot pin
22. Bolt
23. Lock washer
24. Nut
25. Screw
26. Lock washer
27. Plain washer
28. Washer
29. Retaining clip
30. Washer (2)
31. Lock washer
32. Allen screw



COOLING SYSTEM

1. Rear cylinder cowl
2. Front cylinder cowl
3. Allen screw (2)
4. Nut (2)
5. Bolt
6. Lock washer
7. Cowl cover
8. Fan
9. Woodruff key
10. Ball bearing
11. Spacer (2)
12. Locking ring
13. Fan housing
14. Screw
15. Lock washer
16. Junction block bracket
17. Spring washer (4)
18. Flat head screw (3)
19. Screw
20. Shim (5)
21. Pulley half
22. Lock washer
23. Nut
24. Fan belt
25. Fan cover
26. Spacer

REMOVAL

Remove or disconnect the following then lift engine out of vehicle.

Front-mounted engine

- Drive belt
- Muffler
- Rewind starter
- Air silencer
- Choke cable
- Throttle cable
- Fuel lines at carburetor

Note: Secure fuel line to steering support so that the opened ends are higher than the fuel tank.

- Electrical connector

Caution: On electric start model, disconnect negative cable (ground) from battery post **before** disconnecting other wires.

- Engine mount nuts.

Center mounted engine

- Drive belt
- Muffler
- Choke knob
- Throttle cable
- Fuel lines
- Electrical connector

Caution: On electric start model, disconnect negative cable (ground) from battery post **before** disconnecting other wires.

- Separate steering column support at upper column
- Engine mount nuts.

DISASSEMBLY & ASSEMBLY

If necessary, remove drive pulley as described in drive pulley section.

Note: Refer to Technical Data Section for component fitted tolerance and wear limit.

Bottom End

② The center "O" ring/ball bearing combination may vary depending on production date of engine.

For correct assembly, refer to the following chart for identification.

Ball bearing Groove Depth	"O" Ring		
	Thickness	Outside Diameter	Part Number
.059" to .063"	.078"	2 5/16"	420 830 350
.047" to .051"	.070"	2 1/8"	420 830 355

⑤ To remove bearing from crankshaft, use a protective cap and special puller, as illustrated. (See Tool Section).

Prior to installation, place bearings into an oil container and heat the oil to 200 °F. for 5 to 10 min. This will expand bearing and ease installation.

Install bearings with groove outward.

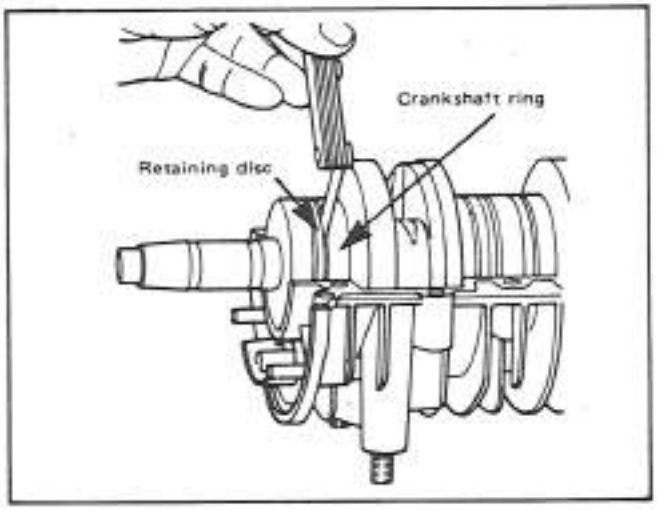
⑨ Crankshaft end-play is adjusted with shim(s) located between crankshaft and magneto side bearing. To determine correct amount of shim(s), proceed as follows.

Remove magneto side bearing and existing shim(s). Slide the appropirate crankshaft ring and the retaining disc on the crankshaft. (See Tool Section).

Position crankshaft assembly into crankcase lower half. Make sure that retaining washers are correctly seated in the grooves.

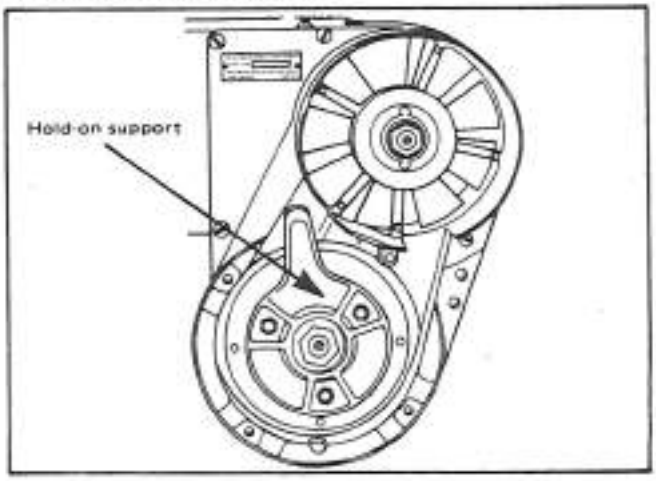
Gently tap crankshaft counterweight until P.T.O. side bearing bears against retaining disc.

Any free-play between the crankshaft ring and magneto side retaining disc minus recommended end-play is the distance to be covered by shim(s). Shims are available in thickness of 0.1 mm/.004", .02 mm/.008", 0.3 mm/.012", 0.5 mm/.020", 1 mm/.039".



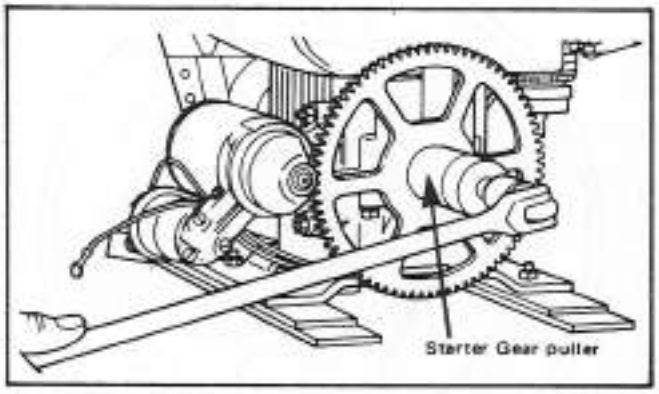
Note: Crankshaft end-play requires adjustment only when crankshaft and/or crankcase is replaced.

⑭ To remove or install magneto retaining nut, lock crankshaft in position with special hold-on support as illustrated. (See Tool Section).



At assembly torque retaining nut to 50-58 ft-lbs.

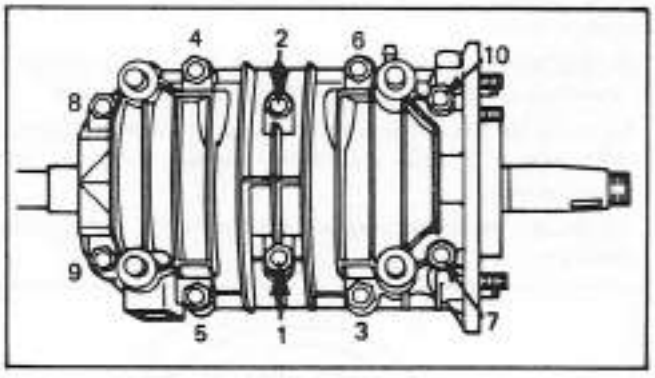
⑯ To remove starter gear from crankshaft it may be necessary to use a special puller as illustrated. (See Special Tool).



At assembly, apply a light coat of anti-seize compound on crankshaft extension nearest starter gear.

⑱ ⑲ Prior to joining of crankcase halves, apply a light coat of "Loctite" crankcase sealant to the mating surfaces of the bottom half.

Position spring washers and nuts on crankcase studs then torque nuts to 14-16 ft-lbs., following illustrated sequence.



㉘ At assembly, torque to 14-16 ft-lbs.

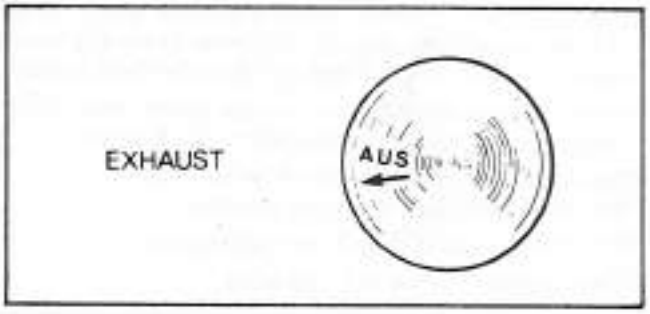
㉛ At assembly, torque crankcase/support nut to 23-29 ft-lbs.

Top End

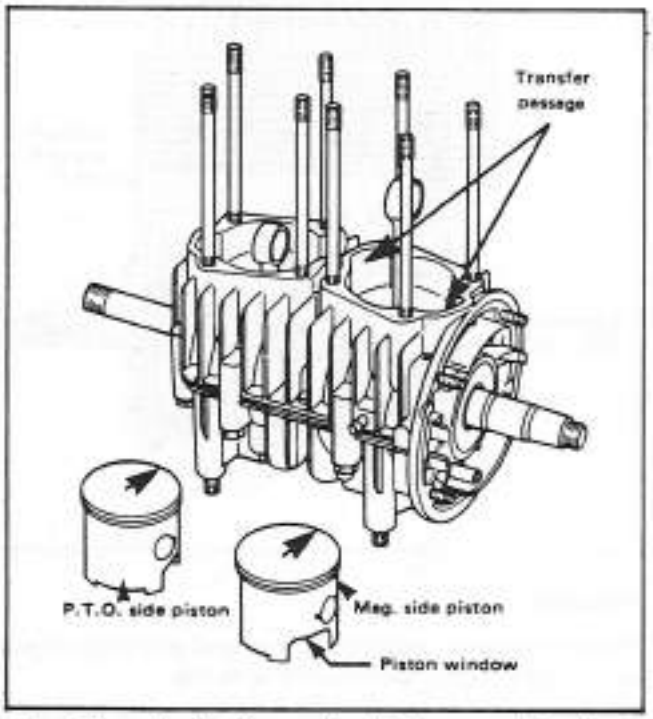
①②③④ Place a clean cloth over crankcase to prevent circlip from falling into crankcase. Use a pointed tool to remove circlips from piston.

Caution: When tapping out gudgeon pins, hold piston firmly in place to eliminate the possibilities of transmitting shock and pressure to the connecting rod.

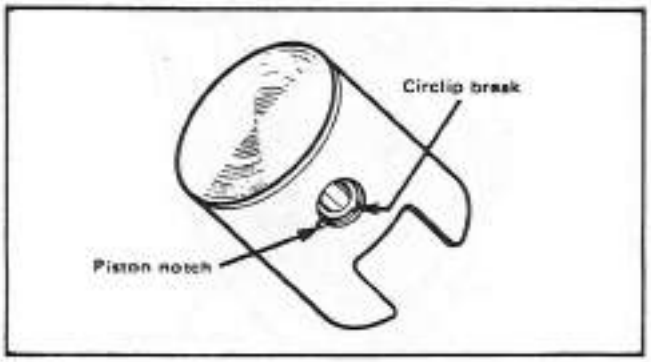
At assembly, place the pistons over the connecting rods with the letters "AUS", over an arrow on the piston dome, facing in direction of the exhaust port.



Also make sure that the piston window is aligned with the crankcase transfer passage when the gudgeon pin orifice is in-line with the connecting rod bore.



Note: Once the circlips are installed turn each circlips so the circlip is not directly on piston notch. Remove any burrs on piston caused through circlip installation with very fine emery cloth.



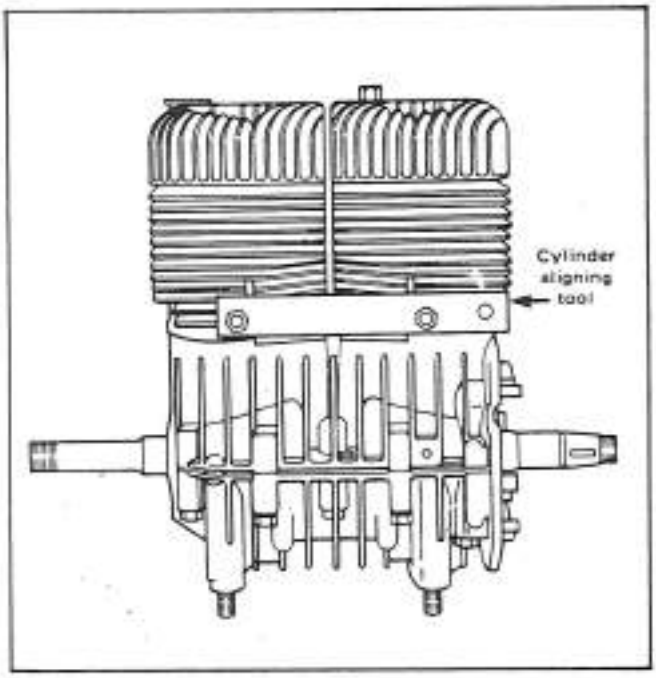
⑧⑨⑩⑪⑫ When installing cylinder and or cylinder head, the cylinder aligning tool must be used to ensure sealing of intake manifold and cylinders.(See Tool Section).

Install exhaust manifold on exhaust socket then install aligning bar and torque distance nut to 14-16 ft-lbs.

Cross torque cylinder head nut to 14-16 ft-lbs.
Remove aligning bar and exhaust manifold.

Note: Torque each cylinder head individually.

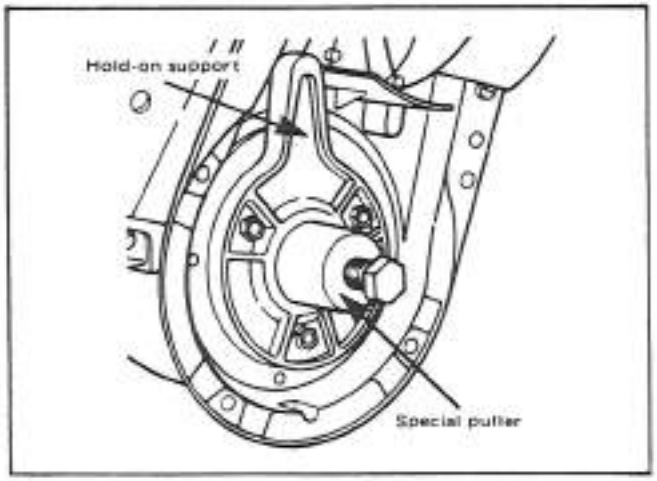
⑭ At assembly, torque to 14-16 ft-lbs.



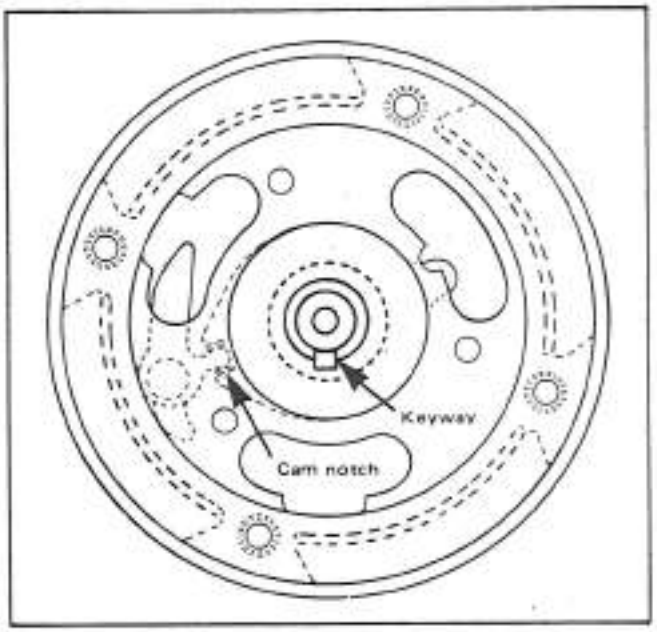
Magneto

⑤ With magneto retaining nut removed and hold-on support in place, install special puller onto hub.

Tighten puller nut and at same time, tap on nut head using a hammer to release magneto from its taper.



At assembly, position magneto on crankshaft with the keyway and the cam notch position as illustrated.



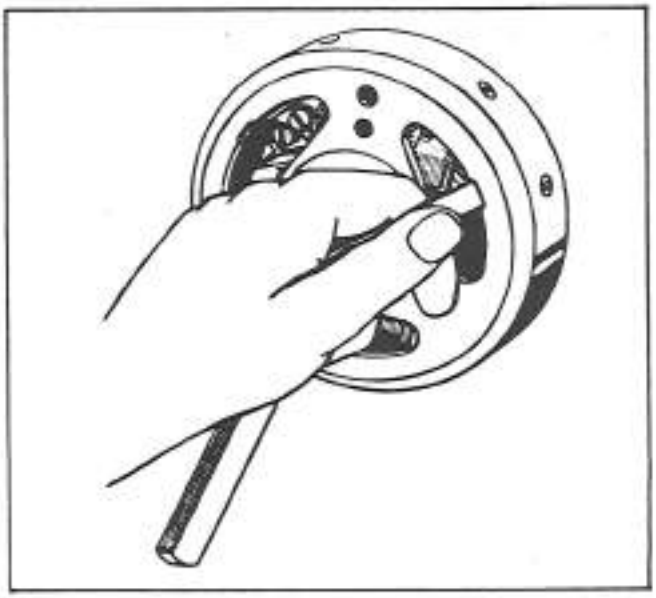
⑥⑦⑧ At assembly, apply a small amount of low temperature grease into spring seating.

⑪ At assembly, apply Loctite "Lock'n Seal" on retaining screw threads.

⑭⑮⑱ Whenever a coil is replaced, the air gap (distance between magnet and armature end) must be adjusted.

To check air gap, insert a feeler gauge of correct thickness (0.31 mm/.012"-0.45 mm/.018") between magnet and armature ends.

If necessary to adjust, slacken retaining screw and relocate armature.



⑯ To replace a capacitor, it is first necessary to unsolder the two (2) black leads using a soldering iron. The capacitor can then be driven out of the armature plate using a suitable punch and hammer. To reinstall, inverse procedure.

⑲ ㉑ When replacing breaker point set, apply a light coat of grease on pivot pin and rubbing block.

Do not remove pivot pin unless replacement is needed. At assembly, apply Loctite "Lock'n Seal" on threads.

㉘ When replacing unit construction type breaker point, apply a small amount of grease on rubbing block.

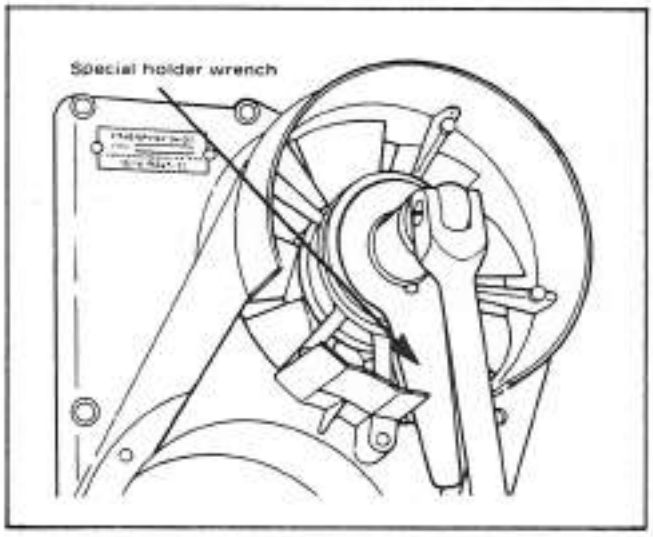
Cooling System

③ ⑱ ⑲ At assembly, apply a light coat of Loctite "Lock'n Seal" on threads. It should be noted that to correctly remove a Loctite locked screw, it is first necessary to slightly tap on head of screw to break Loctite bond.

The screw can then be removed. This will eliminate the possibility of screw breakage.

⑩ It is first necessary to heat bearing housing to 140° -160° F. To remove or install bearing.

⑳ ㉑ ㉓ ㉔ Lock fan pulley with special holder wrench to remove or install pulley retaining nut. (See Tool Section).



Shim(s) located between pulley halves are used to adjust fan belt free-play. Correct free-play is 1/4". If necessary to adjust, install or remove shim(s) between pulley halves. Install excess shim(s) between outer pulley half and washer.

CLEANING

Discard all oil seals, gaskets and "O" rings.

Clean all metal components in a non-ferrous metal cleaner.

Caution: Clean armature using only a clean cloth.

Scrape off carbon formation from cylinder exhaust ports, cylinder exhaust ports, cylinder heads and piston domes.

Note: The letter "AUS" over an arrow on the piston dome must be visible after cleaning.

Clean the piston ring grooves with a groove cleaner tool, or with a piece of broken ring.

Remove old sealant from mating surfaces with Bombardier "Sealant stripper".

Caution: Never use a sharp object to scrape away old sealant as score marks incurred are detrimental to crankcase sealing.

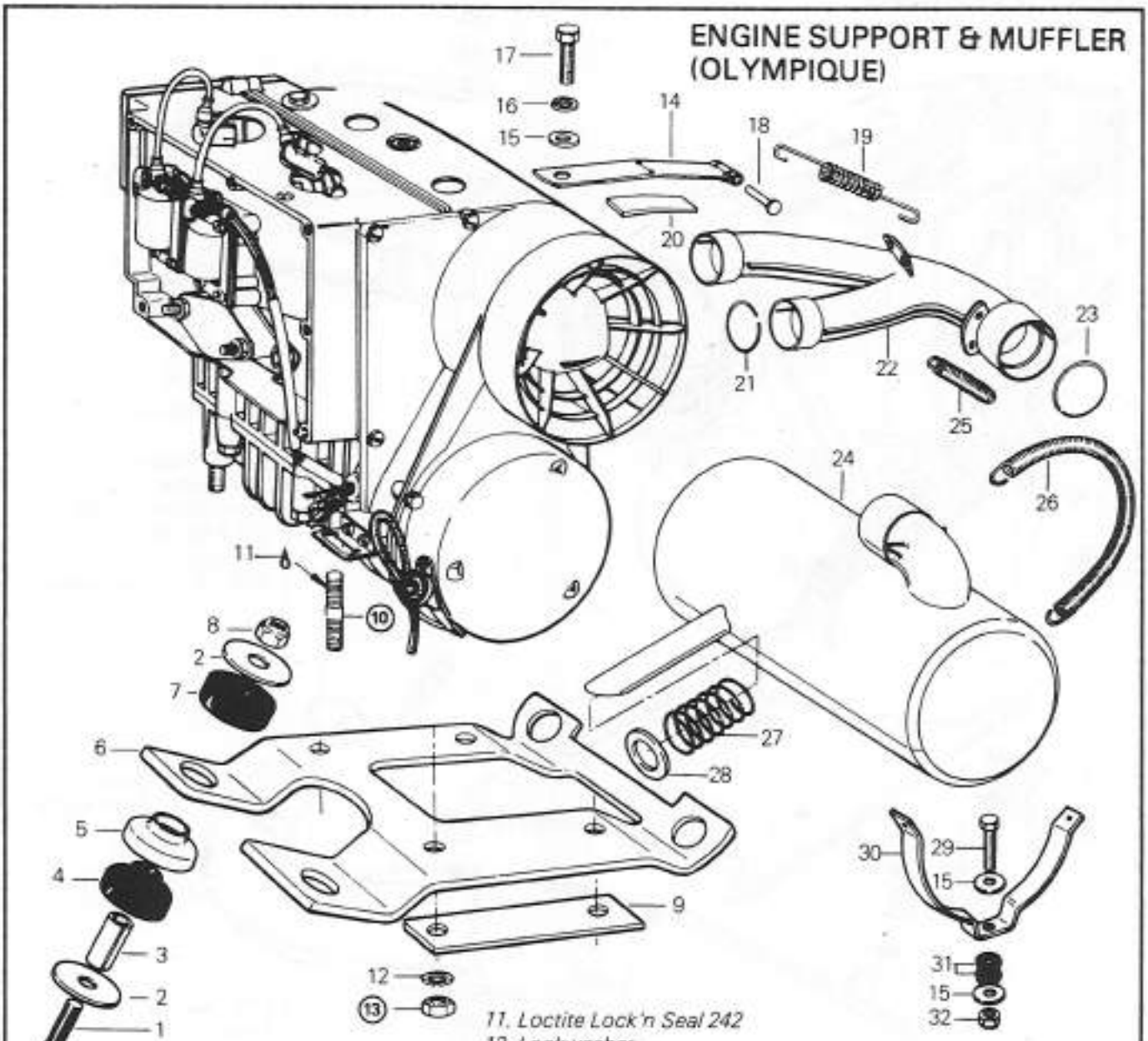
INSTALLATION

To install engine on vehicle, inverse removal procedure. However, pay attention to the following:

- Check ignition timing.
- Check tightness of engine mount nuts.
- After throttle cable installation, check carburetor maximum throttle opening.
- Check pulley alignment.

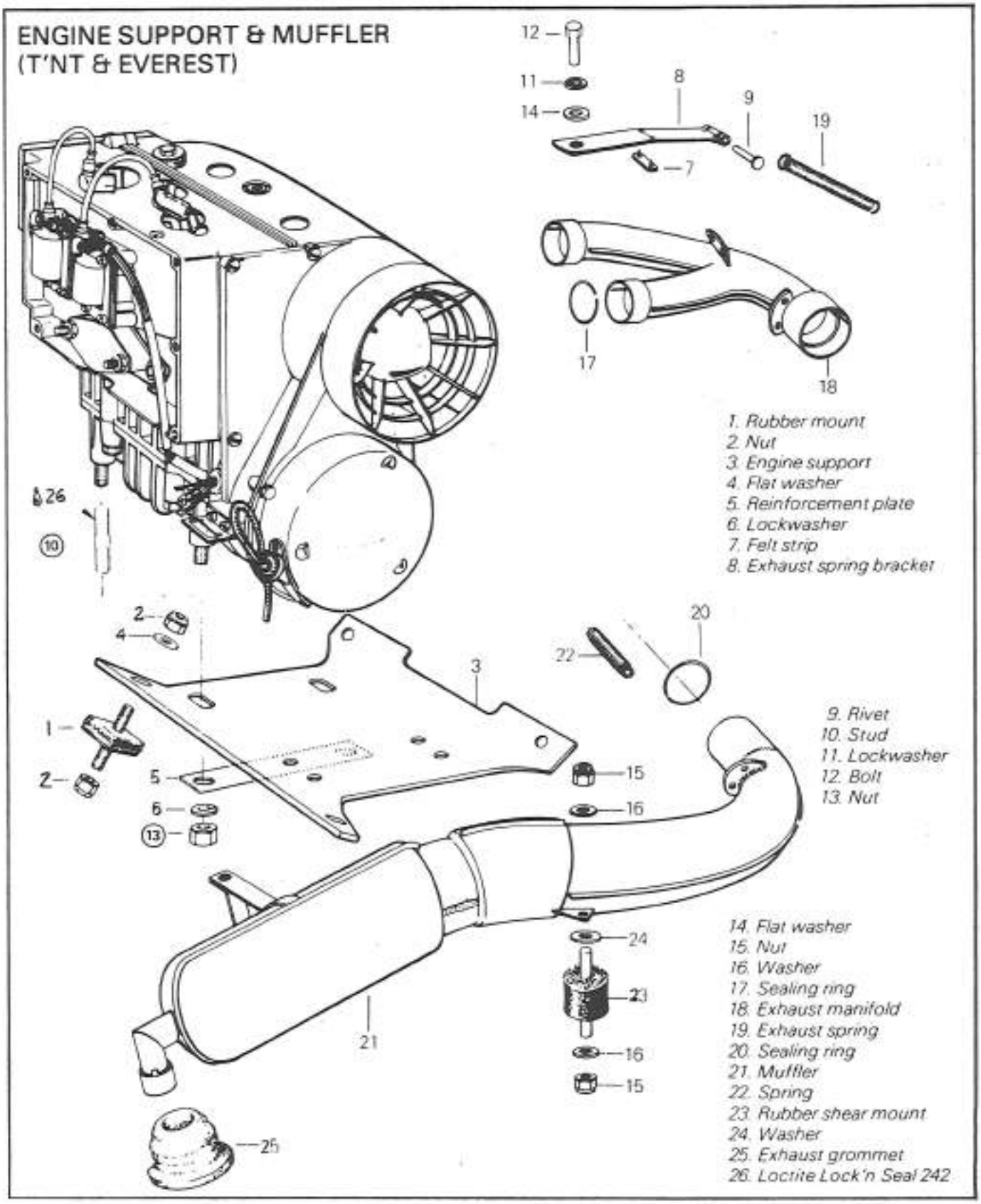
305, 343 ENGINE TYPES (FROM 1976)

ENGINE SUPPORT & MUFFLER (OLYMPIQUE)



1. Carriage bolt
2. Flat washer
3. Spacer bushing
4. Lower rubber damper
5. Damper retainer
6. Engine support
7. Upper rubber damper
8. Nut
9. Reinforcement plate
10. Stud
11. Loctite Lock'n Seal 242
12. Lockwasher
13. Nut
14. Exhaust spring bracket
15. Flat washer
16. Lockwasher
17. Screw
18. Rivet
19. Spring
20. Felt strip
21. Sealing ring
22. Exhaust manifold
23. Sealing ring
24. Muffler
25. Spring
26. Spring
27. Spring
28. Washer
29. Bolt
30. Muffler bracket
31. Rubber spacer
32. Nut

ENGINE SUPPORT & MUFFLER (T'NT & EVEREST)



1. Rubber mount
2. Nut
3. Engine support
4. Flat washer
5. Reinforcement plate
6. Lockwasher
7. Felt strip
8. Exhaust spring bracket
9. Rivet
10. Stud
11. Lockwasher
12. Bolt
13. Nut
14. Flat washer
15. Nut
16. Washer
17. Sealing ring
18. Exhaust manifold
19. Exhaust spring
20. Sealing ring
21. Muffler
22. Spring
23. Rubber shear mount
24. Washer
25. Exhaust grommet
26. Loctite Lock'n Seal 242

ENGINE SUPPORT & MUFFLER

REMOVAL FROM VEHICLE

Remove or disconnect the following (if applicable) then lift engine out of vehicle.

- Pulley guard & drive belt
- Muffler & air duct
- Cab retaining cable
- Air intake silencer
- Fuel lines at carburetor, impulse line
- Throttle cable
- Electrical junction block.

CAUTION: On electric start model, disconnect negative cable (ground) from battery before disconnecting other wires.

- Rewind starter
- Engine mount nuts

DISASSEMBLY & ASSEMBLY

⑩ At assembly on crankcase, apply Loctite Lock'n Seal 242 on threads.

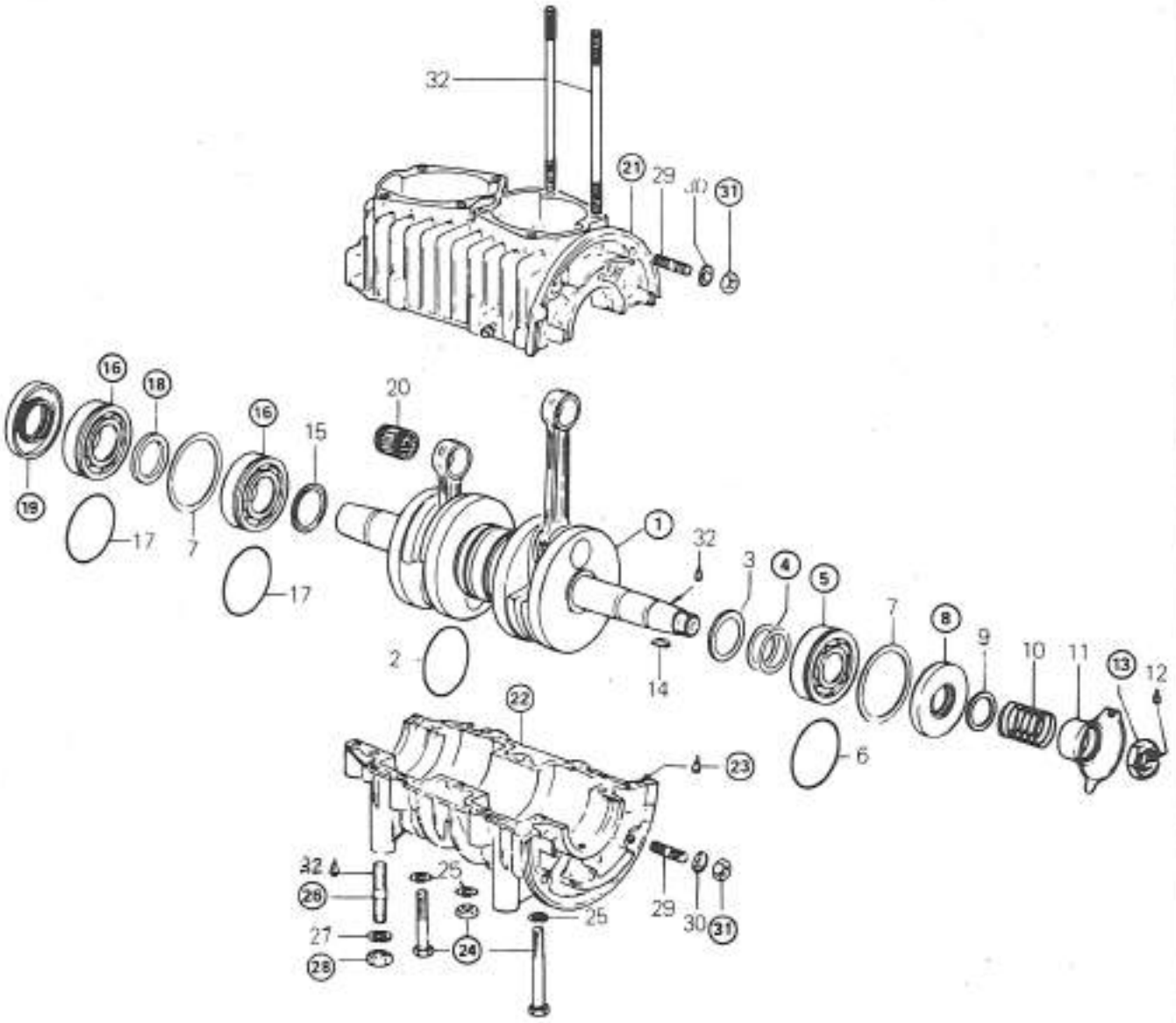
⑬ Torque to 3.6 kg-m (26 ft-lbs).

INSTALLATION ON VEHICLE

To install engine on vehicle, inverse removal procedure. However, pay attention to the following:

- Check ignition timing
- Check tightness of engine mount nuts.
- After throttle cable installation, check carburetor maximum throttle opening.
- Check pulley alignment.

BOTTOM END



1. Crankshaft
2. Sealing ring
3. Distance ring 1 mm (1977)
4. Shim
5. Bearing (MAG)
6. "O" ring
7. Retainer washer
8. Oil seal (MAG)
9. Washer
10. Spring
11. Breaker point cam
12. Loctite Lock'n Seal 242
13. Magneto nut
14. Woodruff key
15. Distance ring 2 mm
16. Bearing (P.T.O.)
17. "O" ring
18. Distance ring 3 mm
19. Oil seal (P.T.O.)
20. Needle cage bearing
21. Crankcase upper half
22. Crankcase lower half
23. Crankcase sealant
24. Bolt or nut with stud
25. Lockwasher
26. Stud
27. Lockwasher
28. Nut
29. Stud
30. Washer
31. Nut
32. Loctite Lock'n Seal 242

BOTTOM END

CLEANING

Discard all oil **seals**, gaskets, "O" rings and sealing rings.

Clean all metal components in a non-ferrous metal cleaner.

Remove old sealant from crankcase mating surfaces with Bombardier sealant stripper.

CAUTION: Never use a sharp object to scrape away old sealant as score marks incurred are detrimental to crankcase sealing.

DISASSEMBLY & ASSEMBLY

General

Refer to Technical Data Section for component fitted tolerance and wear limit.

①④Crankshaft end-play is adjusted with shim(s) located between crankshaft and magneto side bearing. To determine correct amount of shim(s), proceed as follows.

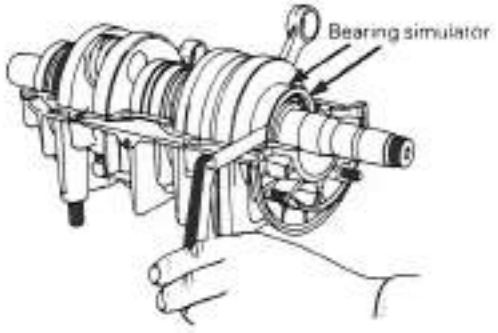
NOTE: Crankshaft end-play requires adjustment only when crankshaft and / or crankcase is replaced.

Remove magneto side bearings and existing shim(s). Slide the appropriate bearing simulator and the retaining washers on the crankshaft. (See Tool Section).

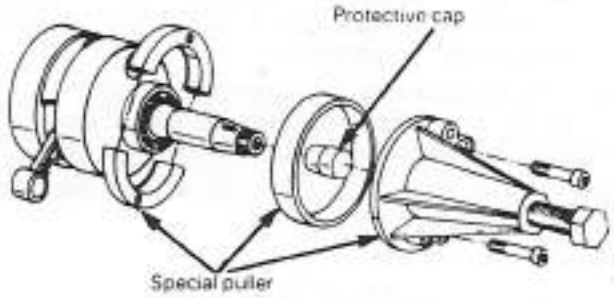
Position crankshaft assembly into crankcase lower half. Make sure that retaining washers are correctly seated in their grooves.

Gently tap crankshaft counterweight until P.T.O. side inner bearing bears against retaining washer.

Any free-play between the bearing simulator and magneto side retaining washer, minus recommended end-play, is the distance to be covered by shim(s). Shims are available in the thickness of 0.10 mm (.004"), 0.15 mm (.006"), 0.20 mm (.008") and 0.30 mm (.012").



⑤⑯To remove bearing from crankshaft use a protective cap and special puller, as illustrated. (See Tool Section).



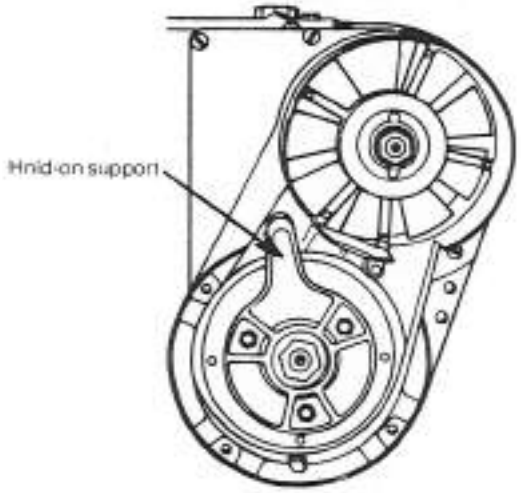
Prior to installation, place bearings into an oil container and heat the oil to 100° C (210° F) for 10 min. This will expand bearings and ease installation.

Install bearings with groove outward.

NOTE: Prior to magneto side bearing installation, determine crankshaft end-play and install required shim(s) on crankshaft extension.

⑧⑱At assembly apply a light coat of lithium grease on seal lip. Seal outer surface should be flush with crankcase.

⑬To remove or install magneto retaining nut, lock crankshaft in position with special hold-on support as illustrated. (See Tool Section).



At assembly apply Loctite Lock'n Seal 242 or equivalent on threads then torque to 8.3 kg-m (60 ft-lbs).

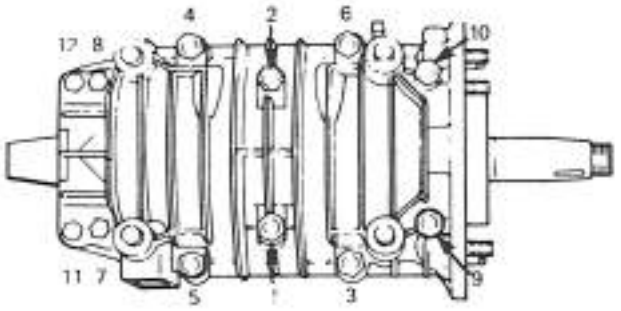
⑲A 4 mm (0.160") distance ring is used on P.T.O. side with crankcase upper half having the oil passage between the two bearings. When the oil passage is between oil seal and outer bearing, a 3 mm (0.120") must be used.

㉑㉒㉓ Crankcase halves are factory matched and therefore, are not interchangeable or available as single halves.

Prior to joining of crankcase halves, prepare mating surfaces with crankcase sealant primer then apply a light coat of crankcase sealant (See Tool Section) as per instructions printed on container.

Position the crankcase halves together and tighten nuts (or bolts) by hand then install armature plate (tighten) on magneto side to correctly align the crankcase halves.

Torque bolts or nuts to 2.1 kg-m (15 ft-lbs) following illustrated sequence.

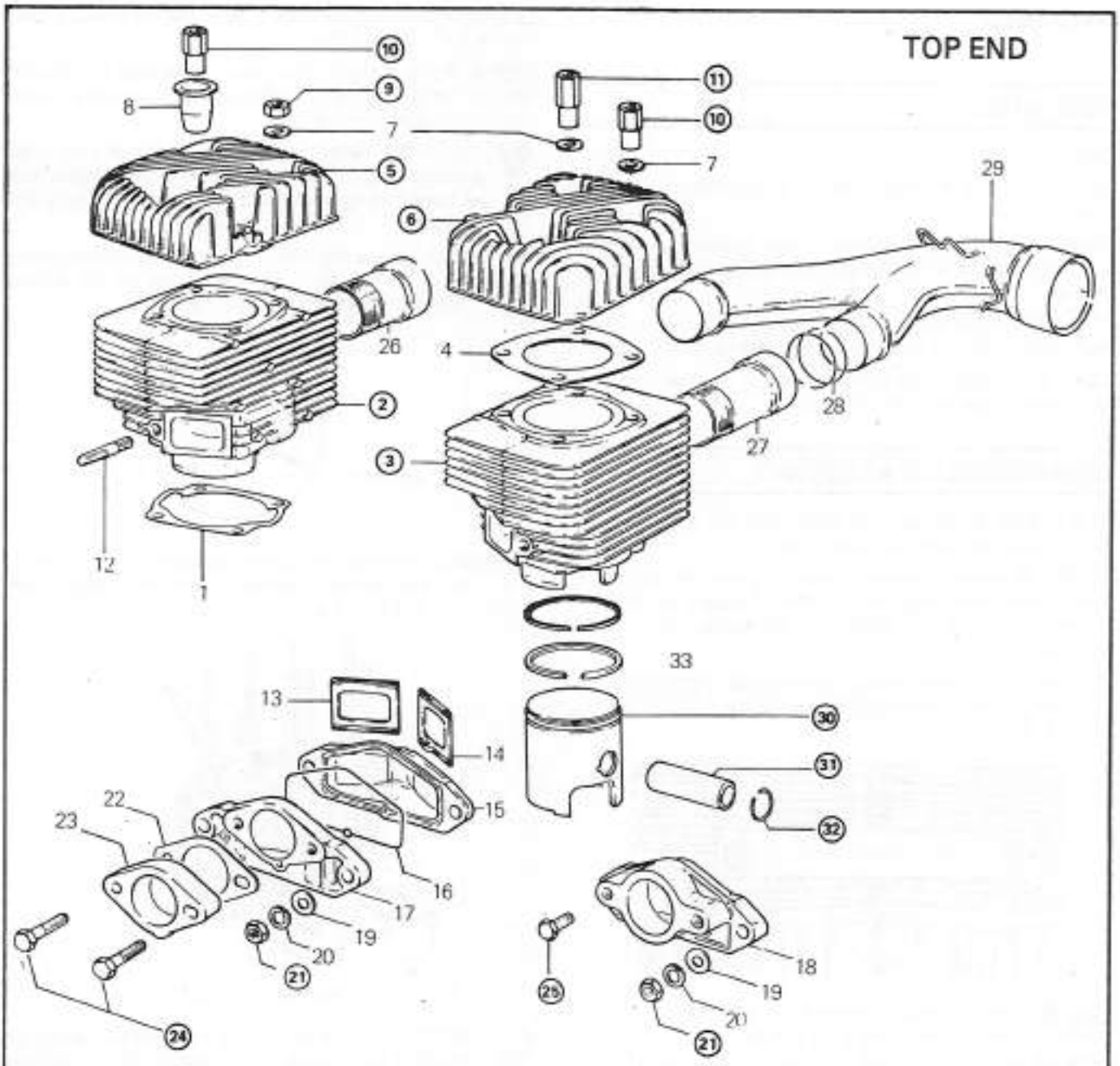


㉔ Torque to 2.1 kg-m (15 ft-lbs).

㉕ At assembly on crankcase apply Loctite Lock'n Seal 242 on threads.

㉖ Torque to 3.6 kg-m (26 ft-lbs).

㉗ Torque to 2.1 kg-m (15 ft-lbs).



1. Gasket (cylinder / crankcase)
2. Cylinder (P.T.O.)
3. Cylinder (MAG)
4. Cylinder head gasket
5. Cylinder head (P.T.O.)
6. Cylinder head (MAG)
7. Flat washer
8. Support sleeve
9. Nut
10. Distance nut (short)
11. Distance nut (long)
12. Stud
13. Gasket (intake P.T.O.)
14. Gasket (intake MAG)
15. Intake manifold
16. Sealing ring
17. Intake cover
18. Intake cover (new type)
19. Flat washer
20. Lockwasher
21. Nut
22. Gasket
23. Isolating flange
24. Screw
25. Screw
26. Exhaust socket (P.T.O.)
27. Exhaust socket (MAG)
28. Sealing ring
29. Exhaust manifold
30. Piston
31. Gudgeon pin
32. Circlip
33. Ring

TOP END

CLEANING

Discard all gaskets.

Clean all metal components in a non-ferrous metal cleaner.

Scrape off carbon formation from cylinder exhaust port, cylinder head and piston dome using a wooden spatula.

NOTE: The letter "AUS" (over an arrow on the piston dome) must be visible after cleaning.

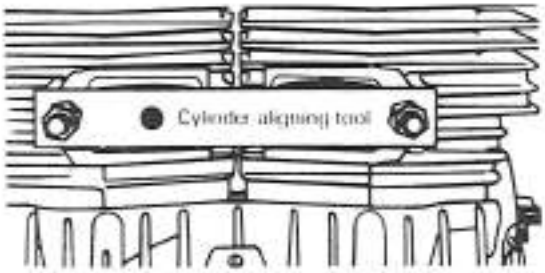
Clean the piston mag grooves with a groove cleaner tool, or with a piece of broken ring.

DISASSEMBLY & ASSEMBLY

NOTE: Refer to technical data for component fitted tolerance and wear limit.

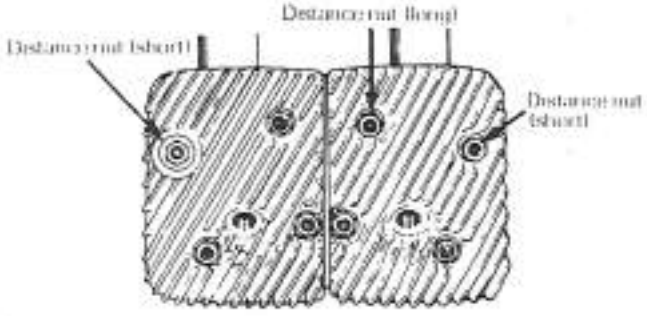
②③⑤⑧ When installing cylinder and / or cylinder head, the cylinder aligning tool must be used to ensure sealing of intake manifold and cylinders. (See Tool Section).

With exhaust manifold and aligning tool installed, you can then cross torque cylinder head nuts to 2.1 kg-m (15 ft-lbs).



⑨⑩⑪ Position nuts and distance nuts as per illustration then cross torque to 2.1 kg-m (15 ft-lbs).

NOTE: Torque each cylinder head individually (exhaust manifold & aligning tool installed).

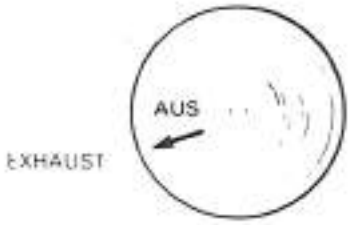


㉑㉔㉕ Apply Loctite Lock'n Seal 242 on threads then torque to 2.1 kg-m (15 ft-lbs).

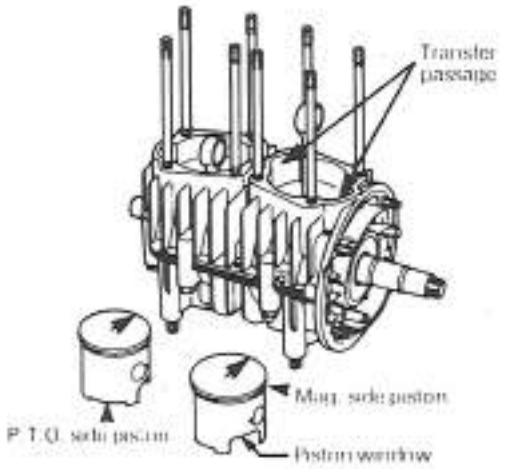
㉖㉗㉘ Place a clean cloth over crankcase to prevent circlip from falling into crankcase. Use a pointed tool to remove circlips from piston.

CAUTION: When tapping out gudgeon pins, hold piston firmly in place to eliminate the possibilities of transmitting shock and pressure to the connecting rod.

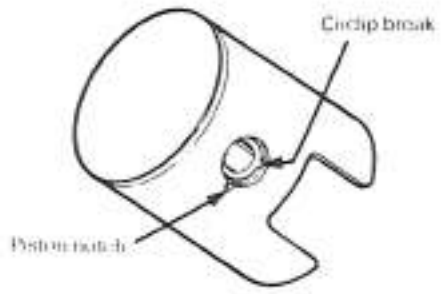
At assembly, place the pistons over the connecting rods with the letters "AUS" (over an arrow on the piston dome) facing in direction of the exhaust port.



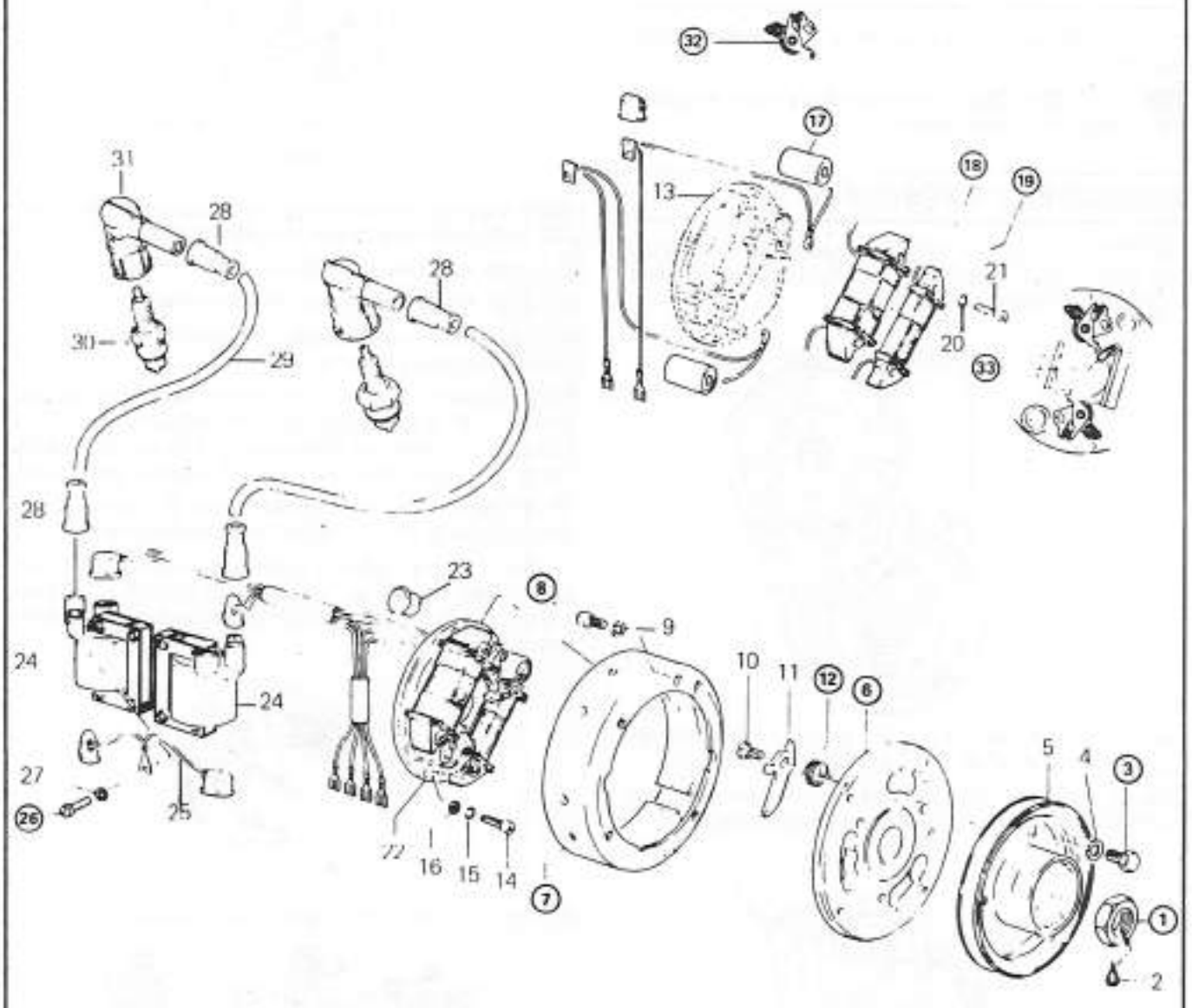
Also make sure that the piston window is aligned with the crankcase transfer passage when the gudgeon pin orifice is in line with the connecting rod bore.



NOTE: Once the circlips are installed turn each circlip so it is not directly on piston notch. Remove any burrs on piston caused through circlip installation with very fine emery cloth.



MAGNETO



1. Magneto nut
2. Loctite Lock'n Seal 242
3. Screw
4. Lockwasher
5. Starting pulley
6. Magneto housing
7. Magneto ring
8. Screw
9. Lockwasher
10. Screw
11. Centrifugal lever
12. Spring
13. Armature plate
14. Screw
15. Lockwasher
16. Flat washer
17. Capacitor
18. Lighting coil
19. Ignition generator coil
20. Washer
21. Screw
22. Armature plate ass'y
23. Wire grommet
24. H.T. coil
25. Ground wire
26. Screw
27. Lockwasher
28. Protector
29. H.T. cable
30. Spark plug
31. Spark plug protector
32. Breaker point set
33. Lubricating wick

MAGNETO

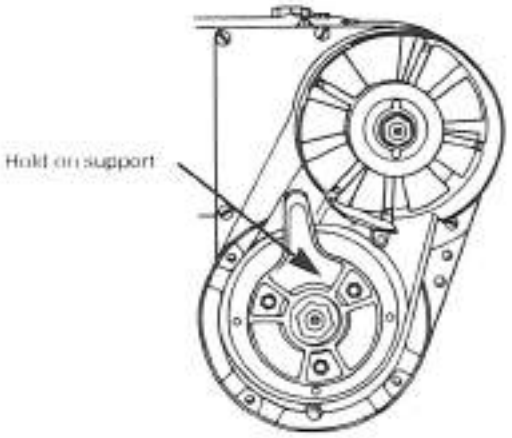
CLEANING

Clean all metal components in a non-ferrous metal cleaner.

CAUTION: Clean armature ass'y and magneto using only a clean cloth.

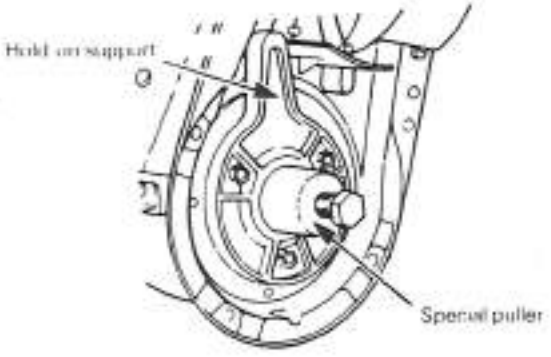
DISASSEMBLY & ASSEMBLY

①⑥⑦To remove or install magneto retaining nut, lock crankshaft in position with special hold-on support as illustrated. (See tool Section).

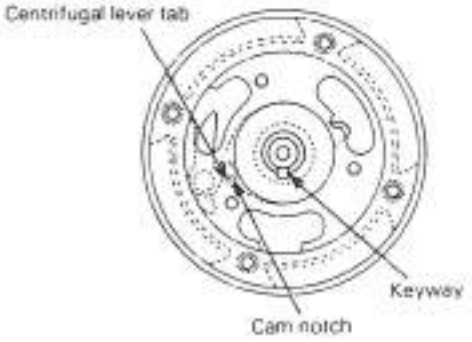


With magneto retaining nut removed and hold-on support in place, install special puller onto support.

Tighten puller bolt and at same time, tap on bolt head using a hammer to release magneto from its taper.



At assembly, clean crankshaft extension (taper) then apply Loctite Lock'n Seal 242 or equivalent, position magneto on crankshaft with the keyway and the cam notch positioned as illustrated.



Install magneto retaining nut (with Loctite Lock'n Seal 242) on threads and torque to 8.3 kg-m (60 ft-lbs).

③ Torque to 2.2 kg-m (16 ft-lbs).

⑧ Apply Loctite Lock'n Seal 242 on threads.

⑫ At assembly apply a small amount of low temperature grease into spring seating.

⑰ To replace a capacitor, it is first necessary to unsolder the two (2) black leads using a soldering iron. The capacitor can then be driven out of the armature plate using a suitable drift. To reinstall, inverse procedure.

⑱⑲Whenever a coil is replaced, the air gap (distance between coil end and magnet) must be adjusted.

To check air gap, insert a feeler gauge of 0.30-0.45 mm (.012"-.018") between magnet and coil ends. If necessary to adjust, slacken coil retaining screws and relocate coil.

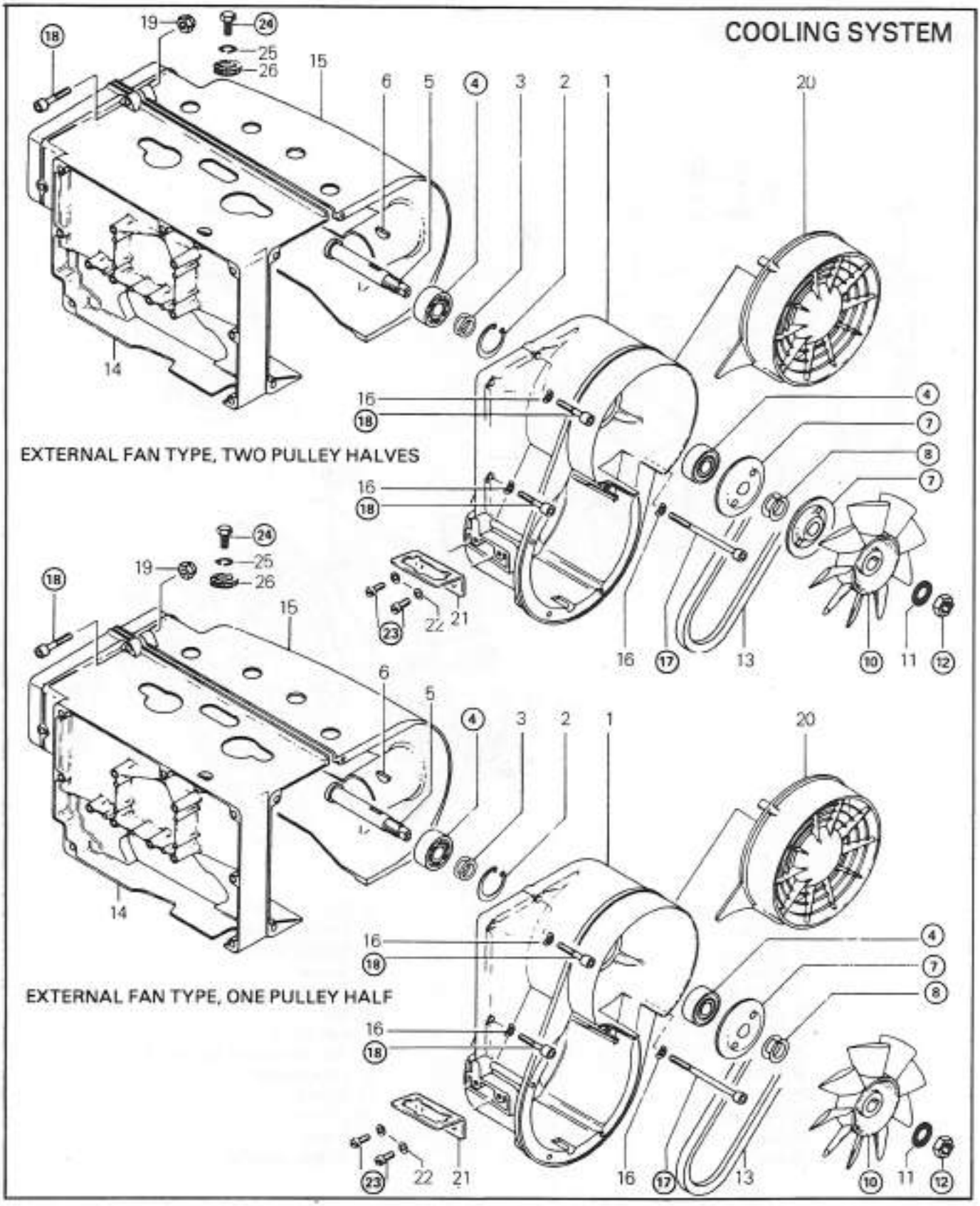
㉖ Apply Loctite Lock'n Seal 242 on threads.

OLD TYPE NEW TYPE

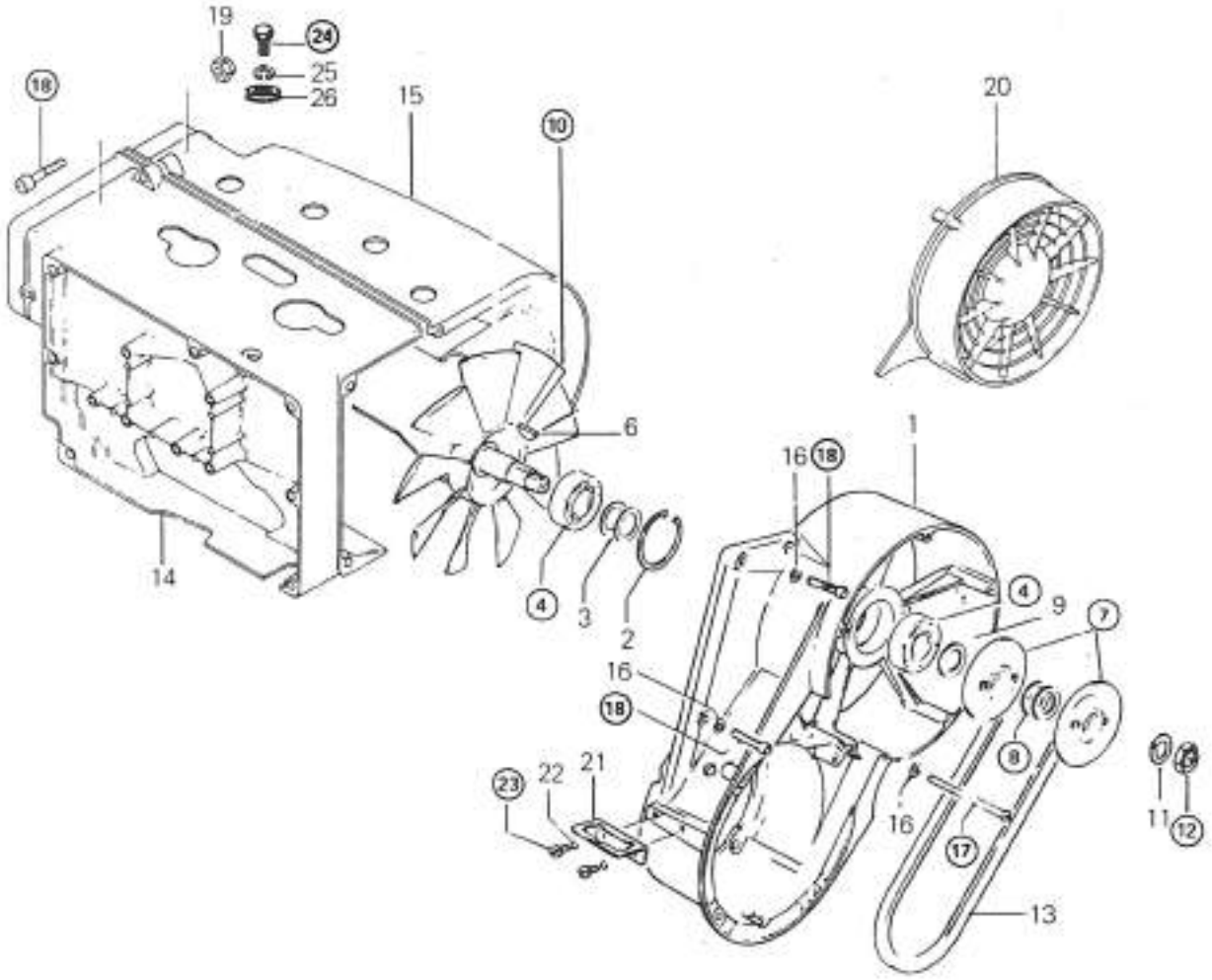
㉜Do not remove pivot pin unless replacement is needed, if removed, reinstall with Loctite Lock'n Seal 242 on threads.

Old type breaker point set can be replaced by new type if pivot pin is removed. When installing new breaker point type it is advisable to fill the pivot pin cavity of the armature plate with Loctite 277 (thick red solution).

㉝When replacing breaker point set, apply a light coat of grease on lubricating wick.


COOLING SYSTEM
EXTERNAL FAN TYPE, TWO PULLEY HALVES
EXTERNAL FAN TYPE, ONE PULLEY HALF

INTERNAL FAN TYPE



1. Fan housing
2. Circlip
3. Shim(s)
4. Bearing
5. Fan shaft
6. Woodruff key
7. Pulley half
8. Shim
9. Shim
10. Fan
11. Washer
12. Nut
13. Belt
14. Fan cowl (intake)
15. Fan cowl (exhaust)
16. Spring washer
17. Screw
18. Screw
19. Nut
20. Fan cover
21. Junction block bracket
22. Lockwasher
23. Screw
24. Screw
25. Lockwasher
26. Rubber washer

COOLING SYSTEM

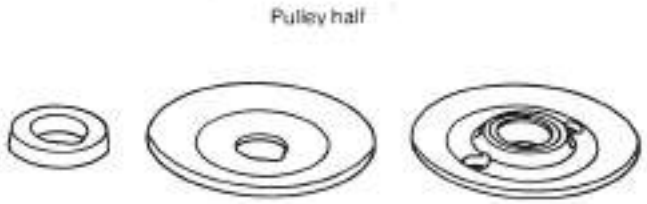
CLEANING

Clean all components in a non-ferrous metal cleaner.

DISASSEMBLY & ASSEMBLY

④ Heat bearing housing to 70° C (160° F) prior to bearing removal or installation.

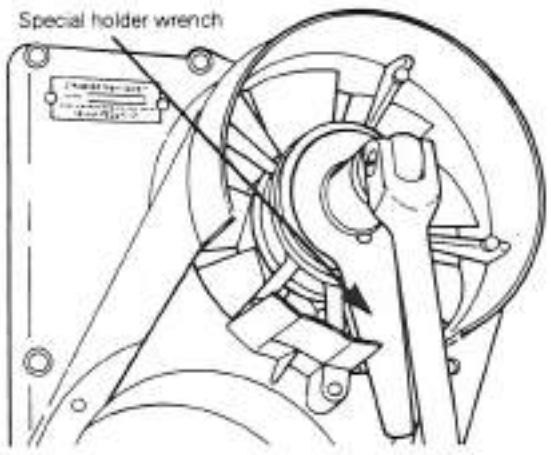
⑦ Newer pulley half does not have a shoulder on its inner face so it is installed with a 6 mm (0.230") spacer.



⑧ Shim(s) located between pulley halves are used to adjust fan belt free-play. Correct free-play is 6 mm (¼ "). If necessary to adjust install or remove shim(s) between pulley halves. Install excess shim(s) between outer pulley half (or fan) and washer of retaining nut.

⑩ There are three types of fan, the first is an internal type, the second and third are external and interchangeable. The second type utilises two pulley halves and the third type utilises one pulley half (the second half being part of the fan itself).

⑫ Lock fan (or pulley half) with special holder wrench to remove or install pulley retaining nut. (See Tool Section).



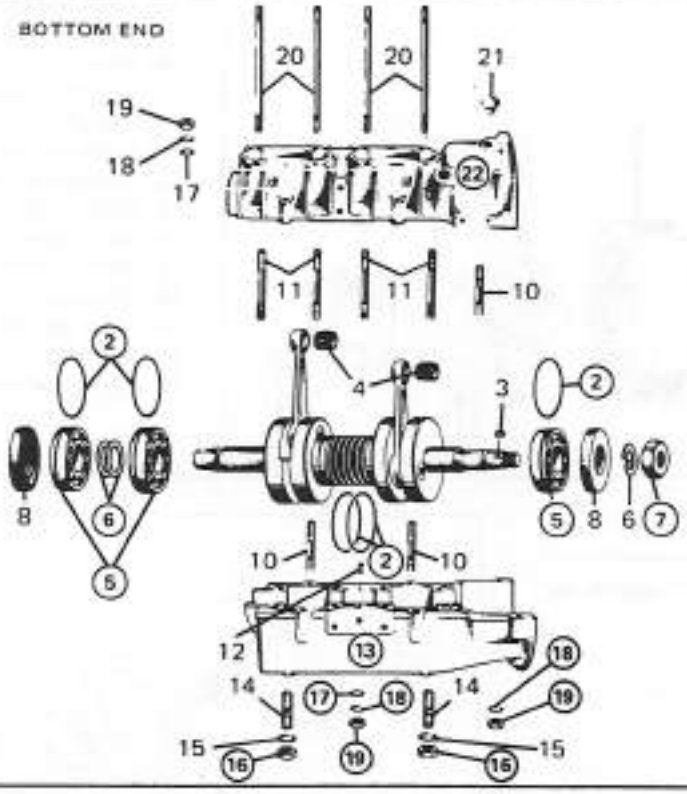
At assembly torque to 6.4 kg-m (46 ft-lbs).

⑰ ⑱ ㉓ Apply Loctite Lock'n Seal 242 on threads.

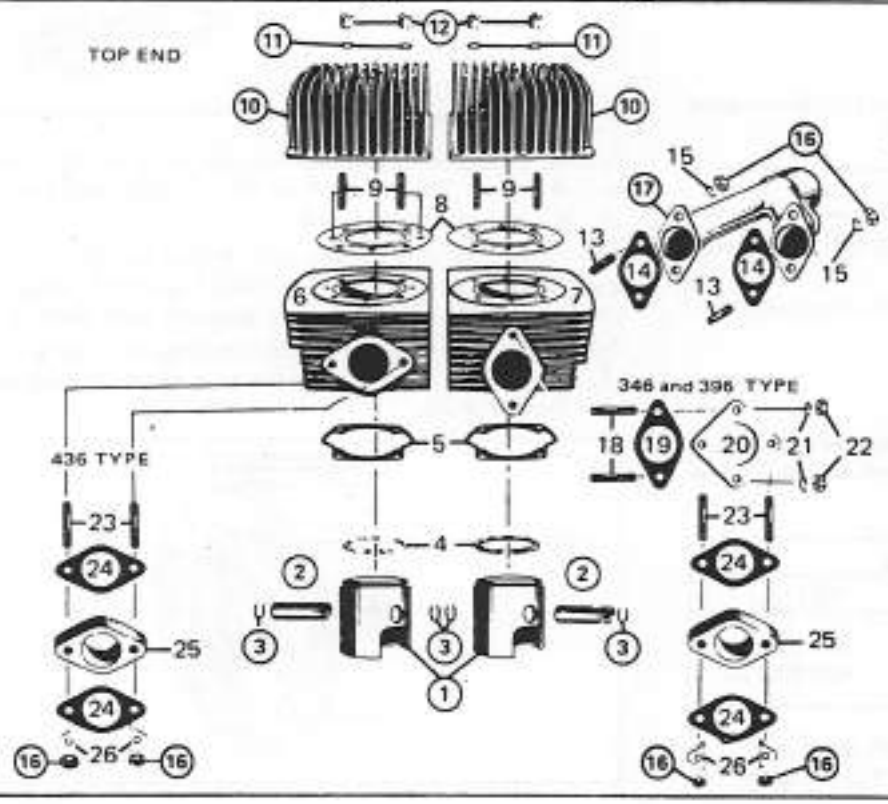
NOTE: It should be noted that to correctly remove a Loctite locked screw, it is first necessary to tap on head of screw to break Loctite bond. This will eliminate the possibility of screw breakage.

㉔ Apply Loctite Lock'n Seal 242 on threads then torque to 1 kg-m (7 ft-lbs).

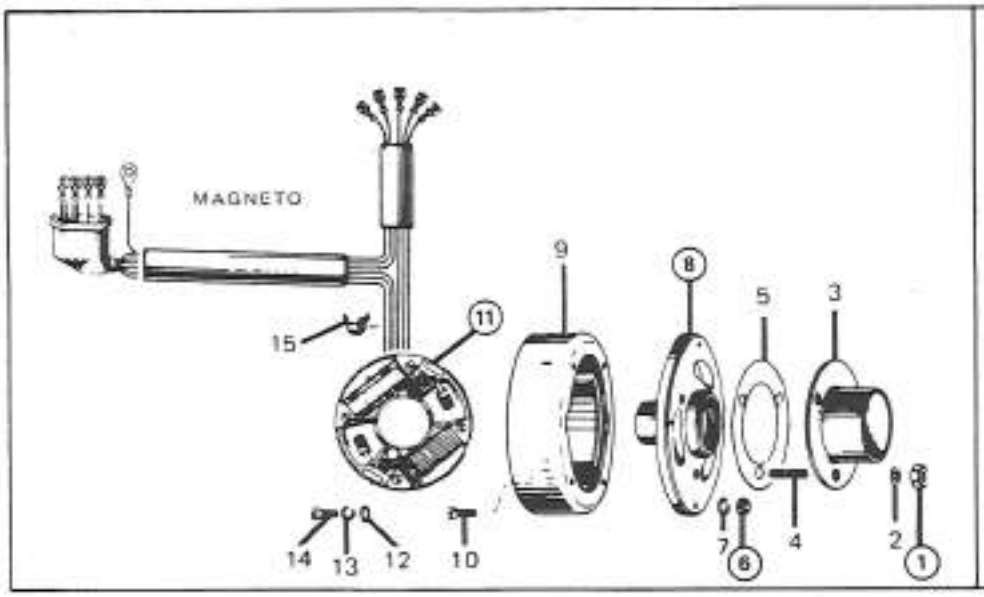
346, 396, 436 ENGINE TYPE



1. Crankshaft
2. "O" ring
3. Woodruff key
4. Needle bearing
5. Ball bearing
6. Lock washer
7. Magneto retaining ring nut
8. Oil seal
9. Shim (1 mm)
10. Stud (6)
11. Stud (8)
12. Dowel pin
13. Crankcase lower half
14. Stud (4)
15. Lock washer (4)
16. Nut (4), M-12
17. Spring washer (12)
18. Lock washer (14)
19. Nut (14)
20. Stud (8)
21. Rubber plug
22. Crankcase upper half



1. Piston
2. Gudgeon pin
3. Circlip
4. Piston ring
5. Cylinder/crankcase gasket
6. Cylinder (P.T.O. side)
7. Cylinder (Mag. side)
8. Cylinder head gasket
9. Cylinder head stud (4 or 8)
10. Cylinder head
11. Plain washer (12 or 16)
12. Cylinder head nut (12 or 16)
13. Exhaust manifold stud (4)
14. Exhaust manifold gasket
15. Lock washer (4)
16. Nut (8)
17. Exhaust manifold
18. Cross flange stud (4)
19. Cross flange gasket (2)
20. Cross flange (2)
21. Lock washer (4)
22. Nut (4)
23. Carburetor stud (4)
24. Flange gasket (4)
25. Isolating flange (2)
26. Lock tab (4)



1. *Nut (3)*
2. *Lock washer (3)*
3. *Starting pulley*
4. *Stud (3)*
5. *Magneto housing cover*
6. *Nut (4)*
7. *Lock washer*
8. *Magneto housing*
9. *Magneto ring*
10. *Allen screw (4)*
11. *Armature plate ass'y*
12. *Flat washer (2)*
13. *Lock washer (2)*
14. *Allen screw (2)*
15. *Rubber grommet*

REMOVAL

Remove or disconnect the following , then lift engine out of vehicle.

- Drive belt
- Muffler
- Rewind starter
- Air silencer
- Choke cable
- Throttle cable
- Fuel lines at carburetor
- Engine mount nuts and washers

Note: Secure fuel line to steering support so that the open ends are located higher than the fuel tank.

DISASSEMBLY & ASSEMBLY

If necessary, removed drive pulley as described in drive pulley section.

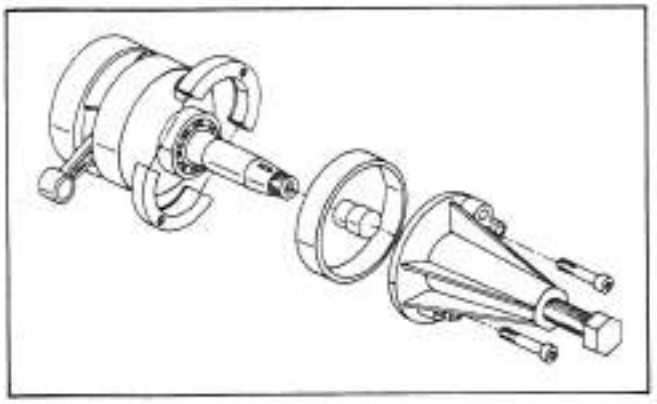
Note: Refer to Technical Data section for component fitted tolerance and wear limit.

Bottom End

②⑤ The "O" ring/ball combination between early and later production engines vary. For correct assembly, refer to the following chart identification.

Ball bearing Groove Depth	"O" Ring	
	Outside Diameter	Part no.
.059" to .063"	2 5/16"	420 830 350
.047" to .051"	2 1/8"	420 830 355

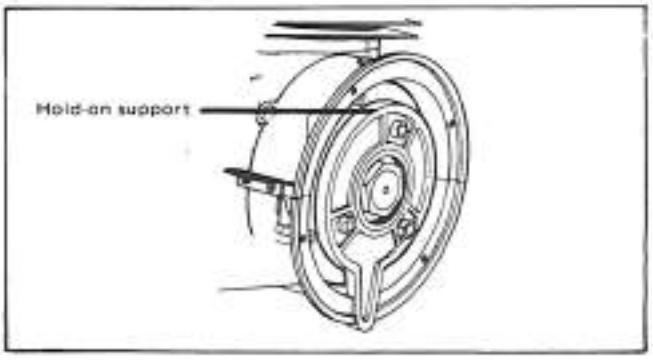
⑤⑨ To remove bearing from crankshaft use a protective cap and special puller, as illustrated. (See Tool Section).



Prior to installation, place bearings into an oil container and heat the oil to 200° F. for 5 to 10 min. (This will expand bearings and ease installation).

Install magneto side bearing with groove outward. Install the P.T.O. side bearings with groove outward. Two (2) .040" shims should be located between each bearing.

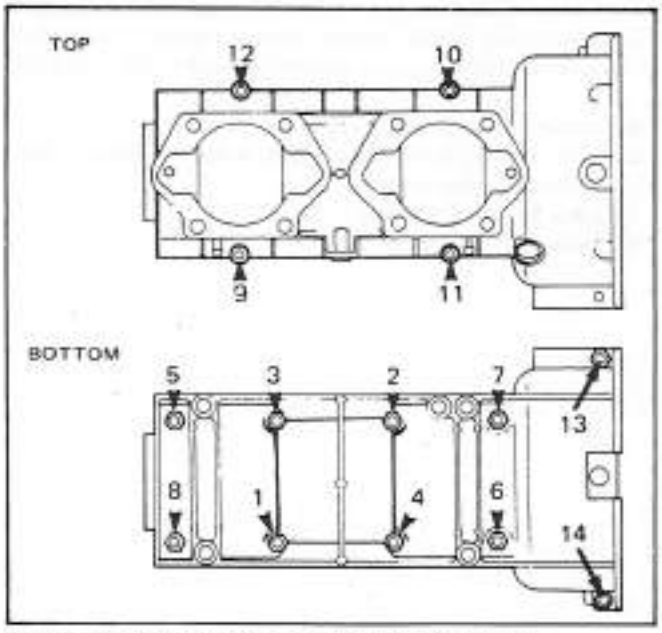
⑦ To remove or install magneto retaining nut, lock crankshaft in position with special hold-on support, as illustrated. (See Tool Section).



At assembly torque magneto retaining nut to 58-62 ft/lbs.

⑬⑰⑱⑲㉒ Prior to joining of crankcase halves, apply a light coat of "Loctite" crankcase sealant to the mating surfaces of the bottom half. Position spring washers, lock washers and nuts on crankcase studs then torque nut to 14-16 ft/lbs. following illustrated sequence.

Note: There is no spring washer on the last two (2) magneto side studs.



⑯ Torque crankcase/support nut to 30-35 ft/lbs.

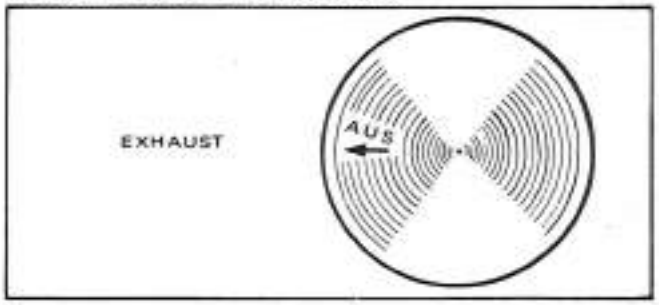
Top End

①②③ Place a clean cloth over crankcase to prevent circlip from falling into crankcase then use a pointed tool to remove circlips from piston.

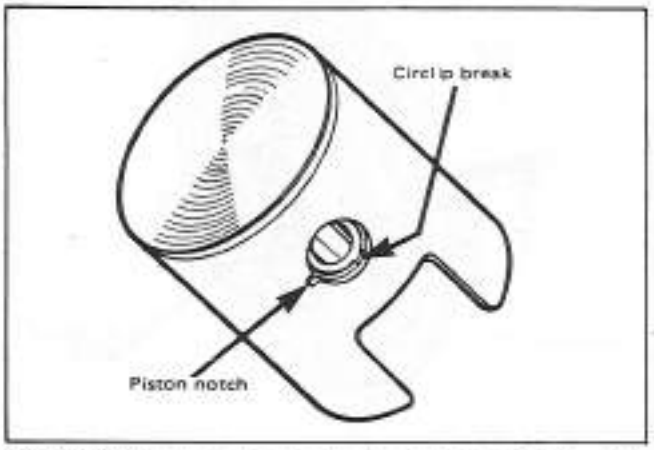
Drive the gudgeon pins in or out using a suitable drive punch and hammer.

Caution: When tapping gudgeon pins in or out of pistons, hold firmly in place to eliminate the possibilities of transmitting shock and pressure to the connecting rod.

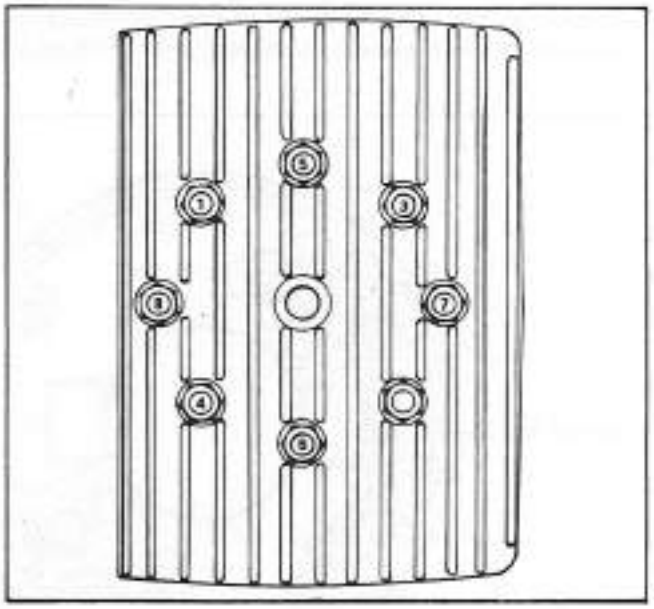
At assembly, place the pistons over the connecting rods with the letters AUS, over an arrow on the piston dome, facing direction of the exhaust port.



Note: Once the circlips are installed, turn each circlip so that the circlip break is not directly in line with piston notch. Using very fine emery cloth, remove any burrs on piston caused through circlip installation.



⑩⑪⑫⑰Torque cylinder head nut to 14-16 ft/lbs. following illustrated sequence.

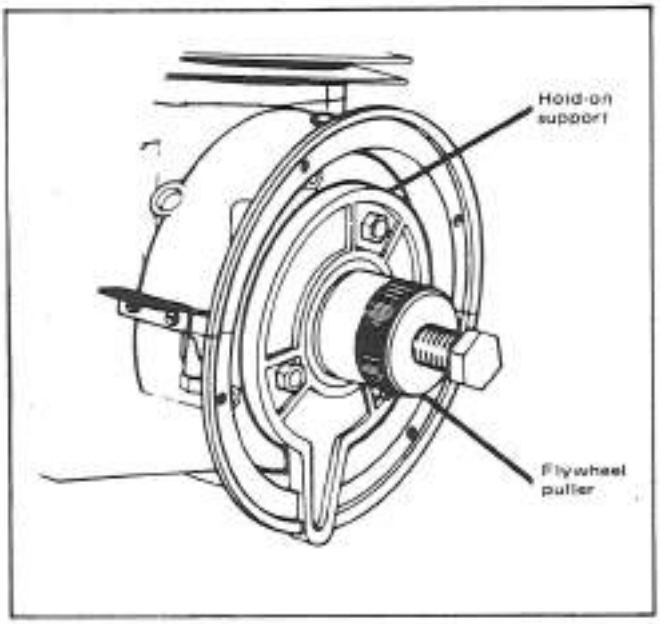


Note: To prevent possible distortion, install exhaust manifold prior to cylinder head tightening.

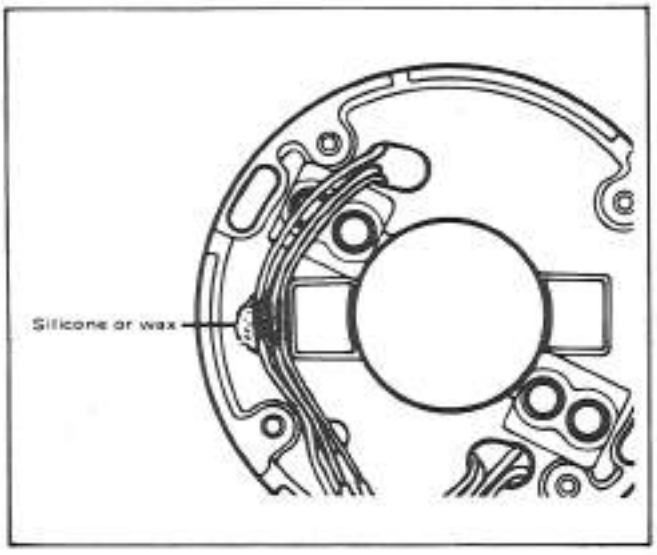
⑯㉒At assembly torque to 14-16 ft/lbs.

Magneto

① At assembly torque to 14-16 ft/lbs.
⑧ At assembly torque to 9 ft/lbs.
⑧ With magneto retaining nut removed and hold-on support in place, install special puller onto hub. Tighten puller nut and at same time, tap on nut head using a hammer to release magneto from its taper. (See Special Tool).



⑪ At assembly, make sure the three (3) bottom wires are positioned as illustrated to prevent squeezing. (A dab of silicon seal or a few drops of candle wax will hold them in place).



CLEANING

Discard all oil seals, gaskets and "O" rings.

Clean all metal components using a non-ferrous metal cleaner.

Caution: Clean armature using only a clean cloth.

Scrape off any carbon formation from cylinder exhaust ports, cylinder heads and piston domes.

Note: The letter AUS over an arrow on the piston dome must be visible after cleaning.

Clean the piston ring grooves with a groove cleaner tool, or using a piece of broken ring.

Remove old sealant from mating surfaces of crankcase with a scraper blade.

Caution: Never use a sharp object to scrape away old sealant as score marks incurred are detrimental to crankcase sealing.

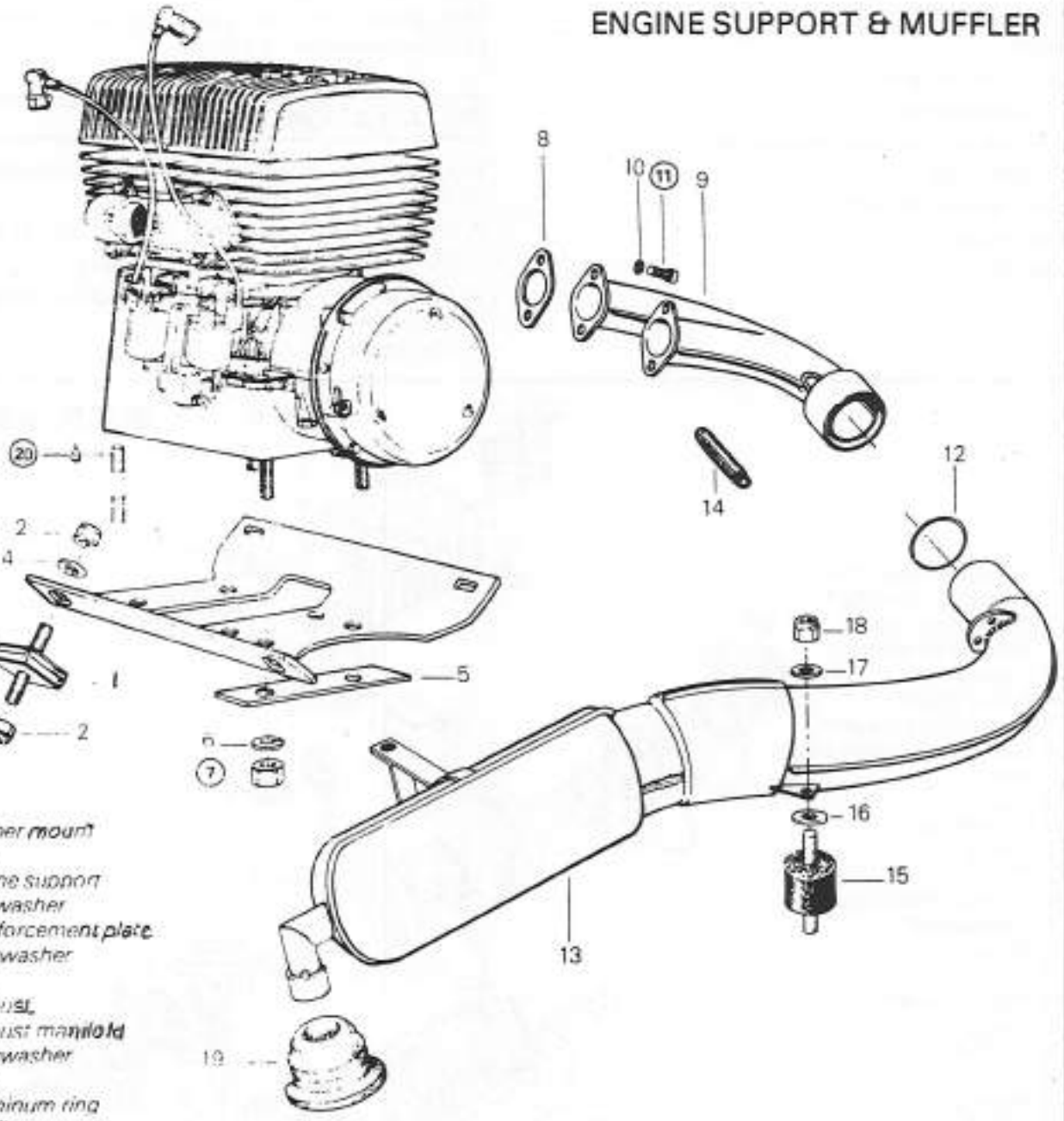
INSTALLATION

To install engine on vehicle inverse removal procedure, however, special attention should be paid to the following:

- Torque engine mount nuts to 25 ft/lbs.
- After throttle cable installation, check maximum throttle opening adjustment.
- Check pulley alignment.
- Check ignition timing.

346, 436 ENGINE TYPE (FROM 1977)

ENGINE SUPPORT & MUFFLER



1. Rubber mount
2. Nut
3. Engine support
4. Flat washer
5. Reinforcement plate
6. Lockwasher
7. Nut
8. Exhaust
9. Exhaust manifold
10. Lockwasher
11. Bolt
12. Aluminum ring
13. Muffler
14. Spring
15. Rubber shear mount
16. Washer
17. Washer
18. Nut
19. Exhaust grommet
20. Stud

REMOVAL FROM VEHICLE

Remove or disconnect the following (if applicable) then lift engine out of vehicle.

- Pulley guard & drive belt.
- Muffler.
- Cab retaining cable.
- Air intake silencer.
- Fuel lines at carburetor, impulse line.
- Throttle cable.
- Electrical junction block.
- Rewind starter.
- Engine mount nuts.

DISASSEMBLY & ASSEMBLY

⑦ Torque to 4.4 kg-m (32 ft-lbs).

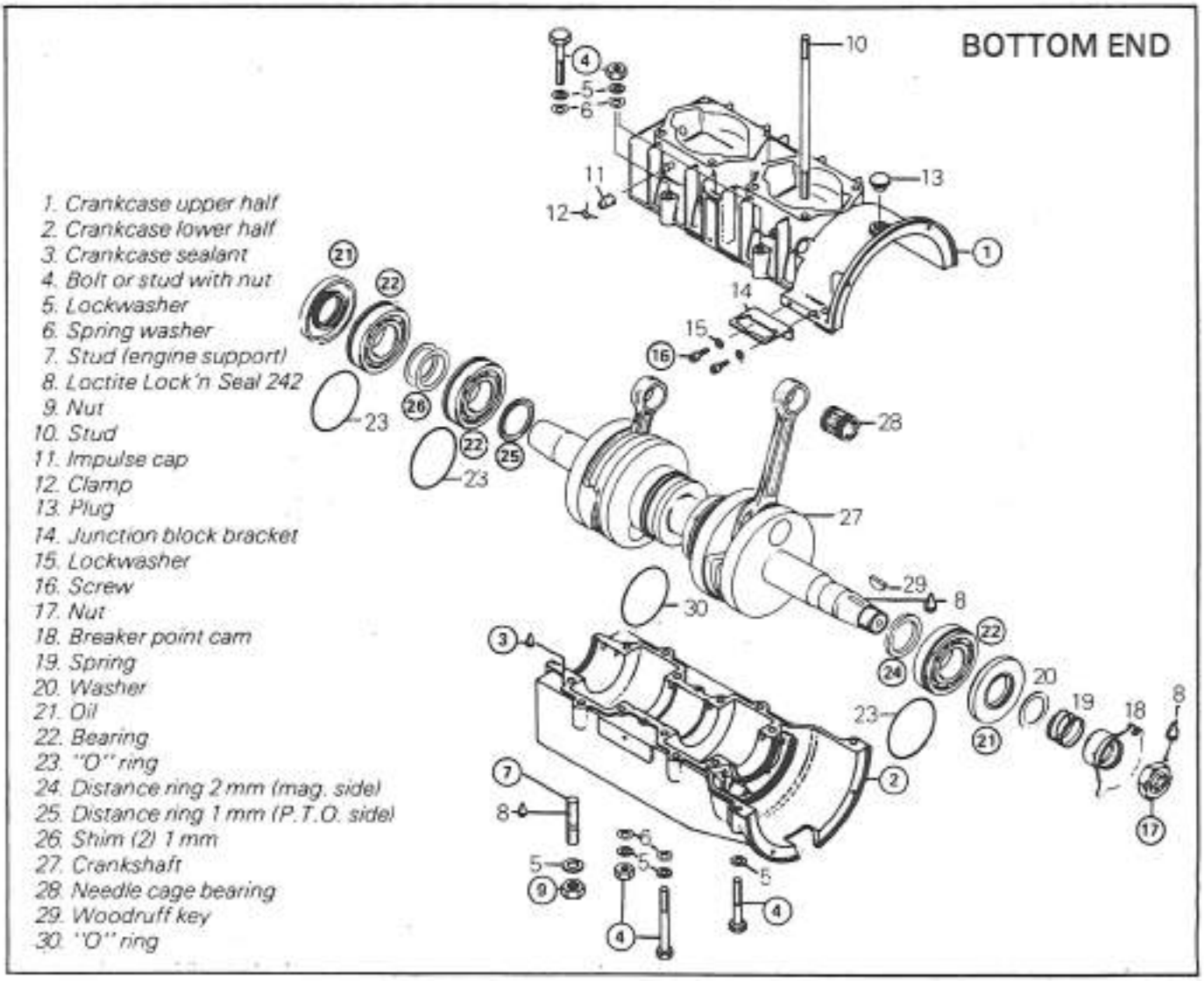
⑪ Torque to 2.1 kg-m (15 ft-lbs).

⑳ At assembly on crankcase, apply Loctite Lock'n Seal 242 or equivalent on threads.

INSTALLATION ON VEHICLE

To install engine on vehicle, inverse removal procedure. However, pay attention to the following:

- Check ignition timing prior to installation in vehicle.
- Check tightness of engine mount nuts.
- After throttle cable installation, check carburetor maximum throttle opening.
- Check pulley alignment.



BOTTOM END

CLEANING

Discard all oil seals, gaskets, "O" rings and sealing rings.

Clean all metal components in a non-ferrous metal cleaner.

Remove old sealant from crankcase mating surfaces with Bombardier sealant stripper.

CAUTION: Never use a sharp object to scrape away old sealant as score marks incurred are detrimental to crankcase sealing.

DISASSEMBLY & ASSEMBLY

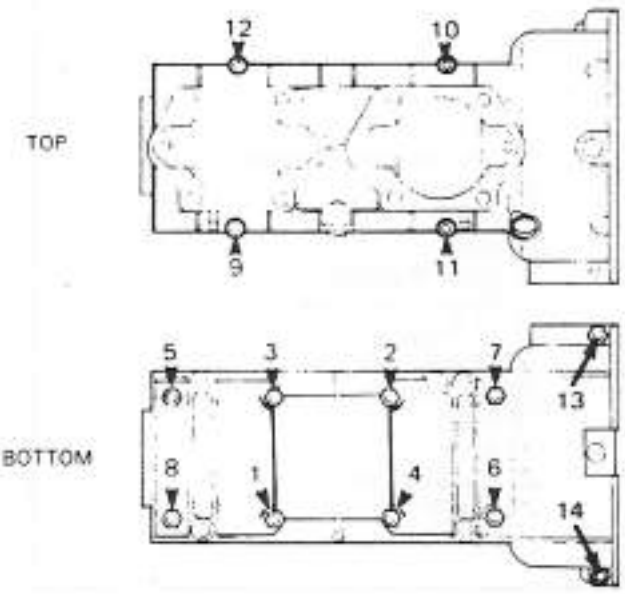
①②③Crankcase halves are factory matched and therefore, are not interchangeable as single halves.

Prior to joining of crankcase halves, prepare mating surfaces with crankcase sealant primer then apply a light coat of crankcase sealant (See tool Section) as per instructions printed on container.

Position the crankcase halves together and tighten nuts (or bolts) by hand then install armature plate (tighten) on magneto side to correctly align the crankcase halves.

Position spring washers, lock washers and nuts or bolts then torque to 2.1 kg-m (15 ft-lbs) following illustrated sequence.

NOTE: There is no spring washer on the last two (2) magneto side studs (no. 1344).



④Torque to 2.1 kg-m (15 ft-lbs).

⑦At assembly on crankcase apply Loctite Lock'n Seal 242 or equivalent on threads.

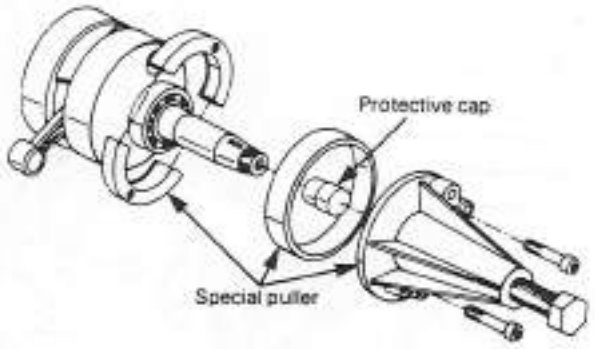
⑨ Torque to 4.4 kg-m (32 ft-lbs).

⑯ Apply Loctite Lock'n Seal 242 or equivalent on threads.

⑰ Apply Loctite Lock'n Seal on threads then torque to 8.3 kg-m (60 ft-lbs).

㉑ At assembly apply a light coat of lithium grease on seal lips then position oil seal with outer surface flush with crankcase.

㉒㉔㉕㉖To remove bearing from crankshaft use a protective cap and special puller, as illustrated. (See Tool Section).

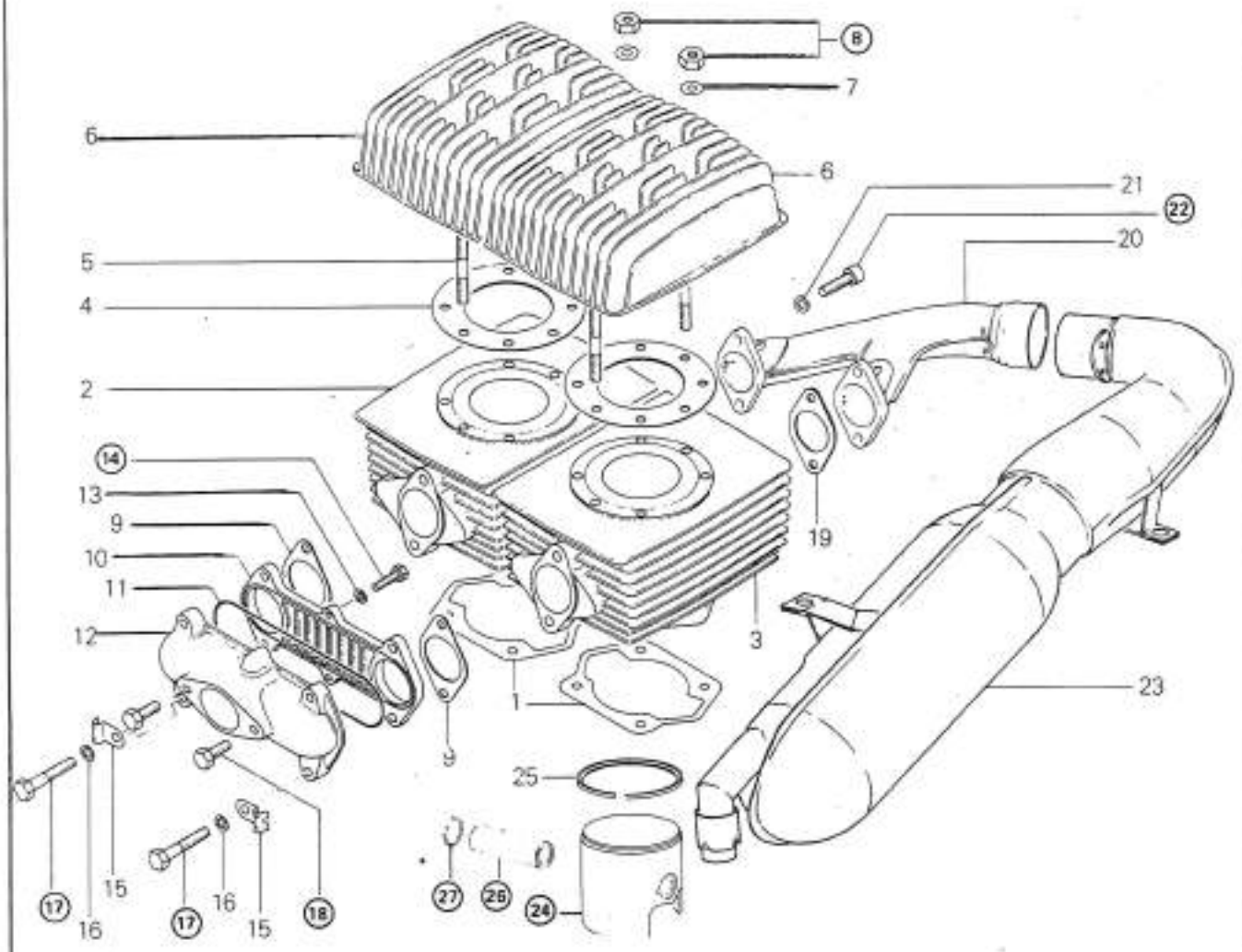


Prior to installation, place bearings into an oil container and heat the oil to 100° C (210° F) for 10 min. This will expand bearings and ease installation.

Before installation of bearing, slide the appropriate distance ring on crankshaft then install bearings with groove outward.

On P.T.O. side position two (2) 1 mm (.040") thick shims between the two bearings.

TOP END



1. Gasket (crankcase / cylinder)
2. Cylinder (P.T.O.)
3. Cylinder (mag.)
4. Cylinder head gasket
5. Stud
6. Cylinder head
7. Flat washer
8. Nut
9. Gasket (intake / cylinder)
10. Intake cover
11. Gasket
12. Intake manifold
13. Lockwasher
14. Screw
15. Ignition cable bracket
16. Lockwasher
17. Bolt
18. Bolt
19. Exhaust gasket
20. Exhaust manifold
21. Lockwasher
22. Screw
23. Muffler
24. Piston
25. Ring
26. Gudgeon pin
27. Circlip

TOP END

CLEANING

Discard all gaskets.

Clean all metal components in a non-ferrous metal cleaner.

Scrape off carbon formation from cylinder exhaust port, cylinder head and piston dome using a wooden spatula.

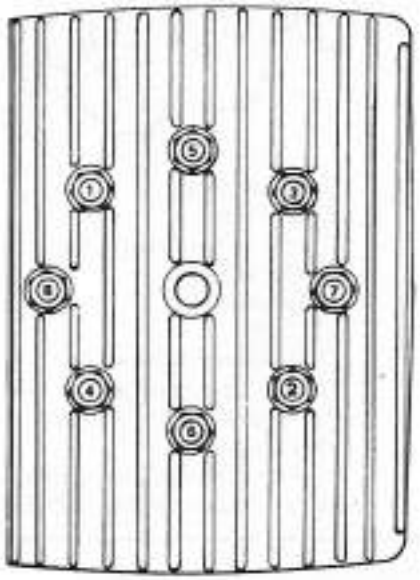
NOTE: The letter "AUS" (over an arrow on the piston dome) must be visible after cleaning.

Clean the piston ring grooves with a groove cleaner tool, or with a piece of broken ring.

DISASSEMBLY ; ASSEMBLY

NOTE: Refer to Technical Data for component fitted tolerance and wear limit.

⑧⑫ Torque to 2.1 kg-m (15 ft-lbs) following illustrated sequence for cylinder head nuts.



NOTE: To prevent leakage, install exhaust manifold prior to cylinder head tightening.

⑭ Torque to 1.4 kg-m (10 ft-lbs).

⑰ Torque to 2.1 kg-m (15 ft-lbs).

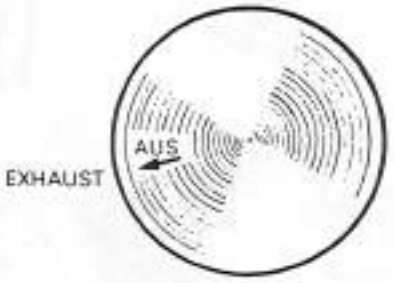
⑱ Torque to 0.5 kg-m (4 ft-lbs).

㉔㉖㉗ Place a clean cloth over crankcase to prevent circlips from falling into crankcase then use a pointed tool to remove circlips from piston.

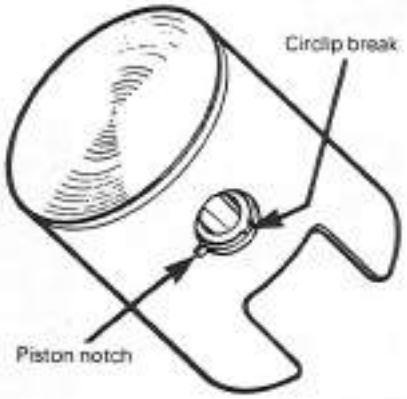
Drive the gudgeon pins in or out using a suitable drive punch and hammer.

CAUTION: When tapping gudgeon pin in or out of piston, hold piston firmly in place to eliminate the possibilities of transmitting shock and pressure to the connecting rod.

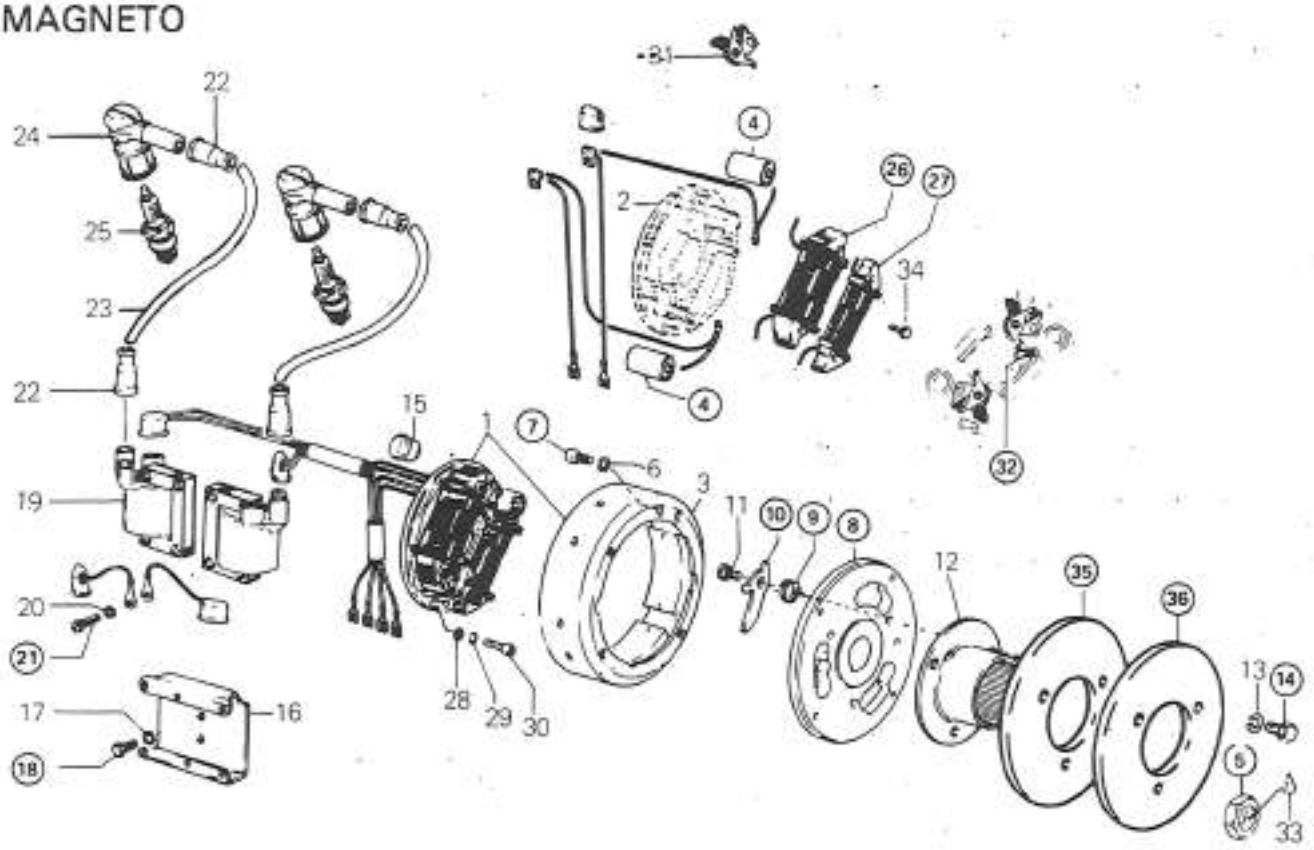
At assembly, place the pistons over the connecting rods with the letters AUS (over an arrow on the piston dome) facing direction of the exhaust port.



Once the circlips are installed, turn each circlip so that the circlip break is not directly in line with piston notch. Using very fine emery cloth, remove any burrs on piston caused through circlip installation.



MAGNETO



1. Armature ass'y
2. Armature plate
3. Magneto ring
4. Capacitor
5. Magneto retaining nut
6. Lockwasher
7. Screw
8. Magneto housing
9. Spring
10. Centrifugal weight
11. Screw
12. Starting pulley
13. Lockwasher
14. Screw
15. Wire grommet
16. Coils bracket
17. Lockwasher
18. Screw
19. Coil
20. Lockwasher
21. Screw
22. Protection cap
23. H.T. cable
24. Spark plug protector
25. Spark plug
26. Lighting coil
27. Ignition generator coil
28. Flat washer
29. Lockwasher
30. Screw
31. Breaker point set
32. Lubricating wick
33. Loctite Lock'n Seal 242
34. Screw
35. Vibration damper (436 only)
36. Vibration damper (436 only)

CLEANING

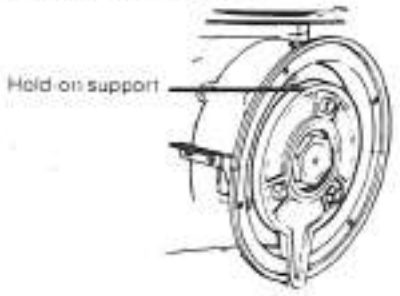
Clean all metal components in a non-ferrous metal cleaner.

CAUTION: Clean armature and magneto using only a clean cloth.

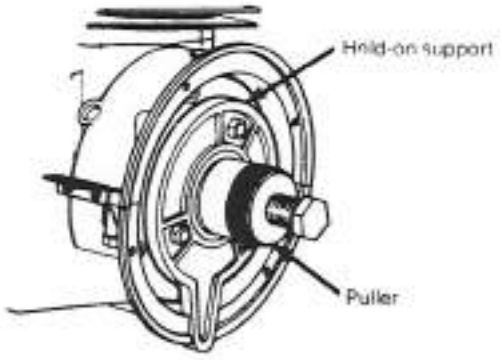
DISASSEMBLY & ASSEMBLY

④ To replace a capacitor, it is first necessary to unsolder the two (2) black leads. The capacitor can then be driven out of the armature plate using a suitable drift and hammer. To reinstall, inverse procedure.

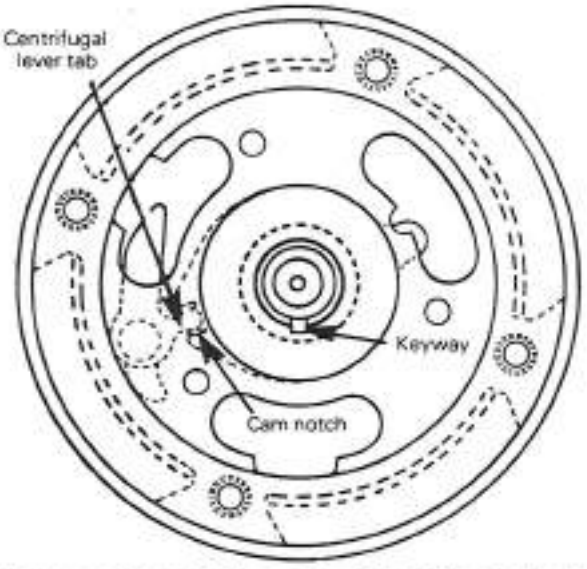
⑤ ⑧ To remove or install magneto retaining nut, lock crankshaft in position with special hold-on support, as illustrated. (See Tool Section).



With magneto retaining nut removed and hold-on support in place, install special puller onto hub. Tighten puller bolt and at same time, tap on bolt head using a hammer to release magneto from its taper.



At assembly, clean crankshaft extension (taper) then apply Loctite Lock'n Seal 242 or equivalent, position magneto on crankshaft with the keyway and the cam notch positioned as illustrated.



Install magneto retaining nut (with Loctite Lock'n Seal 242 on threads) and torque to 8.3 kg-m (60 ft-lbs).

⑦ Apply Loctite Lock'n Seal 242 or equivalent on threads.

⑨ ⑩ At assembly, apply a small amount of low temperature grease into spring seating.

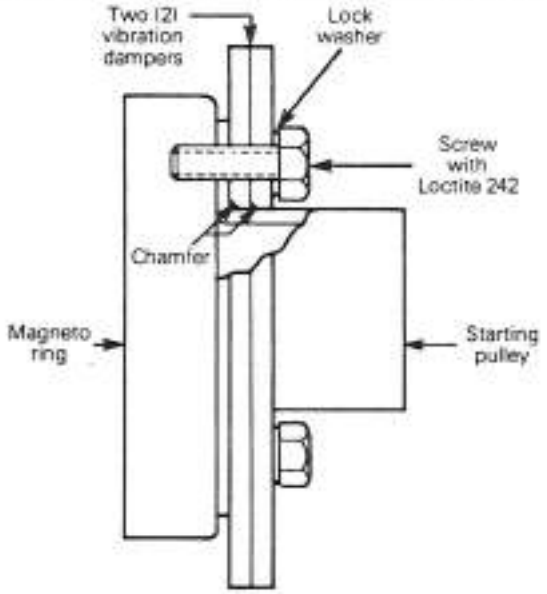
⑱ ㉑ Apply Loctite Lock'n Seal 242 or equivalent on threads.

㉖ ㉗ Whenever a coil is replaced, the air gap (distance between coil end and magnet) must be adjusted.

To check air gap, insert a feeler gauge of 0.30-0.45 mm (.012"-.018") between magnet and coil ends. If necessary to adjust, slacken coil retaining screws and relocate coil.

㉜ When replacing breaker point set, apply a small amount of grease on lubricating wick.

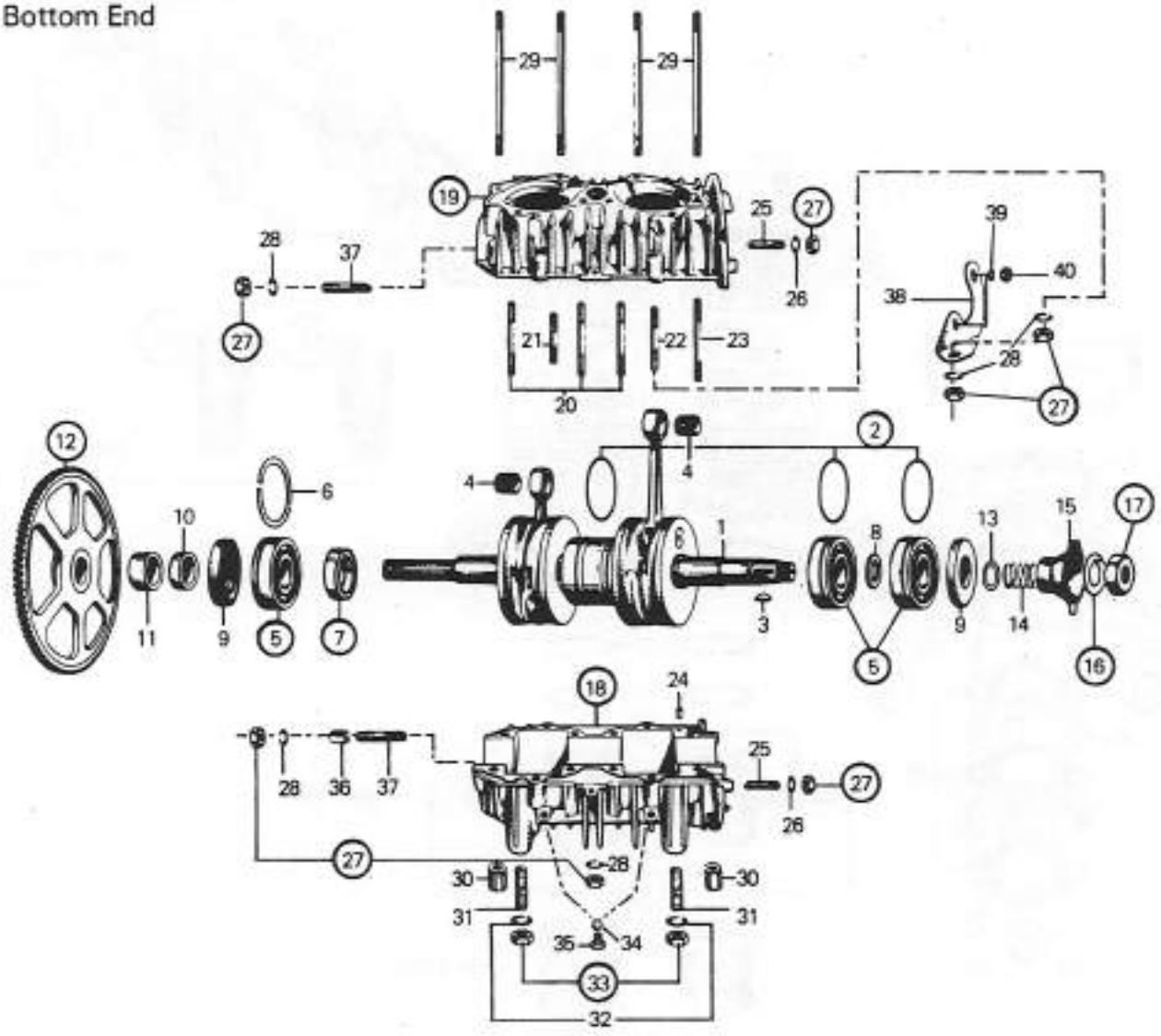
㉝ ㉘ ⑭ Install vibration dampers as per illustration.



Apply Loctite Lock'n Seal 242 or equivalent on threads then torque to 2.1 kg-m (15 ft-lbs).

434, 440 ENGINE TYPE

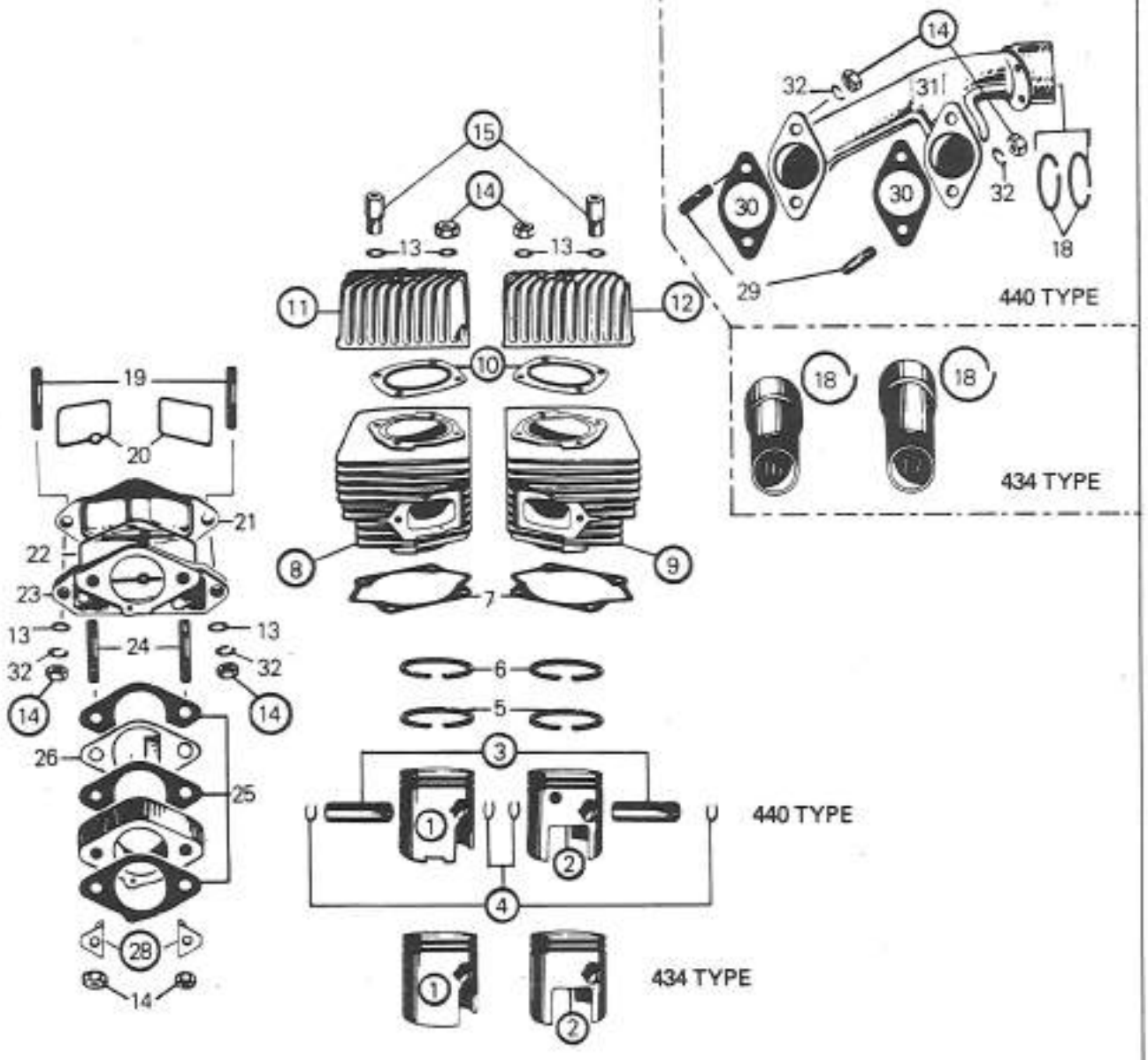
Bottom End



1. *Crankshaft*
2. *"O" ring (5)*
3. *Woodruff key*
4. *Needle bearing*
5. *Ball bearing*
6. *Retaining ring*
7. *Distance ring*
8. *Spacer*
9. *Oil seal*
10. *Distance sleeve*
11. *Distance sleeve*
12. *Starter ring gear*
13. **Washer*
14. **Spring*
15. **Breaker point cam*
16. *Tab washer*
17. *Magneto retaining nut*
18. *Lower crankcase half*
19. *Upper crankcase half*
20. *Crankcase stud (6)*
21. *Crankcase stud*
22. *Crankcase stud*
23. *Crankcase stud*
24. *Dowel pin*
25. *Fan housing stud (4)*
26. *Lock washer (4)*
27. *Nut*
28. *Lock washer*
29. *Cylinder stud (8)*
30. *Distance sleeve (4)*
31. *Engine bracket stud (4)*
32. *Lock washer (4)*
33. *Nut (4)*
34. *Sealing ring*
35. *Crankcase drain plug*
36. *Dowel tube*
37. *Starter stud (2)*
38. *Starter bracket*
39. *Washer (2)*
40. *Nut (2)*

**Not installed on engine equipped with a C.D. ignition system.*

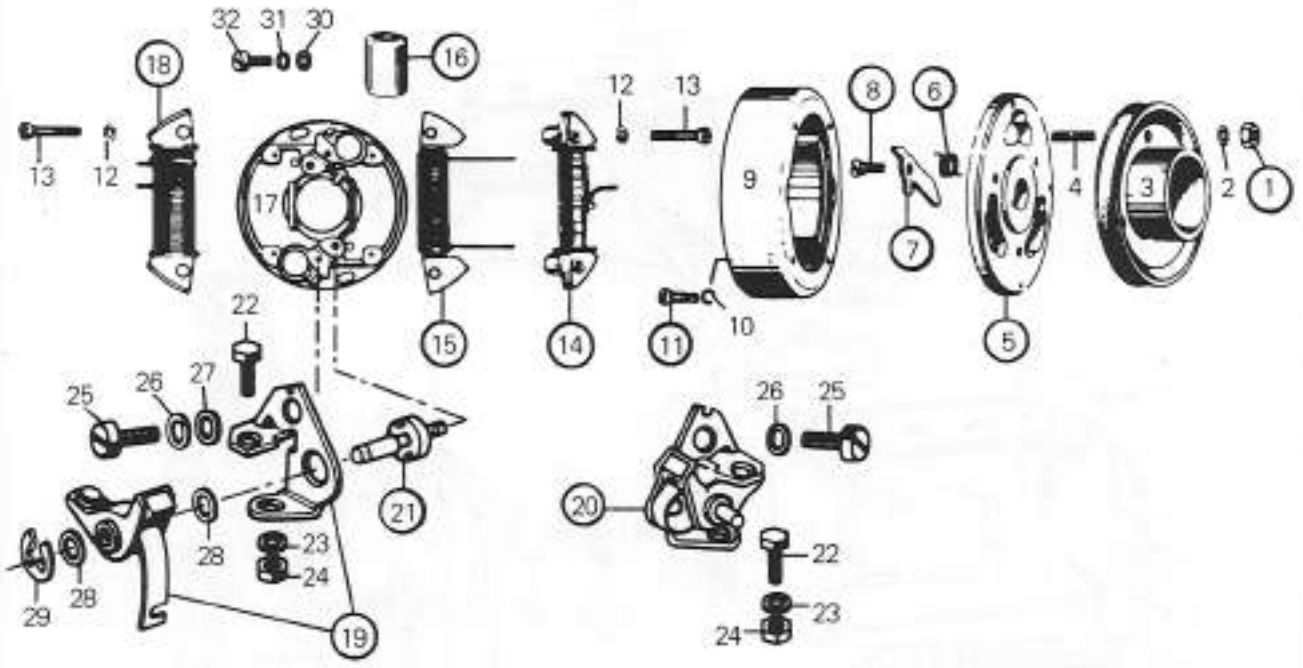
Top End



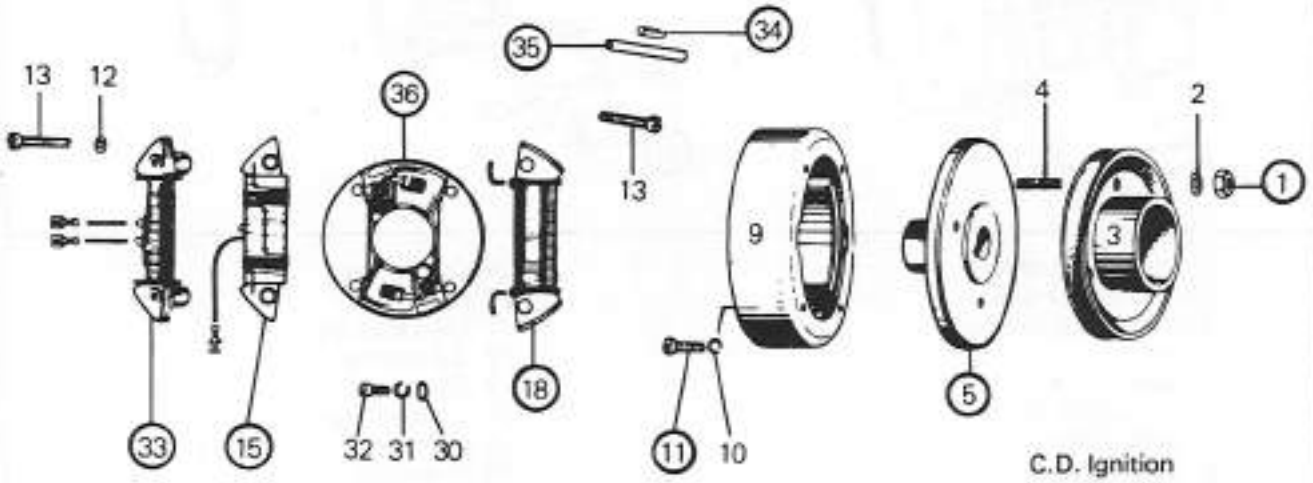
1. Piston (P.T.O. side)
2. Piston (Mag. Side)
3. Gudgeon pin
4. Circlip
5. Rectangular ring
6. "L"-Trapez or rectangular ring
7. Cylinder gasket
8. Cylinder (P.T.O. side)
9. Cylinder (Mag. side)
10. Cylinder head gasket
11. Cylinder head (P.T.O. side)
12. Cylinder head (Mag. side)
13. Flat washer (10)
14. Nut (14)
15. Distance nut
16. Exhaust socket (P.T.O. side-short)
17. Exhaust socket (Mag. side -long)
18. Asbestos string
19. Intake manifold stud
20. Intake manifold ring gasket
21. Intake manifold
22. Manifold cover ring gasket
23. Intake manifold cover
24. Carburetor stud
25. Flange gasket
*26. Intake deflector
27. Isolating flange
28. Tab washer
29. Exhaust manifold stud (4)
30. Exhaust manifold gasket
31. Exhaust manifold
32. Lock washer

*Applicable on 440 type only.

Magneto



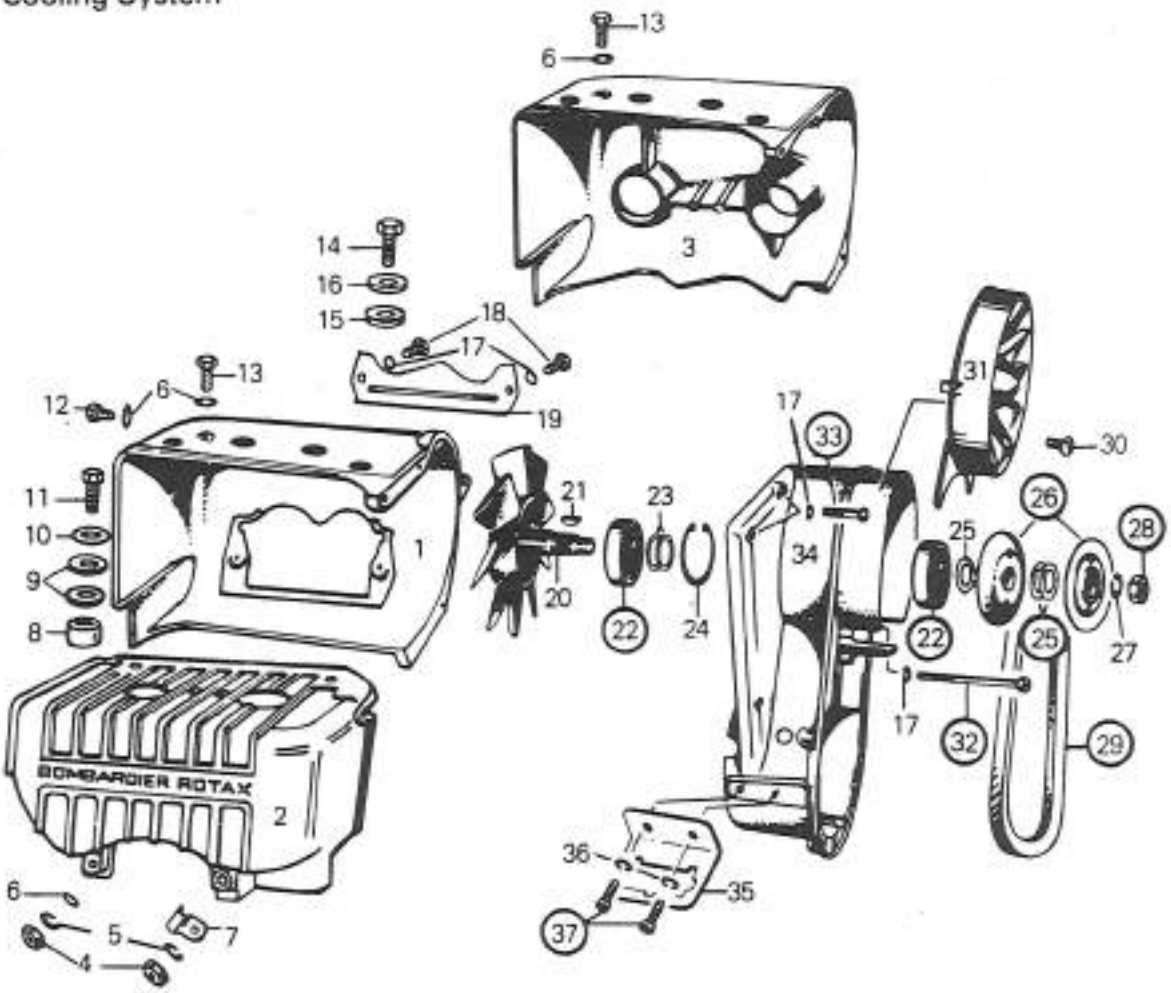
Breaker Point type Ignition



C.D. Ignition

1. Nut (3)
2. Lock washer (3)
3. Fan belt pulley
4. Stud (3)
5. Magneto housing
6. Spring
7. Centrifugal lever
8. Bearing screw
9. Magneto ring
10. Lock washer (4)
11. Allen screw (4)
12. Lock washer
13. Coil retaining screw
14. Brake light coil (23W)
15. Ignition generator coil
16. Capacitor (2)
17. Armature plate
18. Lighting coil (75W, 100W or 110W)
19. Breaker point set
20. Breaker point (unit construction)
21. Pivot pin
22. Bolt
23. Lock washer
24. Nut
25. Screw
26. Lock washer
27. Plain washer
28. Washer
29. Retaining clip
30. Washer (2)
31. Lock washer
32. Allen screw
33. Additional lighting coil (30W)
34. Cable connector
35. Insulating sleeve
36. Armature plate ass'y

Cooling System



1. Cowl (Exhaust side)
2. Cowl (Intake side)
3. Cowl (434 type only)
4. Nut
5. Lock washer
6. Flat washer (3)
7. Cable clamp
8. Spacer (2)
9. Flat washer (3)
10. Lock washer (2)
11. Front cowl retaining bolt (2)
12. Rear cowl retaining bolt
13. Rear cowl retaining bolt (short)
14. Rear cowl retaining bolt (long)
15. Rubber washer
16. Flat washer
17. Spring washer
18. Cover retaining screw
19. Cowl cover
20. Fan
21. Woodruff key
22. Ball bearing
23. Spacer
24. Locking ring
25. Shim (5)
26. Pulley half
27. Lock washer
28. Fan retaining nut
29. Fan belt
30. Protector retaining screw (3)
31. Fan protector
32. Screw
33. Flat head screw
34. Fan housing
35. Junction block bracket
36. Lock washer
37. Screw

REMOVAL

Remove or disconnect the following (if applicable) then lift engine out of vehicle.

- Drive belt.
- Muffler.

Note: On rear-mounted engine vehicle, the muffler and associated components are accessible through an access panel located under the seat rest.

- Cab retaining cable.
- Air silencer.
- Choke cable or primer line at carburetor.
- Throttle cable.
- Fuel lines at carburetor.

Warning: Secure fuel lines so that the opened ends are higher than the fuel tank.

- Electrical connections.

Caution: On electric start model, disconnect negative cable (ground) from battery **before** disconnecting other wires.

- Engine mount nuts.

DISASSEMBLY & ASSEMBLY

General

Refer to Technical data Section for component fitted tolerance and wear limit. If necessary, refer to Drive Pulley Section for pulley removal.

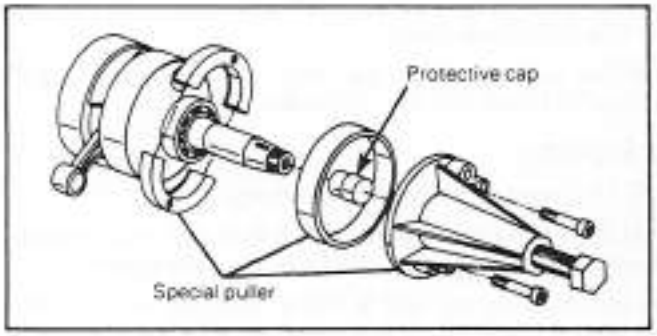
Bottom End

② The outside diameter of the "O" rings installed on engine type 440, vary.

The two magneto side bearings and the center bearing are fitted with small "O" rings (2 1/8" O.D.) while the two labyrinth seals are fitted with large "O" rings (2 5/16" O.D.).

On 434 engine type, only large "O" rings (2 5/16" O.D.) are installed.

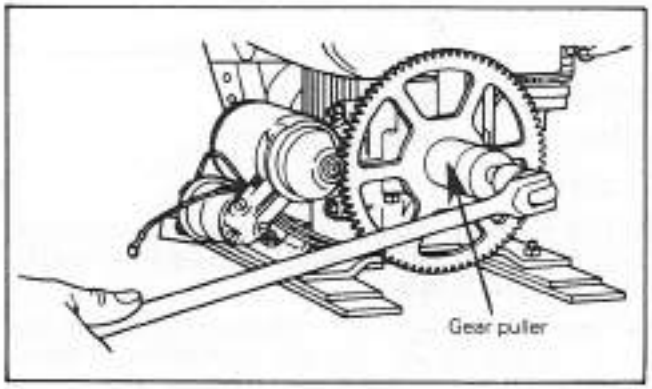
⑥ To remove bearing from crankshaft, use a protective cap and special puller, as illustrated. (See Tool Section).



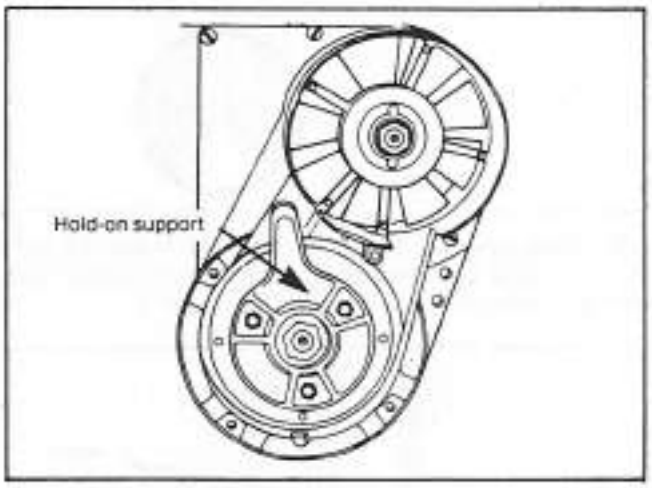
Prior to installation, place bearings into an oil container and heat the oil to 200° F. for 5 to 10 min. This will expand bearing and ease installation. Install bearings with groove outward.

⑦ A distance ring replaces the crankshaft shoulder on type 440 engine, starting from vehicle serial no. 2,749,845.

⑫ To remove starter gear from crankshaft it may be necessary to use a special puller as illustrated (See Tool Section).



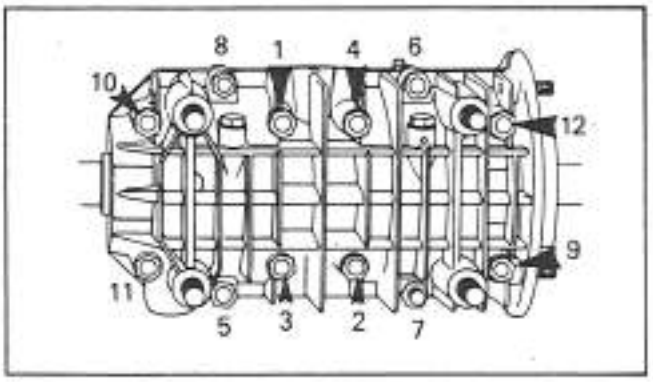
⑯⑰ To remove or install magneto retaining nut, lock crankshaft in position with special hold-on support as illustrated. (See Tool Section).



At assembly, torque retaining nut to 50-58 ft-lbs on 434 type, and to 58-63 ft-lbs on 440 type.

Note: The tab washer located between magneto and retaining nut on late production 440 engine type has been cancelled. Therefore, at assembly apply a light coat of Loctite "Lock'n Seal" on magneto retaining nut threads.

⑱⑲ Prior to joining of crankcase halves, apply a light coat of "Loctite" crankcase sealant to the mating surfaces of the bottom half. Position spring washers and nuts on crankcase studs then torque nuts to 14-16 ft-lbs., following illustrated sequence.



㉗ At assembly, torque to 14-16 ft-lbs.

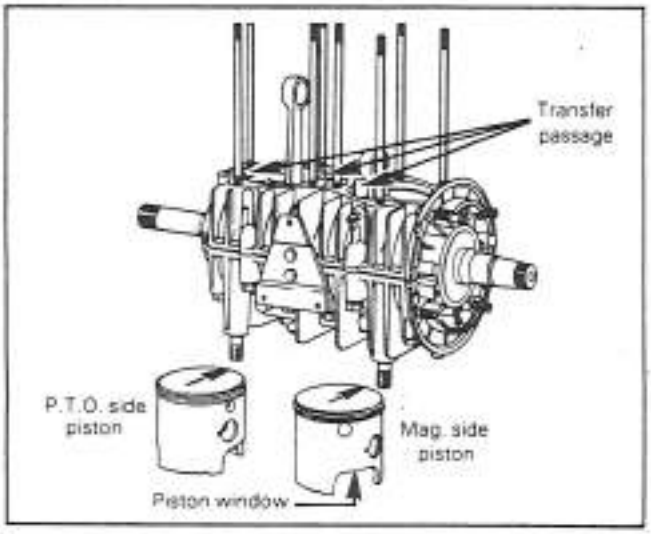
㉝ At assembly, torque to 29-35 ft-lbs.

Top End

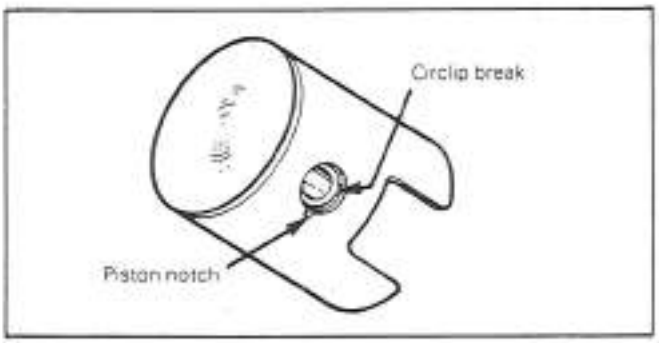
①②③④ Place a clean cloth over crankcase to prevent circlip from falling into crankcase. Use a pointed tool to remove circlips from piston.

Caution: When tapping out gudgeon pins, hold piston firmly in place to eliminate the possibilities of transmitting shock and pressure to the connecting rod.
At assembly, place the pistons over the connecting rods with the letters "AUS", over an arrow on the piston dome, facing in direction of the exhaust port.

Also make sure that the piston window is aligned with the crankcase transfer passage when the gudgeon pin orifice is in-line with the connecting rod bore.



Note: Once the circlips are installed, turn each circlips so it is not directly on piston notch. Remove any burrs on piston caused through circlip installation using very fine emery cloth.

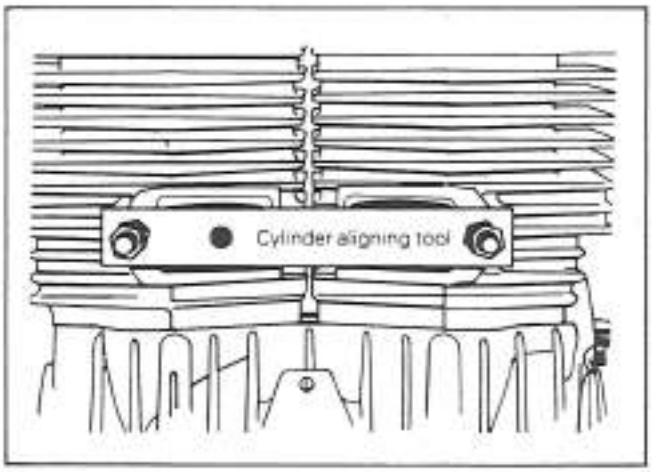


⑧⑨⑩⑪⑫ When installing cylinder and / or cylinder head, the cylinder aligning tool must be used to ensure sealing of intake manifold and cylinders. (See Tool Section).

Install exhaust manifold on cylinder then install aligning bar and torque distance nut to 14-16 ft-lbs.

Cross torque cylinder head nuts to 14-16 ft-lbs.

Note: Torque each head individually.



⑭⑮ At assembly, torque to 14-16 ft-lbs.

㉕ At assembly, position deflector with tap toward inside on magneto side.

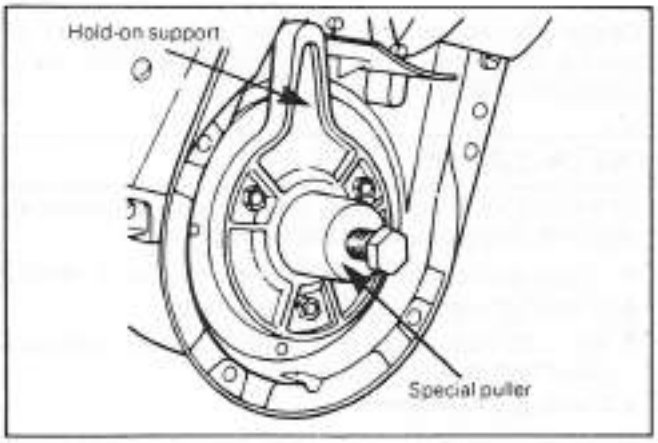
㉘ Tab washer should be replaced if bent more than three (3) times. If in doubt, replace.

Magneto

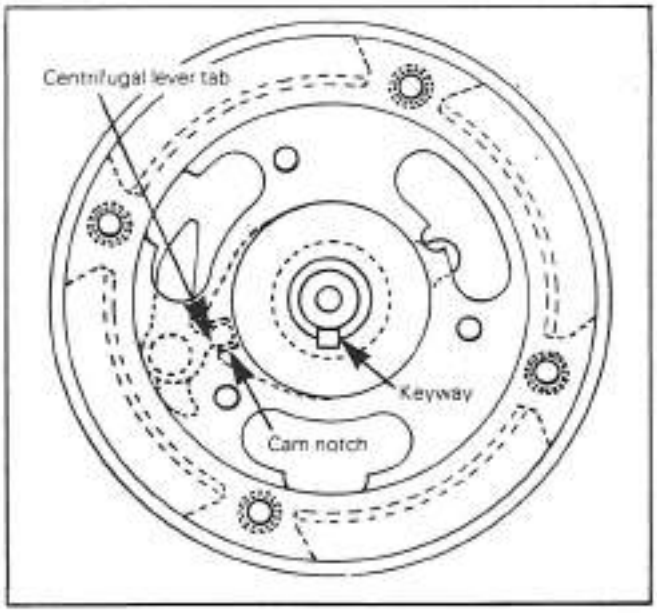
① At assembly, torque to 14-16 ft-lbs.

⑤ With magneto retaining nut removed and hold-on support in place, install special puller onto support.

Tighten puller nut and at same time, tap on nut head using a hammer to release magneto from its taper.



At assembly, install magneto on crankshaft with the keyway, centrifugal lever and breaker point cam position as illustrated.

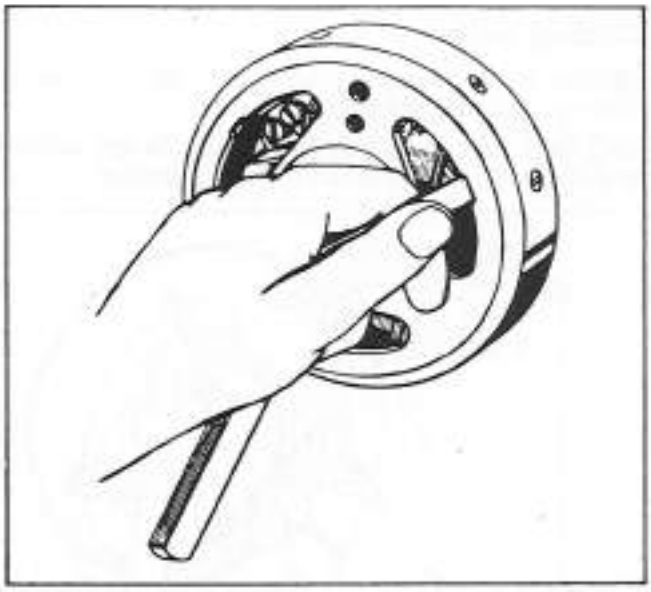


⑥⑦⑧At assembly, apply a small amount of low temperature grease into spring seating.

⑪At assembly, apply Loctite "Lock'n Seal" on retaining screw threads.

⑭⑮⑯㉓Whenever a coil is replaced, the air gap (distance between magnet and armature end) must be adjusted.

To check air gap, insert a feeler gauge of correct thickness (0.31 mm / .012" 0.45 mm / .018") between magnet and armature ends. To adjust, slacken retaining screw and relocate armature.



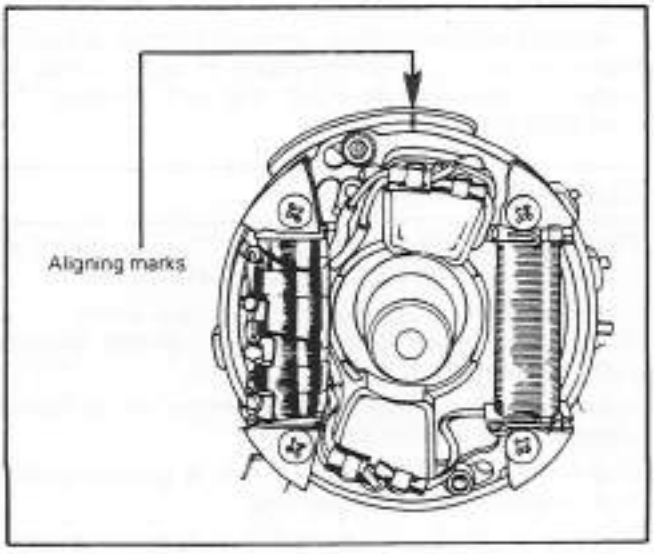
⑱To replace a capacitor, it is first necessary to unsolder the two (2) black leads using a soldering iron. The capacitor can then be driven out of the armature plate using a suitable drift. To reinstall, inverse procedure.

⑲㉑When replacing breaker point set, apply a light coat of grease on pivot pin and rubbing block.

Do not remove pivot pin unless replacement is needed. At assembly, apply Loctite "Lock'n Seal" on threads.

㉙When replacing unit construction type breaker point, apply a small amount of grease on rubbing block.

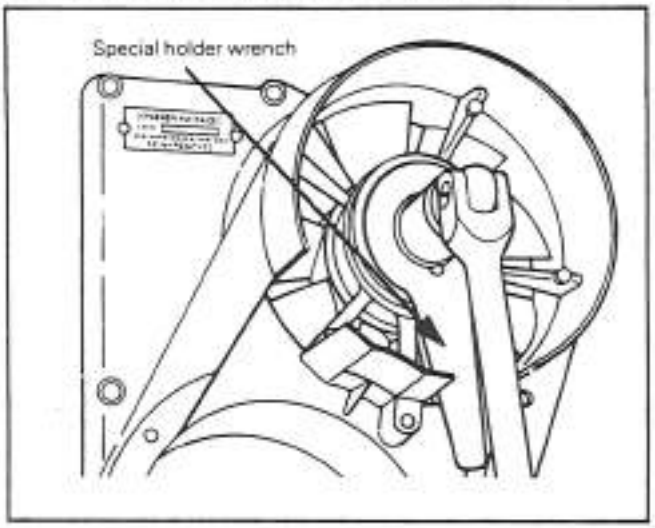
㉟At assembly, align armature plate crankcase marks.



Cooling System

㉒ Heat bearing housing to 140° -160° F. prior to bearing removal or installation.

㉕㉖㉘㉙ Lock fan pulley with special holder wrench or install pulley retaining nut. (See Tool Section).



Shim(s) located between pulley halves are used to adjust fan belt free-play. Correct free-play is ¼". If necessary to adjust install or remove shim(s) between pulley halves. Install excess shim(s) between outer pulley half and washer.

At assembly, torque fan shaft nut to 42-50 ft-lbs.

㉜㉝㊲ At assembly, apply a light coat of Loctite "Lock'n Seal" on threads.

It should be noted that to correctly remove a Loctite locked screw, it is first necessary to tap on head of screw to break Loctite bond. This will eliminate the possibility of screw breakage.

CLEANING

Discard all oil seals, gaskets and "O" rings. Clean all metal components in a non-ferrous metal cleaner.

Caution: Clean armature using only a clean cloth.
Scrape off carbon formation from cylinder exhaust ports, cylinder heads and piston domes.

Note: The letter "AUS" over an arrow on the piston dome must be visible after cleaning.

Clean the piston ring grooves with a groove cleaner tool, or with a piece of broken ring.

Remove old sealant from mating surfaces with Bombardier "Sealant Stripper".

Caution: Never use a sharp object to scrape away old sealant as score marks incurred are detrimental to crankcase sealing.

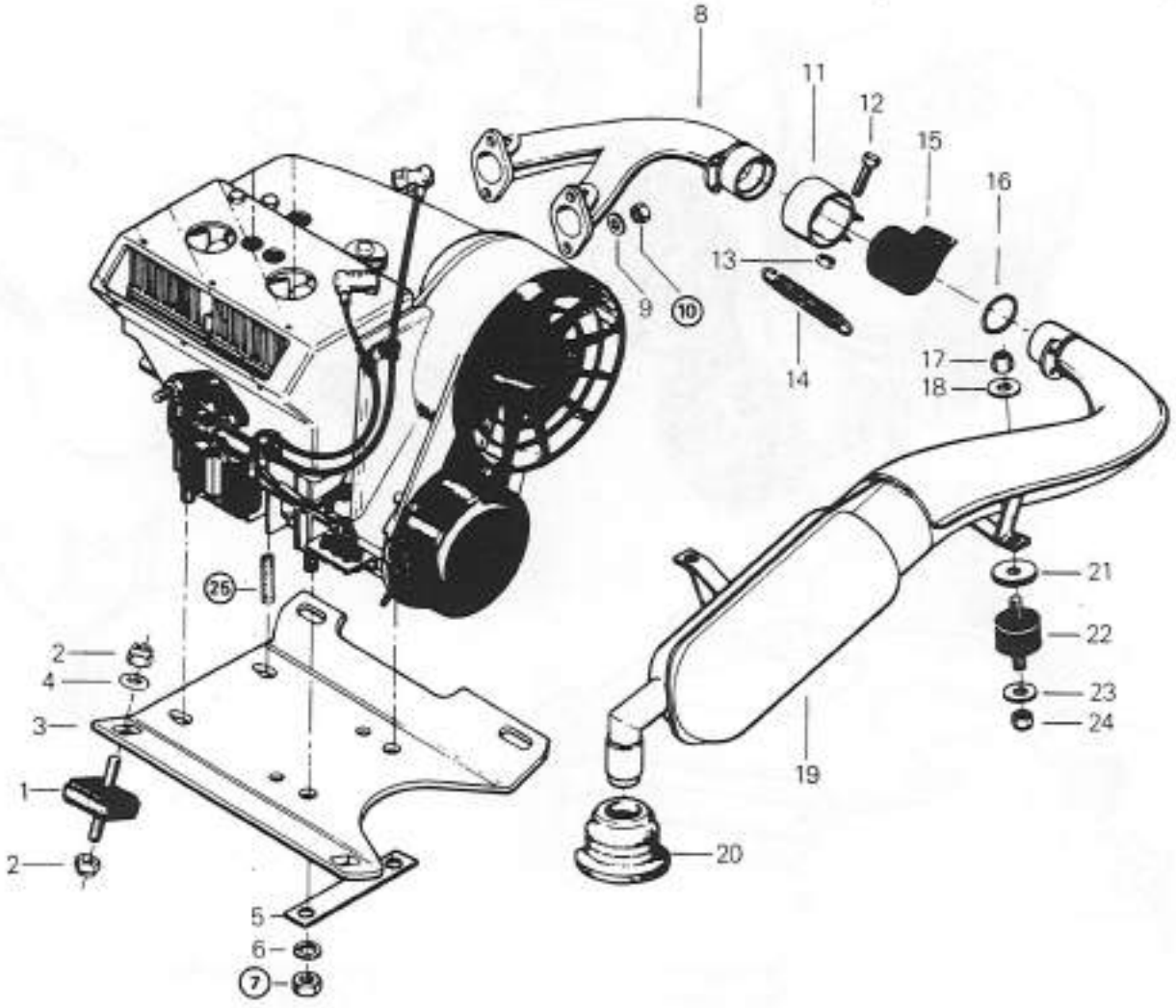
INSTALLATION

To install engine on vehicle, inverse removal procedure. However, pay attention to the following:

- Check ignition timing prior to installation in vehicle.
- Check tightness of engine mount nuts.
- After throttle cable installation, check carburetor maximum throttle opening.
- Check pulley alignment.

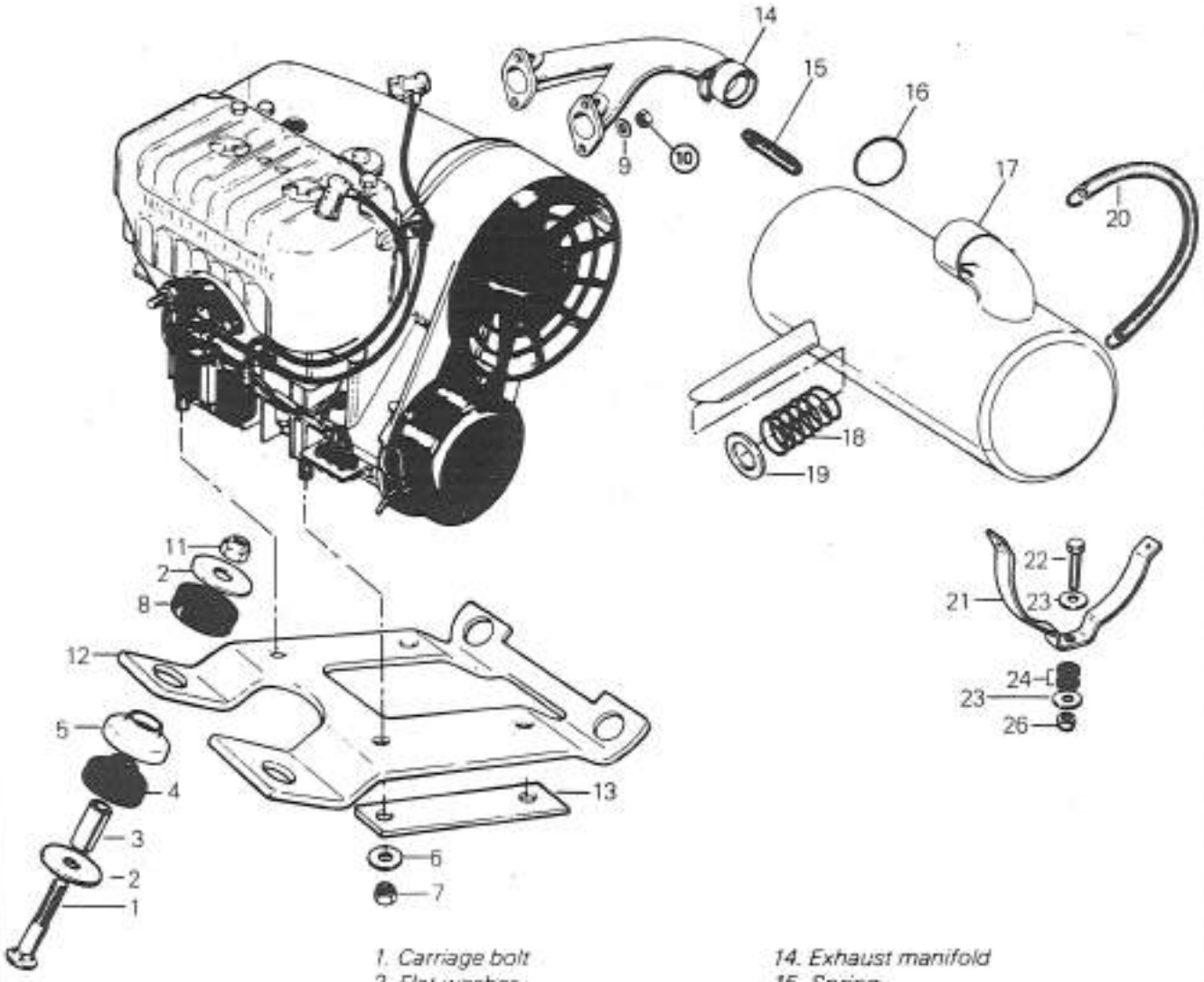
440 ENGINE TYPE (FROM 1976)

ENGINE SUPPORT & MUFFLER (T'NT & EVEREST)



1. *Rubber mount*
2. *Nut*
3. *Engine bracket*
4. *Washer*
5. *Reinforcement plate*
6. *Lockwasher*
7. *Nut*
8. *Exhaust manifold*
9. *Washer*
10. *Nut*
11. *Exhaust collar*
12. *Bolt*
13. *Nut*
14. *Spring*
15. *Asbestos tape*
16. *Aluminum ring*
17. *Nut*
18. *Washer*
19. *Muffler*
20. *Exhaust grommet*
21. *Washer*
22. *Rubber shear mount*
23. *Washer*
24. *Nut*

ENGINE SUPPORT & MUFFLER (OLYMPIQUE 1977)



1. *Carriage bolt*
2. *Flat washer*
3. *Spacer*
4. *Vibration absorber (lower)*
5. *Retainer*
6. *Lockwasher*
7. *Nut*
8. *Vibration absorber (upper)*
9. *Washer*
10. *Nut*
11. *Nut*
12. *Engine bracket*
13. *Reinforcement plate*
14. *Exhaust manifold*
15. *Spring*
16. *Sealing ring*
17. *Muffler*
18. *Spring*
19. *Washer*
20. *Spring*
21. *Muffler support*
22. *Bolt*
23. *Washer*
24. *Rubber spacer*
25. *Stud*
26. *Nut*

ENGINE SUPPORT & MUFFLER

REMOVAL FROM VEHICLE

Remove or disconnect the following (if applicable) then lift engine out of vehicle.

- Pulley guard & drive belt.
- Muffler & air duct.
- Cab retaining cable.
- Air intake silencer.
- Fuel lines at carburetor, impulse line.
- Throttle cable.

Electrical junction block.

CAUTION: On electric start model, disconnect negative cable (ground) from battery before disconnecting other wires.

- Rewind starter.
- Engine mount nuts.

DISASSEMBLY & ASSEMBLY

⑦ Torque to 4.4 kg-m (32 ft-lbs).

⑩ Torque to 2.1 kg-m (15 ft-lbs).

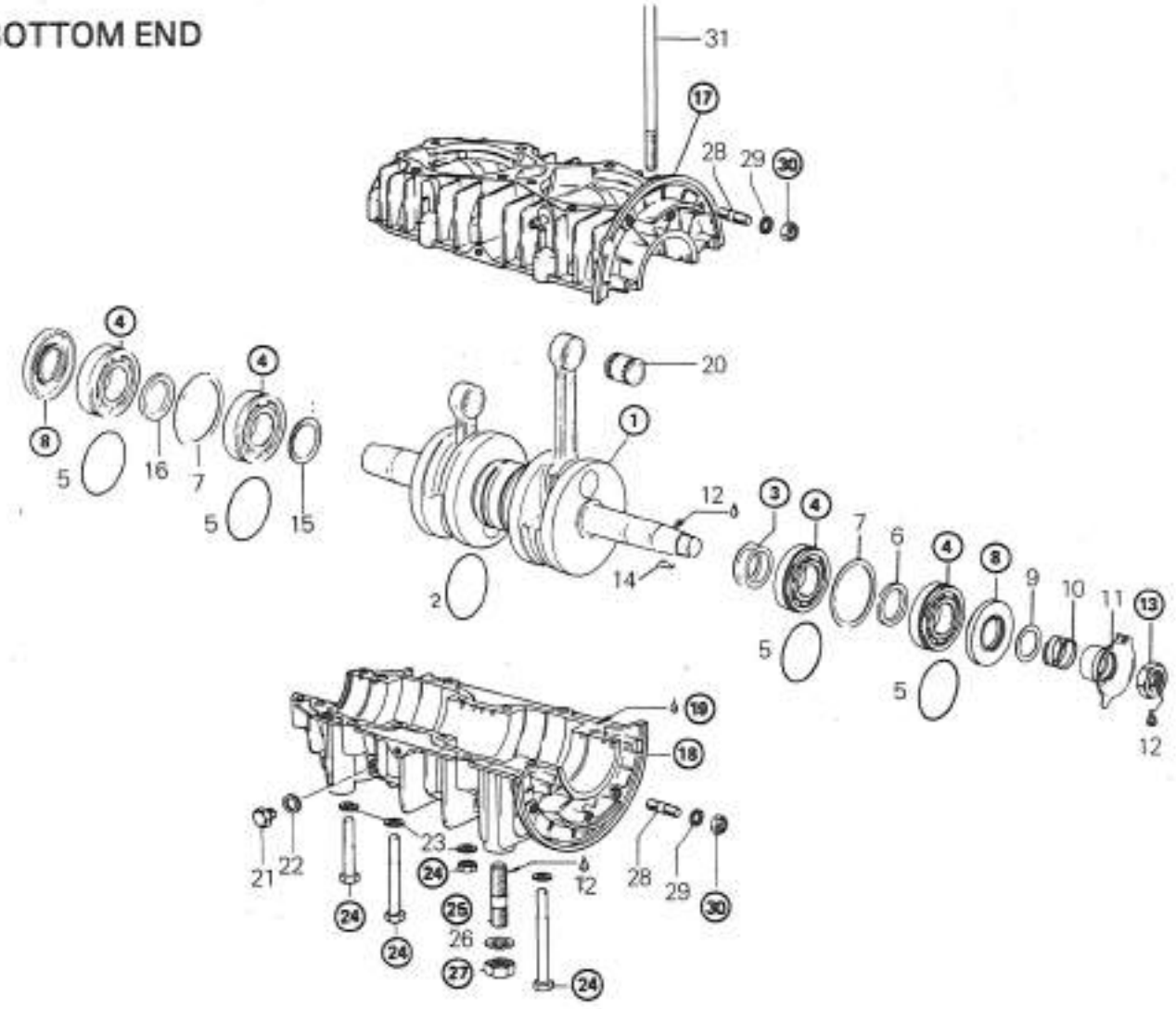
㉕ At assembly on crankcase, apply Loctite Lock'n Seal 242 or equivalent on threads.

INSTALLATION ON VEHICLE

To install engine on vehicle, inverse removal procedure. However, pay attention to the following:

- Check ignition timing prior to installation in vehicle.
- Check tightness of engine mount nuts.
- After throttle cable installation, check carburetor maximum throttle opening.
- Check pulley alignment.

BOTTOM END



1. *Crankshaft*
2. *"O" ring (sealing ring)*
3. *Shim*
4. *Bearing*
5. *"O" ring*
6. *Distance ring (4 mm)*
7. *Retaining washer*
8. *Oil seal*
9. *Washer*
10. *Cam spring*
11. *Breaker point cam*
12. *Loctite 242*
13. *Magneto ring nut*
14. *Woodruff key*
15. *Distance ring 1 mm*
16. *Distance sleeve*
17. *Upper crankcase half*
18. *Lower crankcase half*
19. *Crankcase sealant*
20. *Needle cage bearing*
21. *Drain plug*
22. *Sealing ring*
23. *Lockwasher*
24. *Bolt or stud with nut*
25. *Stud*
26. *Lockwasher*
27. *Nut*
28. *Stud (fan housing)*
29. *Washer (fan housing)*
30. *Nut (fan housing)*
31. *Stud (cylinder)*

BOTTOM END

CLEANING

Discard all oil seals, gaskets, "O" rings and sealing rings.

Clean all metal components in a non-ferrous metal cleaner.

Remove old sealant from crankcase mating surfaces with Bombardier sealant stripper.

CAUTION: Never use a sharp object to scrape away old sealant as score marks incurred are detrimental to crankcase sealing.

DISASSEMBLY & ASSEMBLY

General

Refer to Technical Data Section for component fitted tolerance and wear limit.

①③ Crankshaft end-play is adjusted with shim(s) located between crankshaft and magneto side bearing. To determine correct amount of shim(s), proceed as follows.

NOTE: Crankshaft end-play requires adjustment only when crankshaft and / or crankcase is replaced.

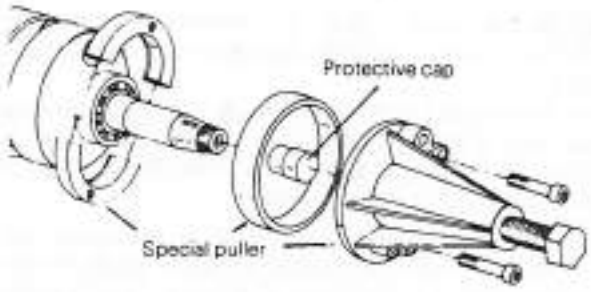
Remove magneto side bearings and existing shim(s). Slide the appropriate bearing simulator and the retaining washers on the crankshaft. (See Tool Section).

Position crankshaft assembly into crankcase lower half. Make sure that retaining washers are correctly seated in the grooves.

Gently tap crankshaft counterweight until P.T.O. side inner bearing bears against retaining washer.

Any free-play between the bearing simulator and magneto side retaining washer, minus recommended end-play, is the distance to be covered by shim(s). Shims are available in the thickness of 0.15 mm (.006"), 0.20 mm (.008") and 0.30 mm (.012").

④ To remove bearing from crankshaft use a protective cap and special puller, as illustrated. (See Tool Section).



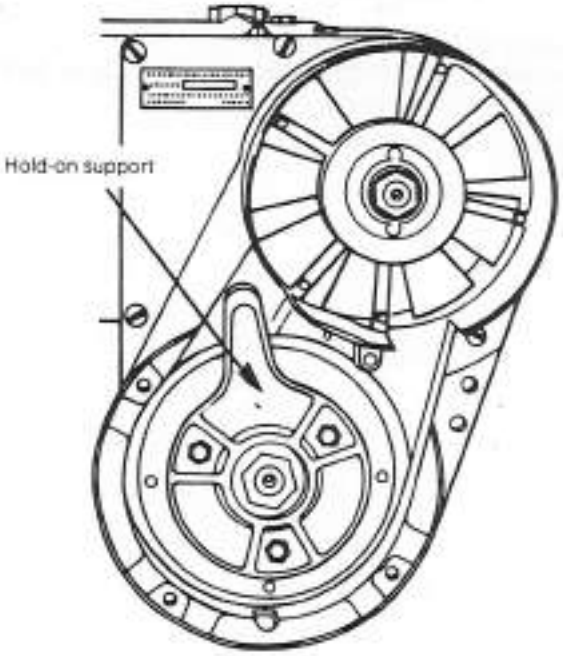
Prior to installation, place bearings into an oil container and heat the oil to 100° C (210° F) for 10 min. This will expand bearings and ease installation.

Install bearings with groove outward.

NOTE: Prior to magneto side bearing installation, determine crankshaft end-play and install required shim(s) on crankshaft extension.

⑧ At assembly apply a light coat of lithium grease on seal lip. Seal outer surface should be flush with crankcase.

⑫ To remove or install magneto retaining nut, lock crankshaft in position with special hold-on support as illustrated. (See Tool Section).

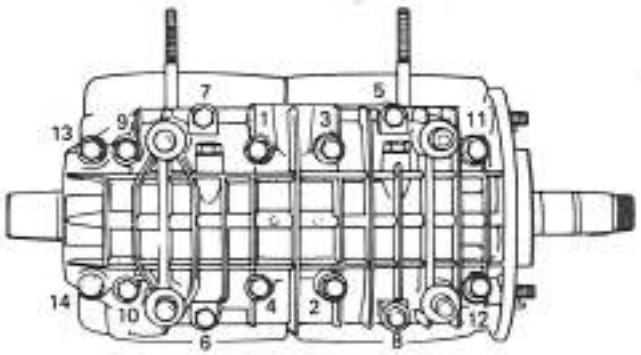


At assembly, apply Loctite Lock'n Seal 242 or equivalent on threads then torque to 8.3 kg-m (60 ft-lbs).

⑰⑱⑲ Crankcase halves are factory matched and therefore, are not interchangeable or available as single halves.
Prior to joining of crankcase halves, prepare mating surfaces with crankcase sealant primer then apply a light coat of crankcase sealant (See Tool Section) as per instructions printed on container.

Position the crankcase halves together and tighten nuts (or bolts) by hand then install armature plate (tighten) on magneto side to correctly align the crankcase halves.

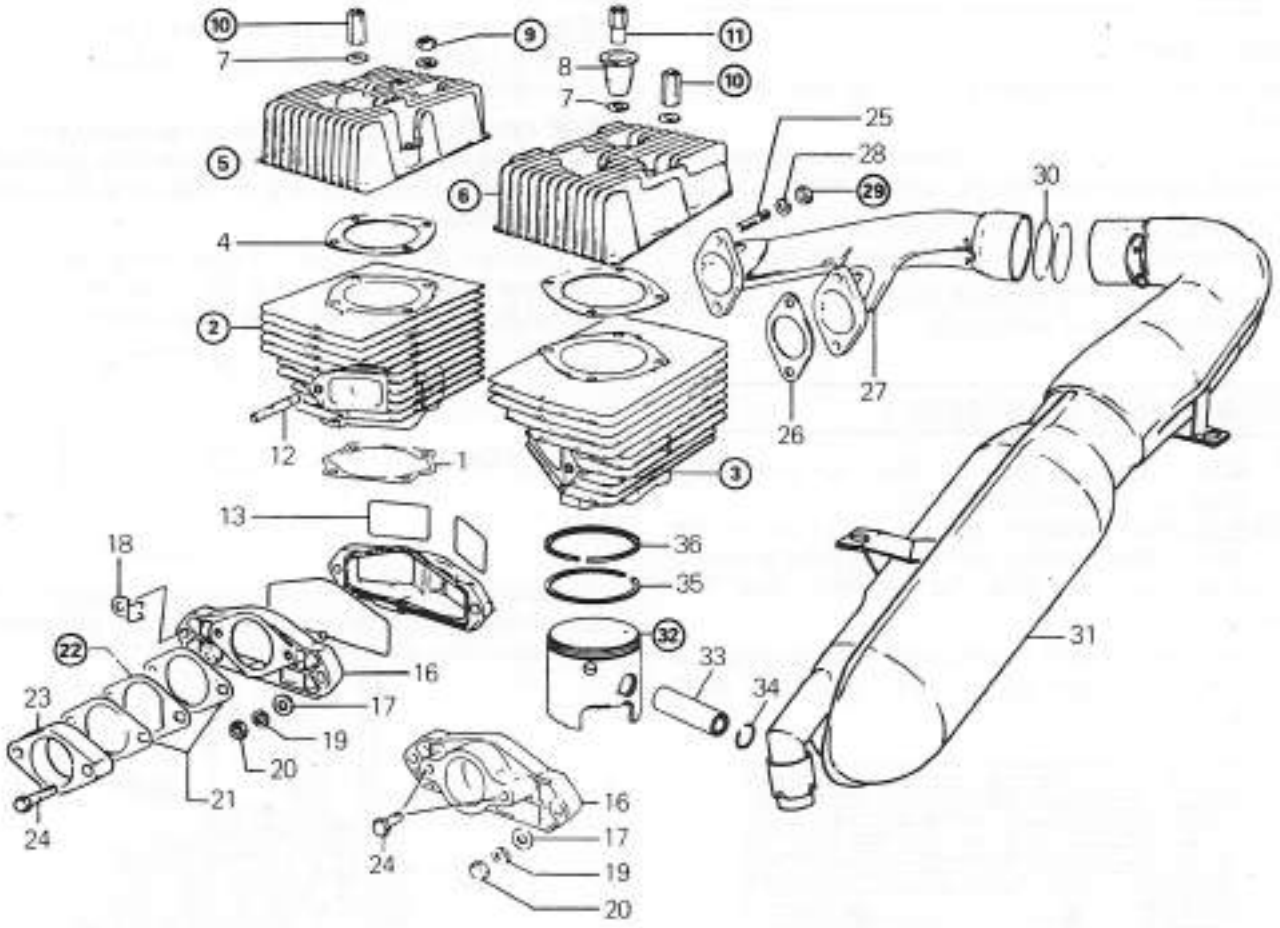
Torque bolts or nuts to 2.2 kg-m (16 ft-lbs) following illustrated sequence.



㉔㉚ Torque to 2.2 kg-m (16 ft-lbs).
㉕ At assembly on crankcase apply Loctite Lock'n Seal 242 or equivalent on threads.

㉗ Torque to 4.4 kg-m (32 ft-lbs).

TOP END



1. Gasket (cylinder / crankcase)
2. Cylinder (P.T.O.)
3. Cylinder (mag.)
4. Cylinder head gasket
5. Cylinder head (P.T.O.)
6. Cylinder head (Mag.)
7. Flat washer
8. Support sleeve
9. Nut
10. Distance nut
11. Distance nut
12. Stud
13. Gasket
14. Intake manifold
15. Gasket
16. Intake cover
17. Flat washer
18. H.T. cable bracket
19. Lockwasher
20. Nut
21. Gasket
22. Intake deflector
23. Isolating flange
24. Bolt
25. Stud or bolt
26. Exhaust gasket
27. Exhaust manifold
28. Lockwasher
29. Nut or bolt
30. Sealing ring
31. Muffler
32. Piston
33. Gudgeon pin
34. Circlip
35. Rectangular ring
36. "L" ring

TOP END

CLEANING

Discard all gaskets.

Clean all metal components in a non-ferrous metal cleaner.

Scrape off carbon formation from cylinder exhaust port, cylinder head and piston dome using a wooden spatula.

NOTE: The letter "AUS" (over an arrow on the piston dome) must be visible after cleaning.

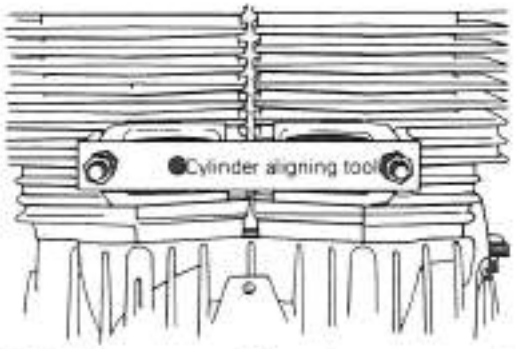
Clean the piston ring grooves with a groove cleaner tool, or with a piece of broken ring.

DISASSEMBLY & ASSEMBLY

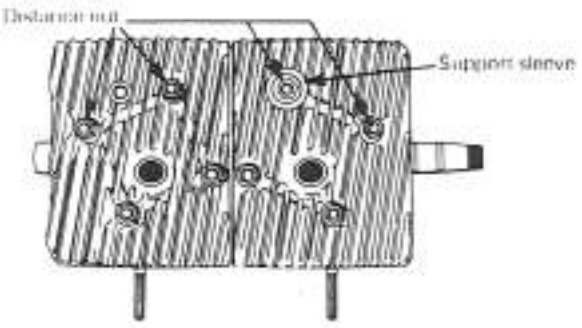
NOTE: Refer to Technical Data for component fitted tolerance and wear limit.

②③⑥⑧ When installing cylinder and / or cylinder head, the cylinder aligning tool must be used to ensure sealing of intake manifold and cylinders. (See Tool Section).

With exhaust manifold and aligning tool installed, you can then cross torque cylinder head nuts to 2.1 kg-m (15 ft-lbs).



⑨⑩⑪ Position nuts and distance nuts as per illustration then cross torque to 2.1 kg-m (15 ft-lbs).



NOTE: Torque each cylinder head individually.

㉒ At assembly, position deflector with tab toward inside on magneto side.

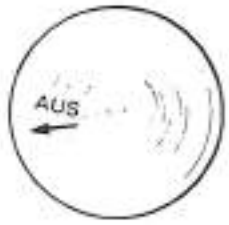
㉔ Torque to 2.1 kg-m (15 ft-lbs).

㉜㉝㉞ Place a clean cloth over crankcase to prevent circlip from falling into crankcase. Use a pointed tool to remove circlips from piston.

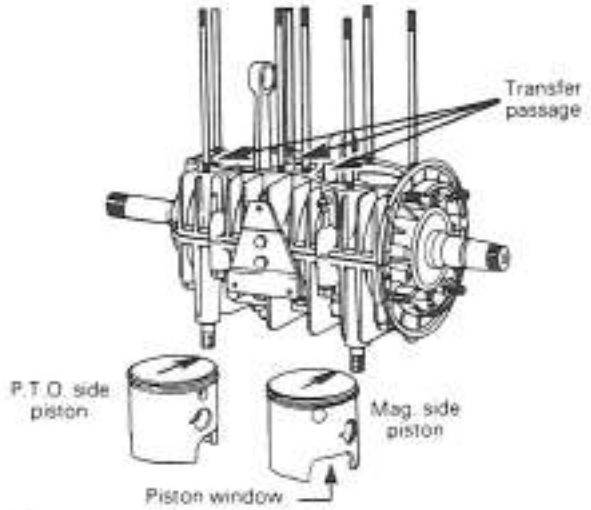
CAUTION: When tapping out gudgeon pins, hold piston firmly in place to eliminate the possibilities of transmitting shock and pressure to the connecting rod.

At assembly, place the pistons over the connecting rods with the letters "AUS" (over an arrow on the piston dome) facing in direction of the exhaust port.

EXHAUST

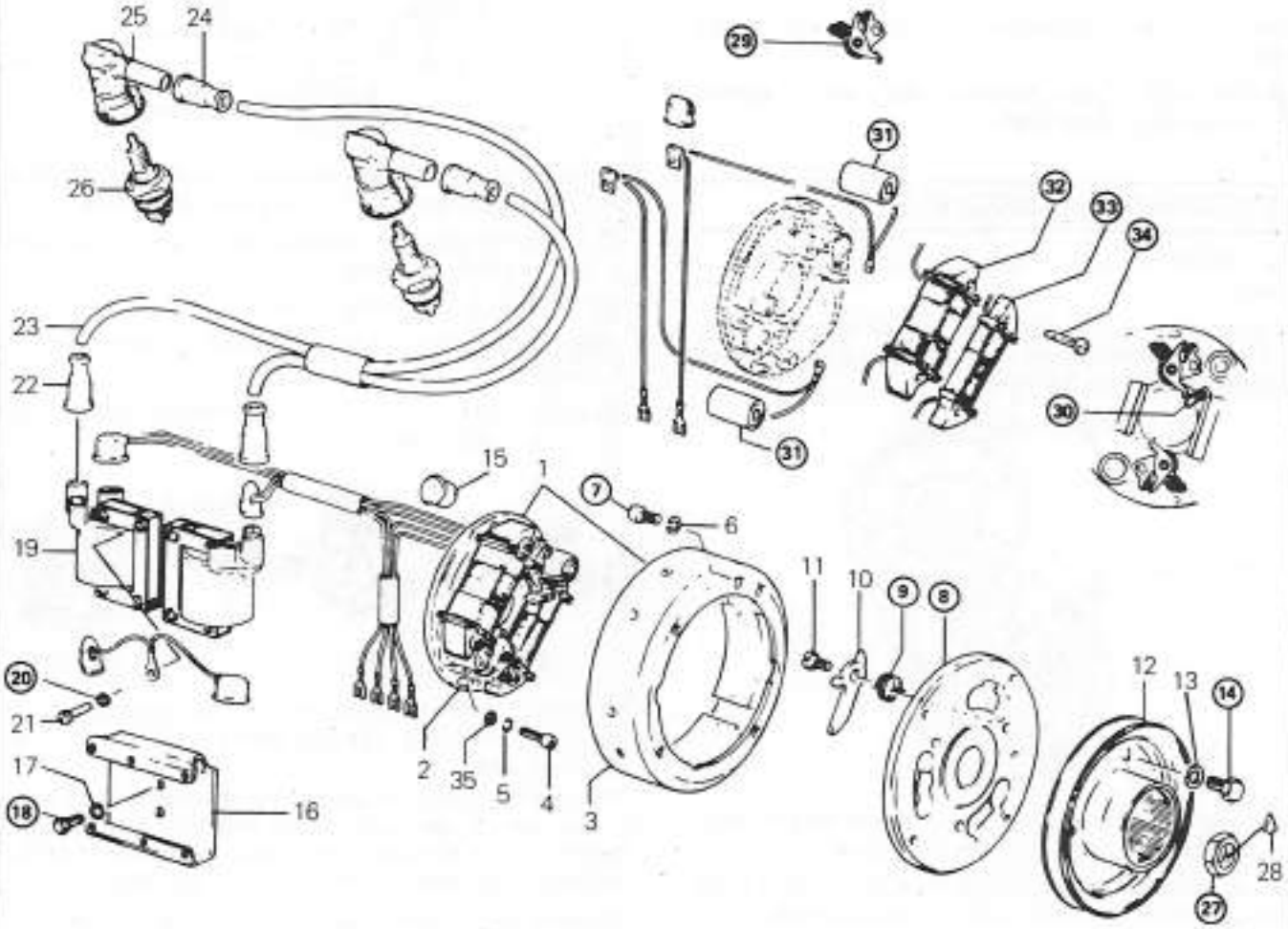


Also make sure that the piston window is aligned with the crankcase transfer passage when the gudgeon pin orifice is in-line with the connecting rod bore.



NOTE: Once the circlips are installed, turn each circlip so it is not directly on piston notch. Remove any burrs on piston caused through circlip installation using very fine emery cloth.

MAGNETO



1. Armature ass'y
2. Armature plate
3. Magneto ring
4. Screw
5. Lockwasher
6. Lockwasher
7. Screw
8. Magneto housing
9. Spring
10. Centrifugal level
11. Screw
12. Starting pulley
13. Lockwasher
14. Screw
15. Wire grommet
16. Coil bracket
17. Lockwasher
18. Screw
19. Ignition coil
20. Lockwasher
21. Screw
22. Protection cap
23. H.T. cable
24. Protection cap
25. Spark plug protector
26. Spark plug
27. Magneto ring nut
28. Loctite 242
29. Breaker point
30. Lubricating wick
31. Capacitor
32. Lighting coil
33. Ignition generator coil
34. Screw
35. Flat washer

MAGNETO

CLEANING

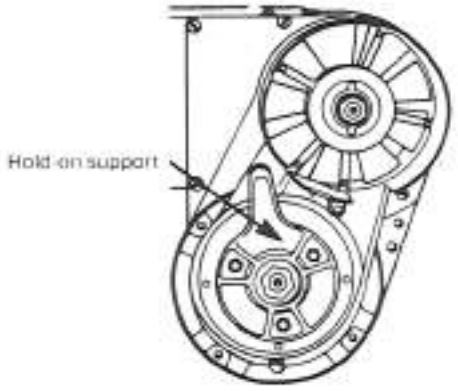
Clean all metal components in a non-ferrous metal cleaner.

CAUTION: Clean armature ass'y and magneto using only a clean cloth.

DISASSEMBLY & ASSEMBLY

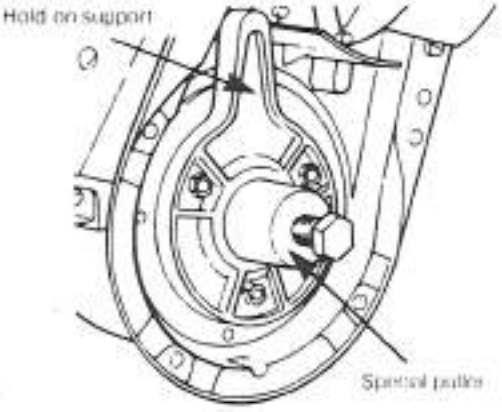
⑦ At assembly apply Loctite Lock'n Seal 242 on threads.

⑧ To remove or install magneto retaining nut, lock crankshaft in position with special hold-on support as illustrated. (See Tool Section).

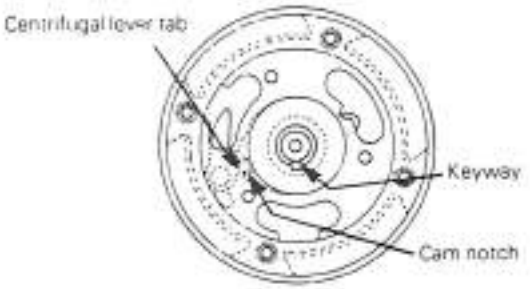


With magneto retaining nut removed and hold-on support in place, install special puller onto support.

Tighten puller bolt and at same time, tap on bolt head using a hammer to release magneto from its taper.



At assembly, clean crankshaft extension (taper) then apply Loctite Lock'n Seal 242 or equivalent, position magneto on crankshaft with the keyway and the cam notch positioned as illustrated.



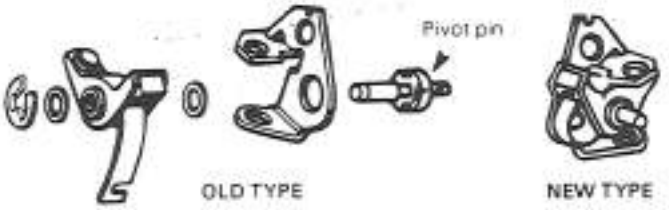
Install magneto retaining nut (with Loctite Lock'n Seal 242 on threads) and torque to 8.3 kg-m (60 ft-lbs).

⑨ At assembly apply a small amount of low temperature grease into spring seating.

⑭ Torque to 2.1 kg-m (15 ft-lbs).

⑱ ⑳ Apply Loctite Lock'n Seal 242 or equivalent on threads.

㉗ Apply Loctite Lock'n Seal 242 on threads then torque to 8.3 kg-m (60 ft-lbs).



㉙ Do not remove pivot pin unless replacement is needed, if removed, reinstall with Loctite Lock'n Seal 242 or threads.

Old type breaker point set can be replaced by new type if pivot pin is removed. When installing new breaker point type it is advisable to fill the pivot pin cavity of the armature plate with Loctite 277 (thick red solution).

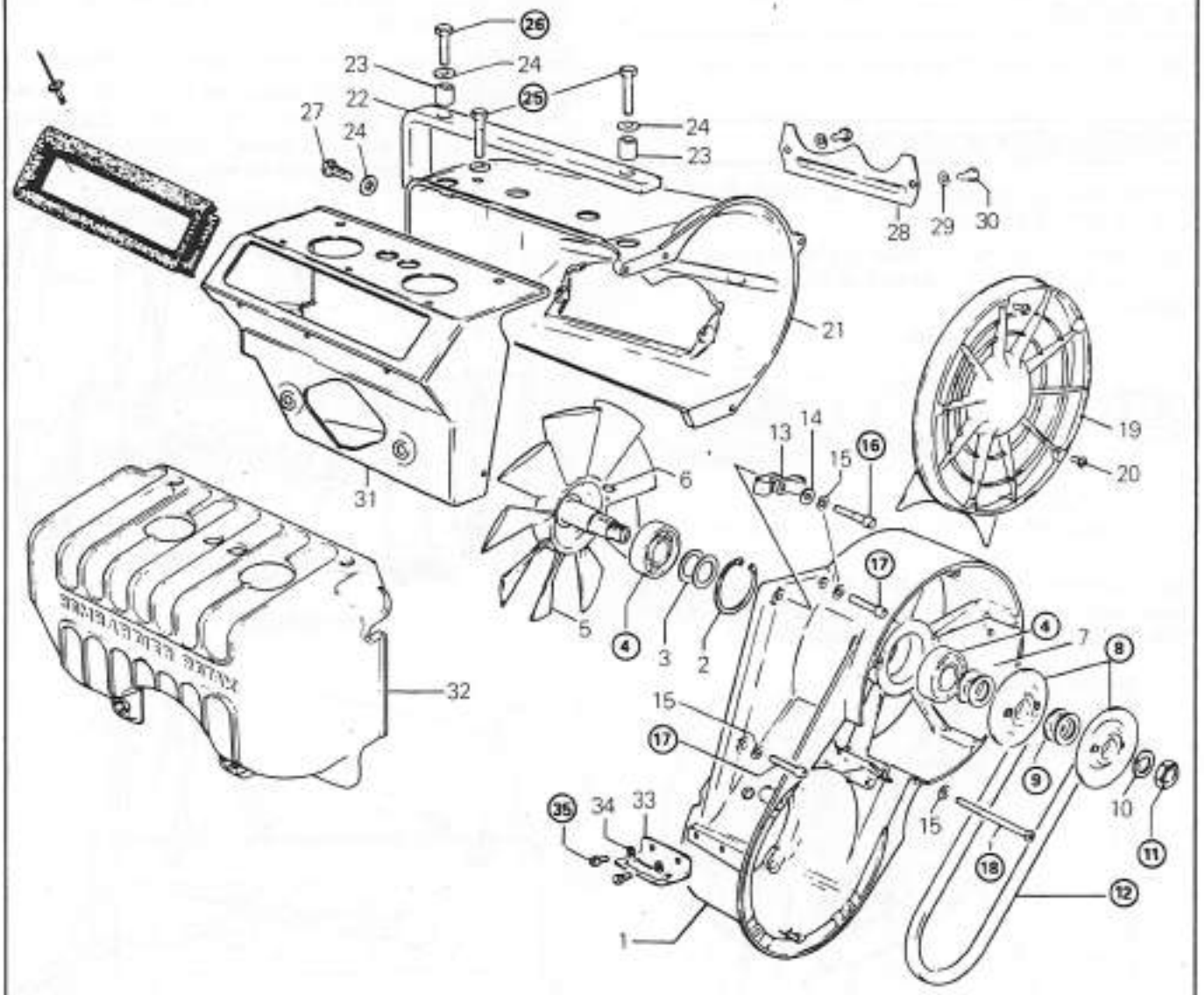
㉚ When replacing breaker point set, apply a light coat of grease on lubricating wick.

㉛ To replace a capacitor, it is first necessary to unsolder the two (2) black leads using a soldering iron. The capacitor can then be driven out of the armature plate using a suitable drift. To reinstall, inverse procedure.

㉜ ㉝ Whenever a coil is replaced, the air gap (distance between coil end and magnet) must be adjusted.

To check air gap, insert a feeler gauge of 0.30-0.45 mm (.012" .018") between magnet and coil ends. If necessary to adjust, slacken coil retaining screws and relocate coil.

COOLING SYSTEM



1. Fan housing
2. Circlip
3. Washer (2)
4. Bearing
5. Fan
6. Woodruff key
7. Shim (2)
8. Pulley halves
9. Shim
10. Lockwasher
11. Nut
12. Belt
13. Cable clamp
14. Washer
15. Spring washer
16. Screew M6 x 35
17. Screw M6 x 30
18. Screw M6 x 80
19. Fan cover
20. Screw
21. Fan cowl (exhaust)
22. Sealing strip
23. Distance sleeve
24. Washer
25. Screw M8 x 35
26. Screw M8x 28
27. Screw M8 x 20
28. Fan cowl cover
29. Spring washer
30. Washer
31. Fan cowl (intake) T'NT Everest
32. Fan cowl (intake) Olymp.
33. Electrical junction block bracket
34. Lockwasher
35. Screw

COOLING SYSTEM

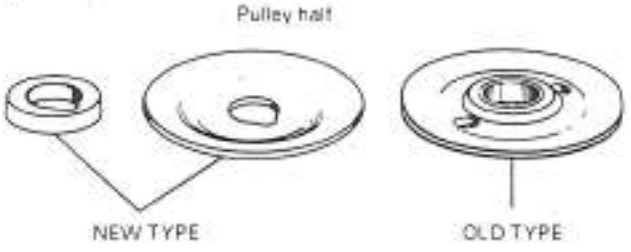
CLEANING

Clean all components in a non ferrous metal cleaner.

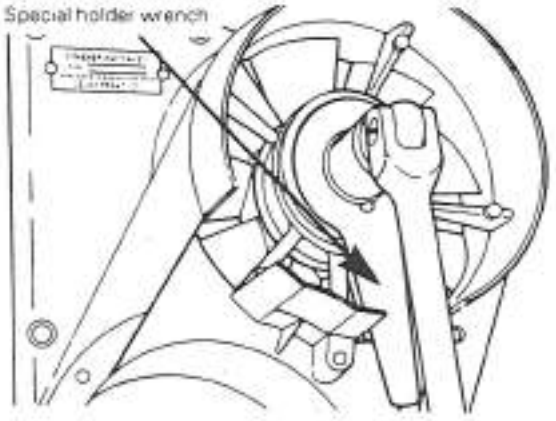
DISASSEMBLY & ASSEMBLY

④Heat bearing housing to 90° C (160° F) prior to bearing removal or installation.

⑧Newer inner pulley half does not have a shoulder on its inner face so it is installed with a 6 mm (.236") spacer.



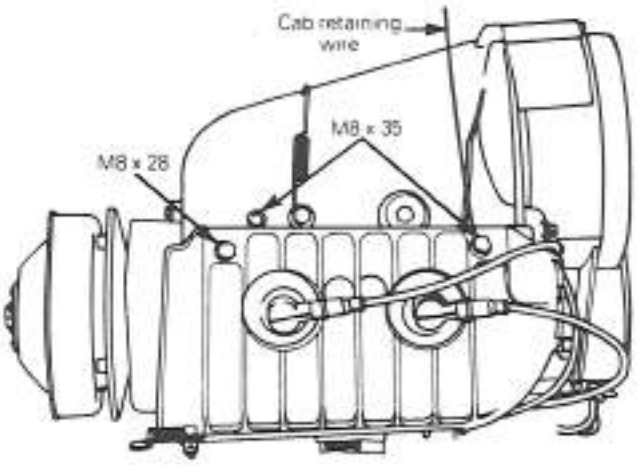
⑪To remove or install pulley retaining nut lock fan pulley with special holder wrench (See Tools Section). At assembly torque nut to 6.4 kg-m (46 ft-lbs).



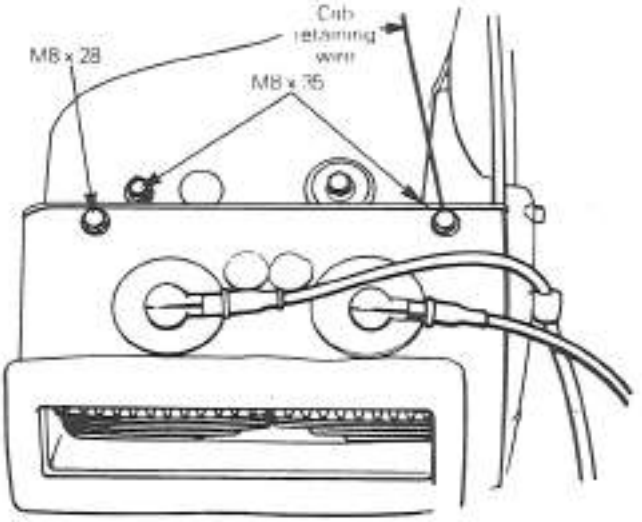
⑨⑫ Shim(s) located between pulley halves are used to adjust fan belt free-play. Correct free-play is 6 mm (¼ "). If necessary to adjust install or remove shim(s) between pulley halves. Install excess shim(s) between outer pulley half and washer.

⑯⑰⑱㉟ Apply Loctite Lock'n Seal 242 on threads.

NOTE: It should be noted that to correctly remove a Loctite locked screw, it is first necessary to tap on head of screw to break Loctite bond. This will eliminate the possibility of screw breakage.



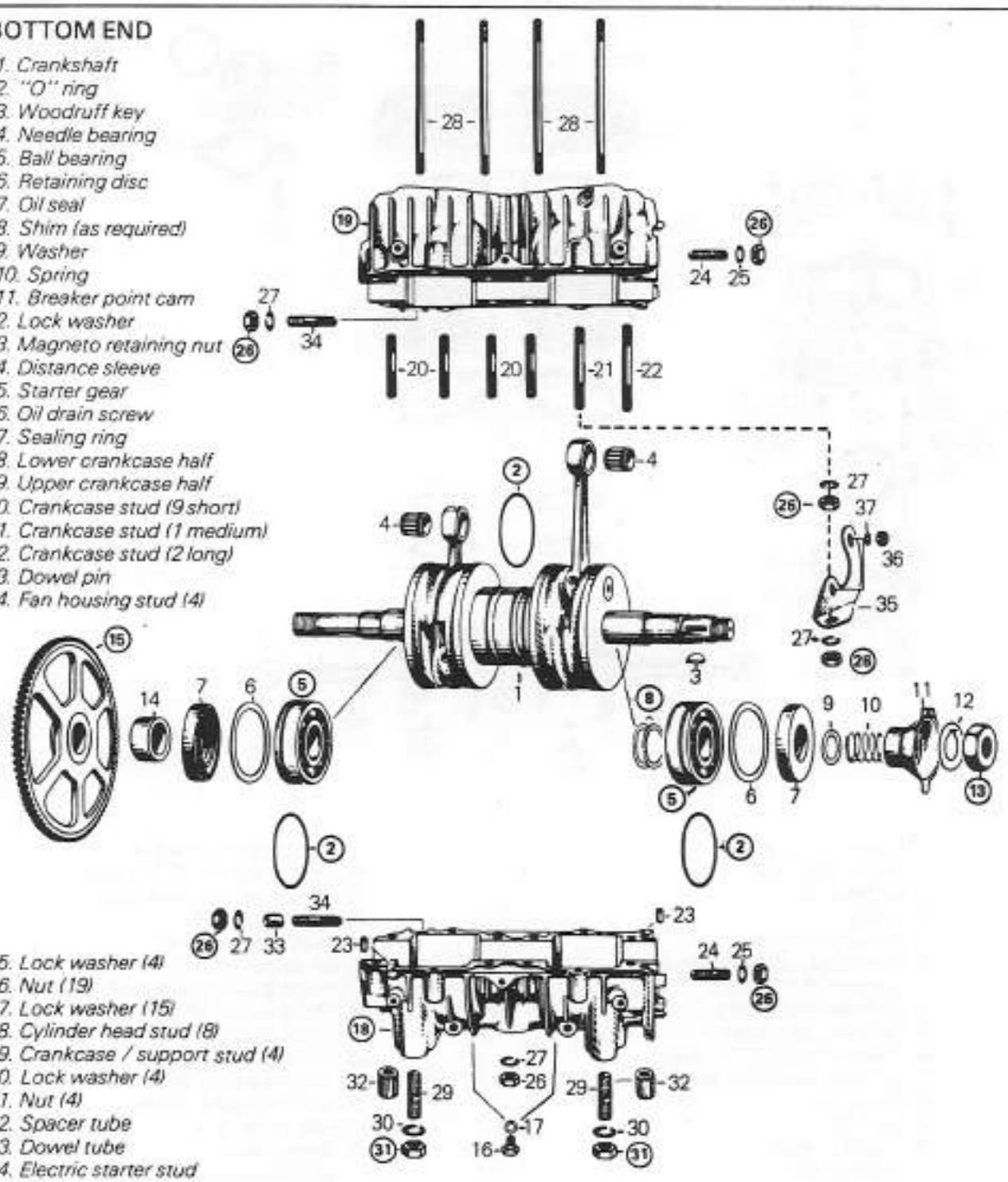
OLYMPIQUE



T'NT & EVEREST

640 ENGINE TYPE

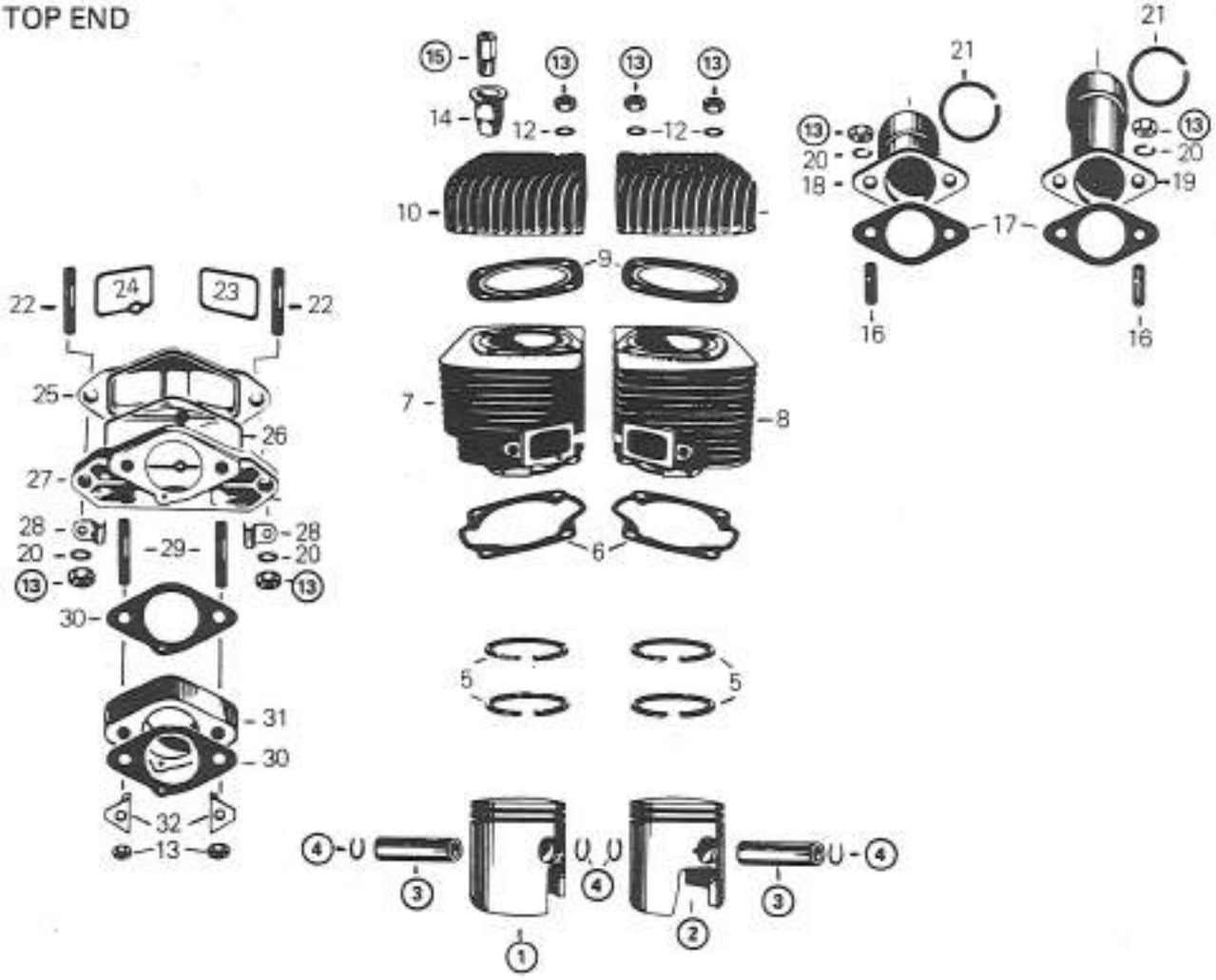
BOTTOM END



1. *Crankshaft*
2. *"O" ring*
3. *Woodruff key*
4. *Needle bearing*
5. *Ball bearing*
6. *Retaining disc*
7. *Oil seal*
8. *Shim (as required)*
*9. *Washer*
*10. *Spring*
*11. *Breaker point cam*
12. *Lock washer*
13. *Magneto retaining nut*
14. *Distance sleeve*
15. *Starter gear*
16. *Oil drain screw*
17. *Sealing ring*
18. *Lower crankcase half*
19. *Upper crankcase half*
20. *Crankcase stud (9 short)*
21. *Crankcase stud (1 medium)*
22. *Crankcase stud (2 long)*
23. *Dowel pin*
24. *Fan housing stud (4)*
25. *Lock washer (4)*
26. *Nut (19)*
27. *Lock washer (15)*
28. *Cylinder head stud (8)*
29. *Crankcase / support stud (4)*
30. *Lock washer (4)*
31. *Nut (4)*
32. *Spacer tube*
33. *Dowel tube*
34. *Electric starter stud*
35. *Starter bracket*
36. *Nut (2)*
37. *Washer (2)*

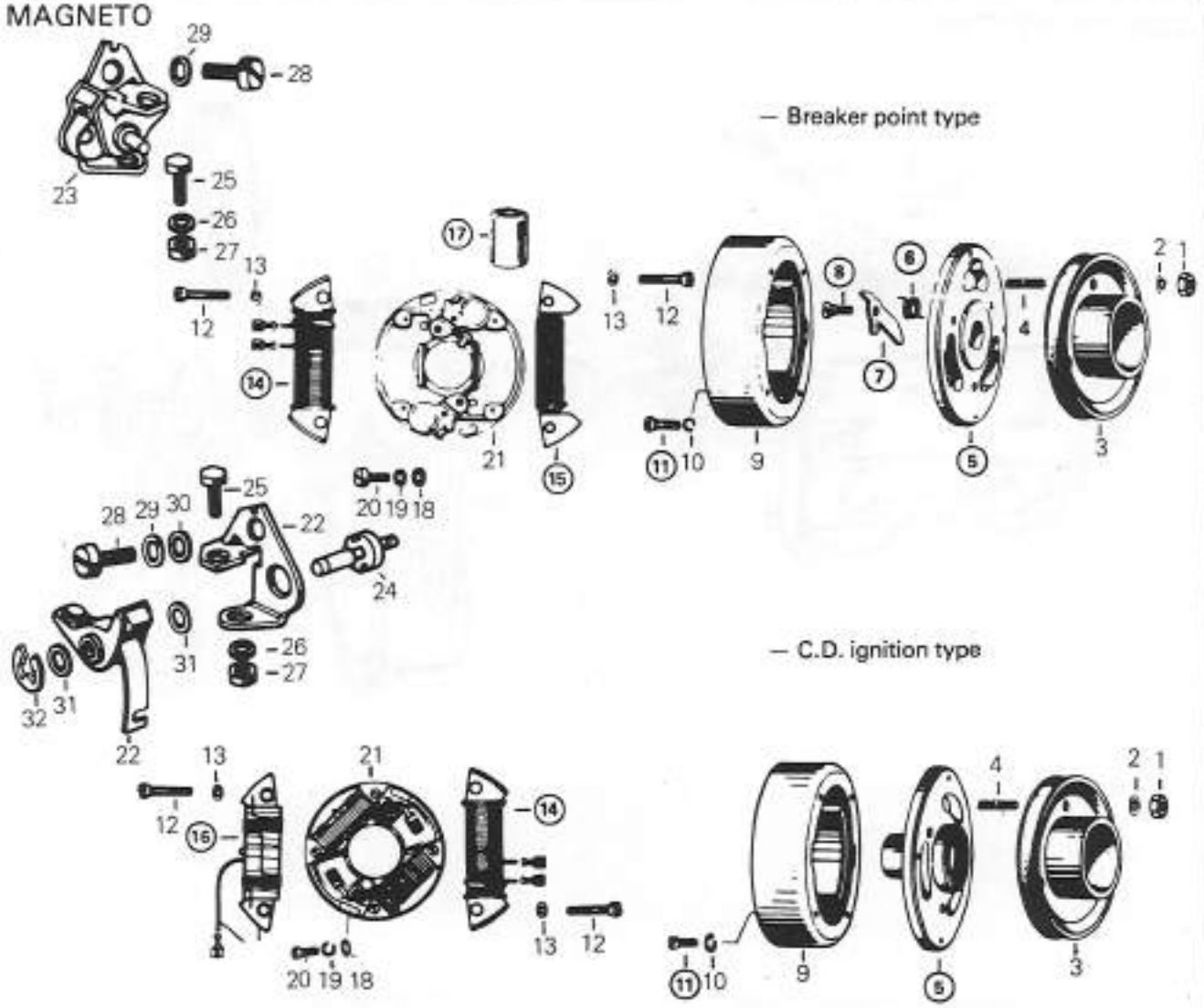
**Breaker point ignition only.*

TOP END



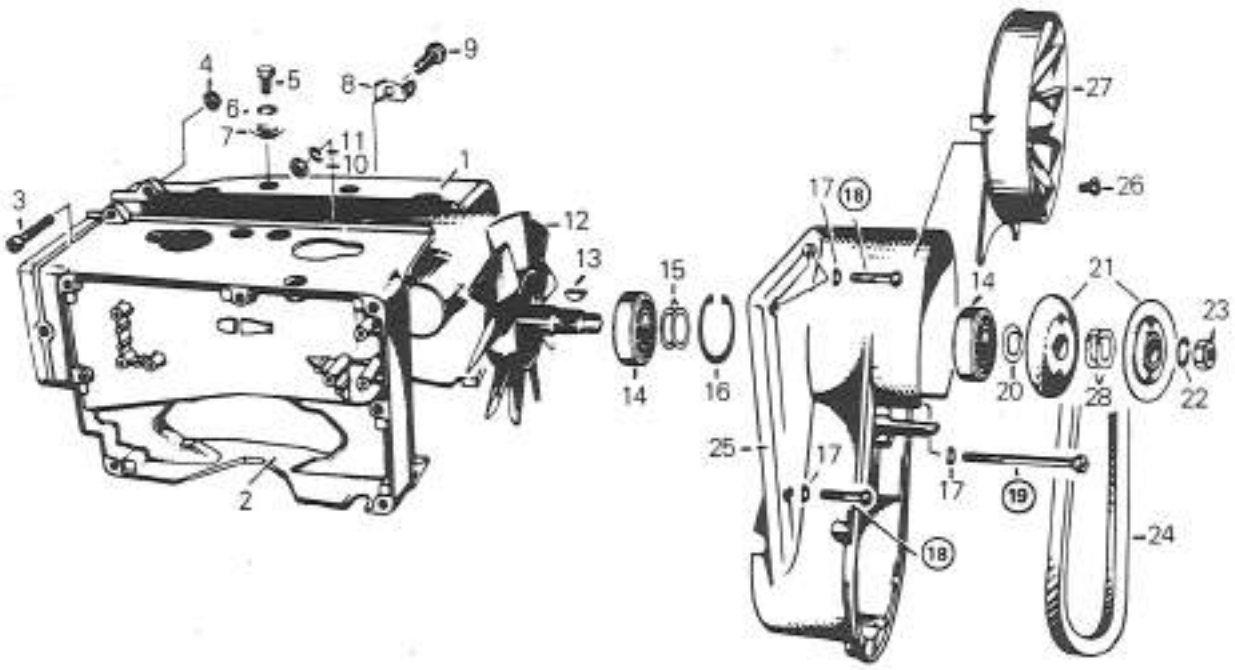
1. *Piston (P.T.O. side)*
2. *Piston (Mag. side)*
3. *Gudgeon pin*
4. *Circlip*
5. *Rectangular ring*
6. *Crankcase / cylinder gasket*
7. *Cylinder (P.T.O. side)*
8. *Cylinder (Mag. side)*
9. *Cylinder head gasket*
10. *Cylinder head (P.T.O. side)*
11. *Cylinder head (Mag. side)*
12. *Washer (7)*
13. *Nut (15)*
14. *Support sleeve*
15. *Distance nut*
16. *Exhaust socket stud (4)*
17. *Exhaust socket gasket*
18. *Exhaust socket (P.T.O. side)*
19. *Exhaust socket (Mag. side)*
20. *Lock washer (6)*
21. *Sealing ring (2 or 4)*
22. *Intake manifold stud*
23. *Profile gasket (Mag. side)*
24. *Profile gasket (P.T.O. side)*
25. *Intake manifold*
26. *Profile gasket*
27. *Intake manifold cover*
28. *Ignition cable bracket*
29. *Carburetor stud*
30. *Flange gasket*
31. *Isolating flange*
32. *Tab washer*

MAGNETO



1. Nut (3)
2. Lock washer (3)
3. Starting pulley
4. Starting pulley stud (3)
5. Magneto housing
6. Centrifugal lever spring
7. Centrifugal lever
8. Bearing screw
9. Magneto ring
10. Lock washer (4)
11. Allen screw (4)
12. Coil retaining screw (4)
13. Lock washer (4)
14. Lighting coil
15. Ignition generator coil
16. Capacitor charging coil
17. Capacitor (2)
18. Washer (2)
19. Lock washer (2)
20. Allen screw (2)
21. Armature plate
22. Breaker point set
23. Breaker point (unit construction)
24. Pivot pin
25. Bolt
26. Lock washer
27. Nut
28. Screw
29. Lock washer
30. Washer
31. Washer
32. Retaining clip

COOLING SYSTEM



1. Cylinder cowl (exhaust side)
2. Cylinder cowl (intake side)
3. Allen screw (2)
4. Lock nut (2)
5. Bolt
6. Lock washer
7. Cowl retainer washer
8. Spring holder
9. Bolt
10. Nut
11. Lock washer
12. Fan
13. Woodruff key
14. Ball bearing
15. Spacer (2)
16. Locking ring
17. Spring washer (4)
18. Flat headed screw (3)
19. Screw
20. Spacer
21. Pulley half
22. Lock washer
23. Nut
24. Fan belt
25. Fan housing
26. Cover retaining screw (3)
27. Fan cover
28. Shim (as required)

REMOVAL

Remove or disconnect the following (if applicable) then lift engine out of vehicle.

- Drive belt.
- Muffler.
- Air silencer tube.
- Choke cable at carburetor.
- Throttle cable at carburetor.
- Fuel lines at carburetor.

Note: Secure fuel lines so that the opened ends are higher than the fuel level in the tank.

- Disconnect negative cable (ground) from battery, then disconnect electrical connections leading from engine.
- Console.
- Engine mount nuts.

DISASSEMBLY & ASSEMBLY

General

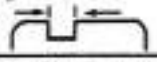
Refer to Technical Data Section for component fitted tolerance and wear limit.

If necessary, refer to Drive Pulley Section for pulley removal.

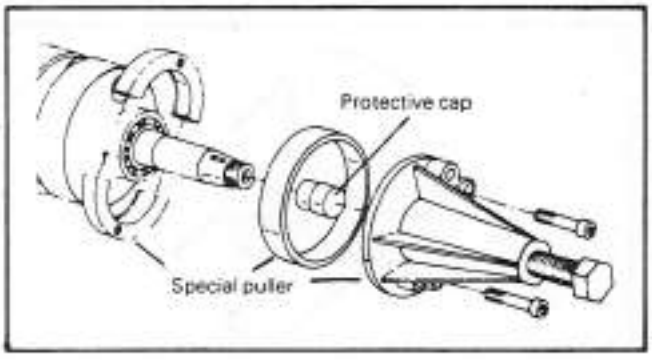
Bottom End

②The "O" ring / ball bearing combination within the same engine may vary depending on production date of engine.

For correct assembly, refer to the following chart for identification.

Ball bearing groove width 	"O" RING	
	Outside diameter	Part number
.118" (3 mm)	2 3/4"	420 830 370
.078" (2 mm)	2 5/16"	420 830 350

⑤To remove bearing from crankshaft use a protective cap and special puller, as illustrated. (See Tool Section).



Prior to installation, place bearings into an oil container and heat the oil to 200° F. for 5 to 10 min. This will expand bearings and ease installation.

Install bearings with groove outward.

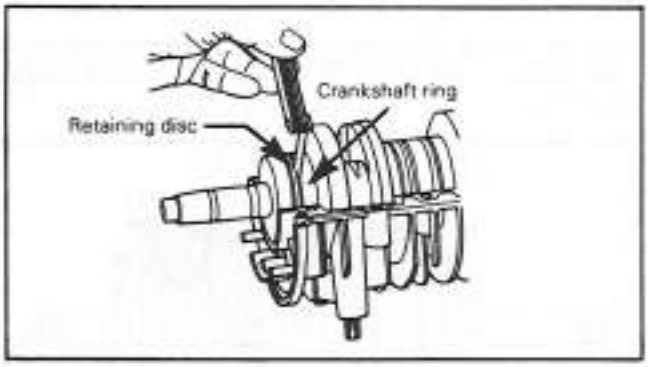
⑧Crankshaft end-play is adjusted with shim(s) located between crankshaft and magneto side bearing. To determine correct amount of shim(s), proceed as follows.

Remove magneto side bearing and existing shim(s). Slide the appropriate crankshaft ring and the retaining disc on the crankshaft. (See Tool Section).

Position crankshaft assembly into crankcase lower half. Make sure that retaining discs are correctly seated in the grooves.

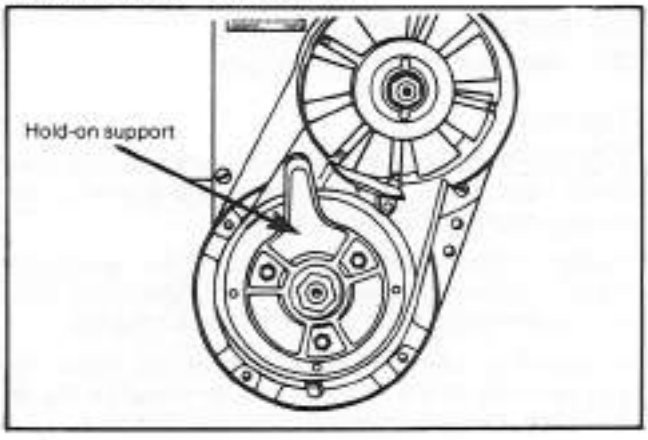
Gently tap crankshaft counterweight until P.T.O. side bearing bears against retaining disc.

Any free-play between the crankshaft ring and magneto side retaining disc, minus recommended end-play, is the distance to be covered by shim(s). Shims are available in the thickness of 0.1 mm / .004", 0.2 mm / .008", 0.3 mm / .012", 0.5 mm / .020", 1 mm / .039".



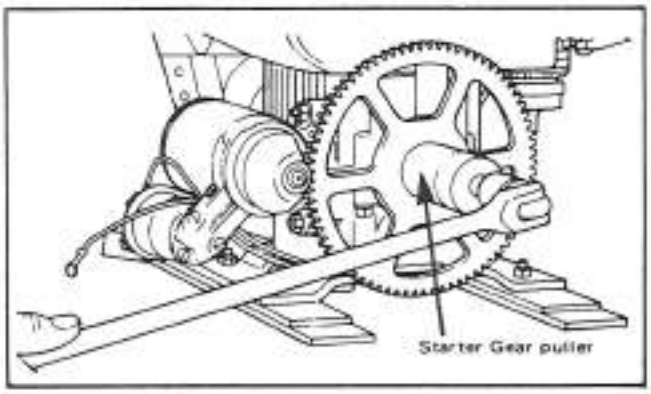
Note: Crankshaft end-play requires adjustment only when crankshaft and / or crankcase is replaced.

⑬To remove or install magneto retaining nut, lock crankshaft in position with special hold-on support as illustrated. (See Tool Section).



At assembly, torque retaining nut to 58-63 ft-lbs.

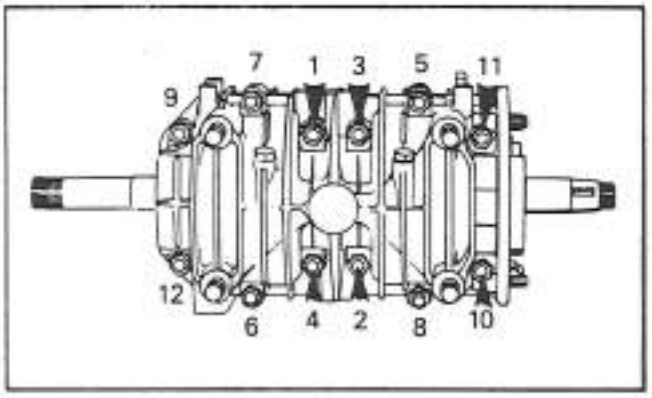
⑮ To remove starter gear from crankshaft it may be necessary to use a special puller as illustrated. (See Special Tool).



At assembly, apply a light coat of anti-seize compound on crankshaft extension nearest starter gear.

⑱ ⑲ Prior to joining of crankcase halves, apply a light coat of "Loctite" crankcase sealant to the mating surfaces of the bottom half.

Position spring washers and nuts on crankcase studs then torque nuts to 14-16 ft-lbs., following illustrated sequence.



㉘ At assembly, torque to 14-16 ft-lbs.

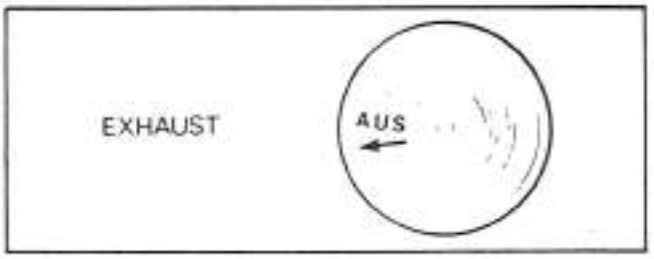
㉛ At assembly, torque to 29-35 ft-lbs.

Top End

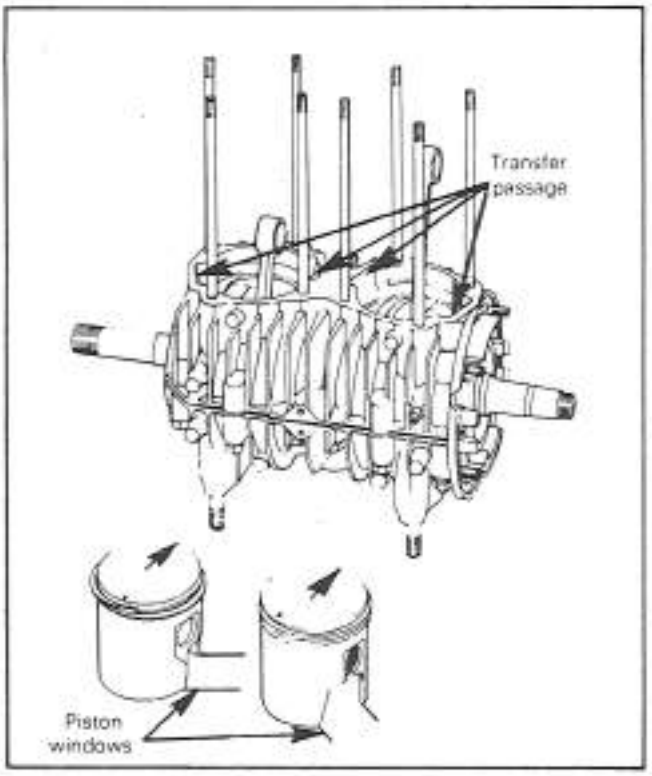
① ② ③ ④ Place a clean cloth over crankcase to prevent circlip from falling into crankcase. Use a pointed tool to remove circlips from piston.

Caution: When tapping out gudgeon pins, hold piston firmly in place to eliminate the possibilities of transmitting shock and pressure to the connecting rod.

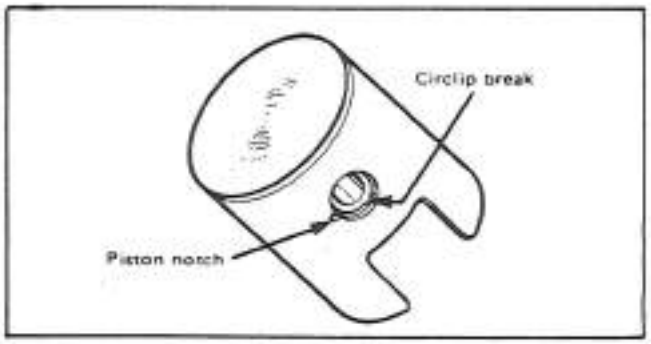
At assembly, place the pistons over the connecting rods with the letters "AUS", over an arrow on the piston dome, facing in direction of the exhaust port.



Also make sure that the piston windows are aligned with the crankcase transfer passages when the gudgeon pin orifice is in-line with the connecting rod bore.



Note: Once the circlips are installed turn each circlip so the circlip break is not directly on piston notch. Remove any burrs from piston caused through circlip installation using very fine emery cloth.



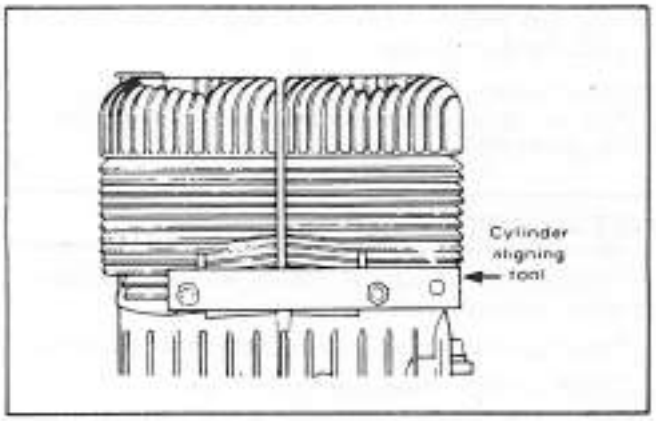
⑦⑧⑨⑩⑪When installing cylinder and / or cylinder head, the cylinder aligning tool must be used to ensure sealing of intake manifold and cylinders. (See Tool Section).

Install muffler on exhaust socket then install aligning bar.

Torque distance nut to 14-16 ft-lbs.

Cross torque cylinder head nut to 14-16 ft-lbs.

Note: Torque each cylinder head individually.

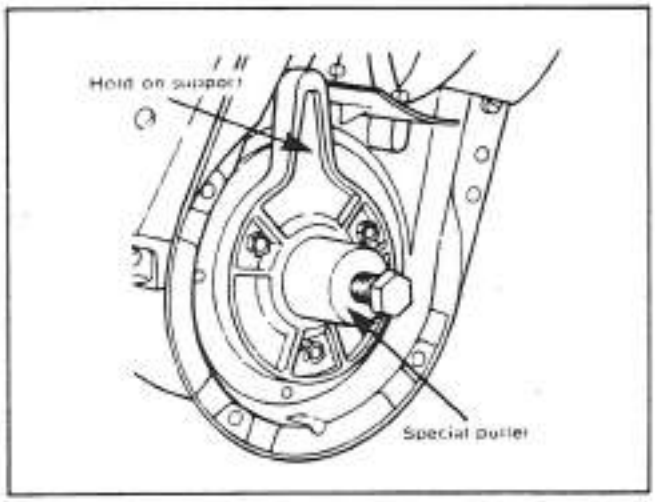


⑬⑮At assembly, torque to 14-16 ft-lbs.

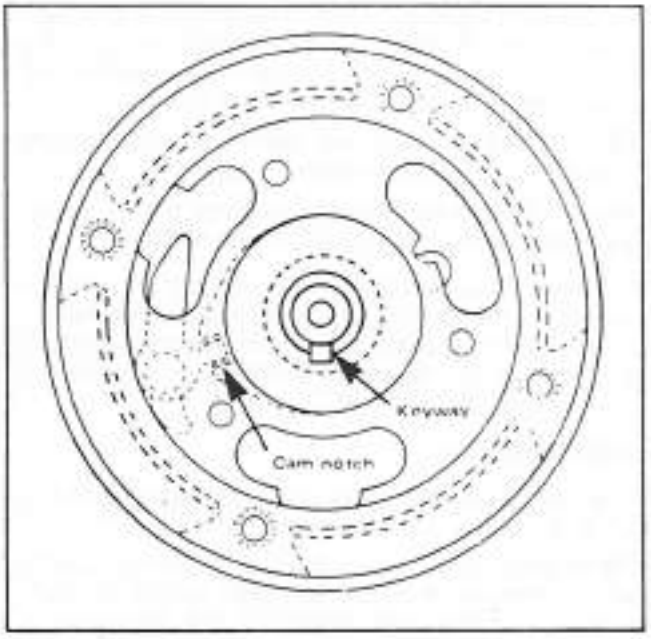
Magneto

⑤With magneto retaining nut removed and hold-on support in place, install special puller onto hub.

Tighten puller nut and at same time, tap on nut head using a hammer to release magneto from its taper.



At assembly, on engine fitted with breaker points, position magneto on crankshaft with the keyway and the cam notch positioned as illustrated.

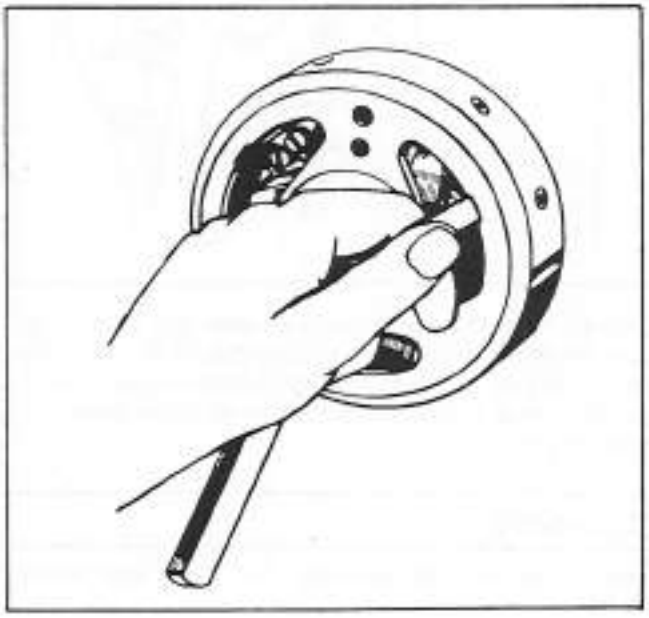


⑥⑦⑧At assembly, apply a small amount of low temperature grease into spring seating.

⑪At assembly, apply Loctite "Lock'n Seal" on retaining screw threads.

⑭⑮⑯Whenever a coil is replaced, the air gap (distance between magnet and armature end) must be adjusted.

To check air gap, insert a feeler gauge of correct thickness (0.31 mm / .012" - 0.45 mm / .018") between magnet and armature ends. If necessary to adjust, slacken retaining screw and relocate armature.



⑰ To replace a capacitor, it is first necessary to unsolder the two (2) black leads. The capacitor can then be driven out of the armature plate using a suitable drift and hammer. To reinstall, inverse procedure.

㉒ ㉔ When replacing breaker point set, apply a **light** coat of grease on pivot pin and rubbing block.

㉓ When replacing unit construction type breaker point, apply a small amount of grease on rubbing block.

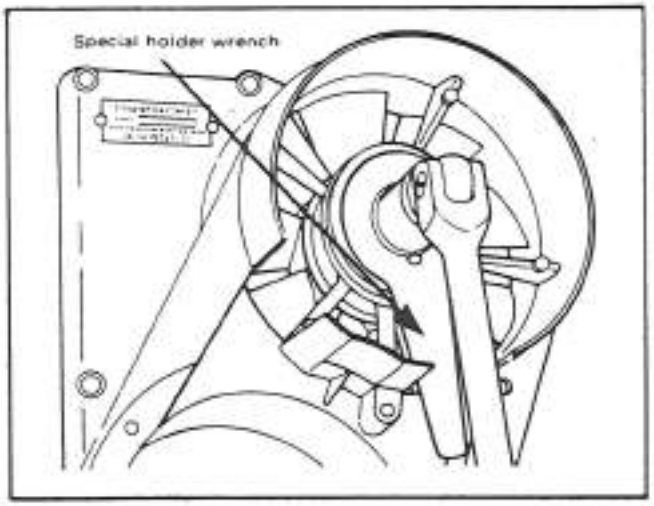
Note: New unit construction type breaker point may be installed on older engine. To install, simply remove pivot pin, then insert new breaker point pin into threaded hole and secure. A special tool is available to remove old pivot pin. (See Tool Section).

Cooling System

⑭ It is first necessary to heat bearing housing to 140° - 160° F. to remove or install bearing.

⑱ ⑲ At assembly, apply a light coat of Loctite "Lock'n Seal" on threads. It should be noted that to correctly remove a Loctite locked screw, it is first necessary to slightly tap o head of screw to break Loctite bond. The screw can then be removed. This will eliminate the possibility of screw breakage.

⑳ ㉒ ㉓ ㉔ Lock fan pulley with special holder wrench to remove or install pulley retaining nut. (See Tool Section).



Shim(s) located between pulley halves are used to adjust fan belt free-play. Correct free-play is ¼". If necessary to adjust, install or remove shim(s) between pulley halves. Install excess shim(s) between outer pulley half and washer.

CLEANING

Discard all oil seals, gaskets, "O" rings and sealing rings.

Clean all metal components in a non-ferrous metal cleaner.

Caution: Clean armature using only a clean cloth.

Scrape off carbon formation from cylinder exhaust ports, cylinder heads and piston domes using a wooden spatula.

Note: The letter "AUS" over an arrow on the piston dome must be visible after cleaning.

Clean the piston ring grooves with a groove cleaner tool, or with a piece of broken ring.

Remove old sealant from crankcase mating surfaces with Bombardier "Sealant stripper".

Caution: Never use a sharp object to scrape away old sealant as score marks incurred are detrimental to crankcase sealing.

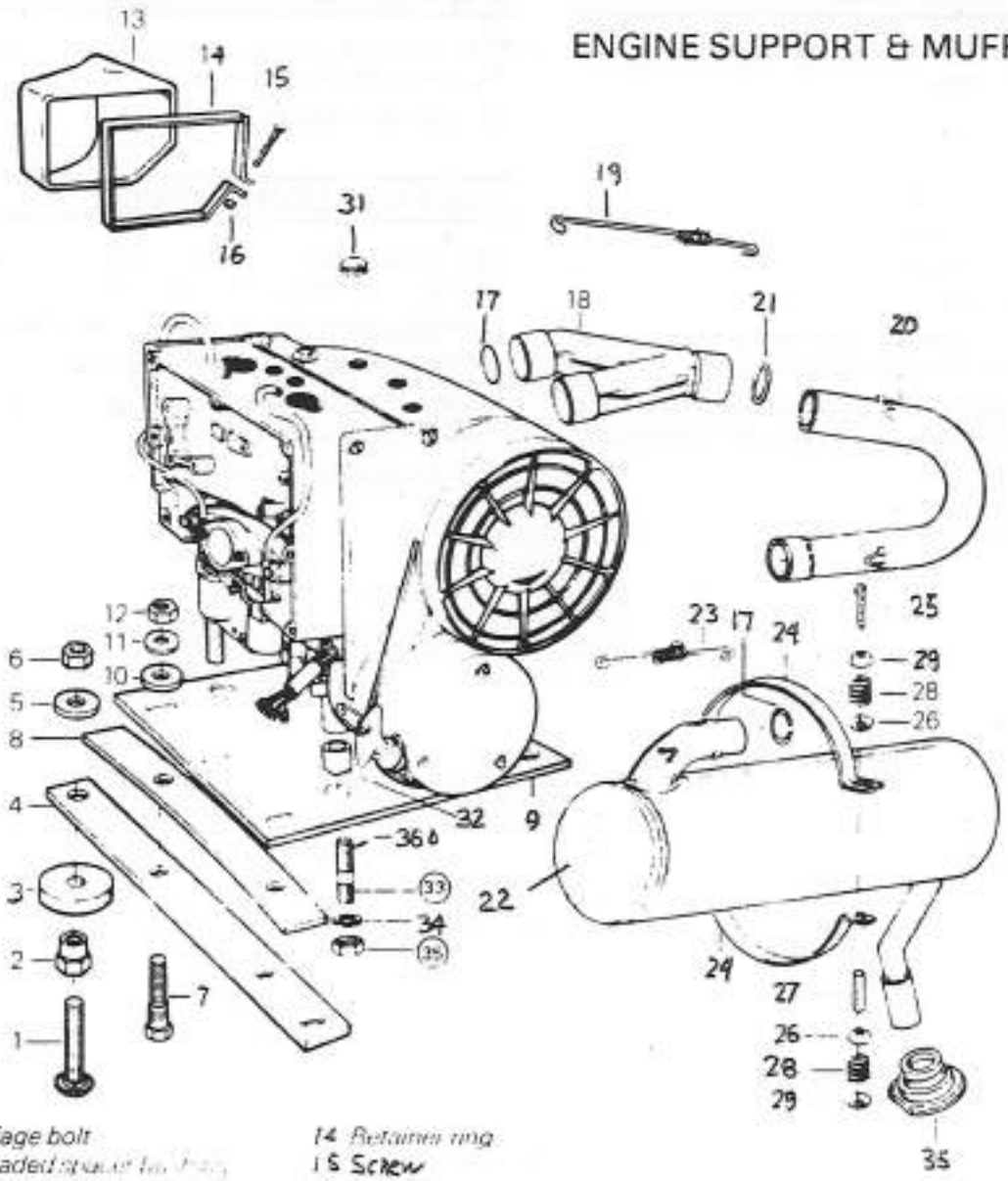
INSTALLATION

To install engine on vehicle, inverse removal procedure. However, pay attention to the following:

- Check ignition timing prior to installation on vehicle.
- Check tightness of engine mount nuts.
- After throttle cable installation, check carburetor maximum throttle opening.
- Check pulley alignment.

640 ENGINE TYPE (FROM 1976)

ENGINE SUPPORT & MUFFLER



1. Carriage bolt
2. Threaded [illegible]
3. Rubber insulator
4. Engine support
5. Washer
6. Nut
7. Bolt
8. Spring leaf
9. Engine bracket
10. Washer
11. Washer
12. Nut
13. Air duct
14. Retaining ring
15. Screw
16. Nut
17. Aluminum ring
18. Exhaust manifold
19. Spring
20. Exhaust manifold elbow
21. Aluminum ring
22. Muffler
23. Spring
24. Muffler clamp
25. Screw
26. Cup
27. Bushing
28. Spring
29. Cup
30. Exhaust grommet
31. Rubber plug
32. Distance sleeve
33. Stud
34. Lockwasher
35. Nut
36. Loctite Lock'n Seal 242

ENGINE SUPPORT & MUFFLER

REMOVAL FROM VEHICLE

Remove or disconnect the following (if applicable) then lift engine out of vehicle.

- Drive belt.
- Muffler.
- Air intake silencer tube.
- Choke cable at carburetor.
- Throttle cable at carburetor.
- Fuel lines at carburetor.

NOTE: Secure fuel lines so that the opened ends are higher than the fuel level in the tank.

- Disconnect negative cable (ground) from battery, then disconnect electrical connections leading from engine.
- Console.
- Engine mount nuts.

DISASSEMBLY & ASSEMBLY

(33) At assembly on crankcase, apply Loctite Lock'n Seal 242 or equivalent on threads.

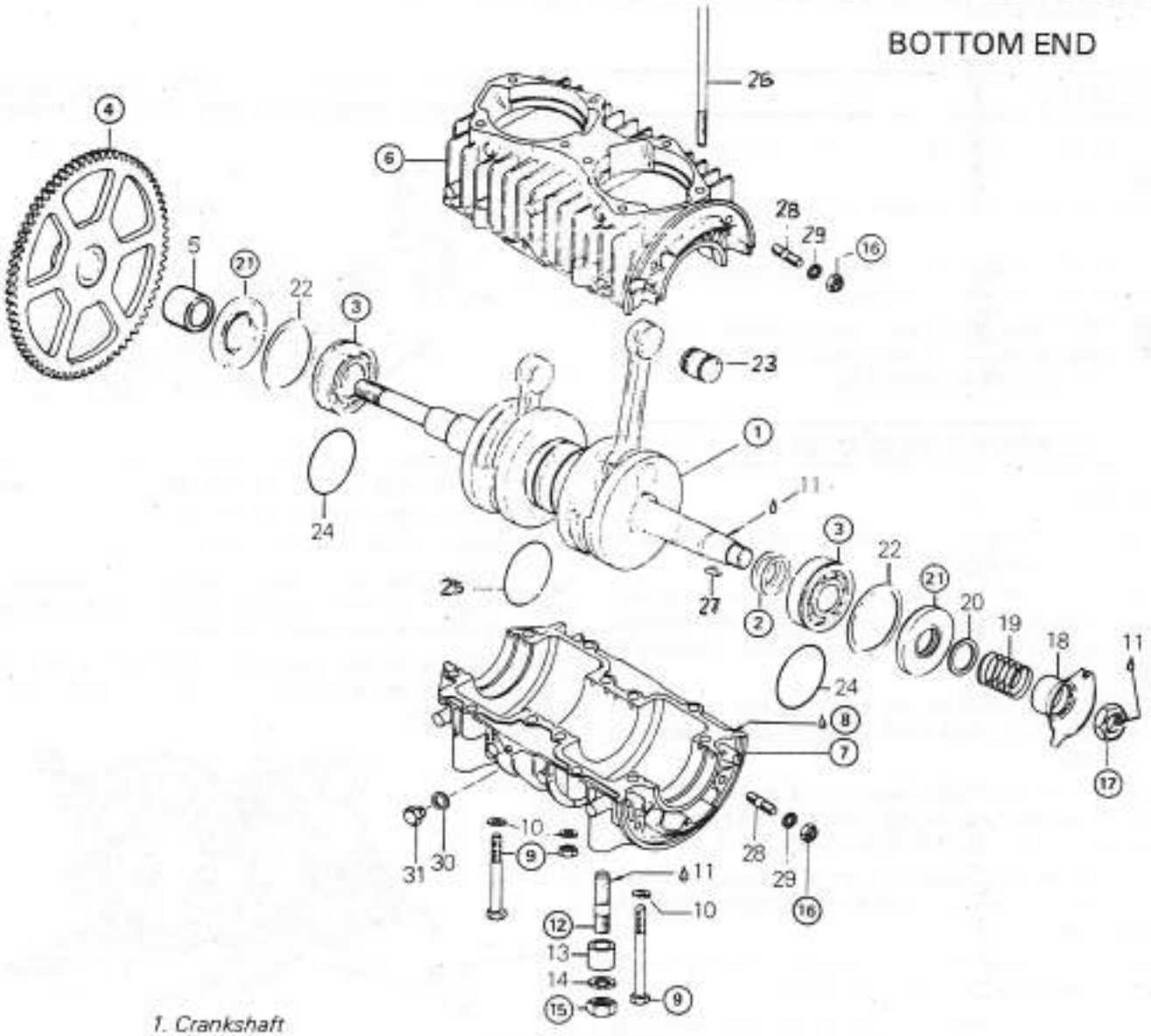
(34) Torque to 4.4 kg-m (32 ft-lbs).

INSATALLATION IN VEHICLE

To install engine on vehicle, inverse removal procedure. However, pay attention to the following:

- Check ignition timing prior to installation on vehicle.
- Check tightness of engine mount nuts.
- After throttle cable installation, check carburetor maximum throttle opening.
- Check pulley alignment.

BOTTOM END



1. Crankshaft
2. Shim
3. Bearing
4. Starter gear
5. Bushing (manual model)
6. Crankcase upper half
7. Crankcase lower half
8. Crankcase sealant
9. Bolt or stud with nut
10. Lockwasher
11. Loctite Lock'n Seal 242
12. Stud
13. Spacer bushing
14. Lockwasher
15. Nut
16. Nut
17. Nut (magneto)
18. Breaker point cam
19. Spring
20. Washer
21. Oil seal
22. Retaining washer
23. Needle cage bearing
24. "O" ring (bearing)
25. "O" ring
26. Stud
27. Woodruff key
28. Stud
29. Washer
30. Washer
31. Screw

BOTTOM END

CLEANING

Discard all oil seals, gaskets, "O" rings and sealing rings.

Clean all metal components in a non-ferrous metal cleaner.

Remove old sealant from crankcase mating surfaces with Bombardier sealant stripper.

CAUTION: Never use a sharp object to scrape away old sealant as score marks incurred are detrimental to crankcase sealing.

DISASSEMBLY & ASSSEMBLY

General

Refer to Technical Data Section for component fitted tolerance and wear limit.

①② Crankshaft end-play is adjusted with shim(s) located between crankshaft and magneto side bearing. To determine correct amount of shim(s), proceed as follows.

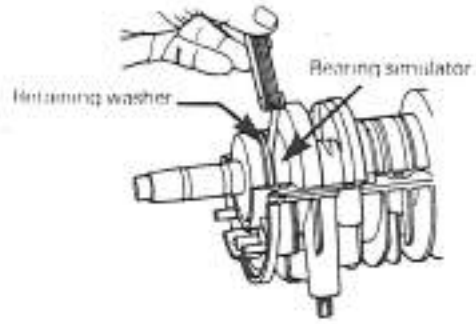
NOTE: Crankshaft end-play requires adjustment only when crankshaft and / or crankcase is replaced.

Remove magneto side bearing and existing shim(s). Slide the appropriate bearing simulator and the retaining washer on the crankshaft. (See Tool Section).

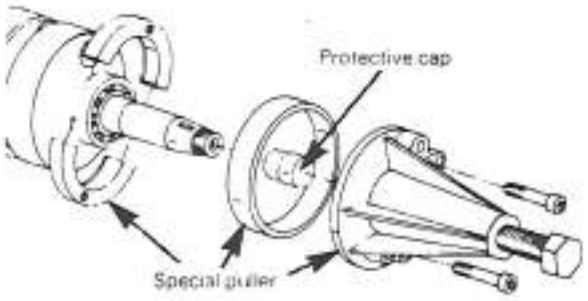
Position crankshaft assembly into crankcase lower half. Make sure that retaining washers are correctly seated in the grooves.

Gently tap crankshaft counterweight until P.T.O. side bearing bears against retaining washer.

Any free-play between the bearing simulator and magneto side retaining washer, minus recommended end-play, is the distance to be covered by shim(s). Shims are available in the thickness of 0.1 mm (.004"), 0.2 mm (.008"), 0.3 mm (.012"), 0.5 mm (.020"), 1 mm (.039").



③ To remove bearing from crankshaft use a protective cap and special puller, as illustrated. (See Tool Section).

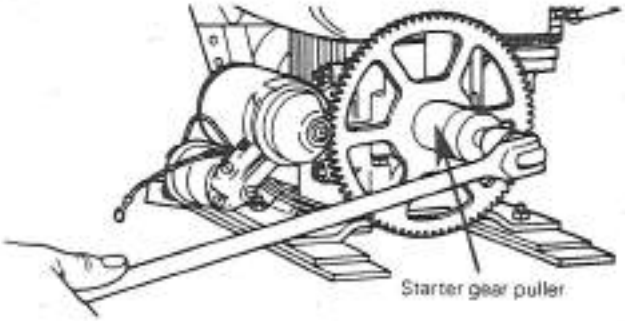


Prior to installation, place bearings into an oil container and heat the oil to 100° C (210° F) for 10 min. This will expand bearings and ease installation.

Install bearings with groove outward.

NOTE: Prior to magneto side bearing installation, determine crankshaft end-play and install required shim(s) on crankshaft extension.

④ To remove starter gear from crankshaft it may be necessary to use a special puller as illustrated. (See Special Tools).



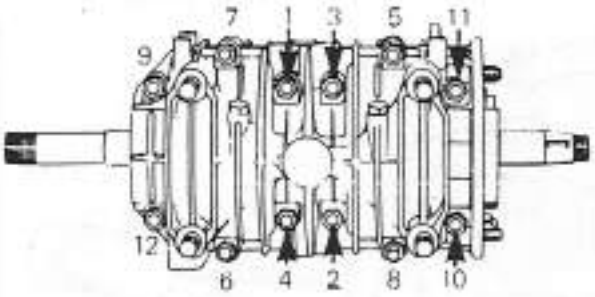
At assembly, apply a light coat of anti-seize compound on crankshaft extension nearest starter gear.

⑥⑦⑧ Crankcase halves are factory matched and therefore, are not interchangeable or available as single halves.

Prior to joining of crankcase halves, prepare mating surfaces with crankcase sealant primer then apply a light coat of crankcase sealant (See Tool Section) as per instructions printed on container.

Position the crankcase halves together and tighten nuts (or bolts) by hand then install armature plate (tighten) on magneto side to correctly align the crankcase halves.

Torque nuts (or bolts) to 2.2 kg-m (16 ft-lbs) following illustrated sequence.



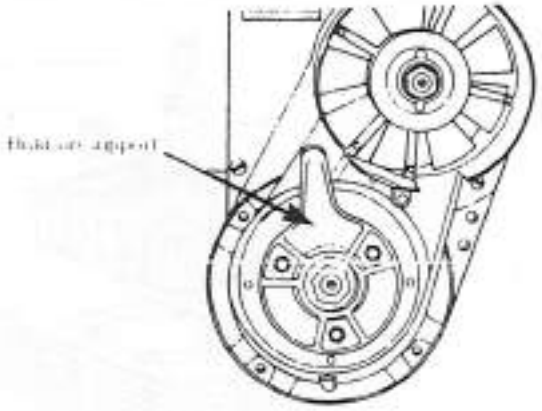
⑨ Torque to 2.2 kg-m (16 ft-lbs).

⑫ At assembly on crankcase, apply Loctite Lock'n Seal 242 or equivalent on threads.

⑯ Torque to 4.4 kg-m (32 ft lbs).

⑱ Torque to 2.2 kg-m (16 ft-lbs).

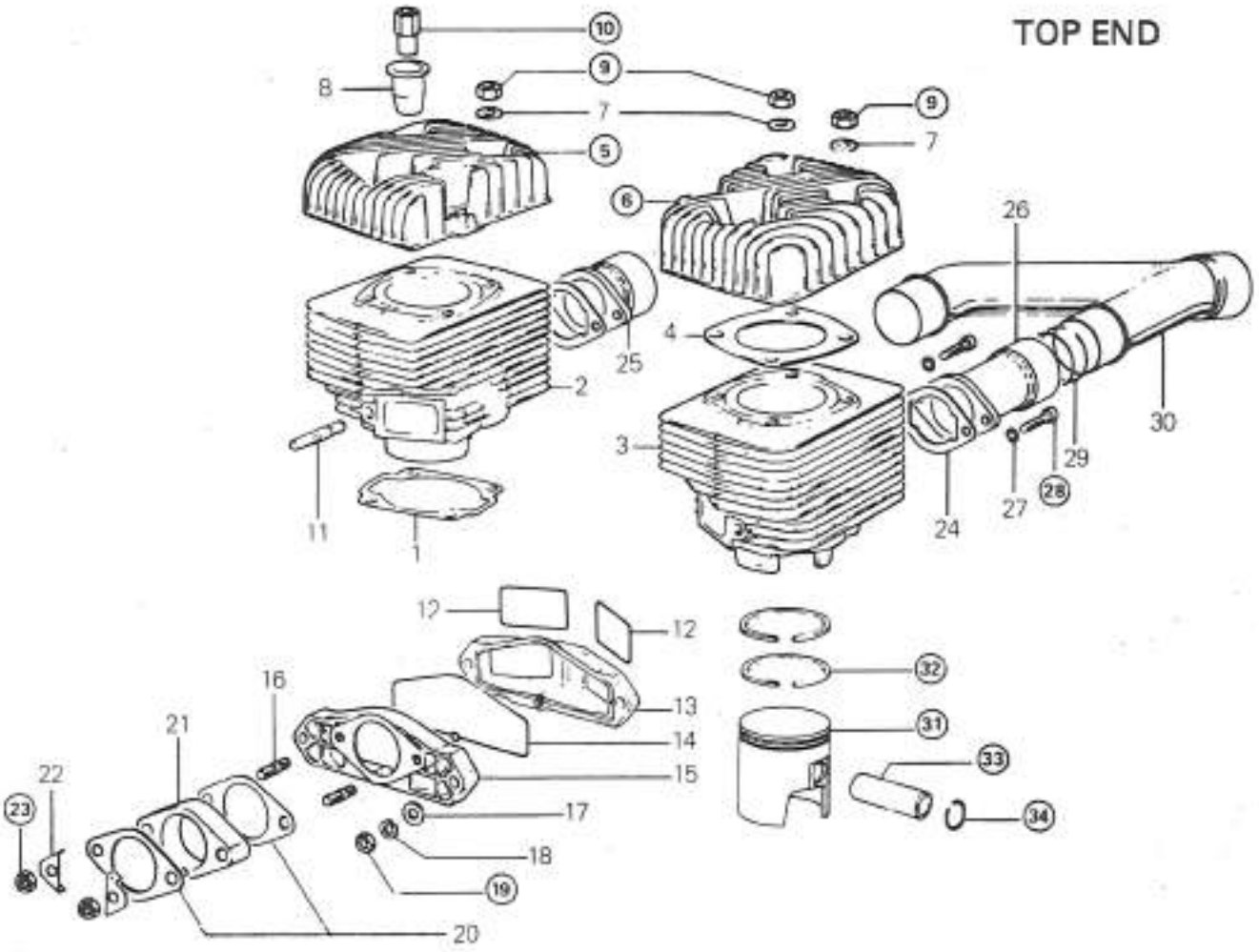
⑰ To remove or install magneto retaining nut, lock crankshaft in position with special hold-on support as illustrated. (See Tool Section).



At assembly, apply Loctite Lock'n Seal 242 or equivalent on threads then torque to 7.5 kg-m (54 ft lbs).

⑳ At assembly apply a light coat of lithium grease on seal lip. Seal outer surface should be flush with crankcase.

TOP END



1. Gasket (cylinder / crankcase)
2. Cylinder (P.T.O.)
3. Cylinder (Mag)
4. Gasket (head, cylinder)
5. Cylinder head (P.T.O.)
6. Cylinder head (Mag)
7. Flat washer
8. Support sleeve
9. Nut
10. Distance nut
11. Stud
12. Gasket
13. Intake manifold
14. Gasket
15. Intake cover
16. Stud
17. Washer
18. Lockwasher
19. Nut
20. Gasket
21. Isolating flange
22. Locking tab
23. Nut
24. Exhaust gasket
25. Exhaust socket (P.T.O.)
26. Exhaust socket (mag)
27. Lockwasher
28. Screw
29. Sealing ring
30. Exhaust manifold
31. Piston
32. Ring
33. Gudgeon pin
34. Circlip

TOP END

CLEANING

Discard all gaskets.

Clean all metal components in a non-ferrous metal cleaner.
Scrape off carbon formation from cylinder exhaust port, cylinder head and piston dome using a wooden spatula.

NOTE: The letter "AUS" lover an arrow on the piston domel must be visible after cleaning.

Clean the piston mag grooves with a groove cleaner tool, or with a piece of broken ring.

DISASSEMBLY & ASSEMBLY

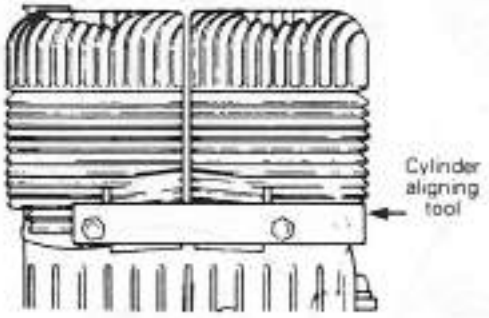
NOTE: Refer to Technical Data for component fitted tolerance and wear limit.

⑤⑥ When installing cylinder and / or cylinder head, the cylinder aligning tool must be used to ensure sealing of intake manifold and exhaust. (See Tool Section).

Install muffler on exhaust socket then install aligning bar.

Cross torque cylinder head nuts to 2.1 kg-m (15 ft-lbs).

NOTE: Torque each cylinder head individually.



⑨⑩ Torque cylinder head nuts to 2.1 kg-m (15 ft-lbs).

⑲㉓㉘ Torque to 2.1 kg-m (15 ft-lbs).

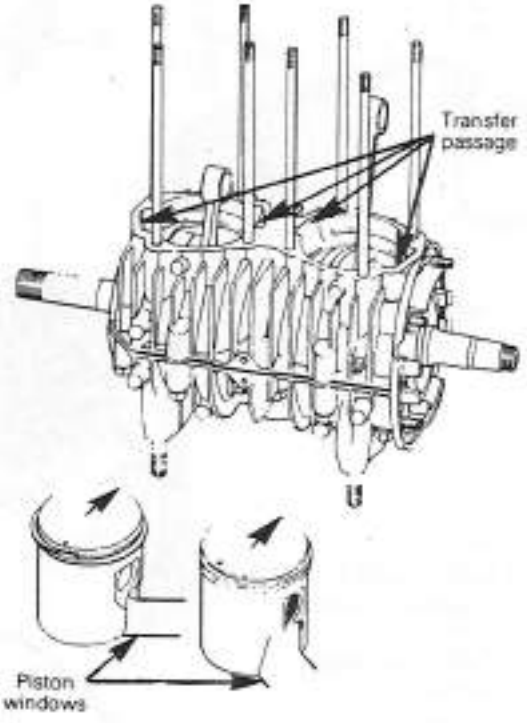
㉛㉝㉞ Place a clean cloth over crankcase to prevent circlip from falling into crankcase. Use a pointed tool to remove circlips from piston.

CAUTION: When tapping out gudgeon pins, hold piston firmly in place to eliminate the possibilities of transmitting shock and pressure to the connecting rod.

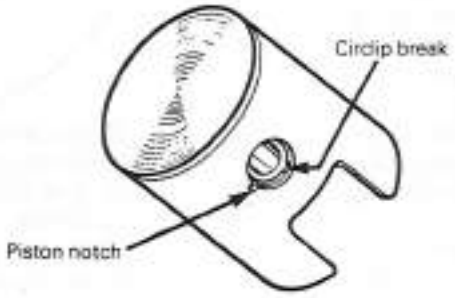
At assembly, place the pistons over the connecting rods with the letters "AUS" lover an arrow on the piston domel facing in direction of the exhaust port.

EXHAUST

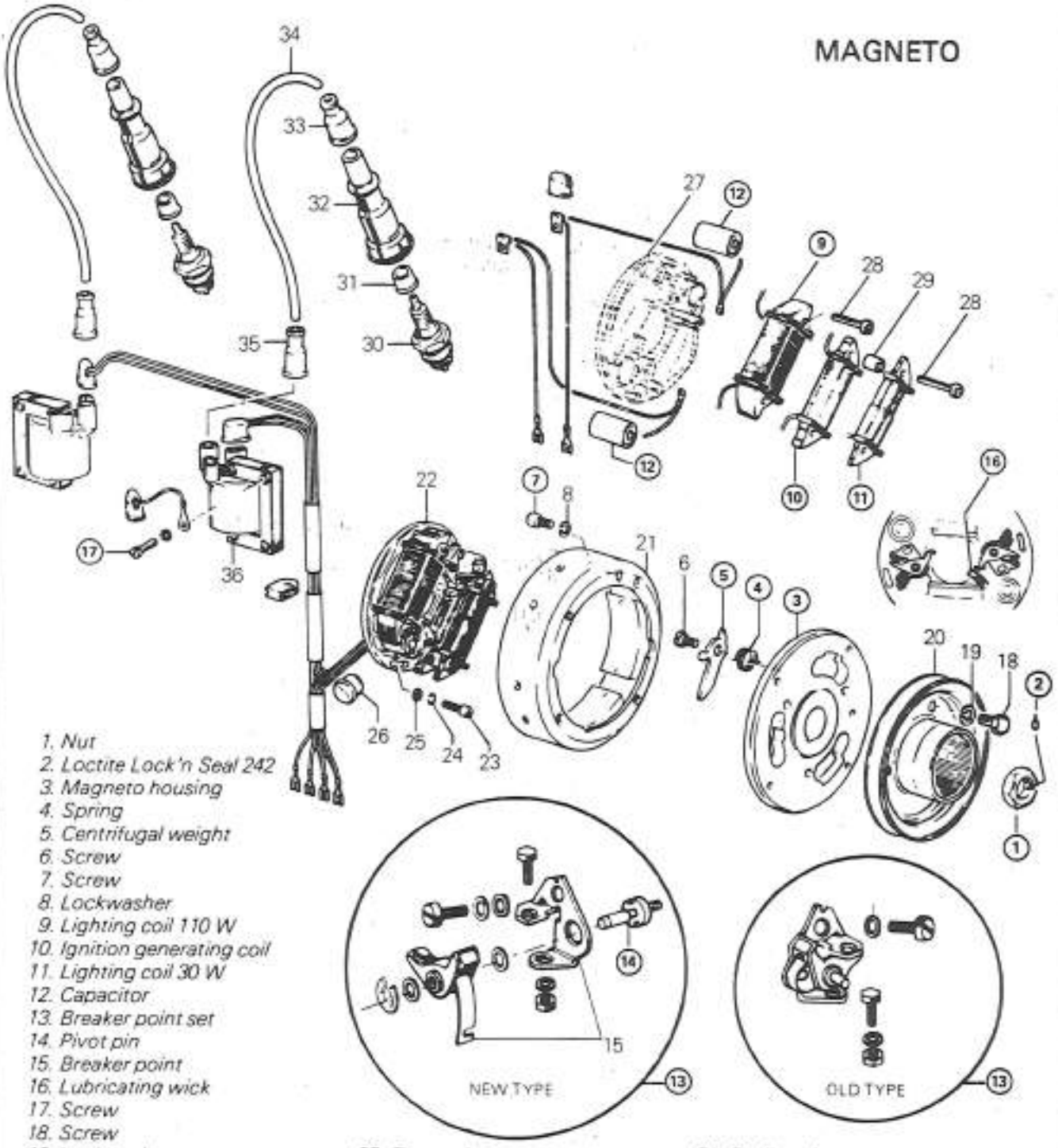
Also make sure that the piston windows are aligned with the crankcase transfer passages when the gudgeon pin orifice is in-line with the connecting rod bore.



NOTE: Once the circlips are installed turn each circlip so the circlip break is not directly on piston notch. Remove any burrs from piston caused through circlip installation using very fine emery cloth.



MAGNETO



1. Nut
2. Loctite Lock'n Seal 242
3. Magneto housing
4. Spring
5. Centrifugal weight
6. Screw
7. Screw
8. Lockwasher
9. Lighting coil 110 W
10. Ignition generating coil
11. Lighting coil 30 W
12. Capacitor
13. Breaker point set
14. Pivot pin
15. Breaker point
16. Lubricating wick
17. Screw
18. Screw
19. Lockwasher
20. Starting pulley
21. Magneto ring
22. Armature
23. Screw
24. Lockwasher
25. Flat washer
26. Wires grommet
27. Armature plate
28. Screw
29. Distance sleeve 11 mm
30. Spark plug
31. Sealing sleeve
32. Spark plug protector (shielded)
33. Protection cap
34. H.T. cable
35. Protection cap
36. Ignition coil

MAGNETO

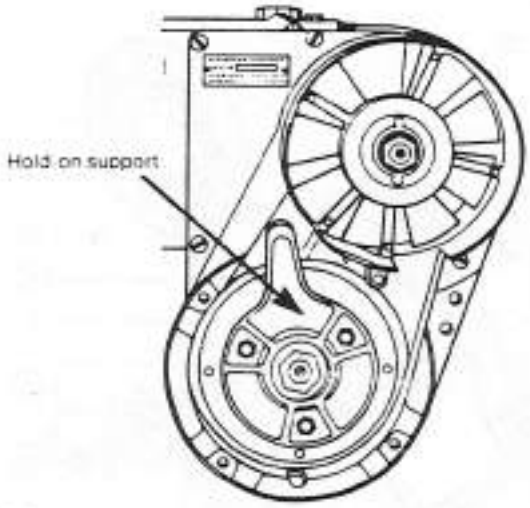
CLEANING

Clean all metal components in a non-ferrous metal cleaner.

CAUTION: Clean armature and magneto using only a clean cloth.

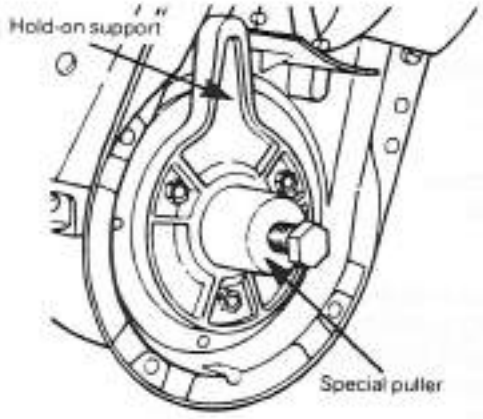
DISASSEMBLY & ASSEMBLY

To remove or install magneto retaining nut, lock crankshaft in position with special hold-on support as illustrated. (See Tool Section)



①②③ With magneto retaining nut removed and hold-on support in place, install special puller onto hub.

Tighten puller bolt and at same time, tap on bolt head using a hamer to release magneto from its taper.



At assembly, clean crankshaft extension (taper) then apply Loctite Lock'n Seal 242 or equivalent.

Install magneto retaining nut (with Loctite Lock'n Seal 242 on threads) and torque to 8.3 kg-m (60 ft-lbs).

④⑤ At assembly, apply a small amount of low temperature grease into spring seating.

⑦ At assembly, apply Loctite Lock'n Seal 242 on retaining screw threads.

④⑩⑪ Whenever a coil is replaced, the air gap (distance between coil end and magnet) must be adjusted.

To check air gap, insert a feeler gauge of 0.30-0.45 mm (.012"-.018") between magnet and coil ends. If necessary to adjust, slacken coil retaining screws and relocate coil.

⑫ To replace a capacitor, it is first necessary to unsolder the two (2) black leads. The capacitor can then be driven out of the armature plate using a suitable drift and hammer. To reinstall, inverse procedure.

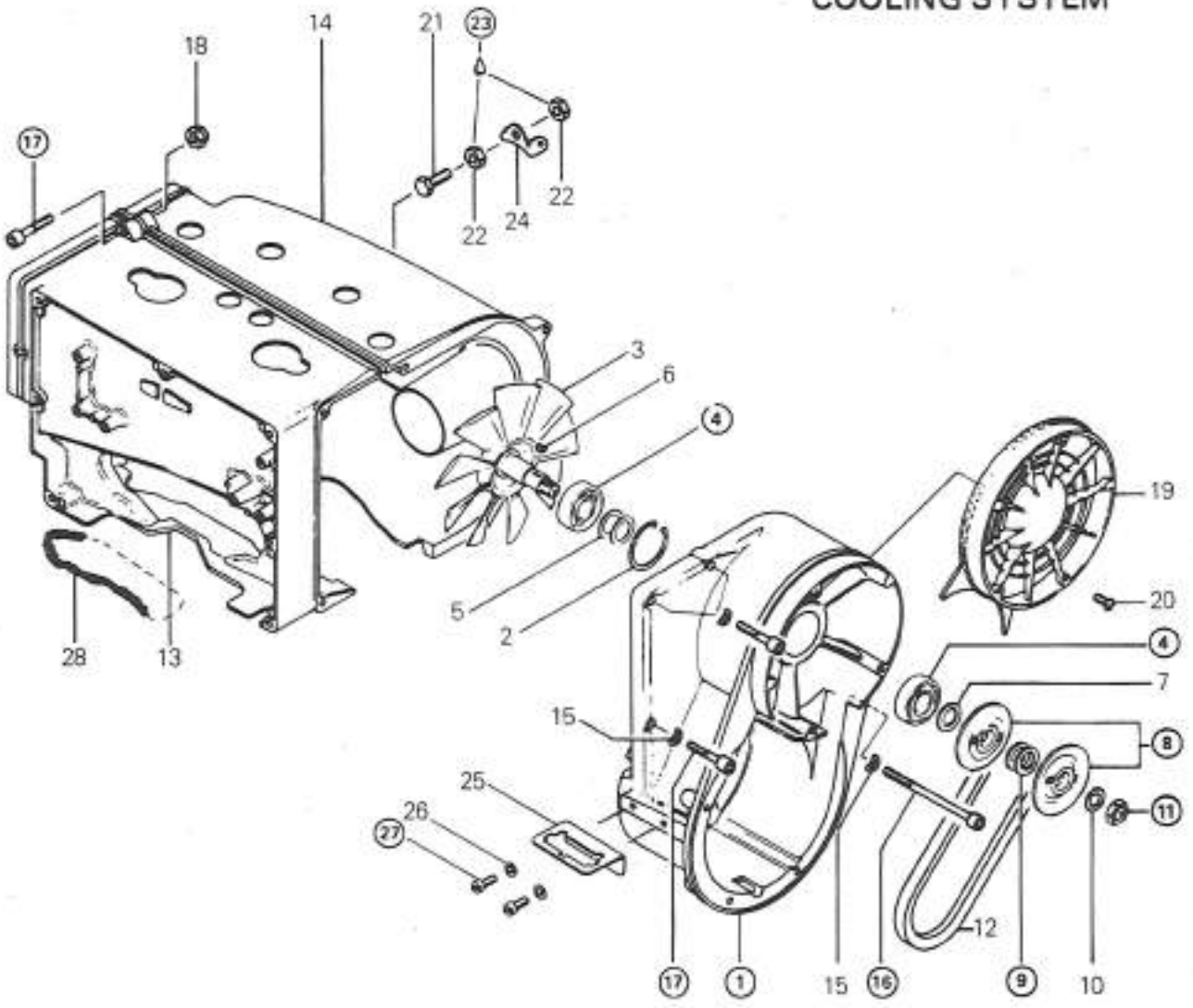
⑬⑭ Do not remove pivot pin unless replacement is needed, if removed reinstall with Loctite Lock'n Seal on threads.

Old type breaker point set can be replaced by new type if pivot pin is removed. When installing new breaker point type it is advisable to fill the pivot pin cavity of the armature plate with Loctite 277 (thick red solution).

⑯ When replacing breaker point set, apply a light coat of grease on lubricating wick.

⑰ Apply Loctite Lock'n Seal 242 on threads.

COOLING SYSTEM



1. Fan housing
2. Locking ring
3. Fan
4. Bearing
5. Washer
6. Woodruff key
7. Washer
8. Pulley (halves)
9. Shim
10. Lockwasher
11. Nut
12. Belt
13. Cylinder cowl (intake)
14. Cylinder cowl (exhaust)
15. Spring washer
16. Screw
17. Screw
18. Nut
19. Fan cover
20. Screw
21. Bolt
22. Nut
23. Loctite Lock'n Seal 242
24. Spring bracket
25. Junction block bracket
26. Lockwasher
27. Screw
28. Sealer (intake / cowl)

COOLING SYSTEM

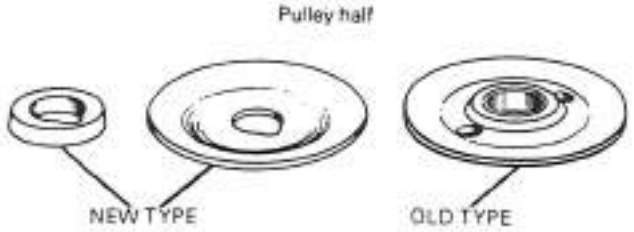
CLEANING

Clean all metal components in a non-ferrous metal cleaner.

DISASSEMBLY & ASSEMBLY

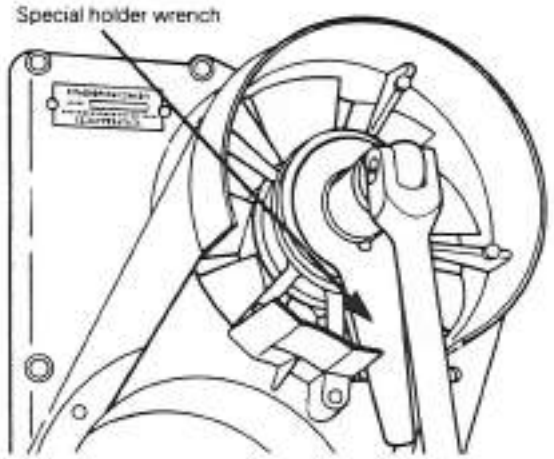
①④ It is first necessary to heat bearing housing to 65° C (150° F) to remove or install bearing.

⑧ Newer pulley half does not have a shoulder on its inner face so it is installed with a 6 mm (.236") spacer.



⑨ Shim(s) located between pulley halves are used to adjust fan belt free-play. Correct free-play is 6 mm (¼"). If necessary to adjust, install or remove shim(s) between pulley halves. Install excess shim(s) between outer pulley half and washer.

⑪ Lock fan pulley with special holder wrench to remove or install pulley retaining nut. (See Tool Section).



At assembly torque nut to 6.4 kg-m (46 ft-lbs).

⑯⑰㉓㉗ At assembly, apply a light coat of Loctite "Lock'n Seal 242" on threads. It should be noted that to correctly remove a Loctite locked screw, it is first necessary to slightly tap on head screw to break Loctite bond. The screw can then be removed. This will eliminate the possibility of screw breakage.

TWO CYLINDER ENGINE — BREAKER POINTS TYPE

FOREWORD

For timing purposes, it is necessary to separate the twin cylinder engines into three groups.

GROUP 1: engine types 248, 294
These engines do not incorporate an automatic advance mechanism. The ignition timing marks on the magneto ring are stamped at the full advance position.

GROUP 2: engine types 338, 401, 434
343 prior to serial no. 2 670 920
440 prior to serial no. 2 748 146
640 prior to serial no. 2 637 301

These engines incorporate an automatic advance mechanism. The ignition timing marks on the magneto ring are stamped at the **no advance** position.

GROUP 3: engine types 305
343 from serial no. 2 670 921
440 from serial no. 2 748 147
640 from serial no. 2 637 302
346 and 436 from 1977

These engines incorporate an automatic advance mechanism. The ignition timing marks on the magneto ring are stamped at the **full advance** position. Therefore, when setting the ignition timing **always hold the centrifugal lever at the full advance position.**

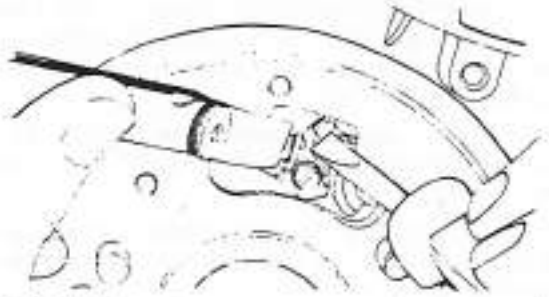
Two methods are detailed in this section; the first using the timing marks stamped on the engine, the second using a T.D.C. gauge.

TIMING MARKS PROCEDURE

1. Disconnect spark plug wires and remove spark plugs.
2. Remove rewind starter assembly from engine then remove the fan protector, starting pulley and "V" belt.

NOTE: The upper breaker points set controls the timing of the magneto side piston and the lower breaker points set controls the P.T.O. side piston.

3. Rotate crankshaft until breaker points, visible through magneto ring opening, are fully open. Adjust points setting to 0.40 mm 0.05 (.016" .002) using a feeler gauge and screwdriver, as illustrated. Repeat procedure for other set of points. **Adjust both side equally.**

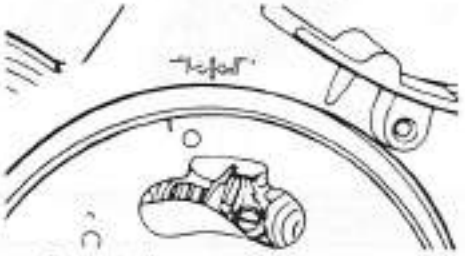


NOTE: Breaker points gap can change upon tightening. Always recheck after tightening.

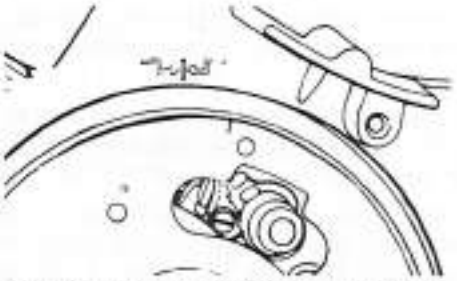
4. Disconnect junction block at engine then connect one lead of a timing light (flashlight type or of a tone timer), to the blue wire (mag. side) leading from engine. Connect other wire to fan cowl (ground).

NOTE: On group III engines, hold centrifugal lever in the open position (toward magneto rim) while performing steps 5, 6 and 7).

5. Slacken the two (2) armature plate retaining screws and turn timing instrument ON. Rotate crankshaft until mag. side piston approaches top dead center and timing marks align. Rotate armature plate until timing light fluctuates or tone signal level varies. Retighten retaining screws.
6. Ignition timing can change upon tightening therefore, rotate the magnetor counter-clockwise ¼ of a turn and slowly turn the magneto back in a clockwise direction. As soon as the timing marks align the timing light should fluctuate, or the tone signal level should vary. Readjust if necessary.

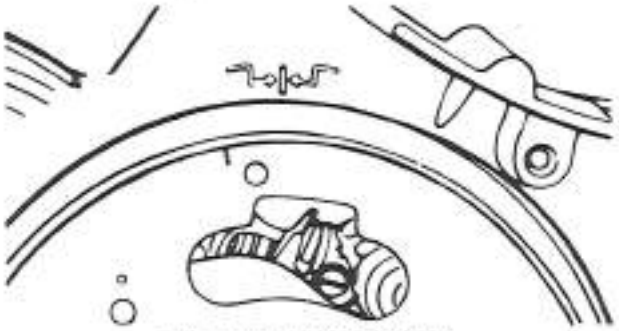


Too early: Turn armature plate clockwise

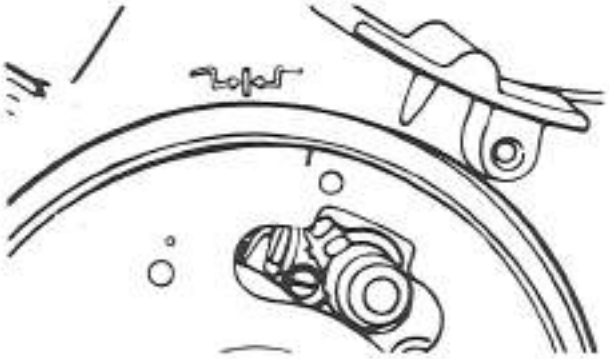


Too late: Turn armature plate counter-clockwise

7. Disconnect timing instrument wire from blue wire then reconnect it to the blue / red wire (P.T.O. side) leading from engine. Rotate crankshaft until P.T.O. side piston approaches top dead center. As soon as timing marks align timing light should fluctuate, or tone signal sound level should vary. If necessary to adjust proceed as follows:
   - If timing is too early decrease breaker points gap toward lower limit, i.e. 0.35 mm (.014"), then re-check timing.
   - If timing is too late increase breaker points gap toward upper limit, i.e. 0.45 mm (.018"), then re-check timing.



Too early: Decrease points gap



Too late: Increase points gap

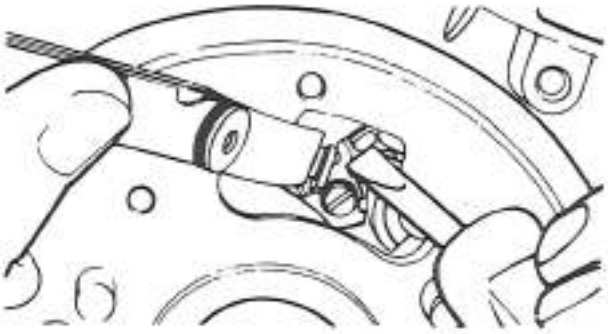
TDC GAUGE PROCEDURE

1. Disconnect spark plug wires and remove spark plugs.
2. Remove rewind starter assembly from engine then remove the fan protector, starting pulley and "V" belt.

NOTE: The upper breaker points set controls the timing of the magneto side piston and the lower breaker points set control the P.T.O. side piston.

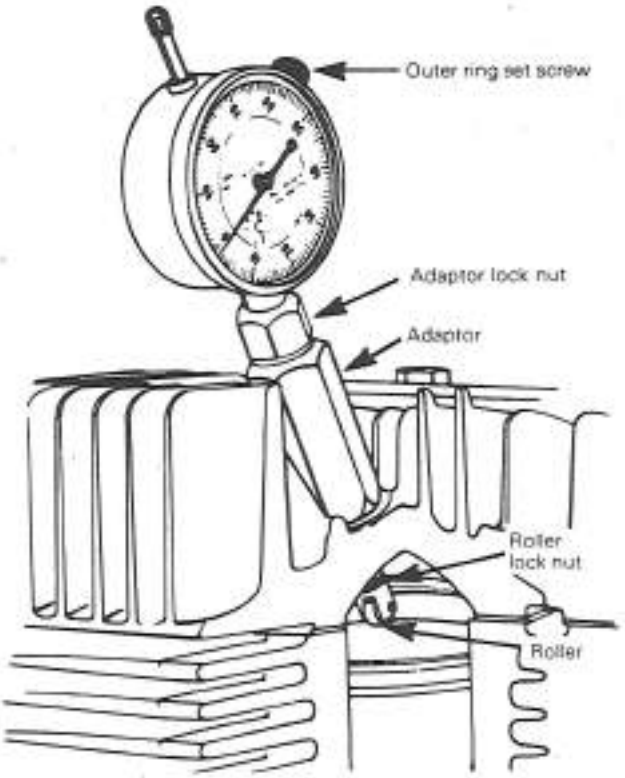
3. Rotate crankshaft until breaker points, visible through magneto ring opening are fully open. Adjust points setting to 0.40 mm ± 0.05 (.016" ± .002) using a feeler gauge and screwdriver, as illustrated.

Repeat procedure for other set of points. **Adjust both side equally.**



NOTE: Breaker points gap can change upon tightening. Always recheck after tightening.

4. Disconnect junction block at engine then connect one lead of a timing light (flashlight type or a tone timer), to the blue wire (mag. side) leading from engine. Connect other wire to fan cowl (ground).
5. Install and adjust T.D.C. gauge on engine as follows.
   - Rotate magneto until mag. side piston is just before top dead center.
   - With gauge in adaptor, adjust roller so that it is parallel with dial face. Tighten roller lock nut.



- Loosen adaptor lock nut then holding gauge with dial face toward magneto, screw adaptor in mag. side spark plug hole.
- Slide gauge far enough into adaptor to obtain a reading then finger tighten adaptor lock nut.
- Rotate magneto until mag. side piston is at Top Dead Center.
- Unlock outer ring of dial and turn it until "O" on dial aligns with pointer.
- Lock outer ring in position.

6. Slacken the two (2) armature plate retaining screws and turn timing instrument ON.

   Rotate magneto counter-clockwise until specified piston position before top dead center is reached. (Refer to Technical Data Section). Hold advance mechanism centrifugal lever in full advance position (toward magneto ring) then slowly rotate armature plate until timing light fluctuates or until tone signal sound level varies. Retighten retaining screws.

   NOTE: Ignition timing can change upon tightening. Always recheck after tightening.

7. Disconnect timing instrument wire from blue wire then reconnect it to the blue / red wire leading from engine. Remove T.D.C. gauge from mag. side and reinstall it on P.T.O. side, as previously detailed.

8. Hold centrifugal lever in full advance position (toward magneto rim) and rotate crankshaft until P.T.O. piston approaches T.D.C. As soon as **same** specified piston position before top dead center as on mag. side is reached the timing light should fluctuate or tone signal level vary. If necessary to adjust proceed as follows:

   With centrifugal lever in full advance position and piston at specified position, slacken lower breaker points set retaining screw then readjust breaker points gap until light fluctuates or tone signal level varies.

   - If timing is too early decrease breaker points gap toward lower limit, i.e. 0.35 mm (.014"), then recheck timing.
   - If timing is too late increase breaker points gap toward upper limit, i.e. 0.45 mm (.018"), then recheck timing.

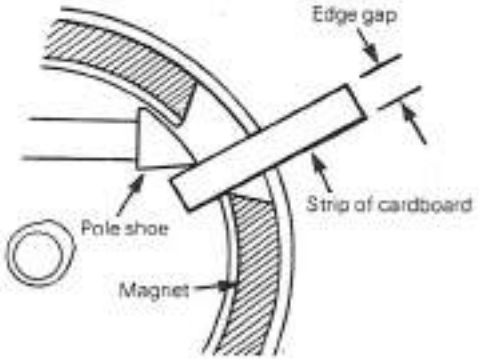
   NOTE: Breaker points gap can change upon tightening. Always recheck after tightening.

EDGE GAP VERIFICATION

By following either of the procedures mentioned herein the edge gap will automatically be adjusted, however, if the edge gap is to be verified, proceed as follows:

- From timing marks, rotate magneto clockwise ¼ of a turn. Hold advance mechanism centrifugal weight in the open position (toward magneto rim) then slowly turn magneto back counter-clockwise until timing light fluctuates or until tone signal sound level varies.

At this point check the distance between pole shoe trailing edge and magnet (edge gap), with a strip of cardboard of appropriate width (Refer to Technical Data Section).



NOTE: Repeat same operation for second cylinder.

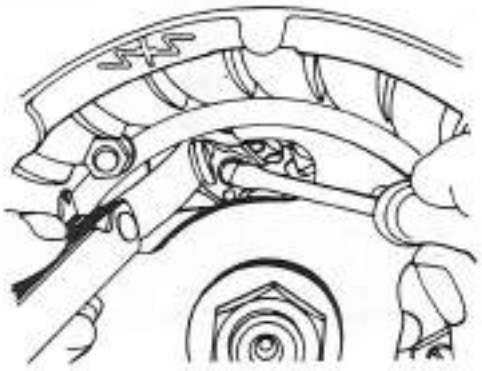
If edge gap is more or less than specified the problem lies within engine internal components (crankshaft out of alignment, broken woodruff key, loose breaker cam, etc.). Corrective measures should be applied.

IGNITION TIMING ONE CYLINDER

Two methods are detailed in this section; the first using the timing marks stamped on the engine, the second using a T.D.C. gauge.

TIMING MARK PROCEDURE

1. Disconnect spark plug wire and remove spark plug.
2. Remove rewind starter assembly from engine then remove the starting pulley from magneto ring.
3. Rotate crankshaft until breaker points, visible through magneto ring opening, are fully open. Adjust points gap to 0.40 mm ± 0.05 mm (.016" ± .002") using a feeler gauge and screwdriver as illustrated.



NOTE: Breaker points gap can change upon tightening. Always recheck after tightening.

4. Disconnect junction block at engine then connect one lead of a timing light (flashlight type), or a tone timer to the black wire leading from engine. Connect other wire to fan cowl (ground).
5. Turn timing instrument ON and rotate magneto until timing marks align. Slacken the three (3) armature plate retaining screws then rotate armature plate until timing light fluctuates or tone signal sound level varies.
   Retighten retaining screw at this position.

Too early:
Turn Armature
Plate Clockwise

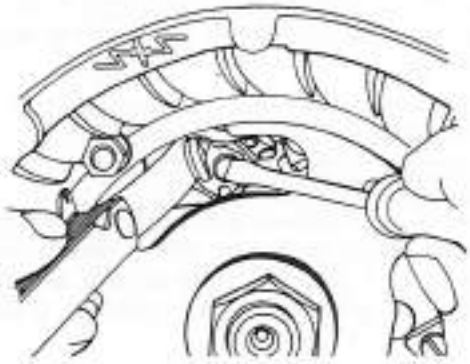
Too late:
Turn Armature
Plate Counter-Clockwise

NOTE: Ignition timing can change upon tightening. Always recheck after tightening.

TDC GAUGE PROCEDURE

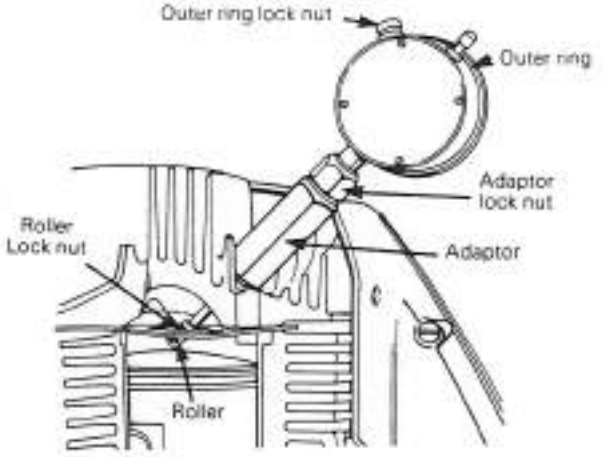
1. Disconnect spark plug wire and remove spark plug.
2. Remove rewind starter assembly from engine then remove the starting pulley from magneto ring.
3. Rotate crankshaft until breaker points, visible through magneto ring opening, are fully opened. Adjust points gap to 0.40 mm ± 0.05 mm (.016" ± .002") using a feeler gauge and screwdriver as illustrated.

NOTE: Breaker points gap can change upon tightening. Always recheck after tightening.



4. Disconnect junction block at engine then connect one lead of a timing instrument (flashlight type or tone timer), to the black wire coming from engine. Connect other wire to fan cowl (ground).
5. Install and adjust T.D.C. gauge on engine as follows:

- Rotate magneto clockwise until piston is just before top dead center.
- With gauge in adaptor, adjust roller so that it is parallel with dial face. Tighten roller lock nut.



- Loosen adaptor lock nut then holding gauge with dial face toward magneto, screw adaptor in spark plug hole.
- Slide gauge far enough into adaptor to obtain a reading then finger tighten adaptor lock nut.
- Rotate magneto until piston is at Top Dead Center.
- Unlock outer ring of dial and turn it until "0" on dial aligns with pointer.
- Lock outer ring in position.

6. Slacken the three (3) armature plate retaining screws and turn timing instrument ON.
7. Rotate magneto counter-clockwise until specified piston position before top dead center is reached. Hold advance mechanism centrifugal lever in full advance position (toward magneto ring) then slowly rotate armature plate until timing light fluctuates or until tone signal sound level varies. Retighten retaining screws.

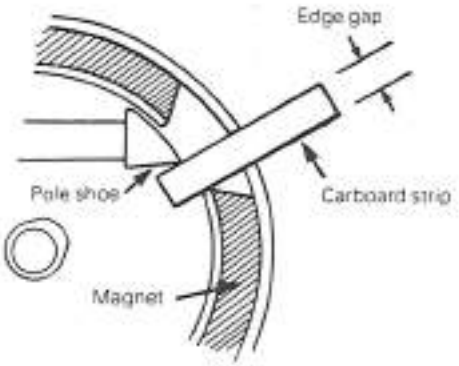
NOTE: Ignition timing can change upon tightening. Always recheck after tightening.

Edge Gap Verification

By following either of the two procedures herein mentioned the edge gap will automatically be adjusted, however, if the edge gap is to be verified, proceed as follows:

From timing marks, rotate magneto clockwise ¼ of a turn. Hold advance mechanism centrifugal weight in the open position (toward magneto rim) then slowly turn magneto back counter-clockwise until timing light fluctuates or until tone signal sound level increases.

At this point check the distance between pole shoe trailing edge and magnet (edge gap), with a strip of cardboard of appropriate width (Refer to Technical Data Section).



If edge gap is more or less than specified the problem lies within engine internal components (crankshaft out of alignment, broken woodruff key, loose breaker cam, etc.) corrective measures should be applied.

C.D. IGNITION

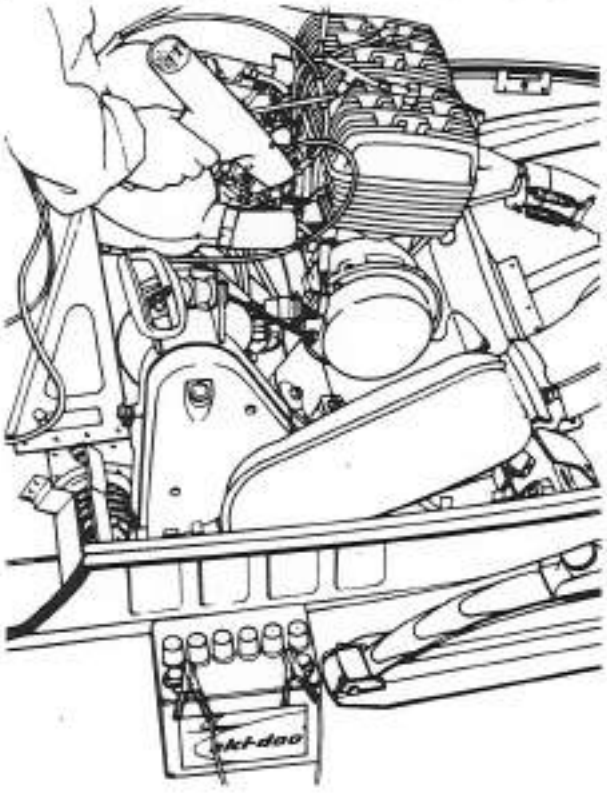
FOREWORD

On models equipped with a C.D. ignition system, plug firing is initiated by an electrical pulse. This pulse is released when a metal projection on the flywheel hub rotates past the pick-up coil. Therefore, timing must be performed while the engine is running.

A stroboscopic timing light such as Sun PTL 45, Snap-On MT215B, Bosch EFAW 169A, or a suitable equivalent, plus a 12 volt battery are needed.

PROCEDURE

Place skis tips against a wall. Use a support incorporating protective guard to block vehicle off the ground. (Approx. 15 cm (6") between track and floor). Remove rubber plug from upper crankcase half. Connect an operating timing light to magneto side spark plug wire.

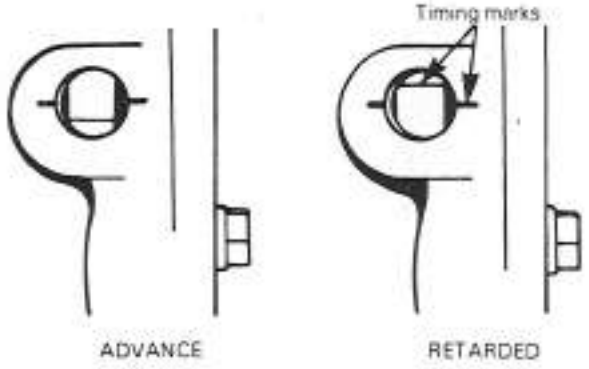


WARNING: Ensure that no one will pass behind the vehicle, even momentarily, while timing engine. Also, make sure that pulley guard is in position and that track is clear of tools, clothes, etc.

Start engine. The magneto ring / crankcase timing marks should coincide when full advance is obtained. Full advance is at 6,000 RPM.

CAUTION: Running the engine unnecessarily will cause premature slider shoe wear.

If the timing marks do not coincide, remove rewind starter and starting pulley. Slacken off the two (2) Allen capscrews securing the armature plate. Rotate plate clockwise if timing is advanced, counter-clockwise if timing is retarded.



Once timing is correct on Mag. side, release throttle, apply the brake and turn off the ignition. Connect timing light to P.T.O. side spark plug wire. Start engine and check if P.T.O. timing coincides with Mag. side timing.

If timing does not coincide, install a T.D.C. gauge into P.T.O. spark plug hole. Scribe true marks on magneto rings at lower and upper timing limits B.T.D.C. (Refer to Technical Data). Repeat for other cylinder.

Position armature plate so that both cylinders fire within specified tolerance.

ELECTRICAL CHARTS INDEX

Year	Model	Chart No.	Headlamp Watt	Tail Light Watt
1974	Elan 250	1	60 / 60	8 / 23
1974	Elan 250E	3	35 / 35	8 / 23
1974	Elan 250 Deluxe, 294 SS	4	35 / 35	5 / 18
1974	Olympique 300	2	60 / 60	8 / 23
1974	Olympique 340, 400, 440	5	60 / 60	8 / 23
1974	Olympique 340E, 440E	6	35 / 35	8 / 23
1974	T'NT 300 SM	4	35 / 35	5 / 18
1974	T'NT 340SM, 440SM, Everest	7	60 / 60	5 / 18
1974	T'NT 340SE, 440SE	8	60 / 60	5 / 18
1974	T'NT F / A 340, 400, 440	9	60 / 60	5 / 18
1974	Nordic 640 ER	10	60 / 60	8 / 23
1974	Alpine 440 ER	11	35 / 35	8 / 23
1974	Alpine 640 ER	12	35 / 35	8 / 23
1974	Elite 440 ER	13	35 / 35	5 / 18
1975	Elan 250	3	60 / 60*	8 / 23
1975	Elan 250 Deluxe, 300 SS	20	35 / 35	5 / 18
1975	Olympique 300-340	15	60 / 60	5 / 18
1975	Olympique 300E - 340E	16	60 / 60	5 / 18
1975	T'NT 340-440	23	60 / 60	5 / 18
1975	T'NT 340E - 440E	22	60 / 60	5 / 18
1975	T'NT Everest 440	17	60 / 60	5 / 18
1975	T'NT Everest 440E	18	60 / 60	5 / 18
1975	T'NT F / A 340 - 440	19	60 / 60	5 / 18
1975	T'NT R / V 245	21	60 / 60	5 / 18
1975	Alpine 640 ER	14	60 / 60	8 / 23
1975	Elite 440 ER	13	35 / 35	5 / 18
1976	Elan 250 (up to se. no. 3013 0399 in).	3	60 / 60*	8 / 23
1976	Elan 250 (from se. no 3013 03999)	24	60 / 60	8 / 23
1976	Elan 250 Deluxe	20	45 / 45	5 / 18
1976	Olympique 300 single	25	60 / 60	5 / 18
1976	Olympique 300 - 340	15	60 / 60	5 / 18
1976	Olympique 300E - 340E	16	60 / 60	5 / 18
1976	Olympique Plus 440	26	60 / 60	5 / 18
1976	T'NT 340	23	60 / 60	5 / 18
1976	T'NT 340E	22	60 / 60	5 / 18
1976	Everest 440	23	60 / 60	5 / 18
1976	Everest 440E	22	60 / 60	5 / 18
1976	T'NT R / V 250-340	28	60 / 60	5 / 18
1976	Alpine 640 ER	27	60 / 60	5 / 18
1977	Elan 250	29	60 / 60	5 / 18
1977	Elan 250 Deluxe	30	45 / 45	5 / 18
1977	Olympique 300 Mono	25	60 / 60	5 / 18
1977	Olympique 300 Twin, 340, 440	31	60 / 60	5 / 18

Year	Model	Chart No.	Headlamp Watt	Tail Light Watt
1977	Olympique 340 E	32	60 / 60	5 / 18
1977	Everest 340	23	60 / 60	5 / 18
1977	Everest 340 E	33	60 / 60	5 / 18
1977	Everest 440	34	60 / 60	5 / 18
1977	Everest 440 E	35	60 / 60	5 / 18
1977	T'NT 340 & 440 F / A, 440 F / C	36	60 / 60	5 / 18
1977	RV 340	37	60 / 60	5 / 18
1977	Alpine 640 ER	38	60 / 60	5 / 18

* 35 / 35 W with electric start option

COLOR CODE			
BK	— BLACK	GN	— GREEN
WH	— WHITE	GY	— GREY
RD	— RED	VI	— VIOLET
BL	— BLUE	OR	— ORANGE
YL	— YELLOW	BR	— BROWN

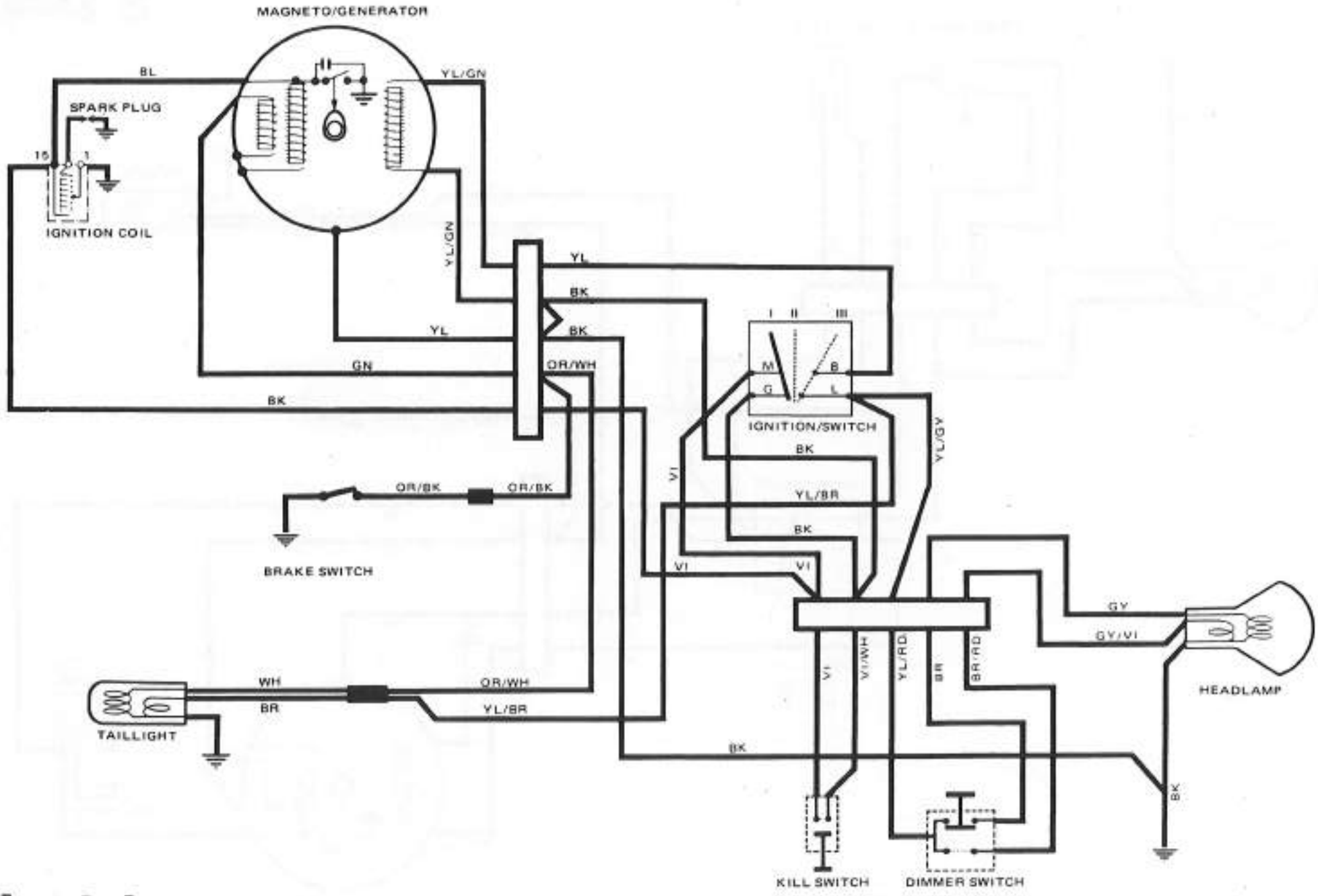

MAGNETO/GENERATOR
BL
YL/GN
SPARK PLUG
15
1
IGNITION COIL
YL/GN
YL
BK
YL
BK
GN
OR/WH
BK
I II III
M
B
G
L
IGNITION/SWITCH
YL/GY
BK
VI
OR/BK
OR/BK
YL/BR
BK
BRAKE SWITCH
VI
VI
GY
GY/VI
HEADLAMP
WH
BR
OR/WH
YL/BR
TAILLIGHT
VI
VI/WH
YL/RD
BR
BR/RD
BK
BK
KILL SWITCH
DIMMER SWITCH

Chart 1

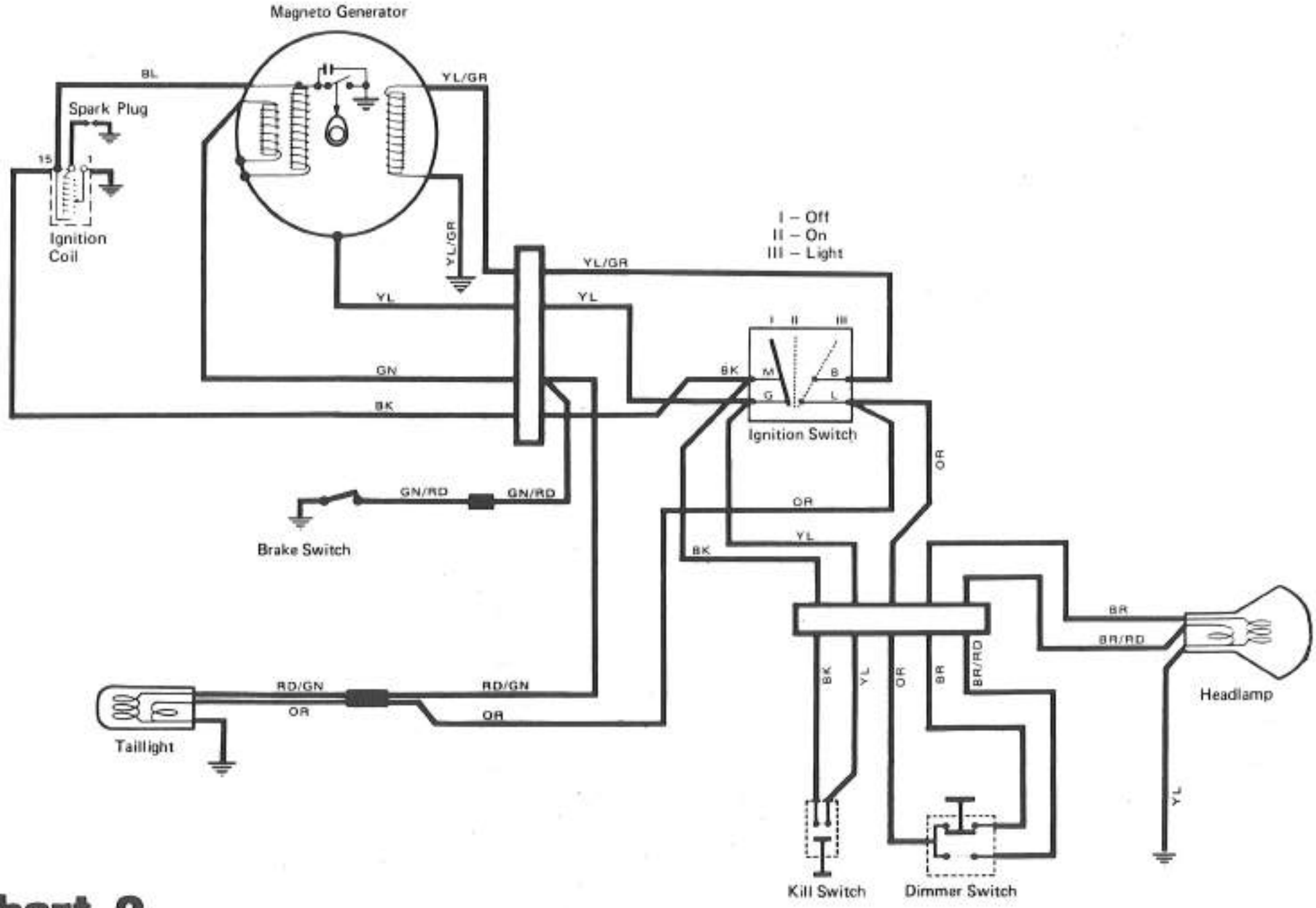

Magneto Generator
BL
YL/GR
Spark Plug
15
1
Ignition Coil
YL/GR
YL
YL/GR
YL
I – Off
II – On
III – Light
I II III
M
B
G
L
Ignition Switch
BK
GN
BK
OR
OR
GN/RD
GN/RD
Brake Switch
YL
BK
BR
BR/RD
Headlamp
RD/GN
OR
RD/GN
OR
Taillight
BK
YL
OR
BR
BR/RD
YL
Kill Switch
Dimmer Switch

Chart 2

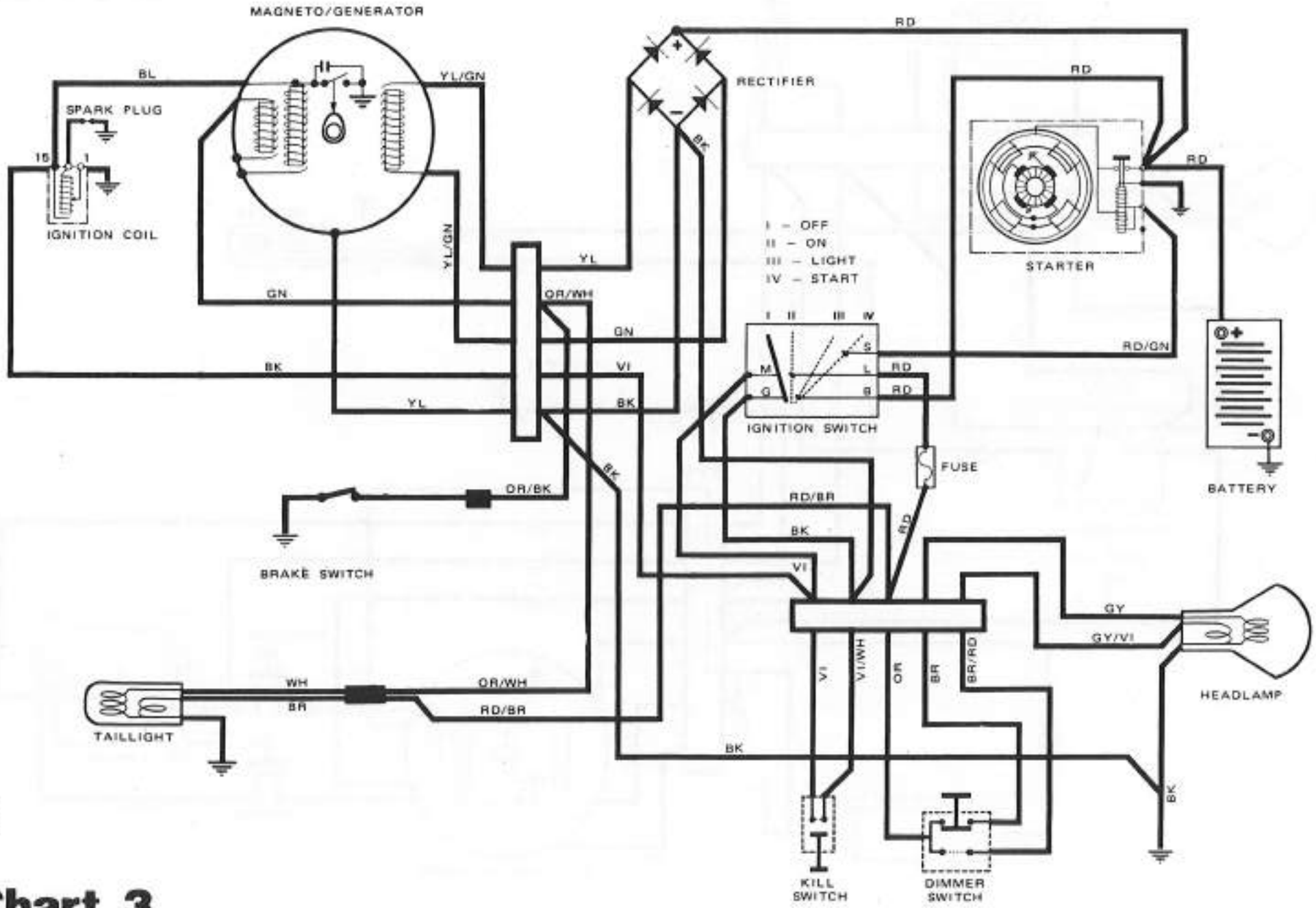

MAGNETO/GENERATOR
BL
YL/GN
SPARK PLUG
15
1
IGNITION COIL
RECTIFIER
RD
BK
YL
GN
OR/WH
YL/GN
I – OFF
II – ON
III – LIGHT
IV – START
I II III IV
S
M
L
G
B
IGNITION SWITCH
STARTER
RD/GN
BATTERY
FUSE
VI
OR/BK
BRAKE SWITCH
RD/BR
WH
BR
TAILLIGHT
GY
GY/VI
HEADLAMP
VI
VI/WH
OR
BR
BR/RD
KILL SWITCH
DIMMER SWITCH

Chart 3

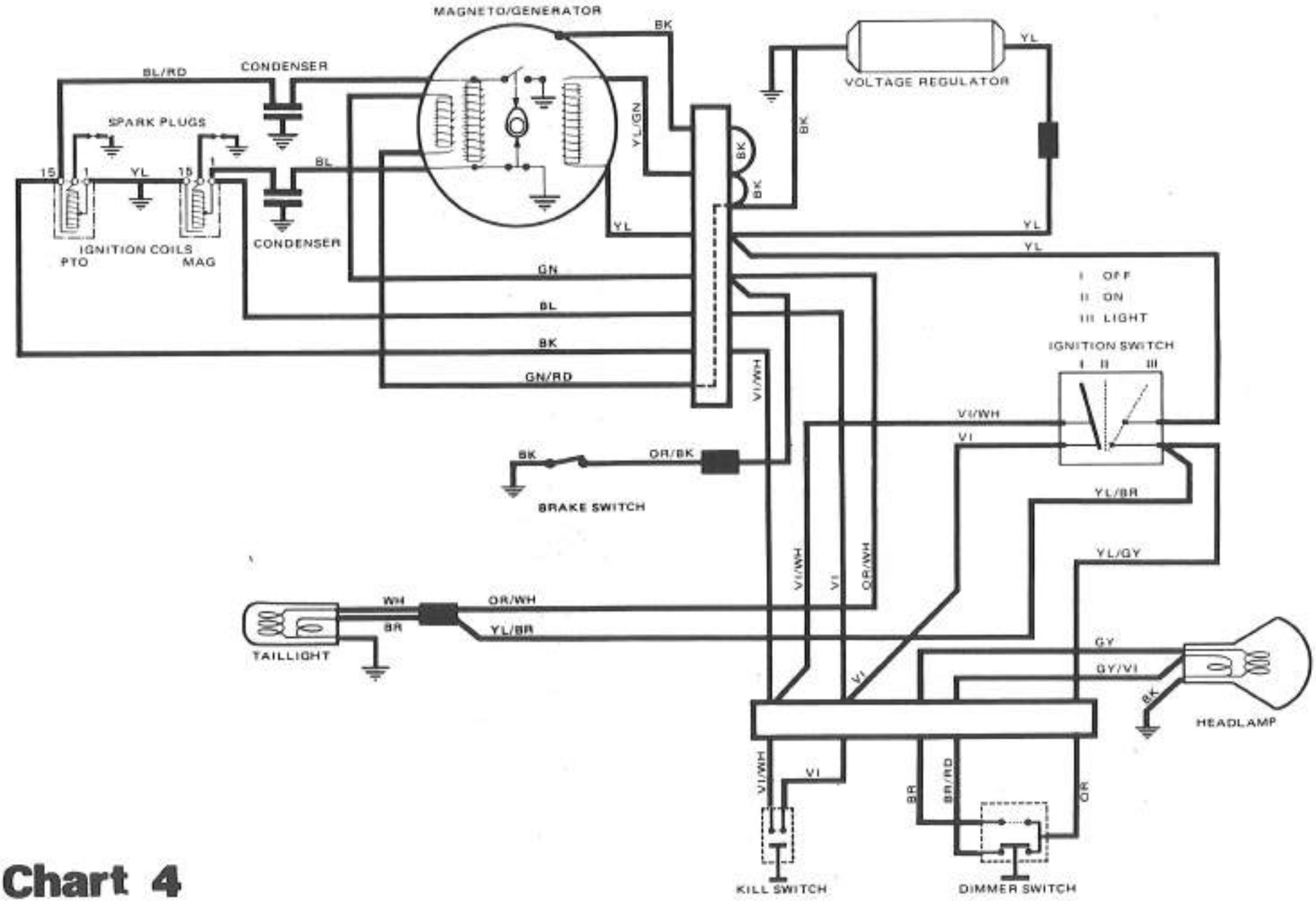

MAGNETO/GENERATOR
BK
YL
VOLTAGE REGULATOR
BL/RD
CONDENSER
SPARK PLUGS
15
1
YL
15
1
BL
YL/GN
BK
BK
BK
YL
YL
YL
IGNITION COILS
PTO
MAG
CONDENSER
GN
BL
BK
GN/RD
I OFF
II ON
III LIGHT
IGNITION SWITCH
I II III
VI/WH
VI
VI/WH
VI
VI/WH
VI
BK
OR/BK
BRAKE SWITCH
YL/BR
YL/GY
WH
BR
OR/WH
YL/BR
TAILLIGHT
GY
GY/VI
BK
HEADLAMP
VI/WH
VI
BR
BR/RD
OR
KILL SWITCH
DIMMER SWITCH

Chart 4

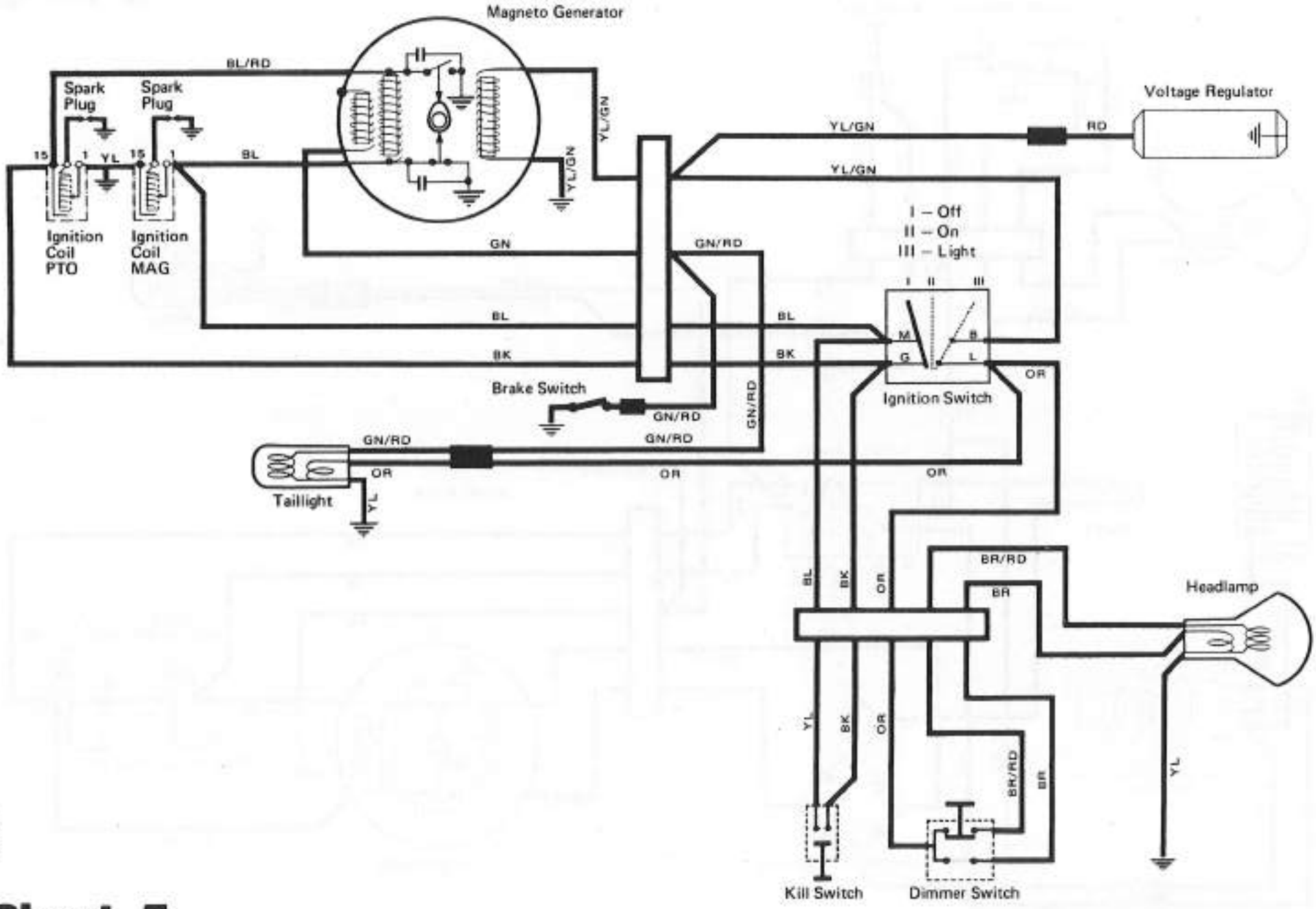

Magneto Generator
BL/RD
Spark Plug
Spark Plug
15
1
YL
15
1
BL
YL/GN
YL/GN
Voltage Regulator
YL/GN
RD
Ignition Coil PTO
Ignition Coil MAG
GN
GN/RD
I – Off
II – On
III – Light
I II III
BL
BL
M
B
G
L
BK
BK
OR
Brake Switch
Ignition Switch
GN/RD
GN/RD
GN/RD
GN/RD
OR
OR
OR
Taillight
YL
BL
BK
OR
BR/RD
BR
Headlamp
YL
BK
OR
BR/RD
BR
YL
Kill Switch
Dimmer Switch

Chart 5

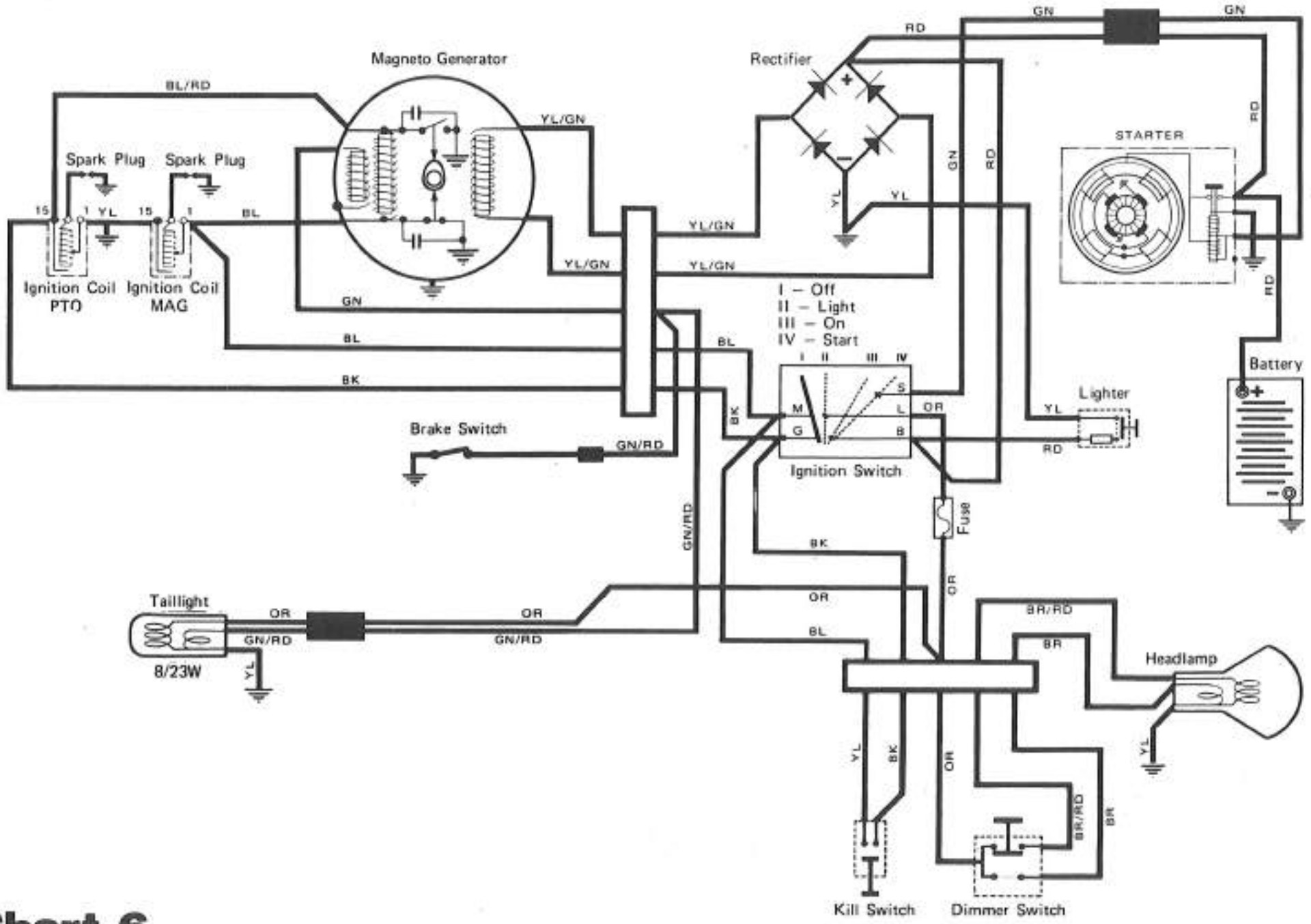

Magneto Generator
Rectifier
STARTER
Battery
Spark Plug
Spark Plug
Ignition Coil PTO
Ignition Coil MAG
BL/RD
YL/GN
GN
RD
BL
BK
YL
I – Off
II – Light
III – On
IV – Start
Ignition Switch
Brake Switch
GN/RD
Lighter
Fu 9A
Taillight
8/23W
OR
BR/RD
BR
Headlamp
Kill Switch
Dimmer Switch

Chart 6

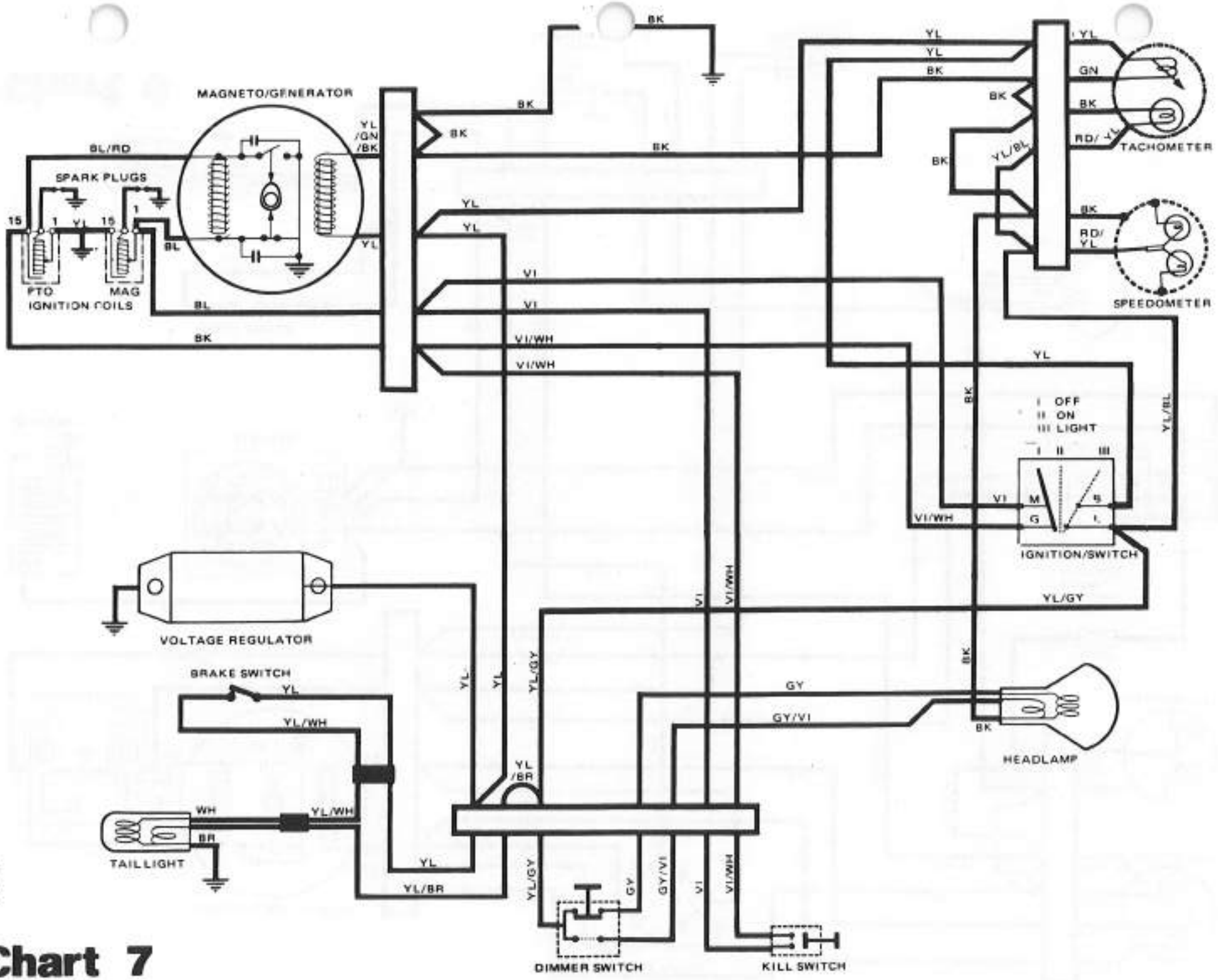

MAGNETO/GENERATOR
SPARK PLUGS
PTO
MAG
IGNITION COILS
TACHOMETER
SPEEDOMETER
I OFF
II ON
III LIGHT
IGNITION/SWITCH
VOLTAGE REGULATOR
BRAKE SWITCH
HEADLAMP
TAIL LIGHT
DIMMER SWITCH
KILL SWITCH

Chart 7

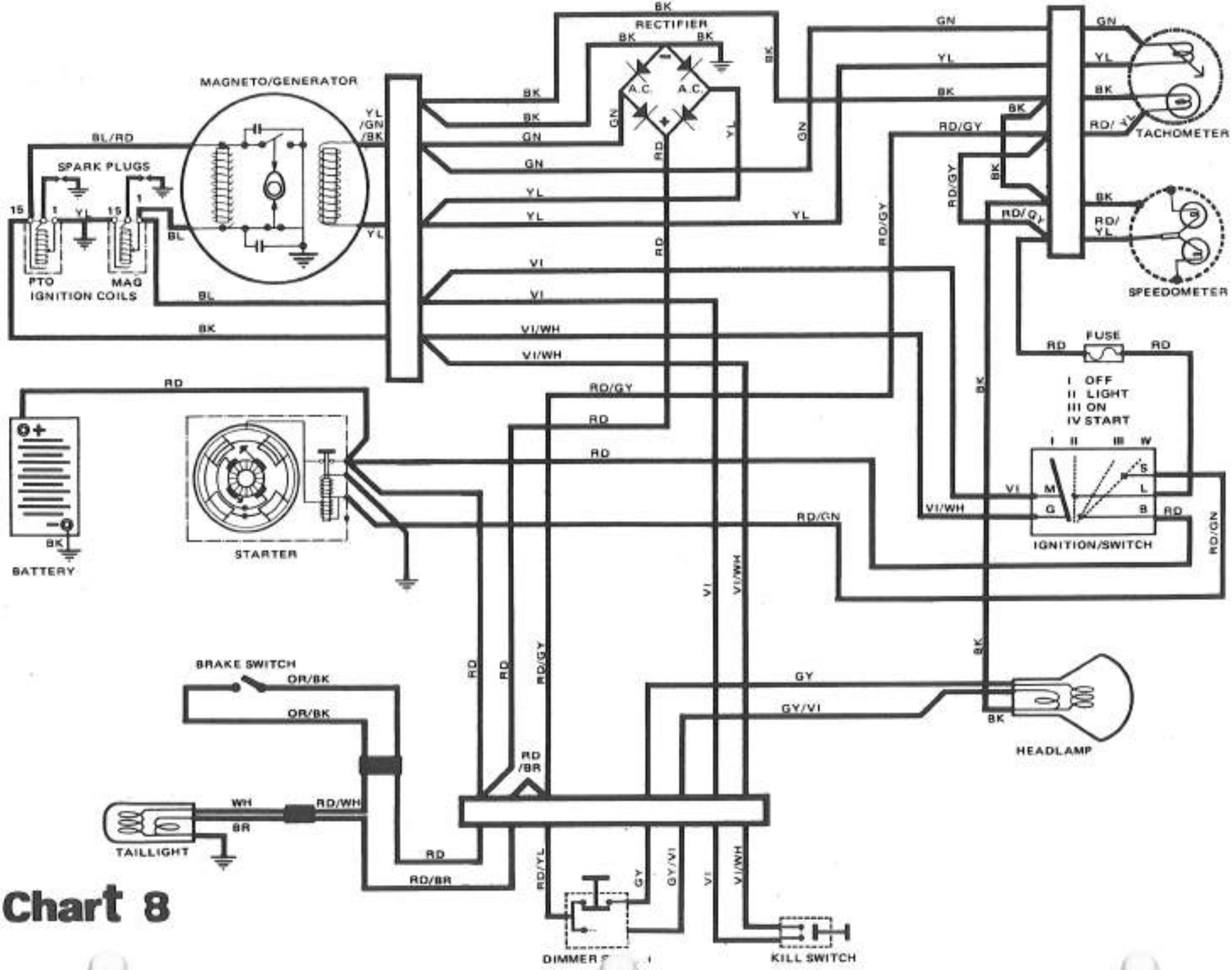

RECTIFIER
A.C.
A.C.
MAGNETO/GENERATOR
SPARK PLUGS
PTO
MAG
IGNITION COILS
BATTERY
STARTER
TACHOMETER
SPEEDOMETER
FUSE
I OFF
II LIGHT
III ON
IV START
IGNITION/SWITCH
BRAKE SWITCH
HEADLAMP
TAILLIGHT
DIMMER
KILL SWITCH
BK
RD
YL
GN
BL
BL/RD
YL/GN/BK
RD/GY
VI
VI/WH
RD/GN
OR/BK
GY
GY/VI
RD/BR
WH
RD/WH
BR
RD/YL
GY/VI

Chart 8

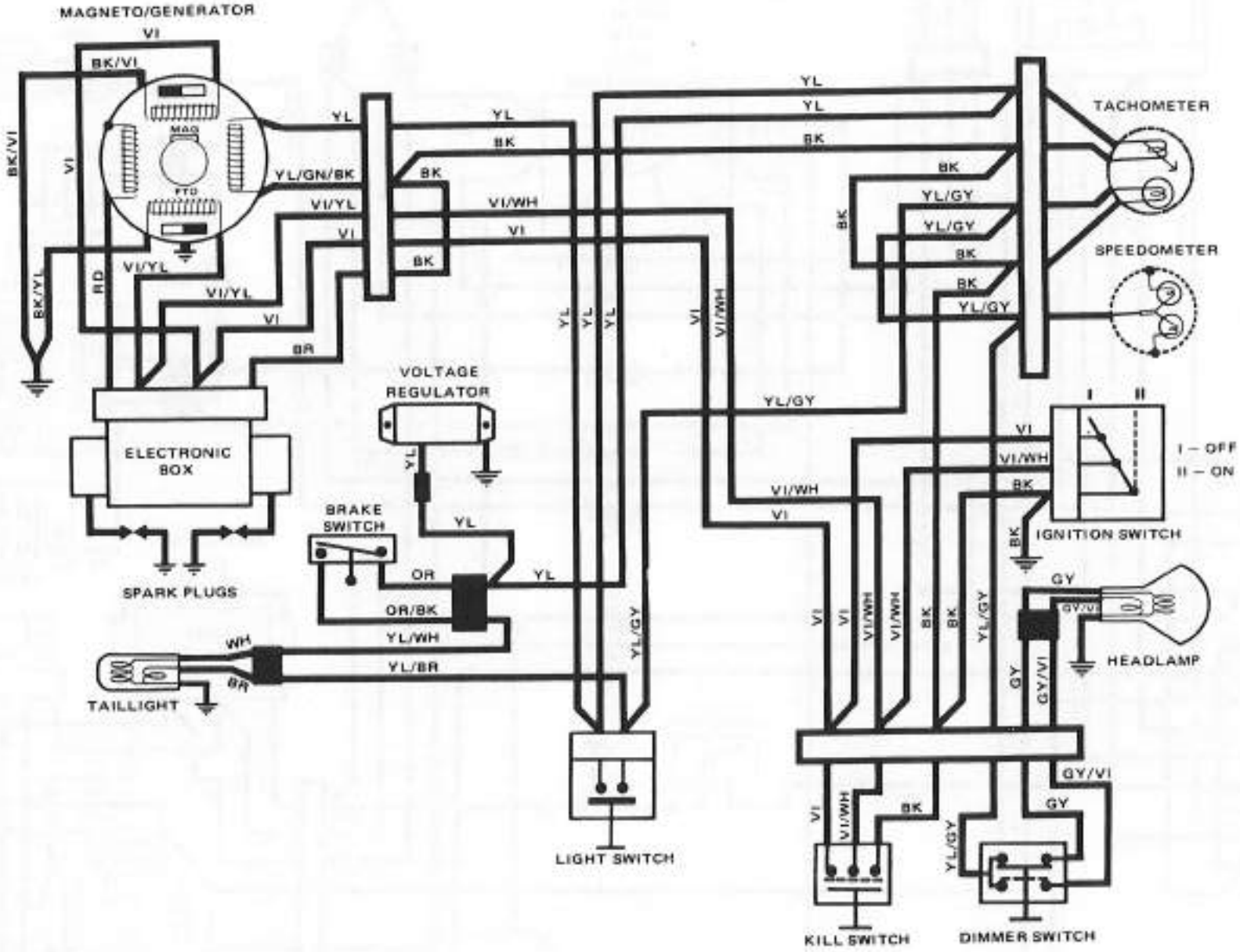

MAGNETO/GENERATOR
VI
BK/VI
MAG
PTO
BK/VI
VI
BK/YL
RD
VI/YL
YL
YL/GN/BK
VI/YL
VI
BK
YL
BK
BK
VI/WH
VI
BK
YL
YL
YL
VI
VI/WH
BR
VOLTAGE REGULATOR
YL
ELECTRONIC BOX
SPARK PLUGS
BRAKE SWITCH
OR
YL
OR/BK
YL/WH
YL/BR
WH
BR
TAILLIGHT
YL/GY
LIGHT SWITCH
YL
YL
BK
BK
YL/GY
YL/GY
BK
BK
YL/GY
TACHOMETER
SPEEDOMETER
YL/GY
VI
VI/WH
BK
I
II
I – OFF
II – ON
IGNITION SWITCH
BK
GY
GY/VI
HEADLAMP
VI
VI
VI/WH
VI/WH
BK
BK
YL/GY
GY
GY/VI
VI
VI/WH
BK
YL/GY
GY
GY/VI
KILL SWITCH
DIMMER SWITCH

Chart 9

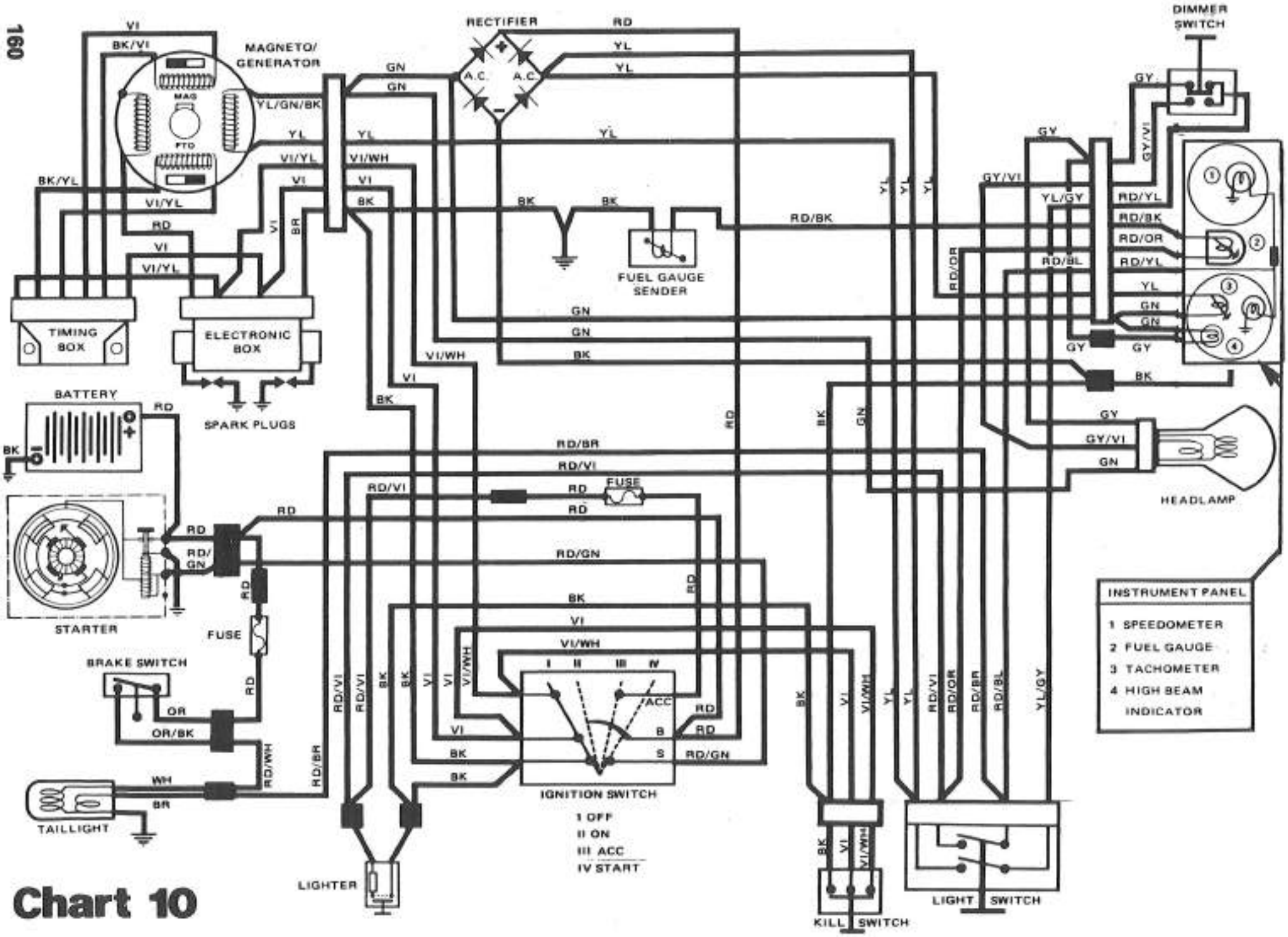

MAGNETO/
GENERATOR
MAG
PTO
RECTIFIER
A.C.
A.C.
DIMMER
SWITCH
TIMING
BOX
ELECTRONIC
BOX
SPARK PLUGS
FUEL GAUGE
SENDER
BATTERY
STARTER
FUSE
BRAKE SWITCH
TAILLIGHT
LIGHTER
IGNITION SWITCH
I OFF
II ON
III ACC
IV START
HEADLAMP
INSTRUMENT PANEL
1 SPEEDOMETER
2 FUEL GAUGE
3 TACHOMETER
4 HIGH BEAM
INDICATOR
KILL SWITCH
LIGHT SWITCH

Chart 10

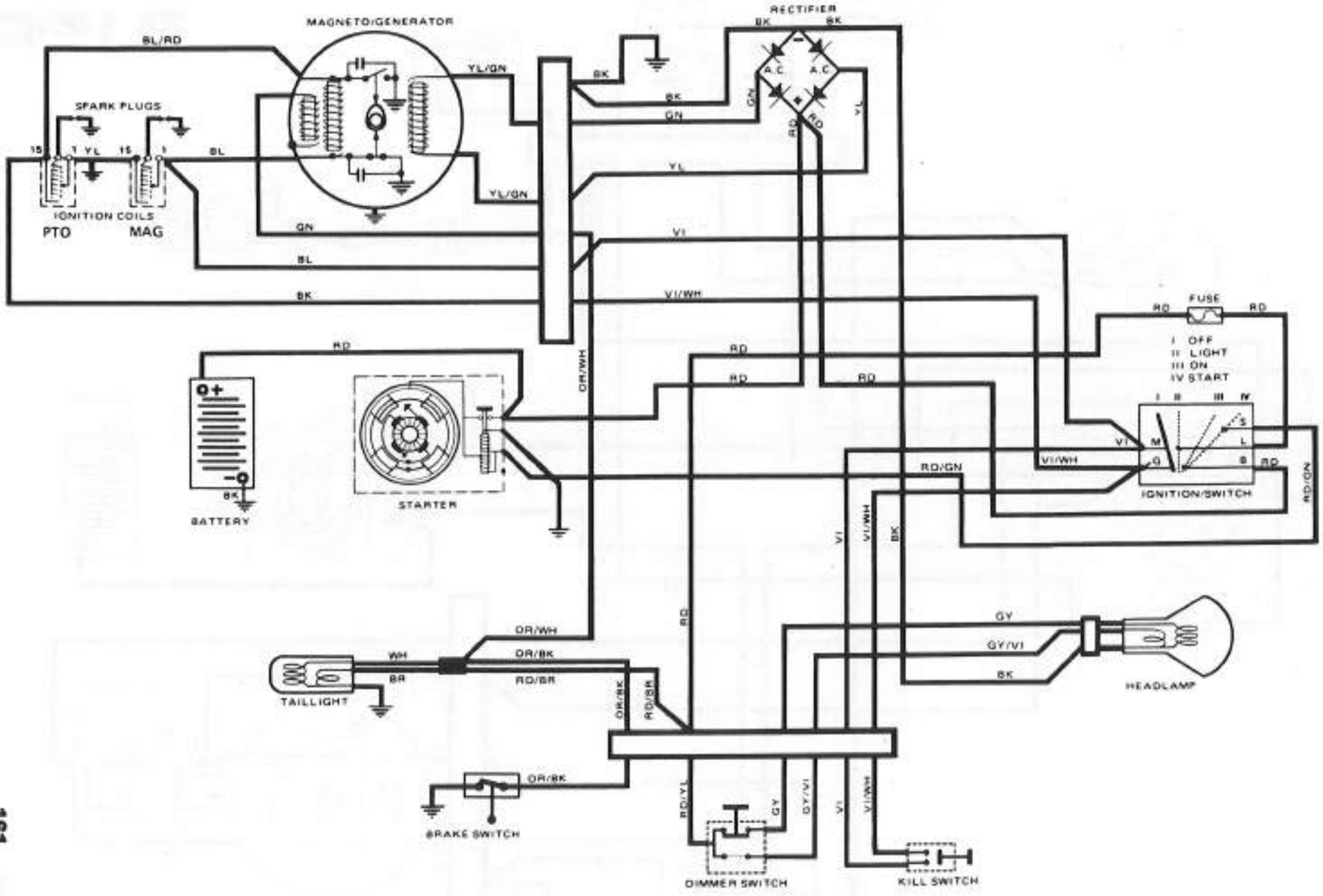

MAGNETO/GENERATOR
RECTIFIER
BL/RD
SPARK PLUGS
YL/GN
BK
GN
YL
BL
IGNITION COILS
PTO
MAG
VI
VI/WH
FUSE
I OFF
II LIGHT
III ON
IV START
RD
OR/WH
BATTERY
STARTER
IGNITION/SWITCH
RD/GN
GY
GY/VI
HEADLAMP
TAILLIGHT
WH
BR
OR/BK
RD/BR
BRAKE SWITCH
DIMMER SWITCH
KILL SWITCH

Chart 11

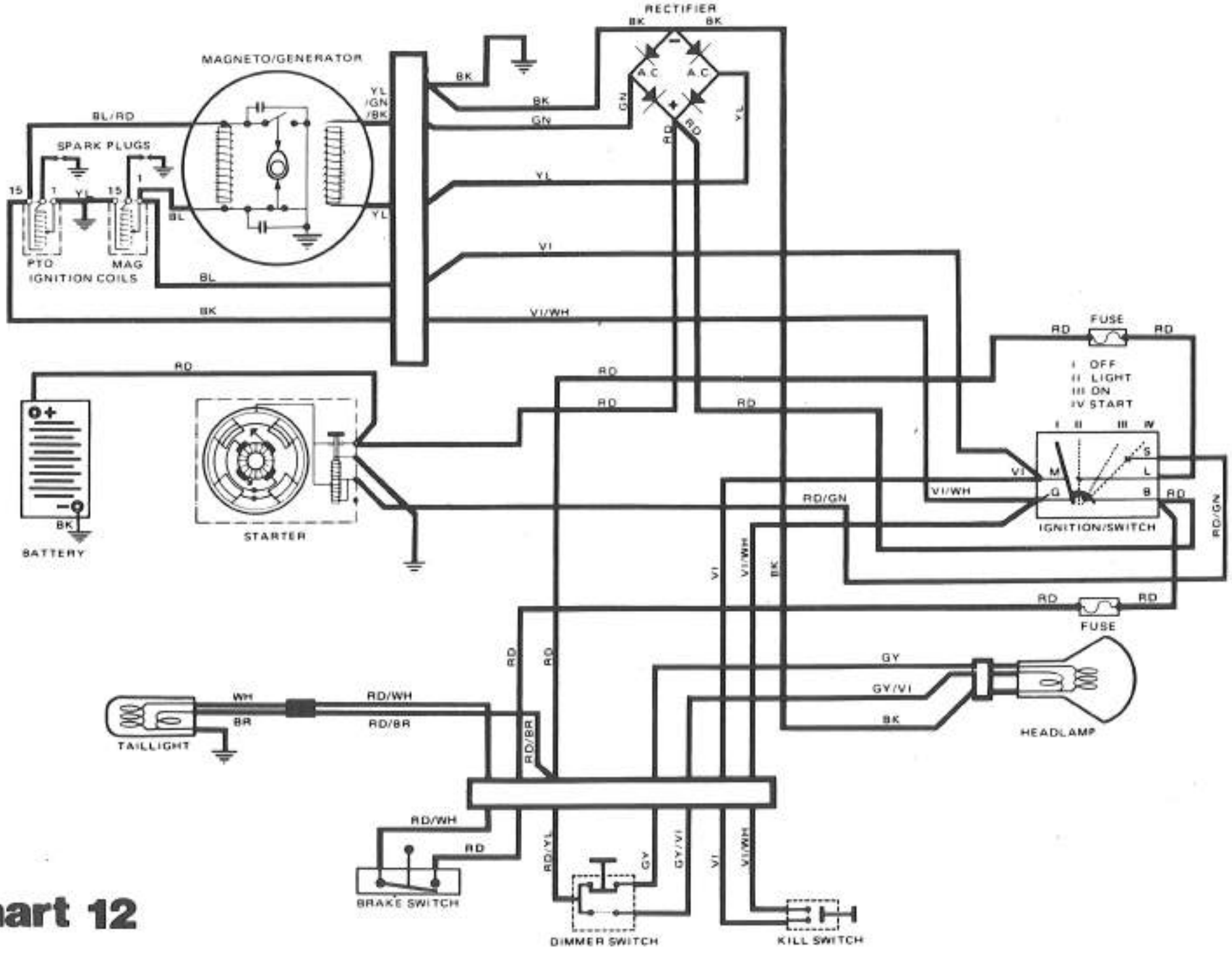

RECTIFIER
BK
BK
A.C
A.C
GN
RD
RD
YL
MAGNETO/GENERATOR
YL /GN /BK
BK
BK
GN
YL
BL/RD
SPARK PLUGS
15
1
YL
15
1
BL
YL
VI
PTO
MAG
IGNITION COILS
BL
BK
VI/WH
FUSE
RD
RD
I OFF
II LIGHT
III ON
IV START
I II III IV
S
M
L
G
B
VI
VI/WH
RD/GN
RD
IGNITION/SWITCH
RD/GN
RD
RD
RD
RD
BK
BATTERY
STARTER
VI
VI/WH
BK
RD
RD
FUSE
GY
GY/VI
BK
HEADLAMP
RD
RD
RD/BR
WH
BR
RD/WH
RD/BR
TAILLIGHT
RD/WH
RD
BRAKE SWITCH
RD/YL
GY
GY/VI
VI
VI/WH
DIMMER SWITCH
KILL SWITCH

Chart 12

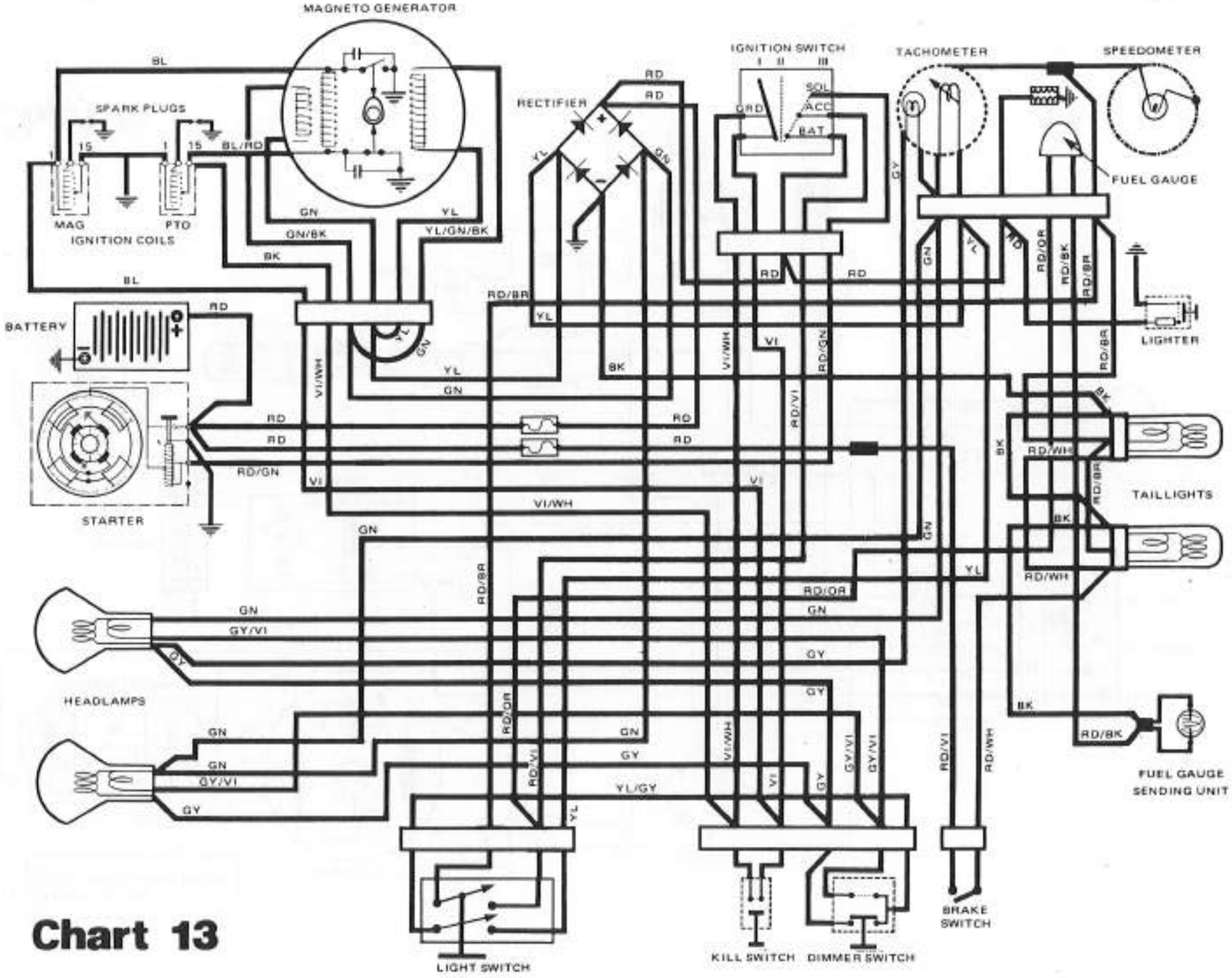

MAGNETO GENERATOR
IGNITION SWITCH
TACHOMETER
SPEEDOMETER
SPARK PLUGS
RECTIFIER
FUEL GAUGE
MAG
PTO
IGNITION COILS
BATTERY
LIGHTER
STARTER
TAILLIGHTS
HEADLAMPS
FUEL GAUGE SENDING UNIT
BRAKE SWITCH
LIGHT SWITCH
KILL SWITCH
DIMMER SWITCH
BL
BL/RD
GN
GN/BK
YL
YL/GN/BK
BK
RD
RD/BR
RD/GN
VI
VI/WH
GY
GY/VI
YL/GY
RD/OR
RD/VI
RD/WH
RD/BK

Chart 13

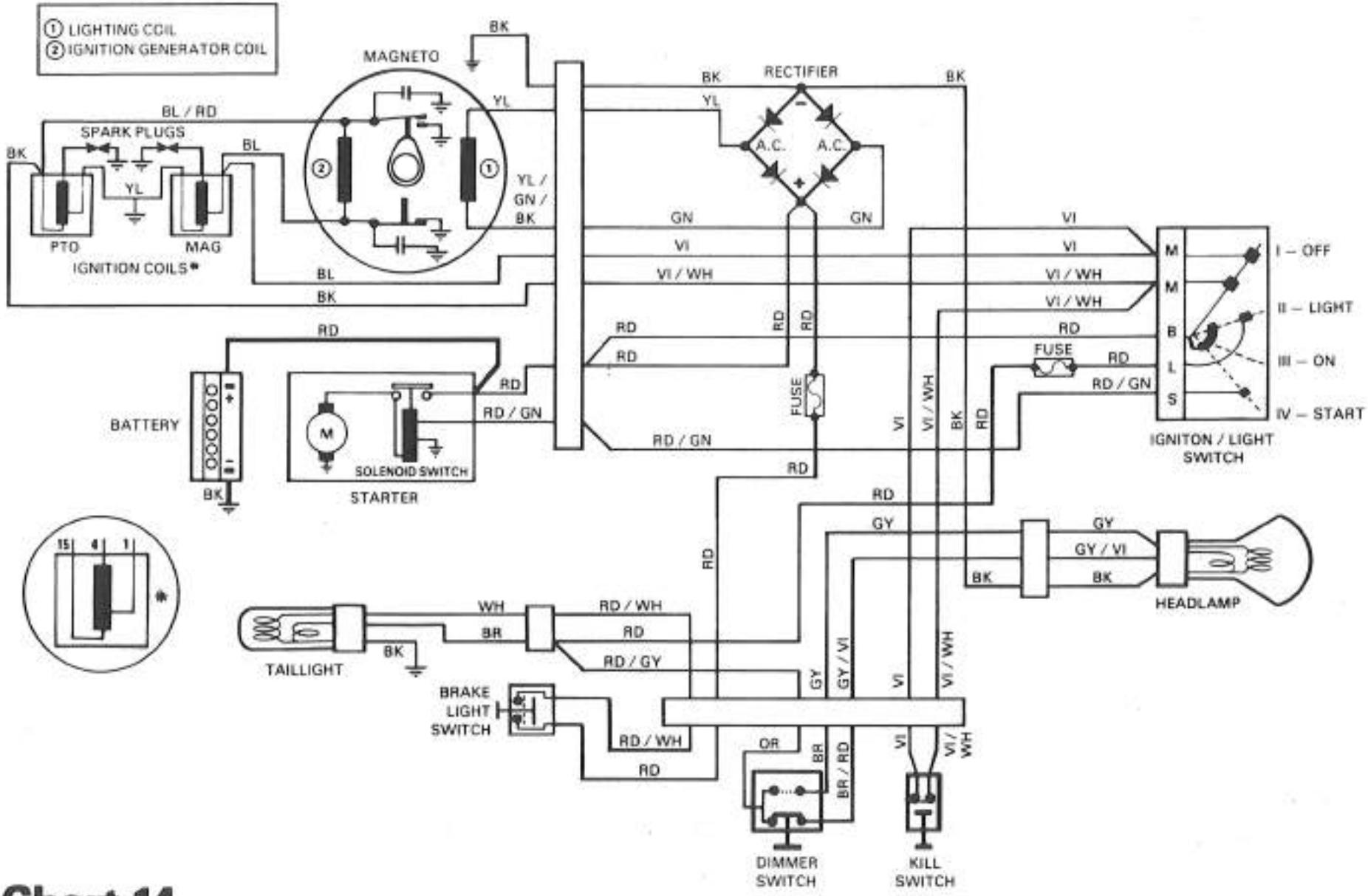

① LIGHTING COIL
② IGNITION GENERATOR COIL
MAGNETO
BK
YL
BL / RD
SPARK PLUGS
BL
BK
YL
PTO
MAG
IGNITION COILS*
YL / GN / BK
BL
BK
RECTIFIER
A.C.
A.C.
GN
VI
VI / WH
RD
RD / GN
BATTERY
STARTER
SOLENOID SWITCH
FUSE
IGNITON / LIGHT SWITCH
I – OFF
II – LIGHT
III – ON
IV – START
HEADLAMP
GY
GY / VI
TAILLIGHT
WH
BR
RD / WH
RD / GY
BRAKE LIGHT SWITCH
OR
BR / RD
DIMMER SWITCH
KILL SWITCH
15
4
1

Chart 14

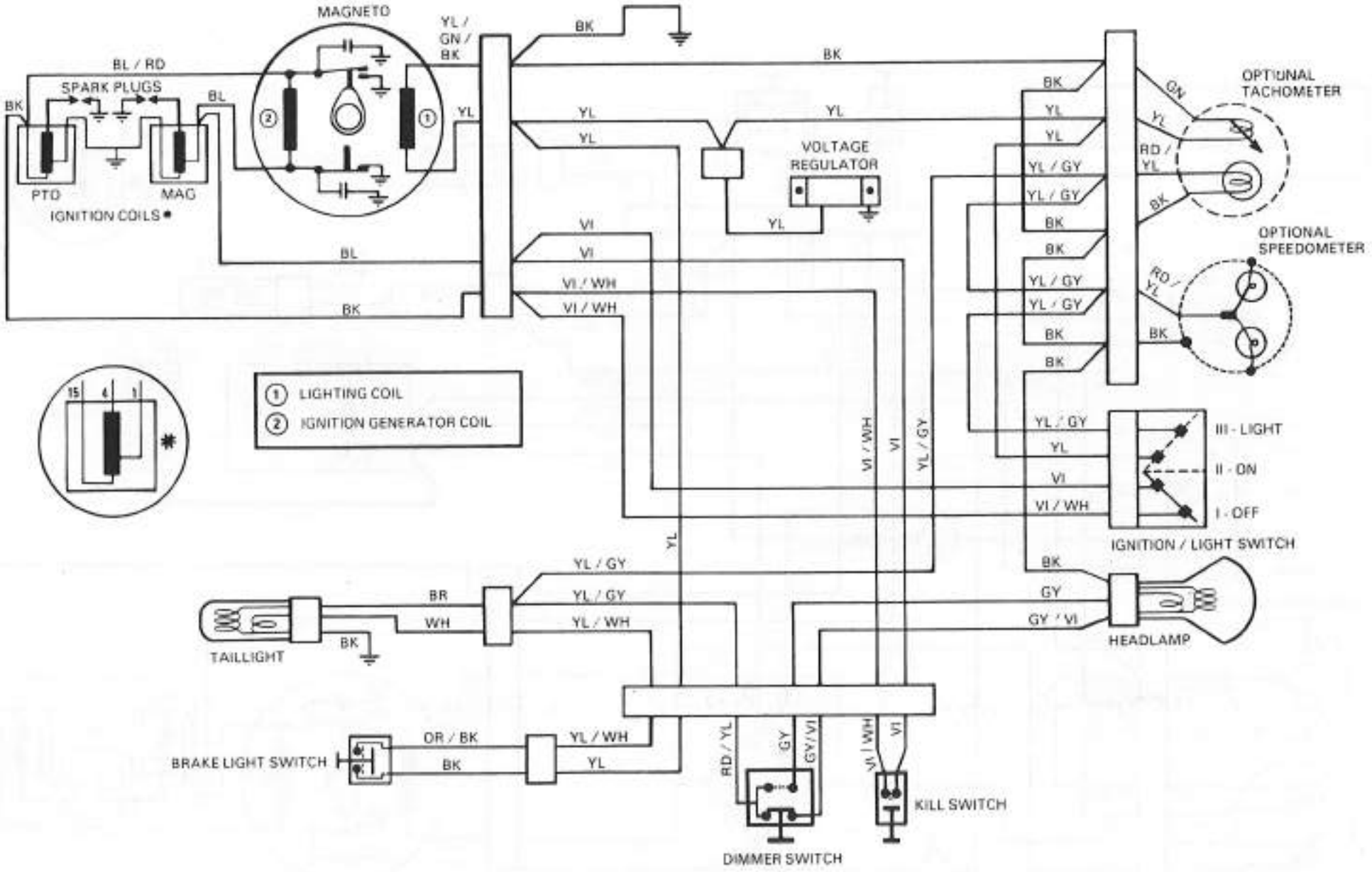

MAGNETO
YL / GN / BK
BK
BL / RD
SPARK PLUGS
BK
BL
YL
PTO
MAG
IGNITION COILS
VOLTAGE REGULATOR
YL
VI
VI / WH
BL
BK
OPTIONAL TACHOMETER
GN
RD / YL
OPTIONAL SPEEDOMETER
YL / GY
15
4
1
① LIGHTING COIL
② IGNITION GENERATOR COIL
III - LIGHT
II - ON
I - OFF
IGNITION / LIGHT SWITCH
GY
GY / VI
HEADLAMP
BR
WH
TAILLIGHT
OR / BK
BRAKE LIGHT SWITCH
RD / YL
GY / VI
KILL SWITCH
DIMMER SWITCH

Chart 15

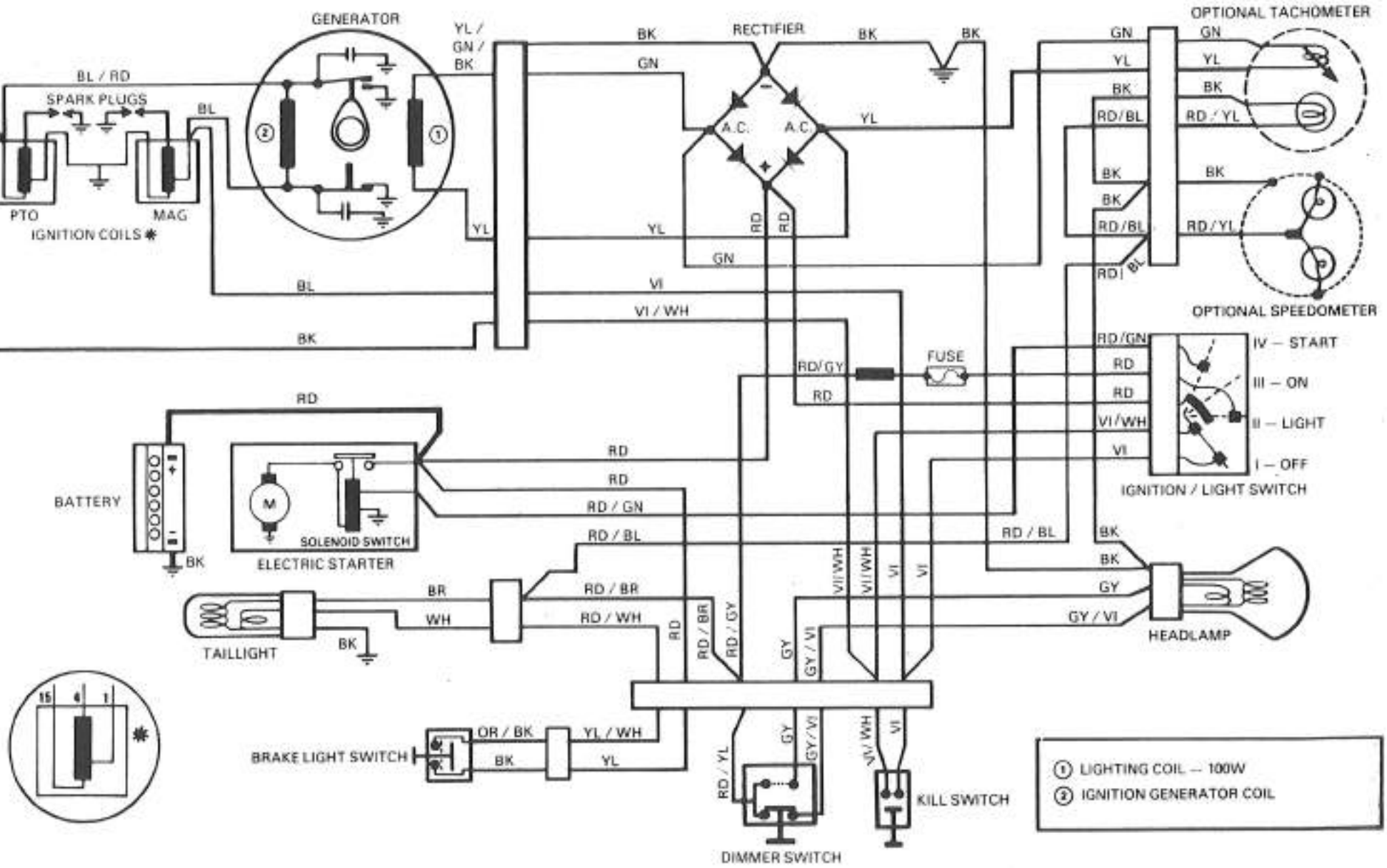
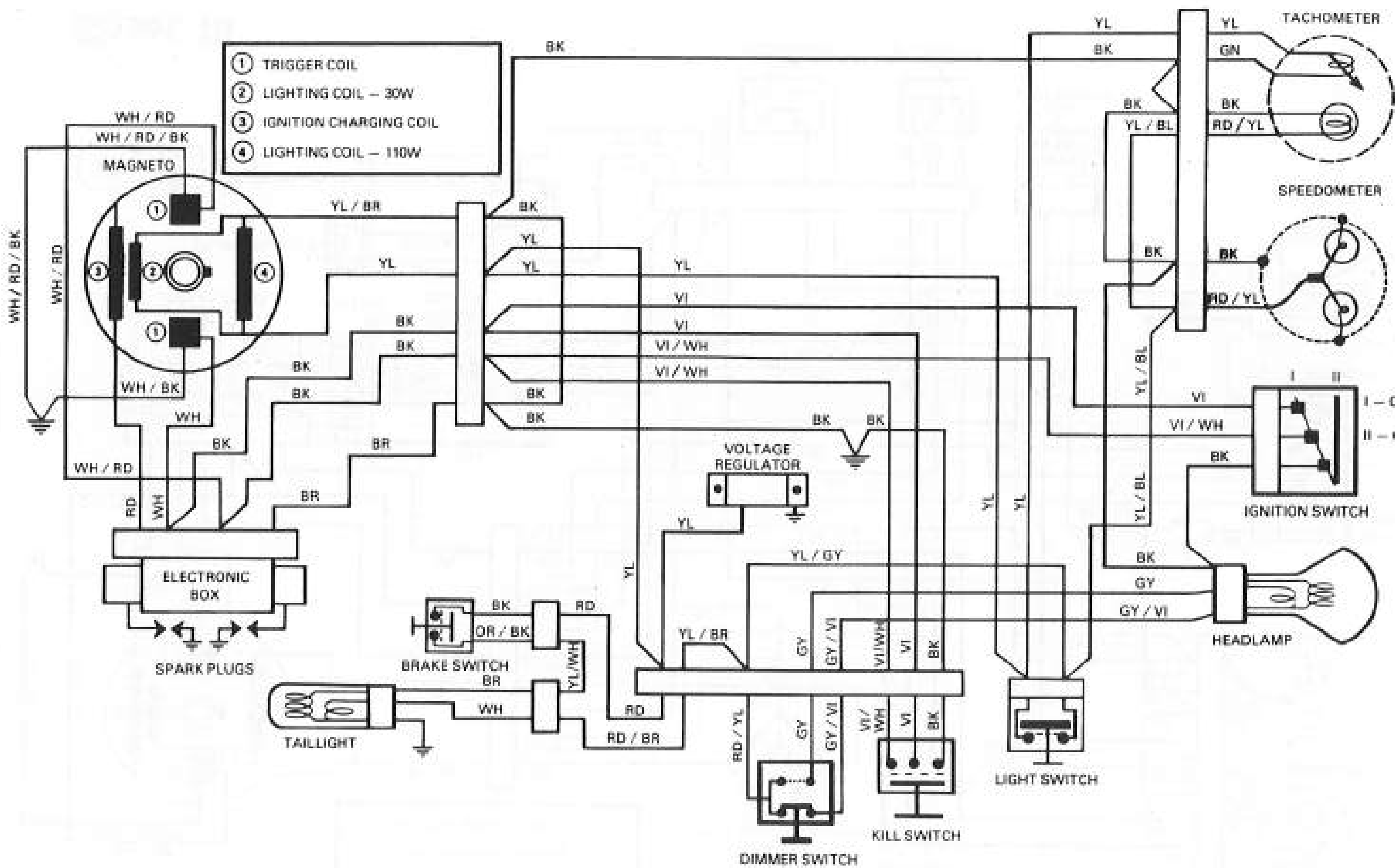

GENERATOR
SPARK PLUGS
BL / RD
BL
PTO
MAG
IGNITION COILS ✱
YL / GN / BK
YL
BK
GN
RECTIFIER
A.C.
A.C.
RD
BL
VI
VI / WH
OPTIONAL TACHOMETER
GN
YL
BK
RD / BL
RD / YL
OPTIONAL SPEEDOMETER
RD / BL
RD / GN
RD / GY
FUSE
IV — START
III — ON
II — LIGHT
I — OFF
IGNITION / LIGHT SWITCH
BATTERY
SOLENOID SWITCH
ELECTRIC STARTER
RD / BR
RD / WH
BR
WH
TAILLIGHT
HEADLAMP
GY
GY / VI
RD / BR
RD / GY
VI / WH
BRAKE LIGHT SWITCH
OR / BK
YL / WH
RD / YL
DIMMER SWITCH
KILL SWITCH
15
4
1
① LIGHTING COIL — 100W
② IGNITION GENERATOR COIL

Chart 16



TRIGGER COIL
LIGHTING COIL — 30W
IGNITION CHARGING COIL
LIGHTING COIL — 110W
MAGNETO
ELECTRONIC BOX
SPARK PLUGS
BRAKE SWITCH
TAILLIGHT
VOLTAGE REGULATOR
DIMMER SWITCH
KILL SWITCH
LIGHT SWITCH
HEADLAMP
IGNITION SWITCH
I — OFF
II — ON
TACHOMETER
SPEEDOMETER

Chart 17

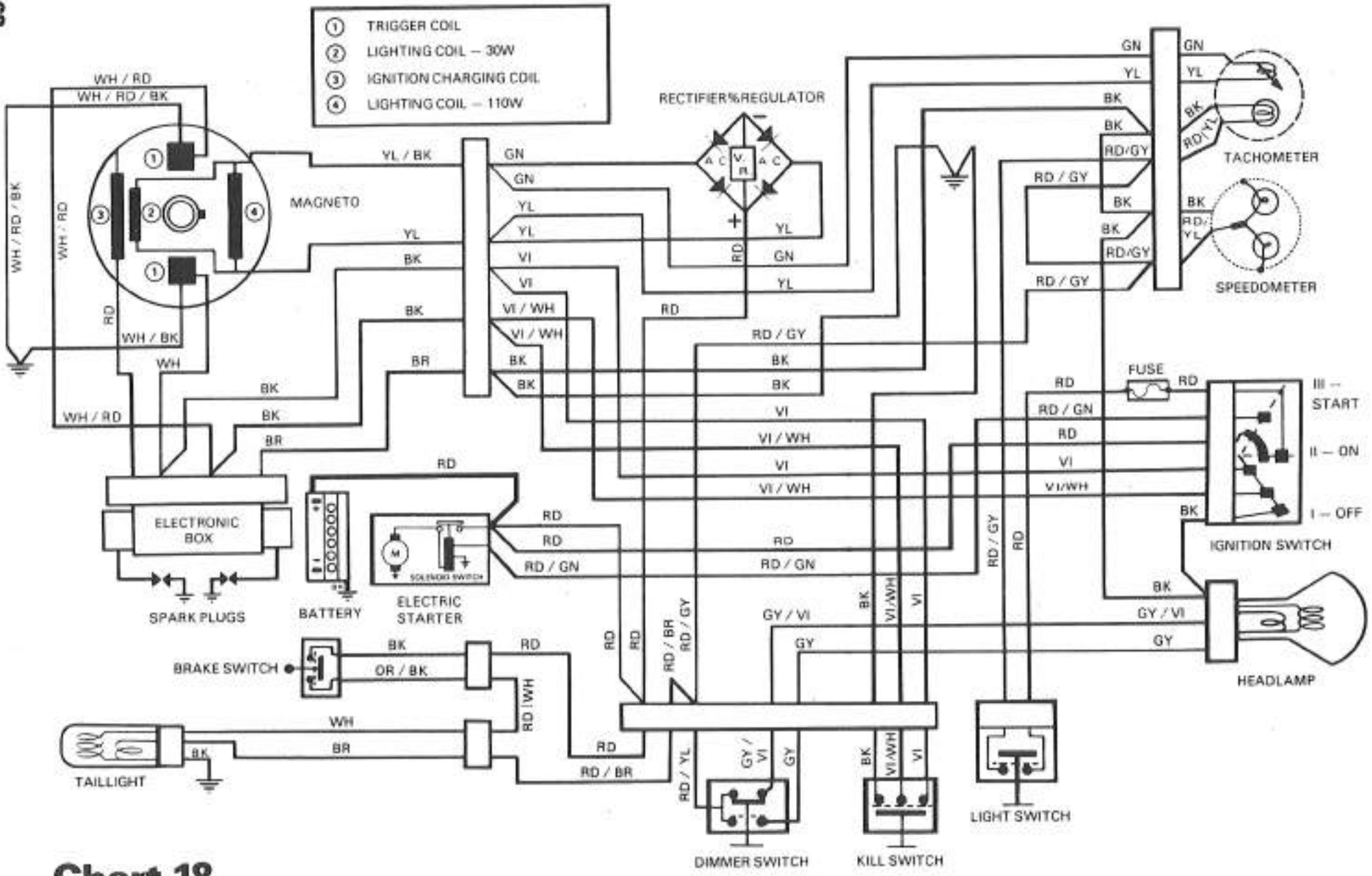

① TRIGGER COIL
② LIGHTING COIL – 30W
③ IGNITION CHARGING COIL
④ LIGHTING COIL – 110W
MAGNETO
RECTIFIER%REGULATOR
TACHOMETER
SPEEDOMETER
FUSE
IGNITION SWITCH
III – START
II – ON
I – OFF
HEADLAMP
ELECTRONIC BOX
SPARK PLUGS
BATTERY
ELECTRIC STARTER
SOLENOID SWITCH
BRAKE SWITCH
TAILLIGHT
DIMMER SWITCH
KILL SWITCH
LIGHT SWITCH
WH / RD
WH / RD / BK
WH / BK
YL / BK
GN
YL
BK
VI
VI / WH
BR
RD
RD / GN
RD / GY
RD / BR
RD / YL
OR / BK
RD / WH
GY / VI
GY
WH
BR

Chart 18

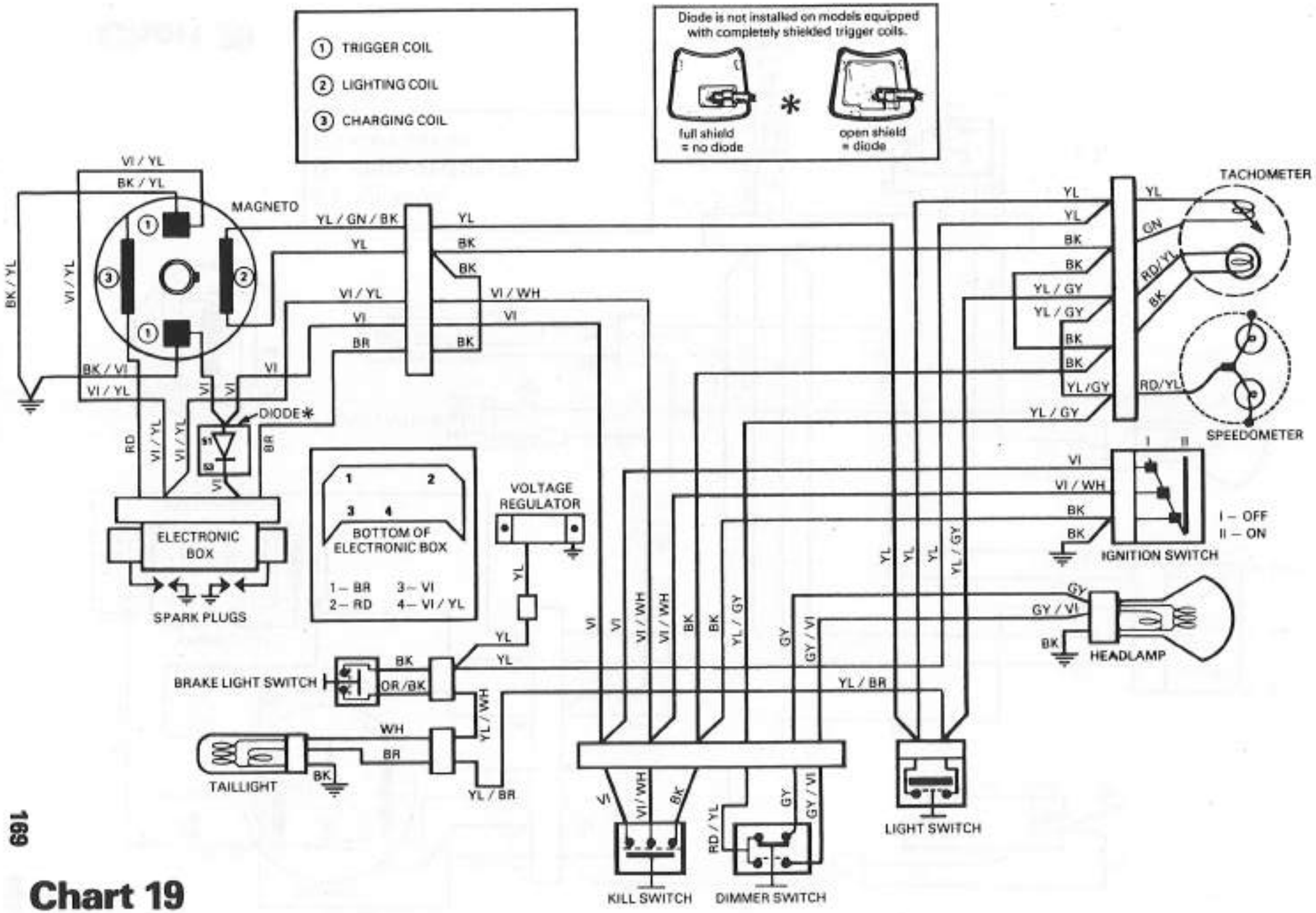

1 TRIGGER COIL
2 LIGHTING COIL
3 CHARGING COIL
Diode is not installed on models equipped with completely shielded trigger coils.
full shield = no diode
*
open shield = diode
MAGNETO
VI / YL
BK / YL
YL / GN / BK
YL
BK
VI / WH
VI
BR
BK / VI
DIODE*
RD
ELECTRONIC BOX
SPARK PLUGS
BOTTOM OF ELECTRONIC BOX
1 2
3 4
1 – BR 3 – VI
2 – RD 4 – VI / YL
VOLTAGE REGULATOR
BRAKE LIGHT SWITCH
OR / BK
WH
TAILLIGHT
YL / BR
KILL SWITCH
DIMMER SWITCH
RD / YL
GY
GY / VI
LIGHT SWITCH
TACHOMETER
GN
RD / YL
SPEEDOMETER
YL / GY
YL / GY
YL / GY
IGNITION SWITCH
I – OFF
II – ON
HEADLAMP
GY
GY / VI

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Chart 19

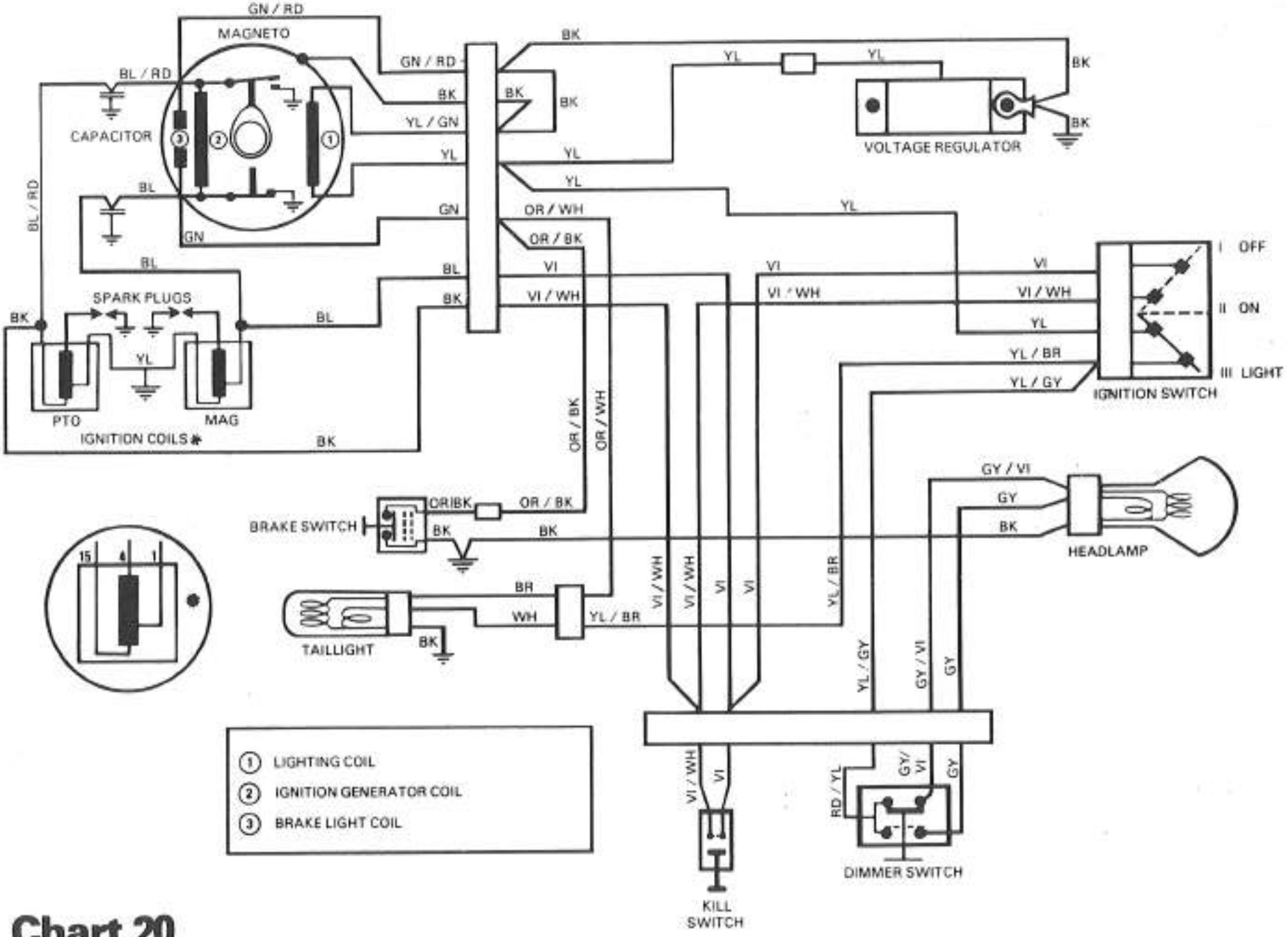

GN / RD
MAGNETO
BL / RD
CAPACITOR
BL / RD
BL
GN
BL
SPARK PLUGS
BK
YL
PTO
MAG
IGNITION COILS *
BK
BL
GN / RD
BK
YL / GN
YL
GN
BL
BK
BK
BK
OR / WH
OR / BK
VI
VI / WH
OR / BK
OR / WH
YL
VOLTAGE REGULATOR
BK
BK
YL
YL
YL
VI
VI / WH
VI
VI / WH
YL
YL / BR
YL / GY
I OFF
II ON
III LIGHT
IGNITION SWITCH
GY / VI
GY
BK
HEADLAMP
BRAKE SWITCH
ORIBK
OR / BK
BK
BK
BR
WH
YL / BR
TAILLIGHT
BK
VI / WH
VI / WH
VI
VI
YL / BR
YL / GY
GY / VI
GY
VI / WH
VI
RD / YL
GY / VI
GY
KILL SWITCH
DIMMER SWITCH
15
4
1
① LIGHTING COIL
② IGNITION GENERATOR COIL
③ BRAKE LIGHT COIL

Chart 20

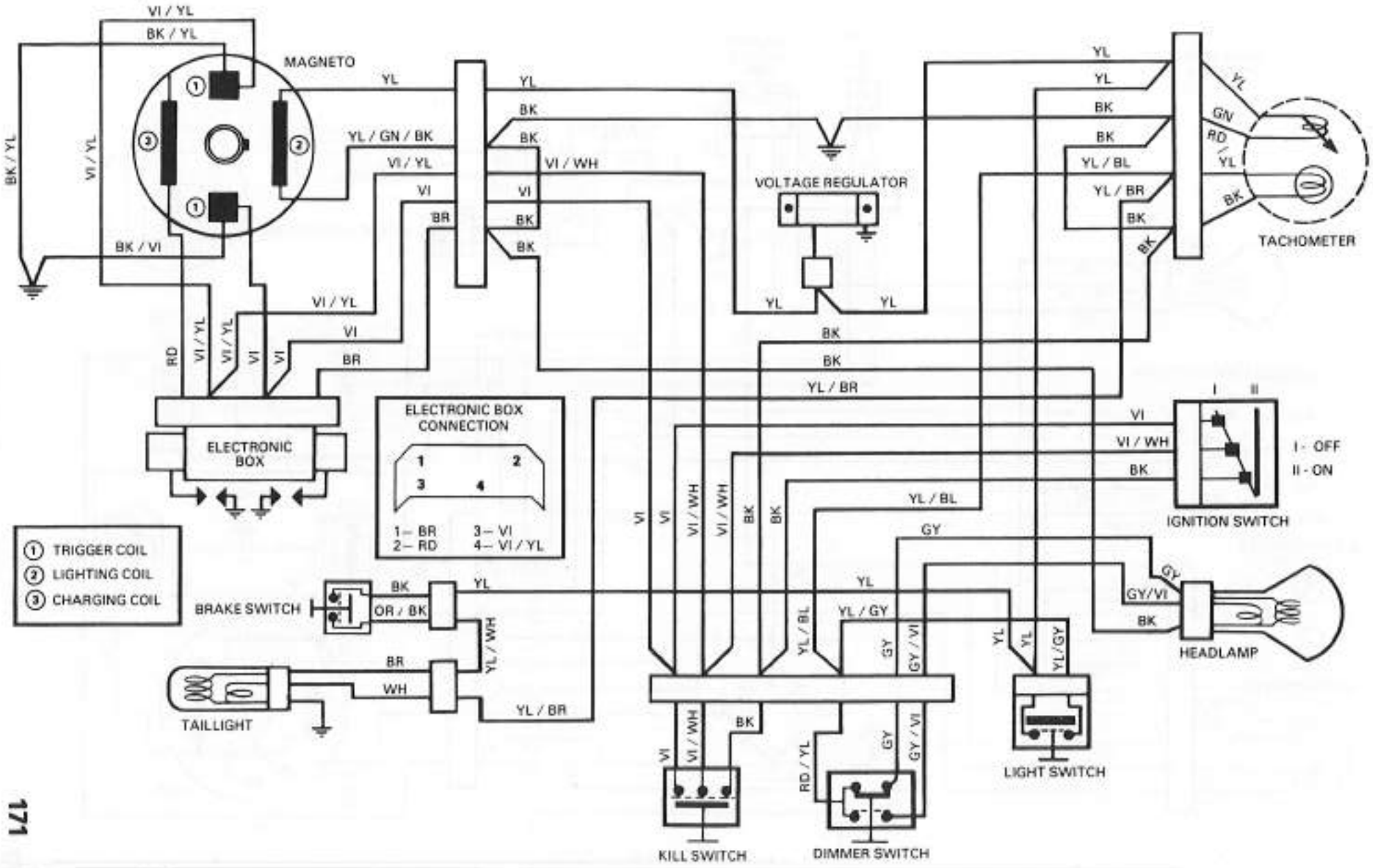

MAGNETO
VOLTAGE REGULATOR
TACHOMETER
ELECTRONIC BOX
ELECTRONIC BOX CONNECTION
1– BR
2– RD
3– VI
4– VI / YL
1 TRIGGER COIL
2 LIGHTING COIL
3 CHARGING COIL
BRAKE SWITCH
TAILLIGHT
IGNITION SWITCH
I - OFF
II - ON
HEADLAMP
LIGHT SWITCH
KILL SWITCH
DIMMER SWITCH

Chart 21

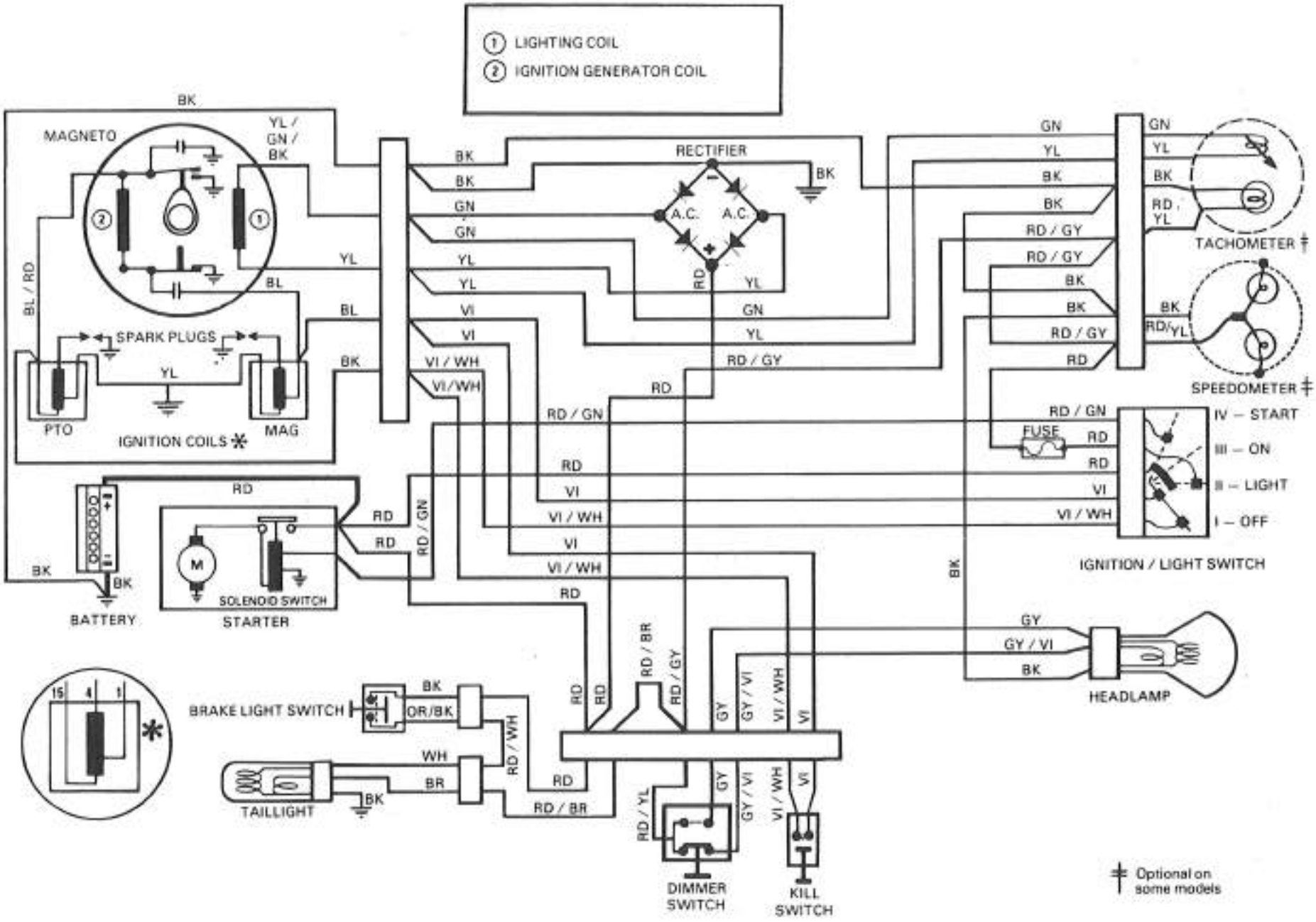

① LIGHTING COIL
② IGNITION GENERATOR COIL
MAGNETO
BK
YL / GN / BK
BL / RD
YL
BL
SPARK PLUGS
PTO
MAG
IGNITION COILS ✱
RECTIFIER
A.C.
A.C.
RD
GN
VI
VI / WH
RD / GN
RD / GY
TACHOMETER ‡
SPEEDOMETER ‡
FUSE
IV – START
III – ON
II – LIGHT
I – OFF
IGNITION / LIGHT SWITCH
BATTERY
STARTER
SOLENOID SWITCH
M
BRAKE LIGHT SWITCH
OR/BK
WH
BR
TAILLIGHT
RD / BR
RD / YL
GY
GY / VI
VI / WH
DIMMER SWITCH
KILL SWITCH
HEADLAMP
15
4
1
‡ Optional on some models

Chart 22

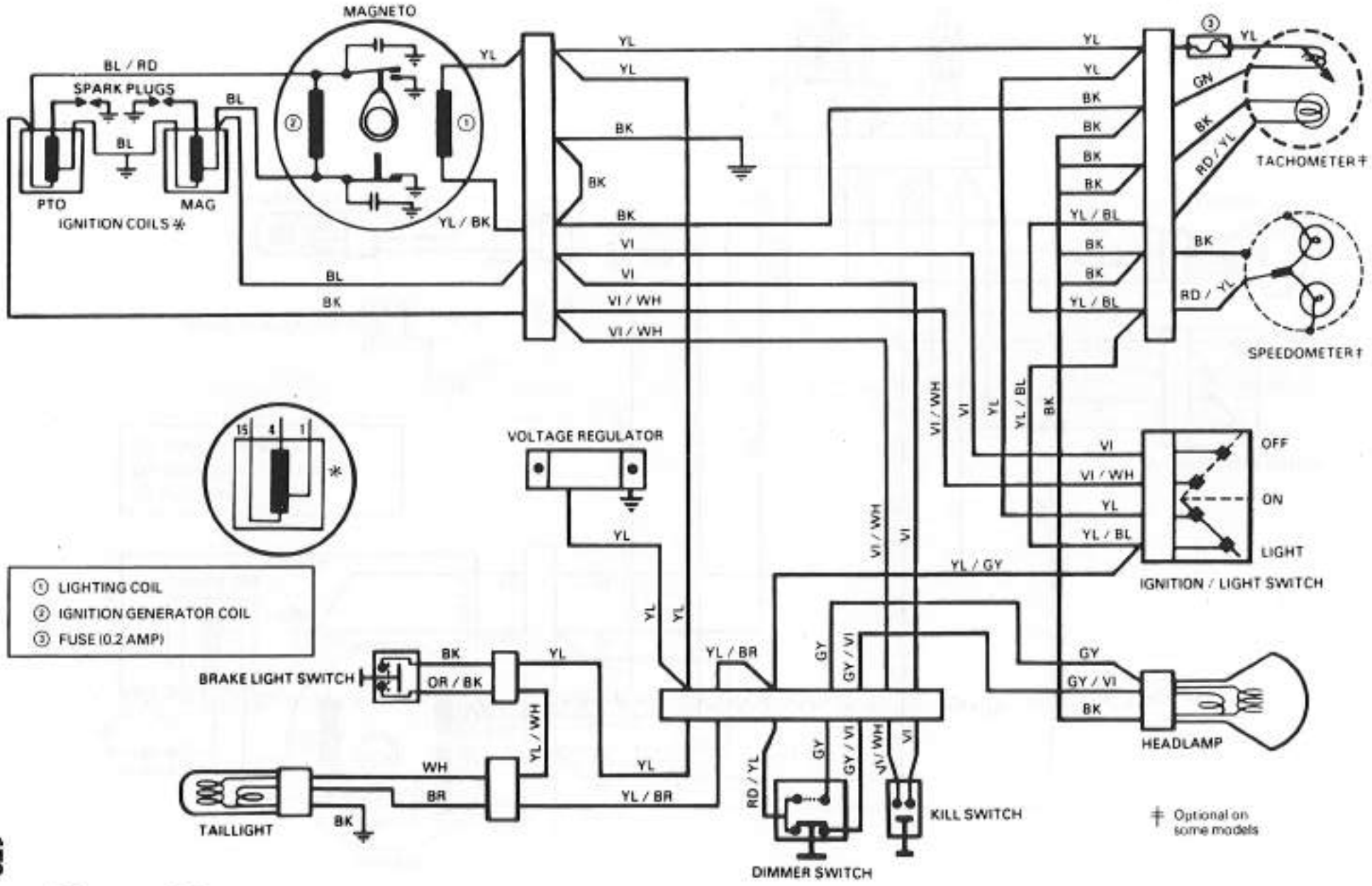

MAGNETO
BL / RD
SPARK PLUGS
BL
PTO
MAG
IGNITION COILS ✻
YL / BK
YL
BK
VI
VI / WH
TACHOMETER †
SPEEDOMETER †
GN
RD / YL
YL / BL
RD / YL
VOLTAGE REGULATOR
IGNITION / LIGHT SWITCH
OFF
ON
LIGHT
YL / GY
① LIGHTING COIL
② IGNITION GENERATOR COIL
③ FUSE (0.2 AMP)
BRAKE LIGHT SWITCH
OR / BK
YL / BR
GY
GY / VI
HEADLAMP
WH
BR
TAILLIGHT
RD / YL
KILL SWITCH
DIMMER SWITCH
† Optional on some models

Chart 23

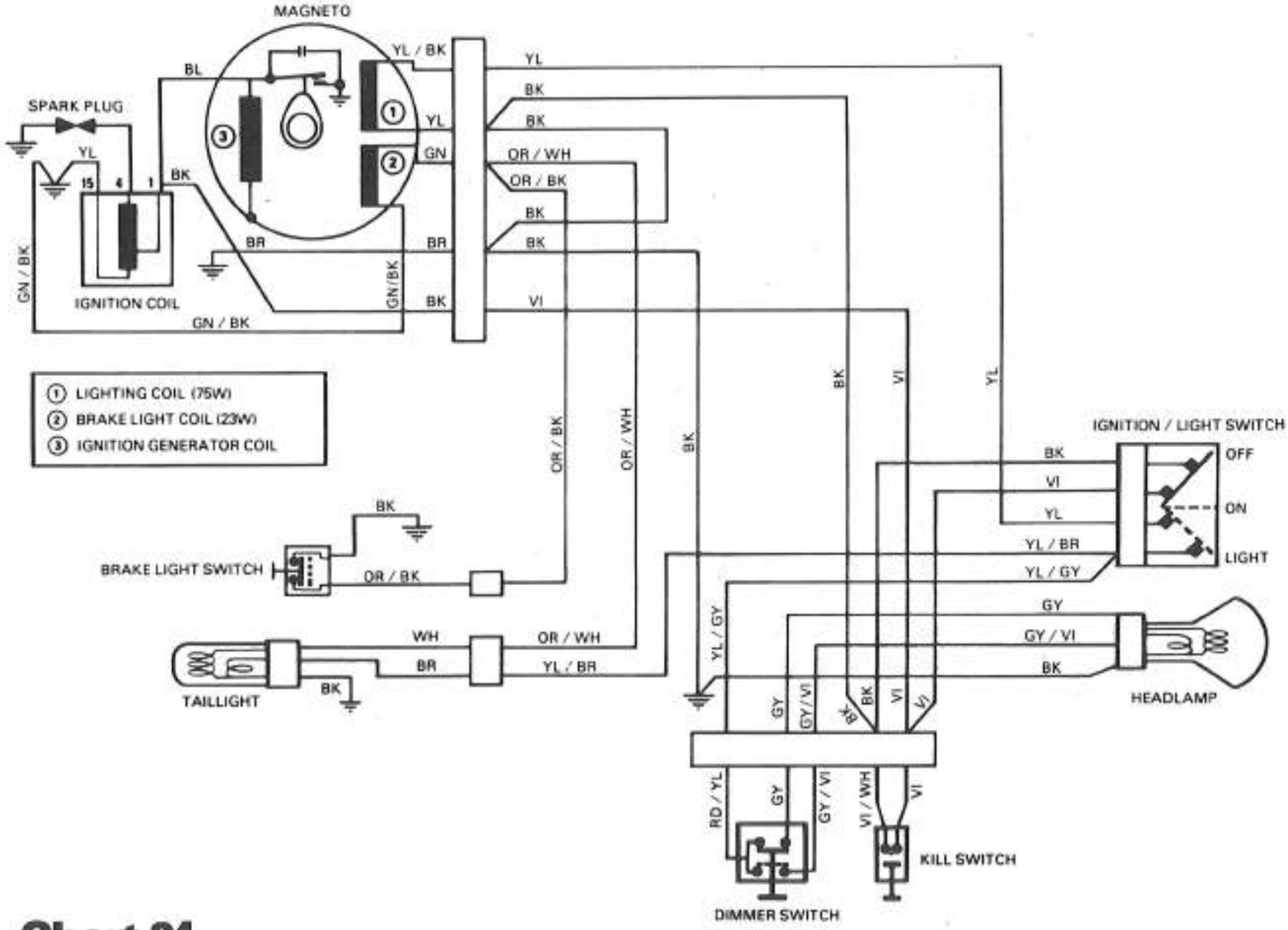

MAGNETO
SPARK PLUG
IGNITION COIL
BL
YL
BK
GN / BK
BR
YL / BK
GN
OR / WH
OR / BK
GN/BK
VI
① LIGHTING COIL (75W)
② BRAKE LIGHT COIL (23W)
③ IGNITION GENERATOR COIL
BRAKE LIGHT SWITCH
TAILLIGHT
WH
YL / BR
IGNITION / LIGHT SWITCH
OFF
ON
LIGHT
YL / GY
GY
GY / VI
HEADLAMP
RD / YL
VI / WH
KILL SWITCH
DIMMER SWITCH

Chart 24

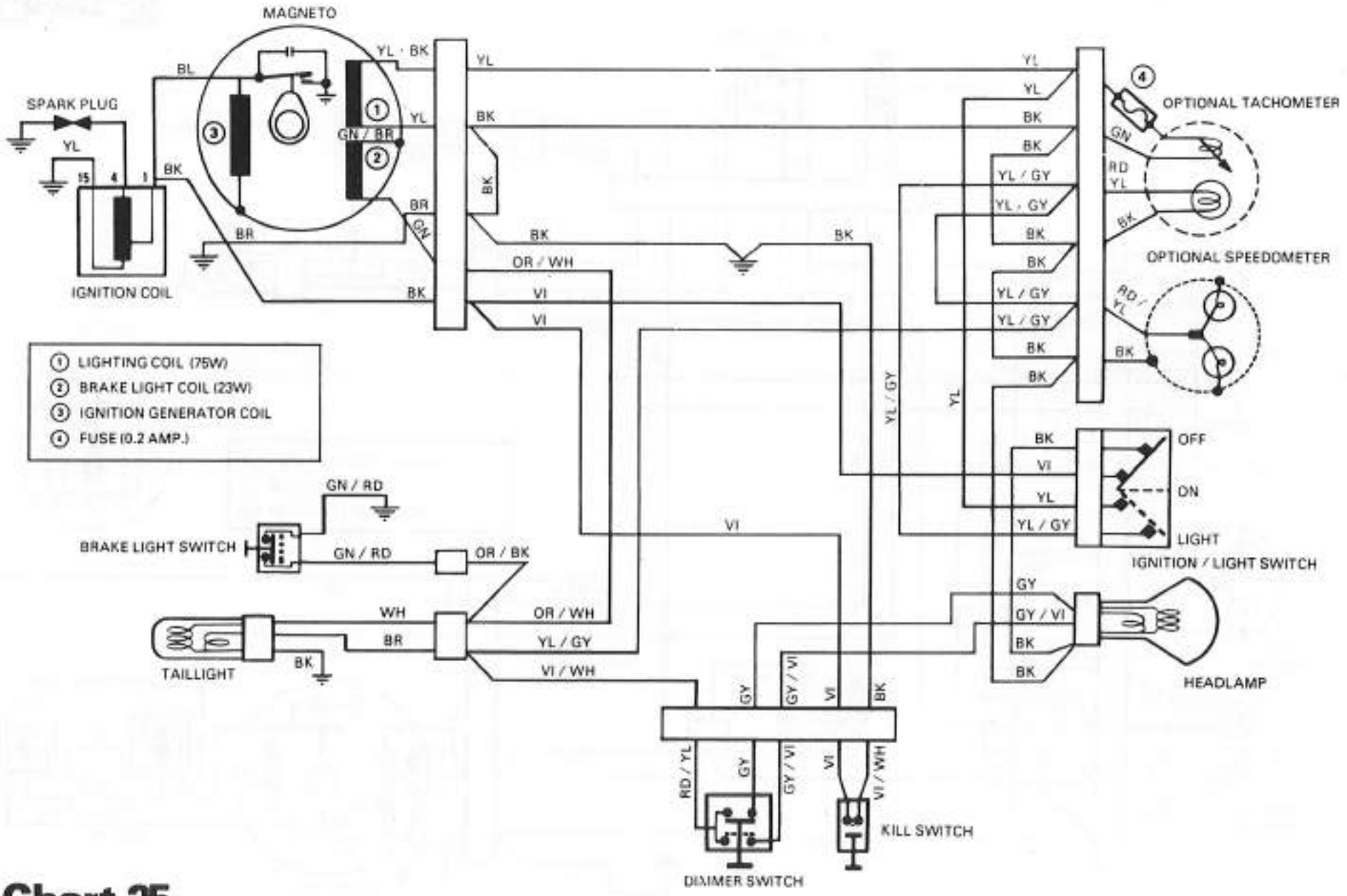

MAGNETO
SPARK PLUG
IGNITION COIL
BL
YL
BK
BR
GN
GN / BR
YL · BK
OR / WH
VI
YL / GY
GY
GY / VI
RD / YL
WH
OR / BK
GN / RD
BRAKE LIGHT SWITCH
TAILLIGHT
VI / WH
① LIGHTING COIL (75W)
② BRAKE LIGHT COIL (23W)
③ IGNITION GENERATOR COIL
④ FUSE (0.2 AMP.)
OPTIONAL TACHOMETER
OPTIONAL SPEEDOMETER
OFF
ON
LIGHT
IGNITION / LIGHT SWITCH
HEADLAMP
KILL SWITCH
DIMMER SWITCH

Chart 25

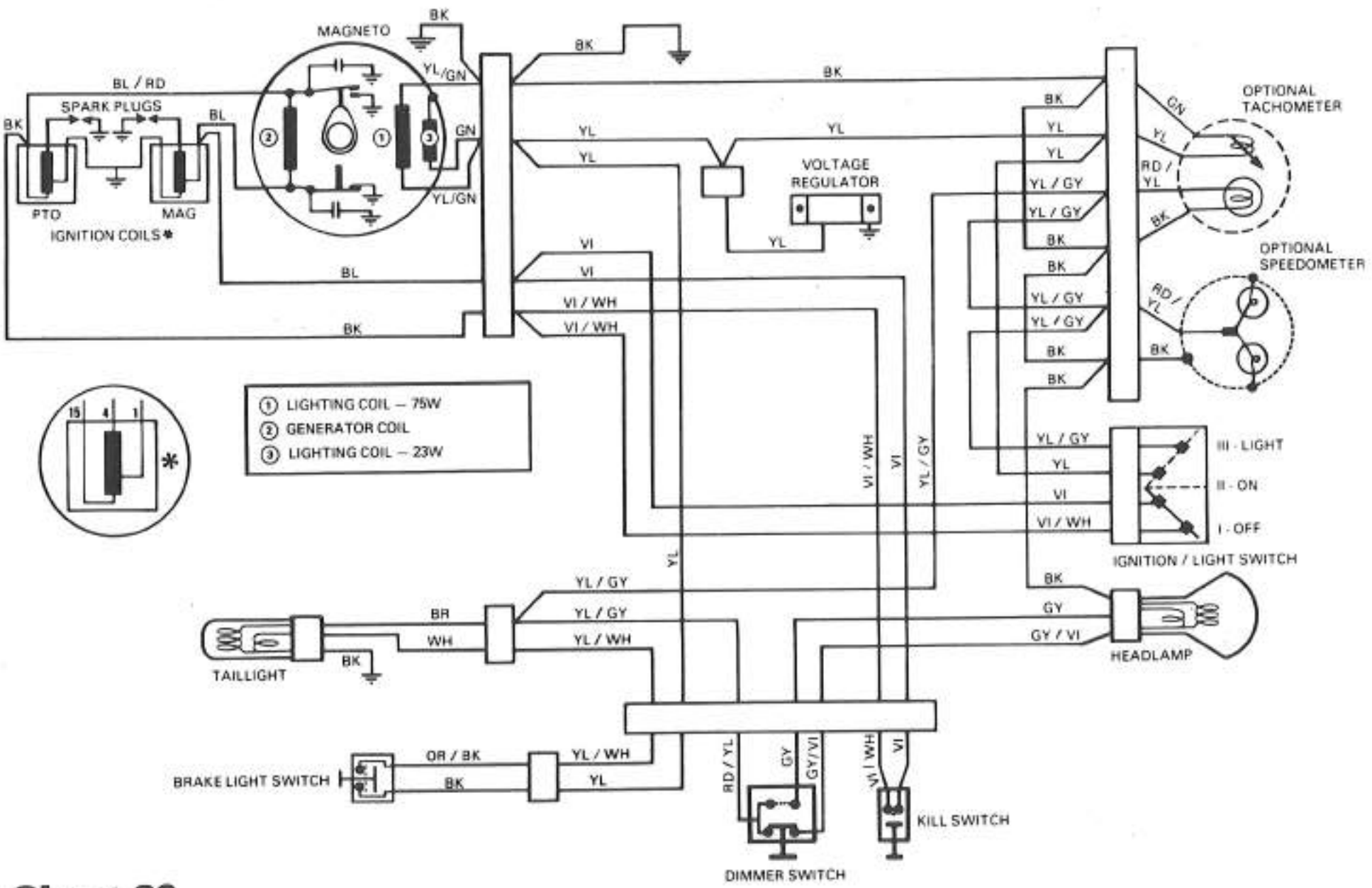

MAGNETO
BK
YL/GN
BL / RD
SPARK PLUGS
BK
BL
GN
YL/GN
PTO
MAG
IGNITION COILS *
BL
BK
YL
VOLTAGE REGULATOR
VI
VI / WH
OPTIONAL TACHOMETER
OPTIONAL SPEEDOMETER
RD / YL
YL / GY
15
4
1
*
① LIGHTING COIL – 75W
② GENERATOR COIL
③ LIGHTING COIL – 23W
III - LIGHT
II - ON
I - OFF
IGNITION / LIGHT SWITCH
BR
WH
GY
GY / VI
TAILLIGHT
HEADLAMP
OR / BK
BRAKE LIGHT SWITCH
RD / YL
GY/VI
KILL SWITCH
DIMMER SWITCH

Chart 26

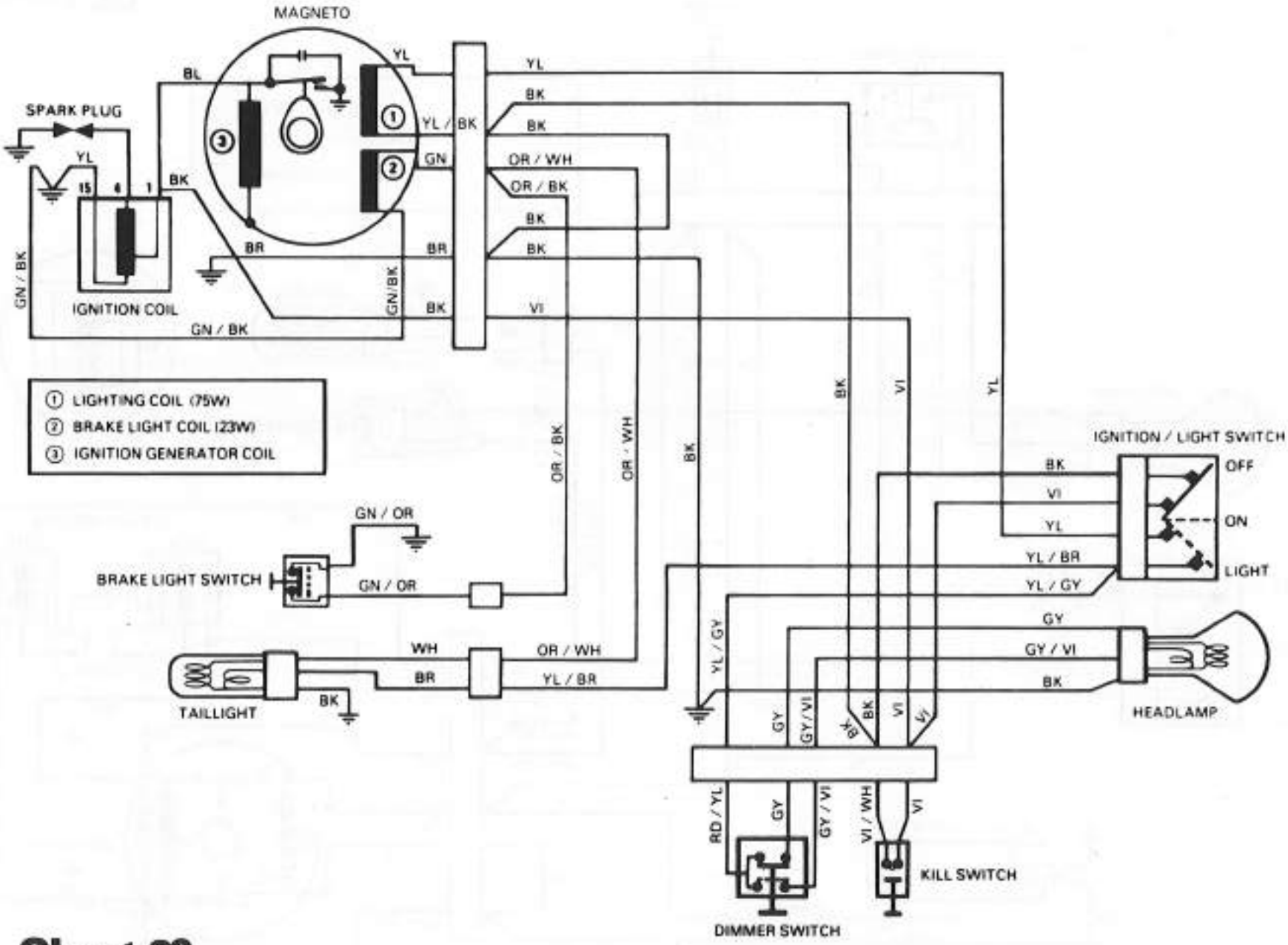

MAGNETO
SPARK PLUG
IGNITION COIL
BRAKE LIGHT SWITCH
TAILLIGHT
IGNITION / LIGHT SWITCH
OFF
ON
LIGHT
HEADLAMP
KILL SWITCH
DIMMER SWITCH
① LIGHTING COIL (75W)
② BRAKE LIGHT COIL (23W)
③ IGNITION GENERATOR COIL

Chart 29

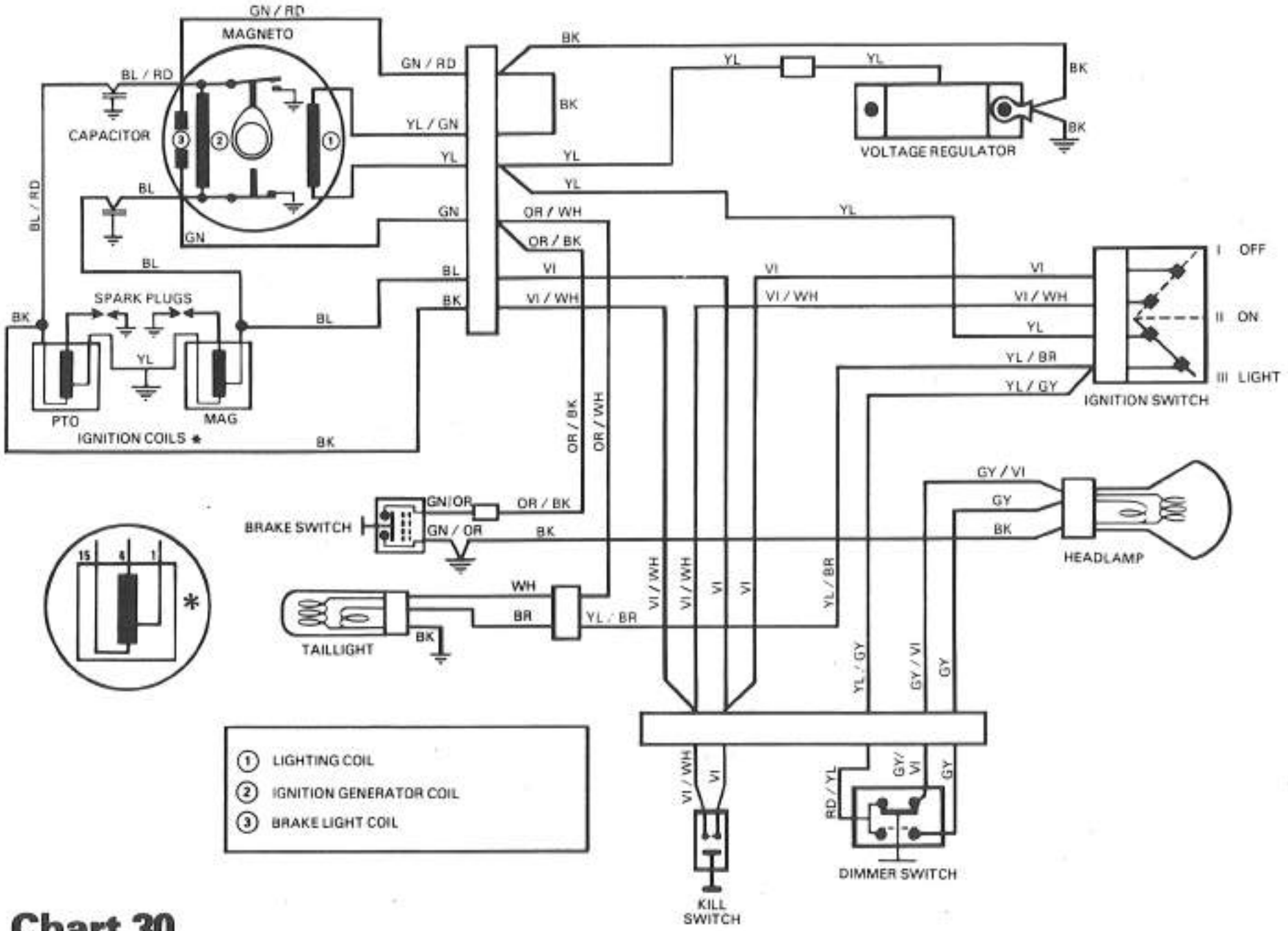

GN / RD
MAGNETO
BL / RD
CAPACITOR
YL / GN
YL
BL
GN
BK
OR / WH
OR / BK
VI
VI / WH
YL
VOLTAGE REGULATOR
SPARK PLUGS
PTO
MAG
IGNITION COILS *
IGNITION SWITCH
I OFF
II ON
III LIGHT
YL / BR
YL / GY
BRAKE SWITCH
GN/OR
GN / OR
HEADLAMP
GY / VI
GY
TAILLIGHT
WH
BR
KILL SWITCH
DIMMER SWITCH
RD / YL
GY / VI
① LIGHTING COIL
② IGNITION GENERATOR COIL
③ BRAKE LIGHT COIL

Chart 30

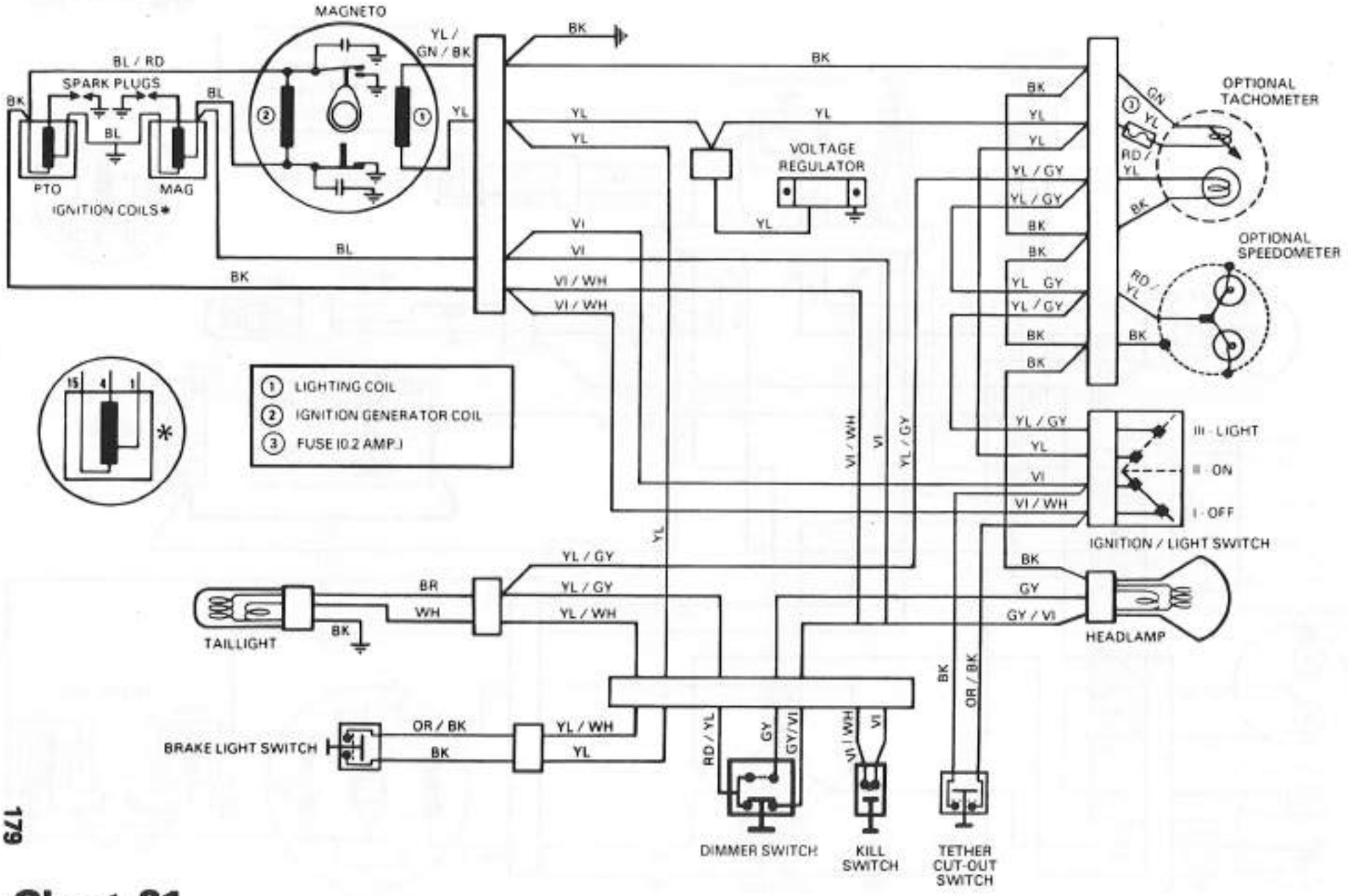

MAGNETO
BL / RD
SPARK PLUGS
BK
BL
PTO
MAG
IGNITION COILS*
YL / GN / BK
YL
BK
VOLTAGE REGULATOR
VI
VI / WH
BL
BK
15
4
1
*
① LIGHTING COIL
② IGNITION GENERATOR COIL
③ FUSE (0.2 AMP.)
OPTIONAL TACHOMETER
GN
RD / YL
OPTIONAL SPEEDOMETER
YL / GY
III - LIGHT
II - ON
I - OFF
IGNITION / LIGHT SWITCH
HW / VI
TAILLIGHT
BR
WH
HEADLAMP
GY
GY / VI
OR / BK
BRAKE LIGHT SWITCH
DIMMER SWITCH
KILL SWITCH
TETHER CUT-OUT SWITCH

Chart 31

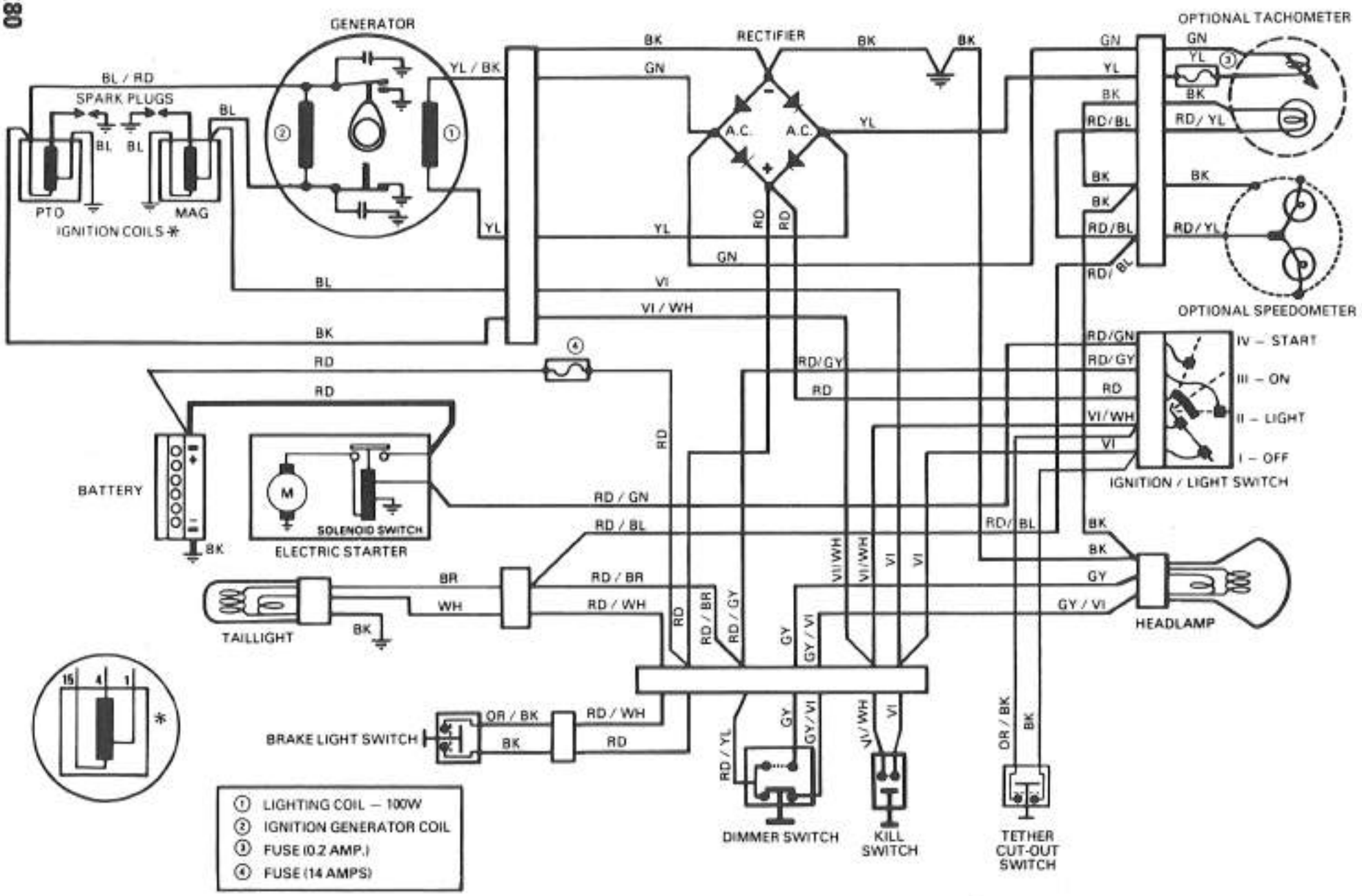

GENERATOR
BL / RD
SPARK PLUGS
BL
BL
BL
PTO
MAG
IGNITION COILS *
YL / BK
YL
BK
GN
RECTIFIER
A.C.
A.C.
BK
BK
YL
RD
RD
YL
GN
BL
VI
VI / WH
BK
RD
RD
RD
RD/GY
RD
RD / GN
RD / BL
RD / BR
RD / WH
BATTERY
BK
SOLENOID SWITCH
ELECTRIC STARTER
BR
WH
BK
TAILLIGHT
OR / BK
BK
RD / WH
RD
BRAKE LIGHT SWITCH
RD / YL
GY
GY / VI
DIMMER SWITCH
VI / WH
VI
KILL SWITCH
OR / BK
BK
TETHER CUT-OUT SWITCH
OPTIONAL TACHOMETER
GN
YL
BK
RD/BL
BK
BK
RD/BL
RD/
OPTIONAL SPEEDOMETER
RD/YL
RD/YL
RD/GN
RD/GY
RD
VI/WH
VI
IV – START
III – ON
II – LIGHT
I – OFF
IGNITION / LIGHT SWITCH
RD/ BL
BK
BK
GY
GY / VI
HEADLAMP
15
4
1
① LIGHTING COIL – 100W
② IGNITION GENERATOR COIL
③ FUSE (0.2 AMP.)
④ FUSE (14 AMPS)

Chart 32

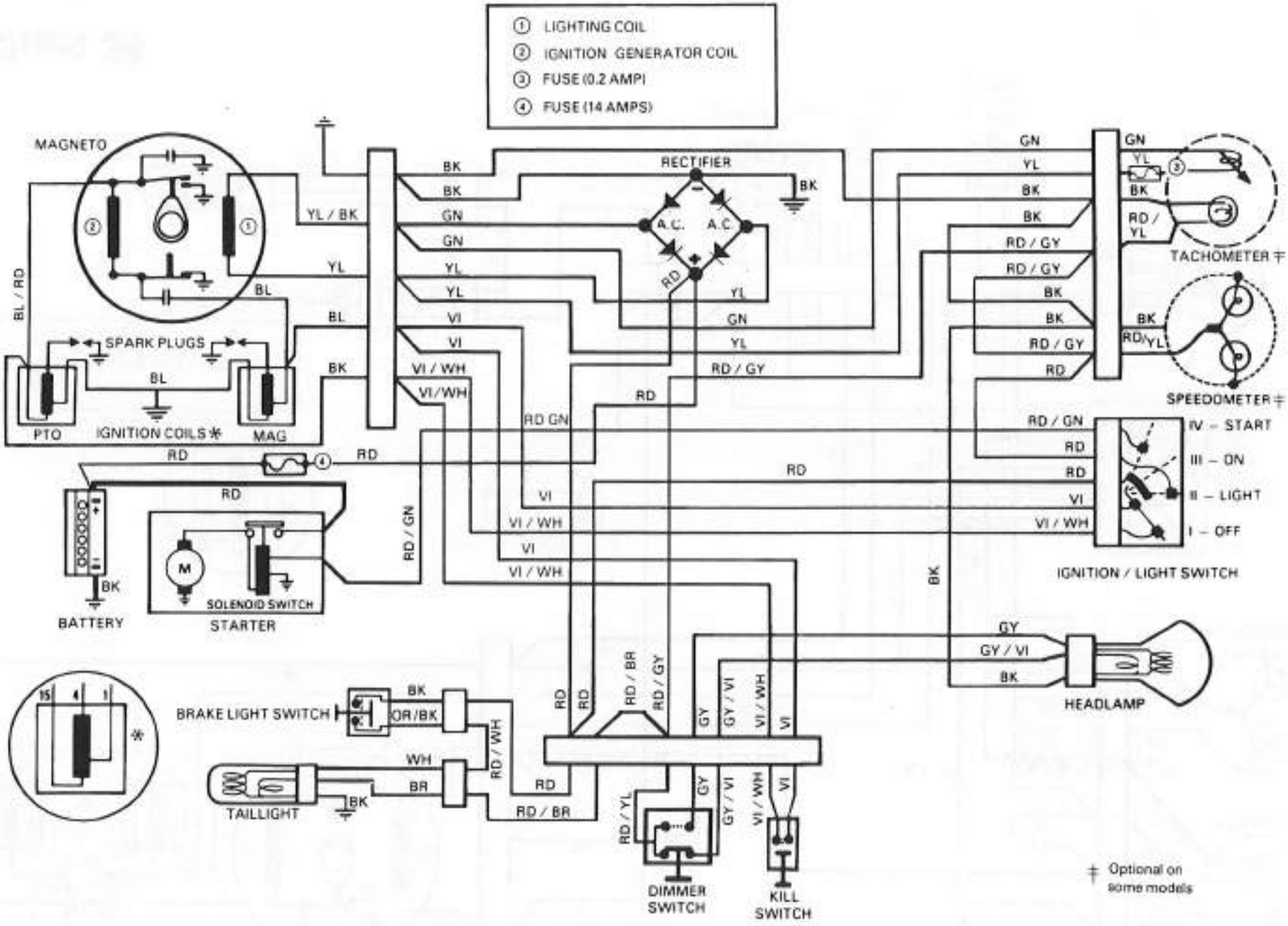

① LIGHTING COIL
② IGNITION GENERATOR COIL
③ FUSE (0.2 AMP)
④ FUSE (14 AMPS)
MAGNETO
RECTIFIER
A.C.
A.C.
SPARK PLUGS
PTO
IGNITION COILS *
MAG
BATTERY
STARTER
SOLENOID SWITCH
TACHOMETER ‡
SPEEDOMETER ‡
IV – START
III – ON
II – LIGHT
I – OFF
IGNITION / LIGHT SWITCH
HEADLAMP
BRAKE LIGHT SWITCH
TAILLIGHT
DIMMER SWITCH
KILL SWITCH
‡ Optional on some models

Chart 33

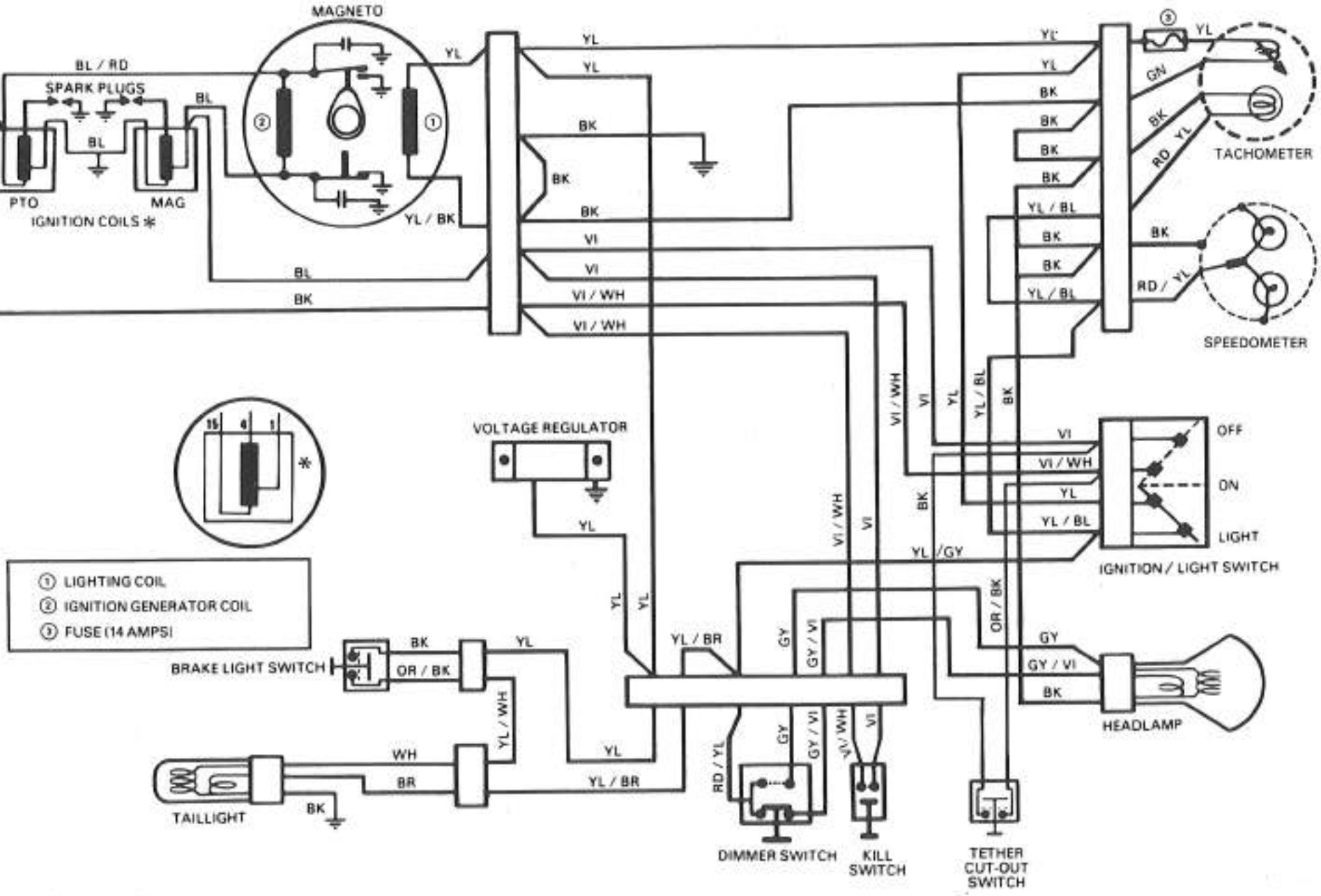

MAGNETO
BL / RD
SPARK PLUGS
BL
PTO
MAG
IGNITION COILS *
YL
YL / BK
BK
VI
VI / WH
TACHOMETER
SPEEDOMETER
YL / BL
GN
RD / YL
OFF
ON
LIGHT
IGNITION / LIGHT SWITCH
VOLTAGE REGULATOR
15
4
1
① LIGHTING COIL
② IGNITION GENERATOR COIL
③ FUSE (14 AMPS)
BRAKE LIGHT SWITCH
OR / BK
YL / WH
WH
BR
YL / BR
TAILLIGHT
GY
GY / VI
RD / YL
DIMMER SWITCH
KILL SWITCH
OR / BK
YL /GY
HEADLAMP
TETHER CUT-OUT SWITCH

Chart 34

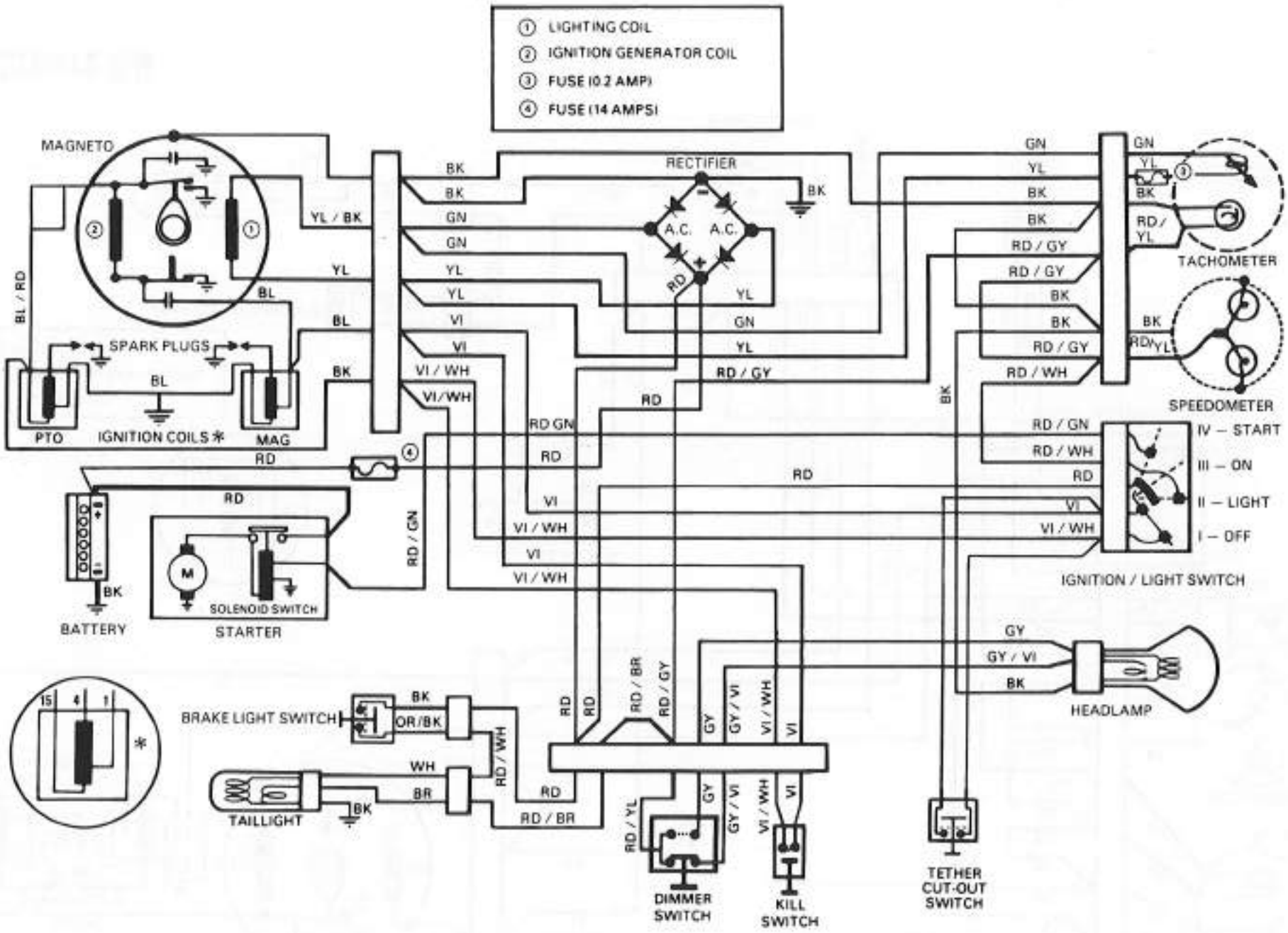

① LIGHTING COIL
② IGNITION GENERATOR COIL
③ FUSE (0.2 AMP)
④ FUSE (14 AMPS)
MAGNETO
RECTIFIER
A.C.
A.C.
SPARK PLUGS
PTO
IGNITION COILS *
MAG
BATTERY
STARTER
SOLENOID SWITCH
TACHOMETER
SPEEDOMETER
IV – START
III – ON
II – LIGHT
I – OFF
IGNITION / LIGHT SWITCH
HEADLAMP
BRAKE LIGHT SWITCH
TAILLIGHT
DIMMER SWITCH
KILL SWITCH
TETHER CUT-OUT SWITCH
BK
BL
BL / RD
YL
YL / BK
VI
VI / WH
GN
RD
RD GN
RD / GN
RD / BR
RD / GY
RD / WH
RD / YL
GY
GY / VI
OR / BK
WH
BR

Chart 35

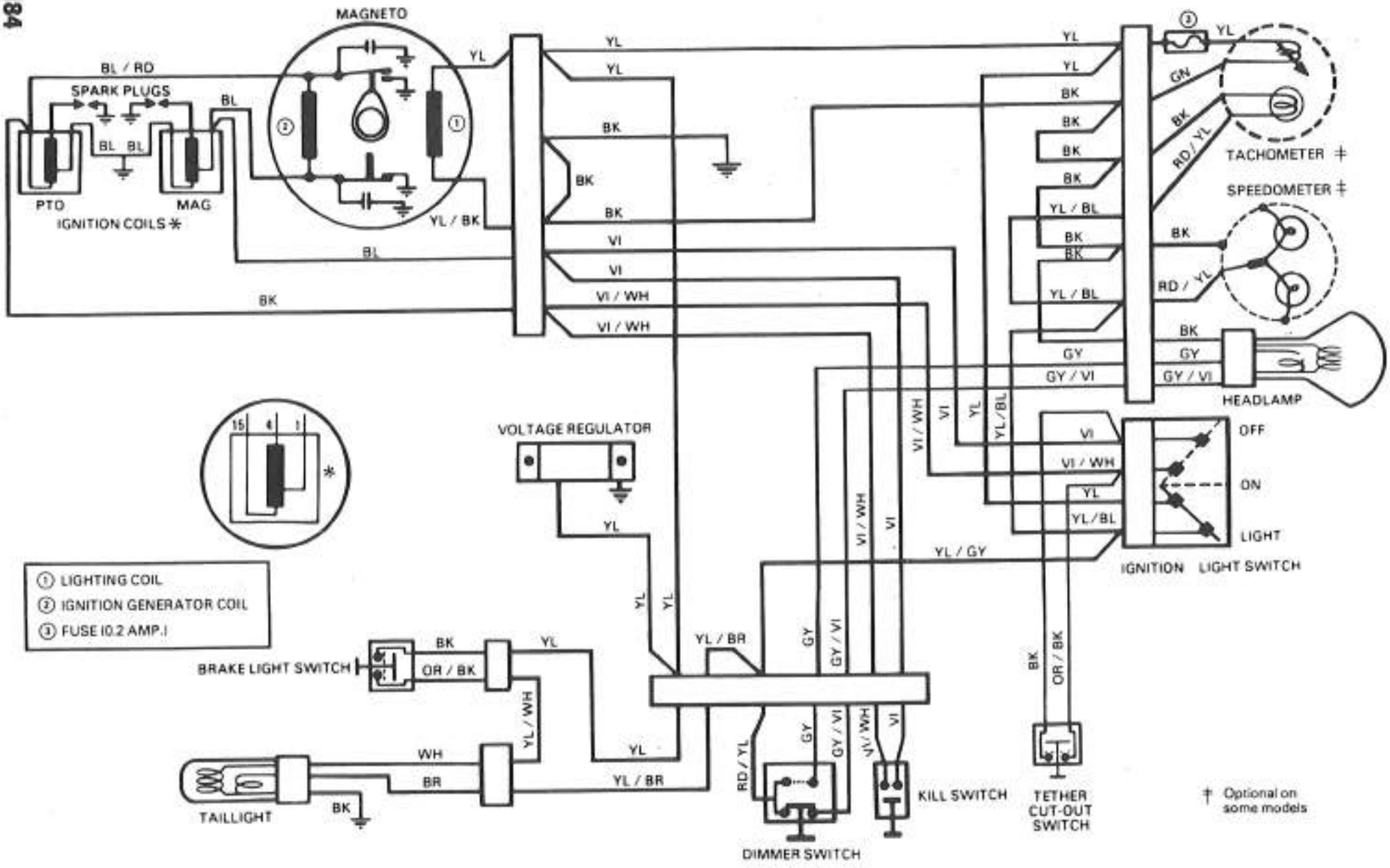

MAGNETO
BL / RD
SPARK PLUGS
BL
BL BL
PTO
MAG
IGNITION COILS *
YL
YL / BK
BK
VI
VI / WH
BL
YL / BL
GY
GY / VI
GN
RD / YL
TACHOMETER ‡
SPEEDOMETER ‡
HEADLAMP
OFF
ON
LIGHT
IGNITION LIGHT SWITCH
VOLTAGE REGULATOR
15 4 1
*
① LIGHTING COIL
② IGNITION GENERATOR COIL
③ FUSE (0.2 AMP.)
BRAKE LIGHT SWITCH
OR / BK
WH
BR
YL / WH
YL / BR
TAILLIGHT
RD / YL
KILL SWITCH
DIMMER SWITCH
TETHER CUT-OUT SWITCH
† Optional on some models

Chart 36

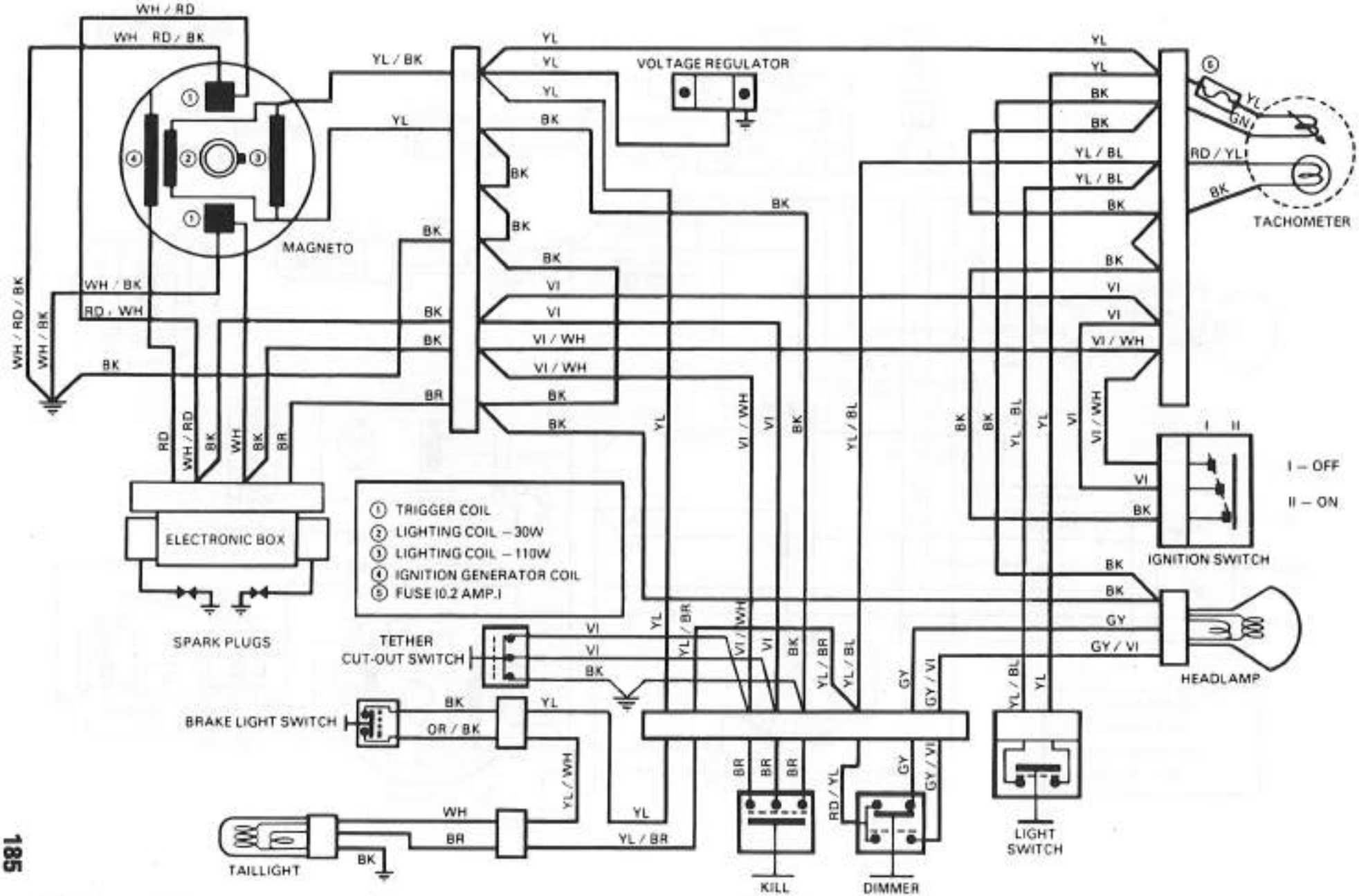

WH / RD
WH RD / BK
YL / BK
YL
MAGNETO
VOLTAGE REGULATOR
TACHOMETER
RD / YL
WH / BK
RD / WH
WH / RD / BK
WH / BK
BK
BR
RD
WH / RD
BK
WH
ELECTRONIC BOX
SPARK PLUGS
① TRIGGER COIL
② LIGHTING COIL – 30W
③ LIGHTING COIL – 110W
④ IGNITION GENERATOR COIL
⑤ FUSE (0.2 AMP.)
TETHER
CUT-OUT SWITCH
VI
YL / BR
VI / WH
YL / BL
BRAKE LIGHT SWITCH
OR / BK
GY
GY / VI
GN
IGNITION SWITCH
I – OFF
II – ON
HEADLAMP
TAILLIGHT
KILL
SWITCH
DIMMER
SWITCH
LIGHT
SWITCH

Chart 37

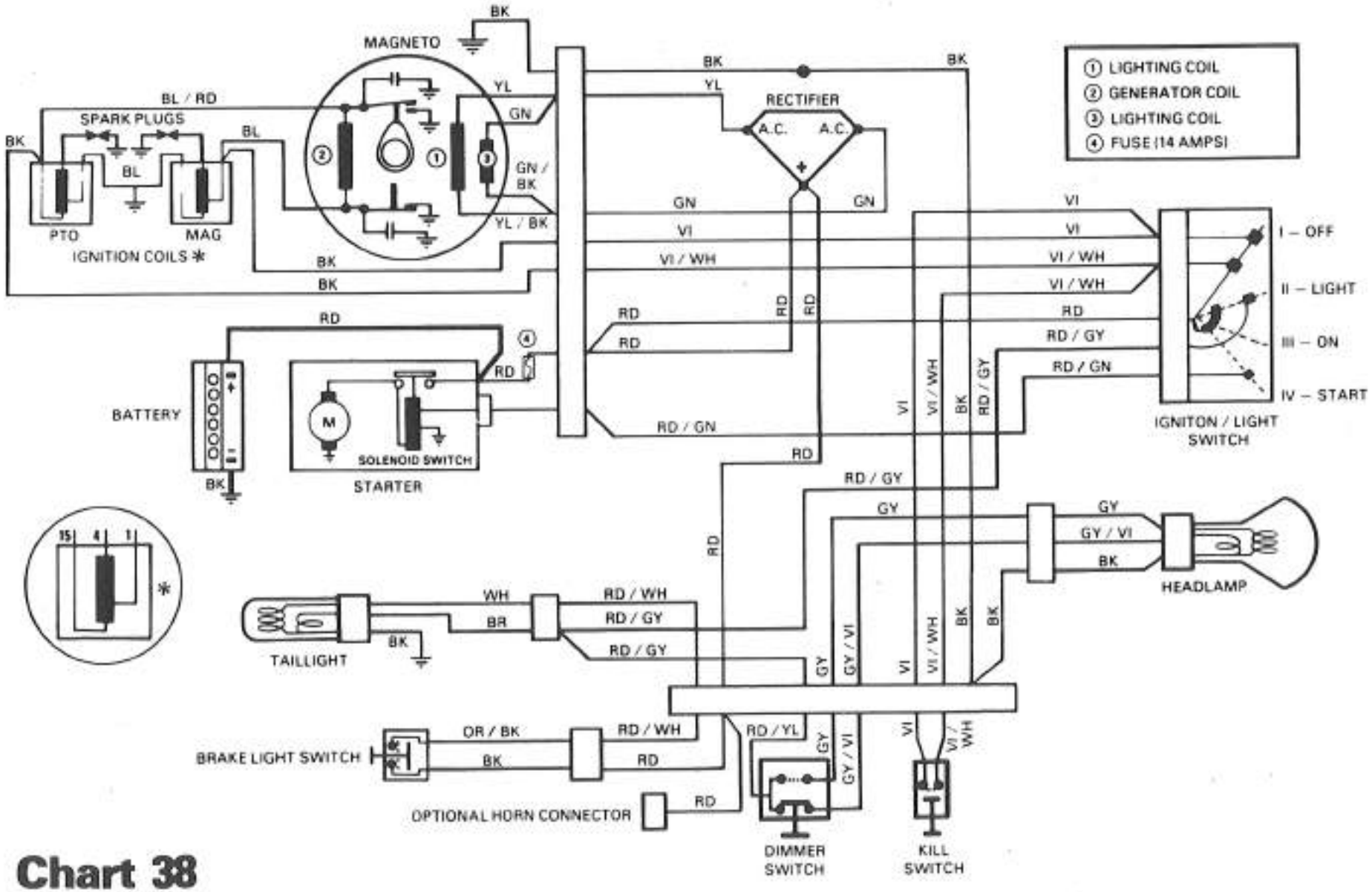
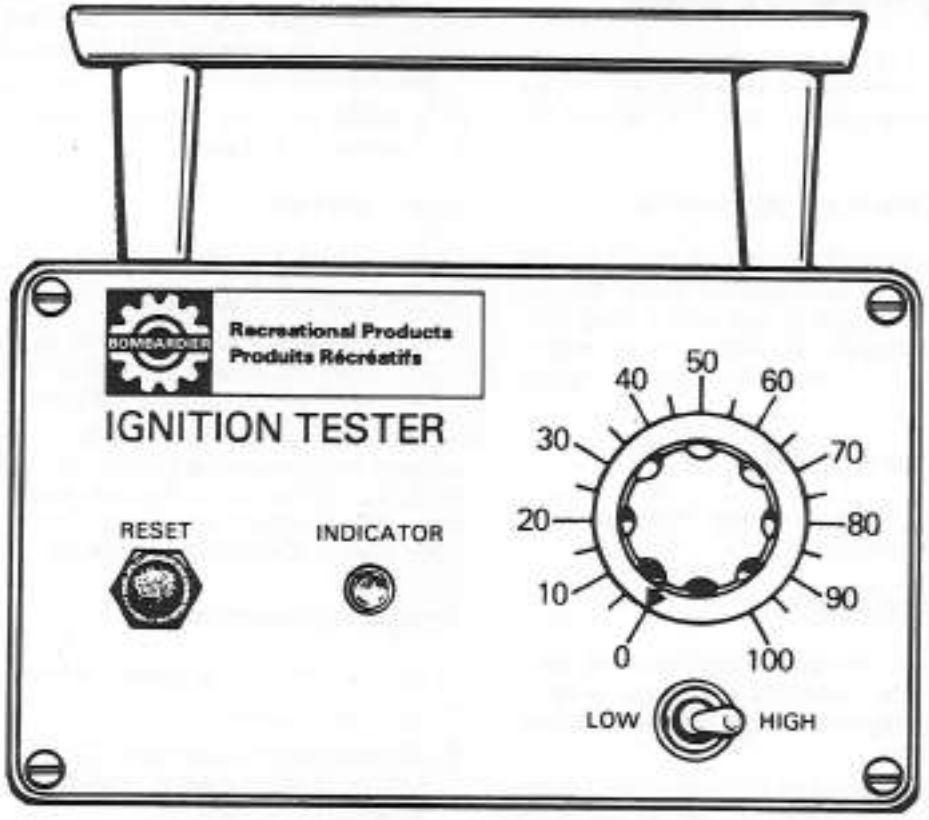

MAGNETO
BK
BL / RD
SPARK PLUGS
BK
BL
PTO
MAG
IGNITION COILS *
YL
GN
GN / BK
YL / BK
BK
BK
BK
YL
RECTIFIER
A.C.
A.C.
+
GN
GN
① LIGHTING COIL
② GENERATOR COIL
③ LIGHTING COIL
④ FUSE (14 AMPS)
VI
VI
VI / WH
VI / WH
RD
RD / GY
RD / GN
I – OFF
II – LIGHT
III – ON
IV – START
IGNITON / LIGHT SWITCH
RD
RD
RD
RD
RD
④
BATTERY
M
SOLENOID SWITCH
STARTER
RD / GN
BK
RD
RD / GY
GY
GY
GY / VI
BK
HEADLAMP
15
4
1
*
WH
BR
BK
TAILLIGHT
RD / WH
RD / GY
RD / GY
GY
GY / VI
VI
VI / WH
BK
BK
OR / BK
BK
BRAKE LIGHT SWITCH
RD / WH
RD
RD
OPTIONAL HORN CONNECTOR
RD / YL
GY
GY / VI
DIMMER SWITCH
VI
VI / WH
KILL SWITCH

Chart 38

BOMBARDIER IGNITION TESTER



GENERAL

The Bombardier ignition tester is an electrical energy measuring device capable of measuring the peak energy output of a coil.

The tester is of solid state construction and performs as a comparator. The correct value of energy output is indicated in each test and is then compared with the value taken from the engine being tested.

The energy output is verified by means of a 0-100 scale on the tester. The greater the energy output, the greater value indication on the scale. The indication is in the form of an incandescent lamp that lights when the scale knob is set at the position corresponding to the energy output.

The tester has two input ranges selected by a toggle switch. The LOW range is sensitive to AC or DC voltages from 0.5 to 27 volts. The HIGH range is sensitive to AC or DC voltages of from approximately 75 to 500 volts.

TEST CONDITION

All tests are performed on the vehicle at cranking speed. It would seem logical that removal of spark plugs would allow the engine to turn over faster, therefore raising the output level of the ignition system. It was found that vigorous cranking against compression causes the flywheel to snap over, raising the output higher than by cranking without compression. If output results are marginal, output can be measured with and without compression. **Test values listed are taken against compression.**
Always crank vigorously as in actual starting.

Read all instructions **thoroughly** and as you become familiar with this test instrument it will be possible to test a complete ignition system in a matter of minutes. Always proceed in the following order:

1. Connect tester **P** and **N** clip leads as illustrated.
2. Follow test procedure sequence.
3. After every test that lights the indicator lamp, **reset** the indicator circuit by depressing the reset button.

ANALYSIS OF TEST RESULTS

Indicator lamp lights at specific setting.

Output is as specified. Test results should repeat three times. If readings do not repeat, output is erratic and cause should be investigated (loose connections or components, etc.).

Indicator lamp lights at a lower setting.

This indicates that the output is less than that designed to operate the engine in a satisfactory manner. The engine may run at a lower setting, but be the subject to hard starting and misfire. Be certain that correct engine cranking conditions were met before condemning the ignition.

Indicator lamp does not light.

One component is defective. Proceed as instructed to find defective component.

Intermittent ignition problems

In dealing with intermittent problems there is no easy diagnosis. For example, problems that occur only at normal engine operating temperature have to be tested under similar conditions.

In most cases of temperature and / or vibration failure, only parts replacement can solve the problem as most of these failures return to normal when engine is not running.

Double trouble

There is always the possibility of more than one defective parts. If after a component has been replaced, the problem still persists, carefully repeat the complete test procedure to find the other defective part.

ANALYSER TEST AND MAINTENANCE

A test simulator is provided with each tester as a means to test the lamp, detector circuit, and batteries.

High scale test

a) Place switch in HIGH position. Plug the simulator into an electric outlet (117 VAC) for ten seconds.

CAUTION: After charging, do not touch plug terminals while pressing test button. A mild shock will result.

b) Remove the simulator from the outlet, and connect the "P" and "N" leads from the tester to the simulator as indicated on the button of the simulator.

c) Set the tester dial to 50, or below. Depress the button of the simulator. The indicator lamp on the tester should light.

NOTE: For each test performed by the simulator, it must be recharged.

Low scale test

a) Place switch in LOW position.

b) Set tester dial to 50, or below.

c) Connect **N** lead to negative terminal of 12 volt battery. Connect **P** lead to positive terminal of 12 volt battery: indicator lamp should light.

If lamp does not light, check tester batteries. If they are installed correctly and are good, check the clip leads for faulty connections. If no fault can be found, refer to the warranty statement for instructions for sending the tester back to Electro-Specialties, Inc.

Battery replacement

1. Remove the four (4) screws securing cover to case.
2. Carefully lift cover.
3. Replace batteries with size "C" Alkaline batteries. Be sure to observe polarity markings on battery holder or lamp will not light.
4. Install cover on case carefully being certain that no wires are pinched between cover and case. Secure cover.

NOTE: Weak batteries will not impair tester operation or calibration. The light will grow dim.

The ignition tester may give false readings if the rivets on the back cover come in contact with metal.

Indicator knob alignment

Check indicator knob alignment by turning knob fully clockwise. The white mark on the knob must align with no. 100 on the scale. If the marks does not line up with the no. 100, loosen the knob set screw, line the mark on the knob with no. 100, and tighten the set screw. Recheck alignment.

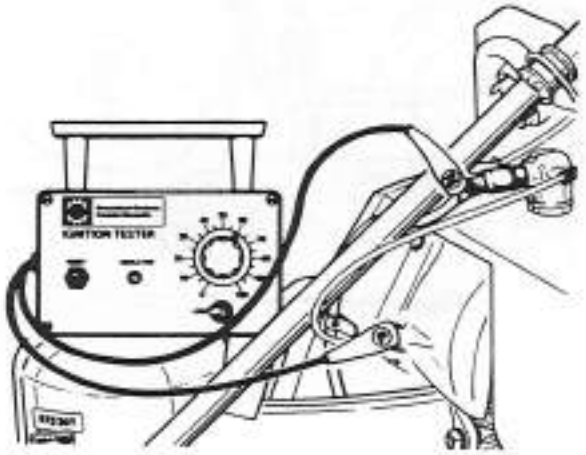
NOTE: If after adjustment, the knob is turned fully counter-clockwise and it does not exactly align with the 0, it is of no consequence.

TESTS INDEX

Test no. 1: Ignition coil output to spark plug

NOTE: To obtain accurate readings it is necessary to install a new correctly gapped spark plug. However, if test is performed on engine before spark plug is changed, a low or no tester reading could indicate a fouled or faulty spark plug . Replace spark plug by a new one and recheck.

1. Attach tester **N** lead over spark plug wire directly behind spark plug cap. Connect **P** lead to a good engine ground.



CAUTION: Never connect the tester lead directly to the inner metallic spark plug wire.

2. Set tester dial and switch as follows:

Engine type	Switch position	Dial	
		With suppressor cap	Without suppressor cap
247, 302	LOW	60	45

3. Turn ignition key to ON, disable kill button circuit, then crank engine.

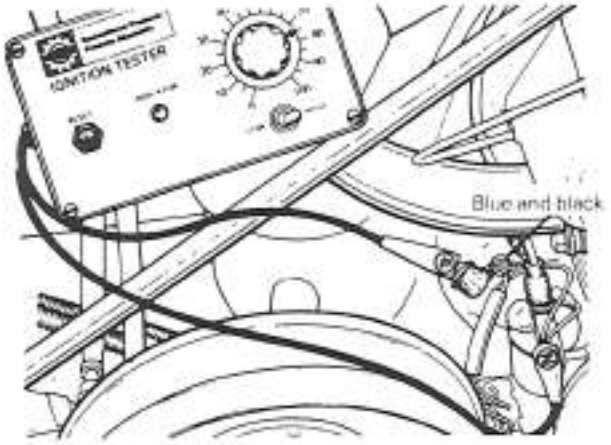
A. Indicator lamp lights: Ignition output is up to specifications. Repeat test at least three (3) times to verify reading and check for consistent output.

B. Indicator lamp does not light: Ignition coil output is low or spark plug is faulty if test no. 2 is positive.

WARNING: Lift rear of vehicle off the ground while performing this test as the engine may start.

Test no. 2: Ignition generator coil output

1. Disconnect blue and black wires from terminal (15) of ignition coil.
2. Attach tester **P** lead to **blue** and **black** wires previously disconnected. Connect tester **N** lead to a good engine ground.



3. Set tester dial and switch as follows:

Engine type	Switch position	Dial
247, 302	HIGH	75

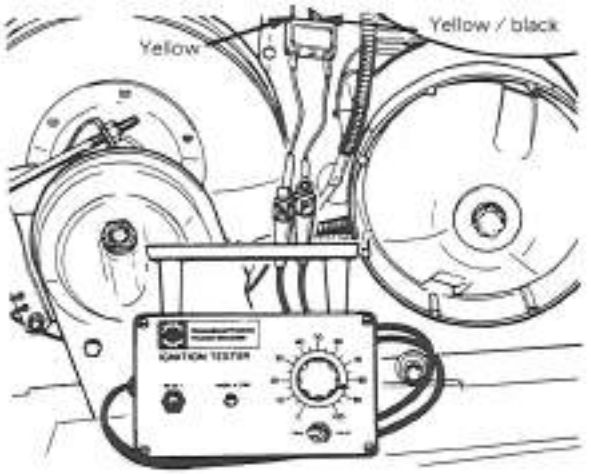
4. Turn ignition key to ON position, disable kill button circuit then crank engine.

A. Indicator lamp lights: Coil output is up to specifications. Repeat test at least three (3) times to verify reading and check for consistency.

B. Indicator lamp does not light: Coil output is below specifications. This could be caused by a faulty coil or breaker points. Check breaker points condition and adjustment, and correct as necessary. Repeat test. If lamp still does not light the coil is defective and should be replaced.

Test no. 3: Lighting coil output

1. Disconnect wiring harness junction block at engine.
2. Connect tester leads as illustrated using two (2) harness adaptors.



3. Set tester dial and switch as follows:

Engine type	Switch position	Dial
247, 302	LOW	85

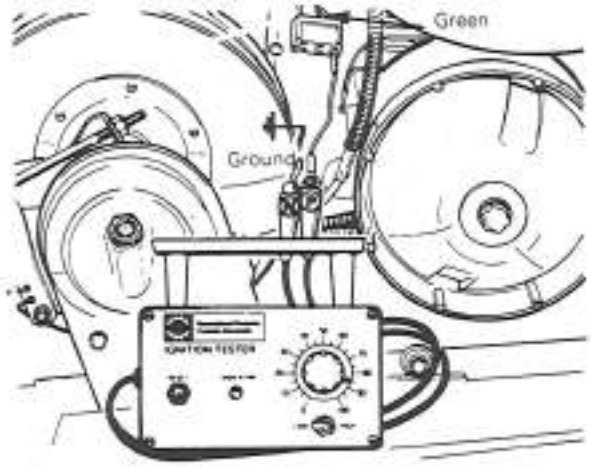
4. With ignition key to OFF position, crank engine.

A. Indicator lamp lights: Lighting coil output is up to specifications. Repeat test at least three (3) times to verify reading and consistency.

B. Indicator lamp does not light: Lighting coil is defective.

Test no. 4: Brake light coil output

1. Disconnect wiring harness junction block at engine.
2. Connect tester leads as illustrated using two (2) harness adaptors.



3. Set tester dial and switch as follows:

Engine type	Switch position	Dial
247, 302	LOW	85

4. With ignition key to OFF position, crank engine.

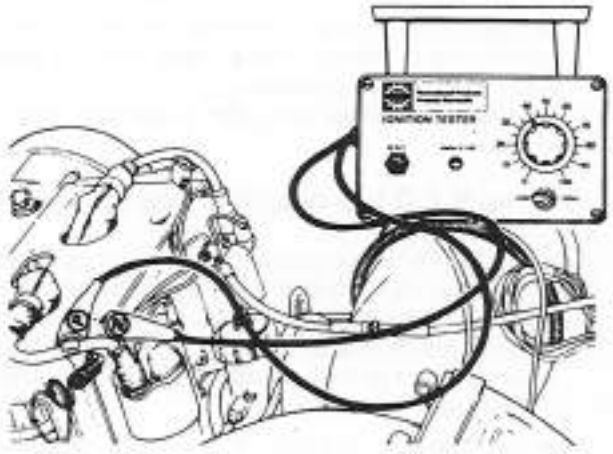
A. Indicator lamp lights: Brake light coil output is up to specifications. Repeat test at least three (3) times to verify reading and consistency.

B. Indicator lamp does not light: Brake light coil is defective.

Test no. 5: Ignition coil output to spark plug

NOTE: To obtain accurate readings it is necessary to install new, correctly gapped spark plugs. However, if test is performed on engine before spark plugs are changed, a low or no reading could indicate fouled or faulty spark plugs. Replace them by new ones and re-check.

1. Attach tester **P** lead over P.T.O. spark plug wire directly behind spark plug cap. Connect **N** lead to a good engine ground.



CAUTION: Never connect the tester lead directly to the inner metallic spark plug wire.

2. Set tester dial and switch as follows:

Engine type	Switch position	Dial	
		Without suppressor cap	With suppressor cap
248, 294, 305, 338, 343, 401, 402, 434, 440, 640, 346, 436	LOW	40	50

3. Turn ignition switch key to ON position, disable kill button circuit then crank engine.

A. Indicator lamp lights: Coil output is up to specifications. Repeat test at least three (3) times to verify reading and check for consistency.

B. Indicator lamp does not light: Coil output is low or spark plug is faulty if test no. 6 is positive.

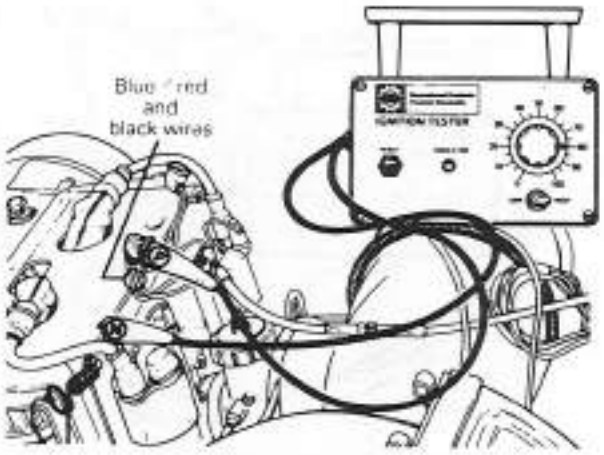
4. Repeat above procedure on other side.

WARNING: Lift rear of vehicle off the ground while performing this test as the engine may start.

Test no. 6: Ignition generator coil output

1. Disconnect blue / red and black wires from terminal (15) of P.T.O. side ignition coil. Disconnect the two blue wires from terminal (1) of magneto side ignition coil. Make sure that both connectors do not touch the engine (ground).

2. Connect tester **P** lead to **blue / red** and **black** wires previously disconnected. Connect **N** lead to a good engine ground.



3. Set tester switch and dial as follows:

Engine type	Year	Switch position	Dial
248, 294		HIGH	75
305, 343, 346, 436, 402, 440, 640	1975,76,77	HIGH	80
338, 401, 434		HIGH	70

4. Turn ignition key to ON position, disable cut-out button circuit then crank engine.

A. Indicator lamp lights: Generator coil output is up to specifications. Repeat test at least three (3) times to verify reading and consistency.

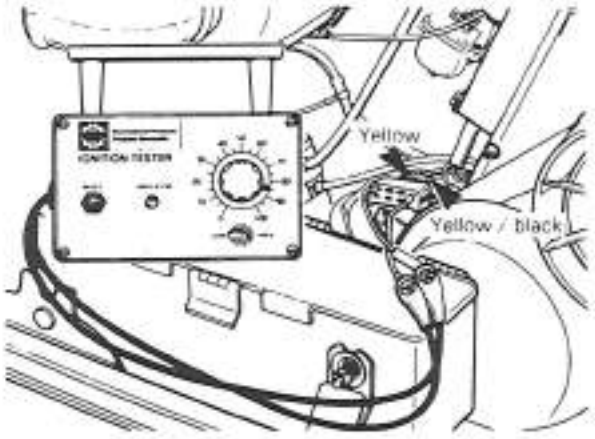
B. Indicator lamp does not light: Generator coil output is below specifications. This could be caused either by a faulty coil or breaker points.

5. Repeat test with other side (**blue** wires). If test indicates good on magneto side wire, but not on the other, suspect faulty breaker points. If test indicates no output on either side, suspect either faulty generator coil or breaker points.

Test no. 7: Lighting coil output

NOTE: In some engine types covered by this test an additional lighting coil is connected in parallel with the main lighting coil, in this case, the test will determine if the whole assembly is working right or not. If test result appears to be negative, the electrical resistance of each component must be checked separately. (Refer to Technical Data 08, 05-03).

1. Disconnect wiring harness junction block at engine.
2. Connect tester leads as illustrated using two (2) harness adaptors.



3. Set tester dial and switch as follows:

Engine type	Year	Switch position	Dial
248, 294		LOW	80
305, 343, 402, 440, 640, 346, 436	1975-76-77	LOW	85

4. With ignition key to OFF position crank engine.

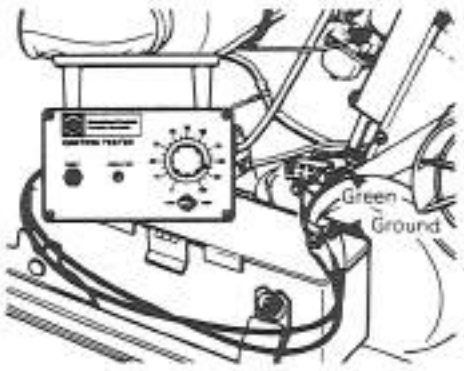
A. Indicator lamp lights: Lighting coil output is up to specifications. Repeat test at least three (3) times to verify reading and consistency.

B. Indicator lamp does not light: Lighting coil is defective.

Test no. 8: Brake light coil output

NOTE: This test is applicable to engine types 338 & 401 (1974) and 434 (1974-75).

1. Disconnect wiring harness junction block at engine.
2. Connect tester leads as illustrated using two (2) harness adaptors.



3. Set tester dial and switch as follows:

Engine type	Year	Switch position	Dial
338, 401 434	1974 1974-75	LOW	85

4. With ignition key to OFF position crank engine.

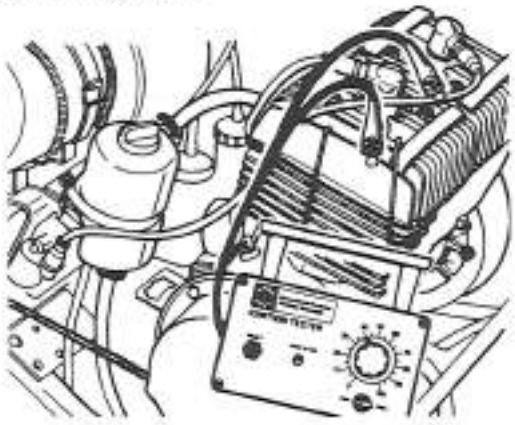
A. Indicator lamp lights: Brake light coil output is up to specifications. Repeat test at least three (3) times to verify reading and consistency.

B. Indicator lamp does not light: Brake light coil is defective.

Test no. 9: CD box output to spark plug

NOTE: To obtain accurate readings it is necessary to install new, correctly gapped spark plugs. However, if test is performed on engine before spark plugs are changed, a low or no reading could indicate fouled or faulty spark plugs. Replace them by new ones and re-check.

1. Attach tester **P** lead over P.T.O. spark plug wire directly behind spark plug cap. Connect **N** lead to a good engine ground.



CAUTION: Never connect the tester lead directly to the inner metallic spark plug wire.

2. Set tester switch and dial as follows:

Engine type	Switch position	Dial	
		With suppressor cap	Without suppressor cap
245, 345, 346, 396, 436, 440, 640	LOW	40	20

3. Turn ignition switch key to ON position, disable kill button circuit then crank engine.

A. **Indicator lamp lights:** CD box output is up to specifications. Repeat test at least three (3) times to verify reading and check for consistency.

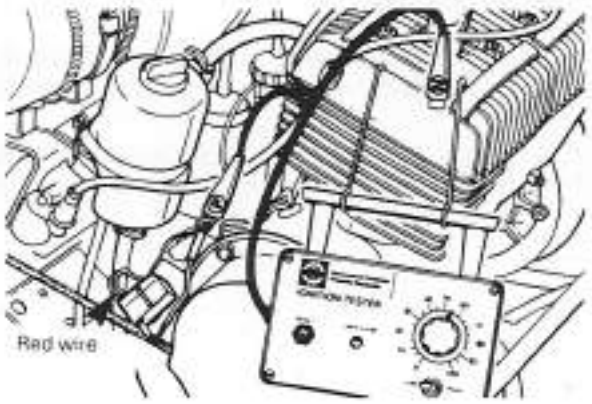
B. **Indicator lamp does not light:** If ignition generator coil and trigger coil test (no. 10, 11, 12) are positive, CD box output is low or spark plug is faulty.

WARNING: Lift rear of vehicle off the ground while performing this test as the engine may start.

4. Repeat above procedure on other side.

Test no. 10: Ignition generator coil output

1. Disconnect wire connector from C.D.I. electronic box.
2. Using one (1) harness adaptor, connect tester **P** test lead to **red** wire of connector removed from C.D.I. electronic box. Connect **N** test lead to ground (engine); do not use brown wire as ground.



3. Set tester switch and dial as follows:

Engine type	Switch position	Dial
2435, 345, 346, 396, 436, 440, 640	HIGH	55

4. Turn ignition key to **ON** position, disable cut-out button circuit then crank engine.

A. **Indicator lamp lights:** Charging coil output is up to specifications. Repeat test at least three (3) times to verify reading and check for consistency.

B. **Indicator lamp does not light:** If trigger coil test (no. 11 or 12) is positive, the problem is a faulty ignition generator coil.

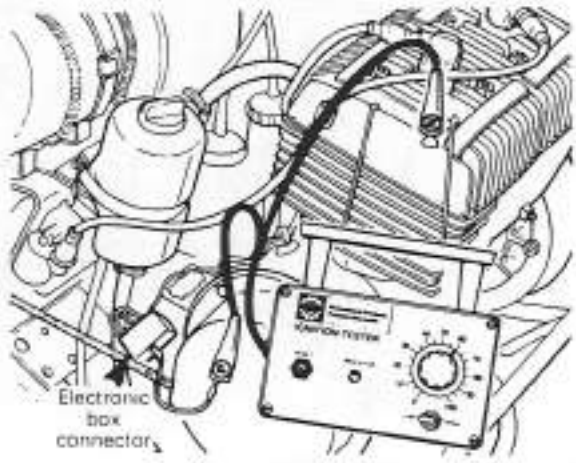
WARNING: Do not touch tester P lead clip while cranking the engine. Also make sure that tester P lead clip does not contact any metallic object.

Test no. 11: Trigger coil output (all engine types except 640)

1. Connect tester leads as follows:

– Connect tester **P** lead, as illustrated, to wire coming from P.T.O. side trigger at connector removed from C.D.I. electronic box. Use one (1) harness adaptor.

– Connect tester **N** lead to a good engine ground.



2. Set tester switch and dial as follows:

Engine type	Switch position	Dial
245, 345, 346, 396, 436, 440	LOW	60

3. Turn ignition key to **ON** position, disable cut-out button circuit then crank engine.

A. **Indicator lamp lights:** Trigger coil output is up to specifications. Repeat test at least three (3) times to verify reading and check for consistency.

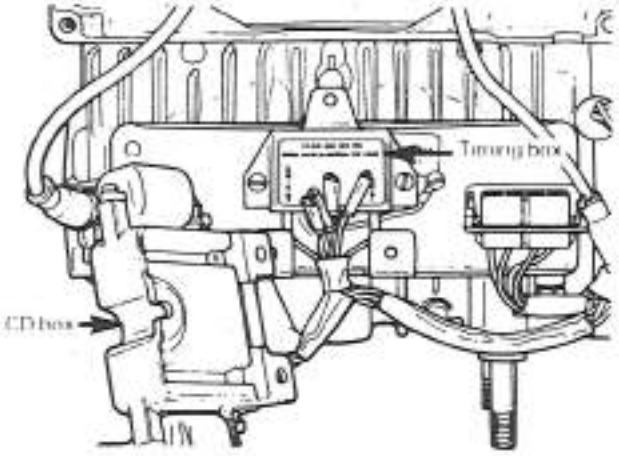
B. **Indicator lamp does not light:** The problem is a faulty trigger coil.

NOTE: If not output is indicated on trigger coil, carefully inspect the trigger ground connection wire connected to C.D.I. electronic box retaining screw. Clean and tighten connection then repeat test.

4. Connect tester leads to opposite trigger as follows:
   - Connect tester **P** lead to wire leading from mag side trigger.
   - Leave tester **N** lead connected to a good engine ground.

Test no. 12: Trigger coil output (640 engine type)

1. Disconnect wire connector from C.D.I. electronic box, remove the C.D.I. electronic box from its bracket then disconnect the four (4) wires (violet, black / violet, black / yellow, violet / yellow) fitted with clear insulating sleeve from the timing box.

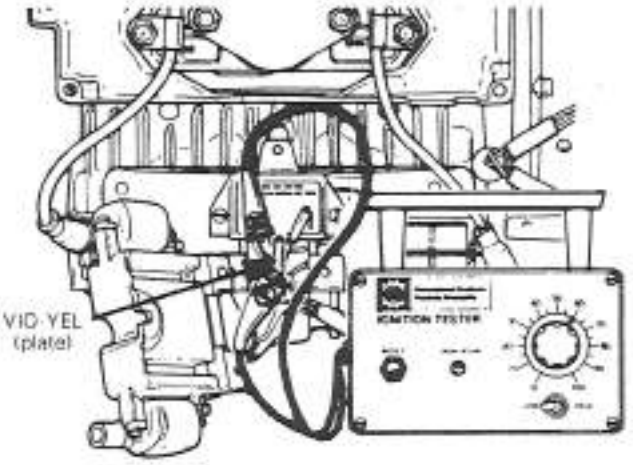


Connect tester leads as follows:

Connect tester **P** lead, as illustrated, to **violet / yellow** wire removed from timing box terminal marked Vio-Yel (plate).

NOTE: There are two (2) violet / yellow wires connected to the timing box; use the one with a clear plastic insulator.

- Connect tester **N** lead to **black / yellow** wire removed from timing box.



2. Set tester switch and dial as follows:

Engine type	Switch position	Dial
640	LOW	60

3. Turn ignition key to **ON** position, disable cut-out button circuit then crank engine.

A. **Indicator lamp lights:** Trigger coil output is up to specifications. Repeat test at least three (3) times to verify reading and check for consistency.

B. **Indicator lamp does not light:** The problem is a faulty trigger coil.

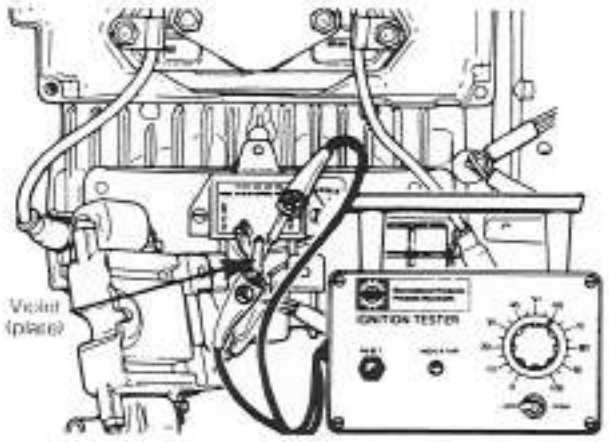
If above test indicates correct trigger coils output and ignition is unsatisfactory test timing box.

Timing box test

1. Connect tester **P** lead, as illustrated, to **violet** wire removed from timing box terminal marked Vio (plate).

NOTE: There are two violet wires connected to the timing box; use the one with a clear plastic insulator.

– Connect **N** lead to **black / violet** wire removed from timing box.



2. Turn ignition key to **ON** position, disable cut-out button circuit then crank engine.

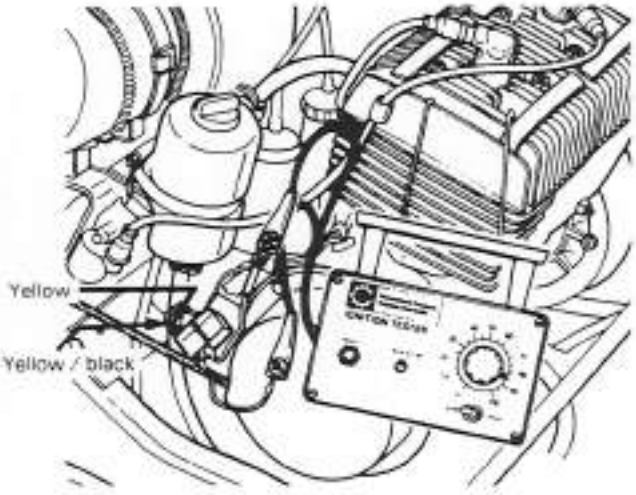
A. Indicator lamp lights: Timing box is up to specifications. Repeat test at least three (3) times to verify reading and check for consistency.

B. Indicator lamp does not light: The problem is a faulty timing box.

Test no. 13: Lighting oil output

NOTE: In some engine types covered by this test an additional lighting coil is connected in parallel with the main lighting coil, in this case the test will determine if the whole assembly is working right or not. If test result appears to be negative, the electrical resistance of each component must be checked separately. (Refer to Technical Data 08, 05-02).

1. Disconnected wiring harness junction block at engine.
2. Connect tester leads as illustrated using two (2) harness adaptors.



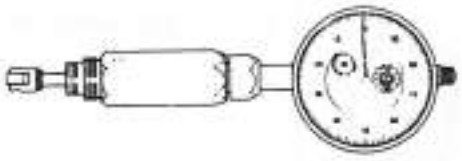
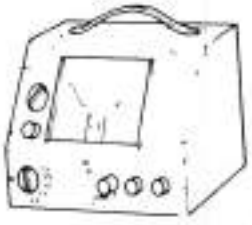
3. Set tester dial and switch as follows:

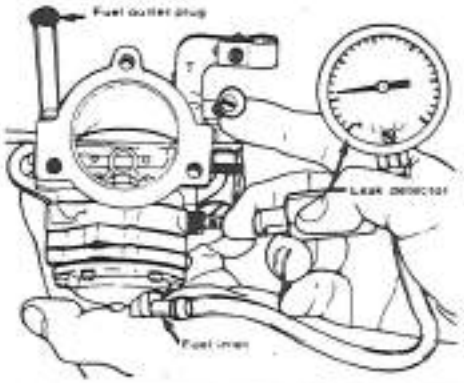
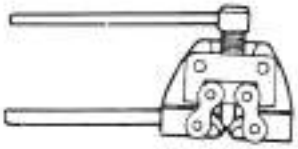
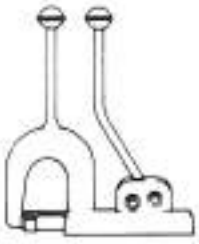
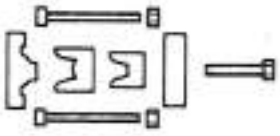
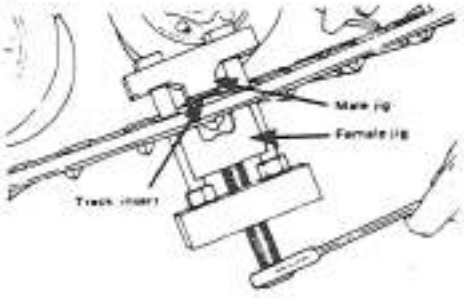
Engine type	Switch position	Dial
245, 345, 346, 396, 436, 440, 640	LOW	85

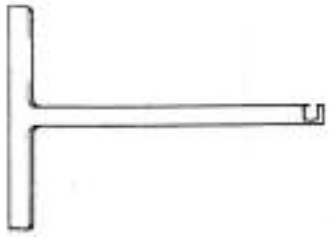
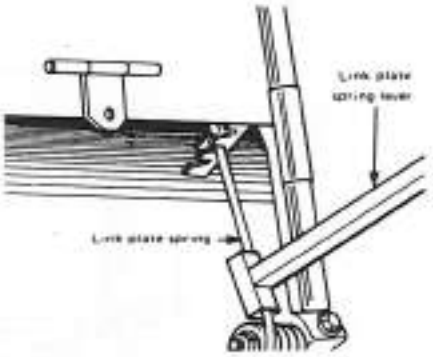
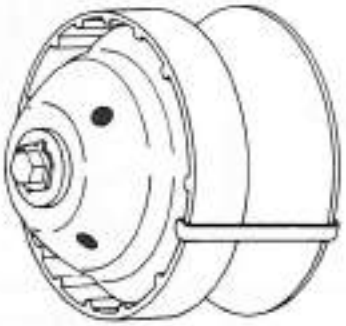
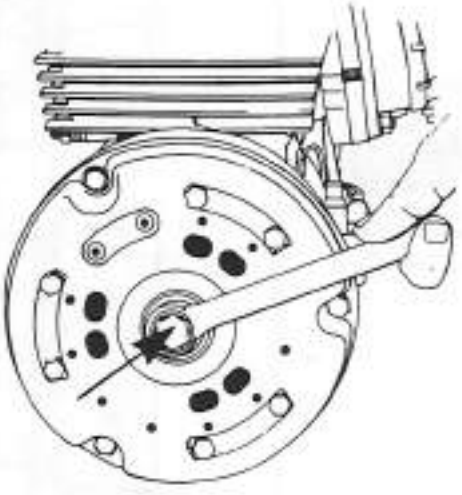
4. With ignition key to OFF position, crank engine.

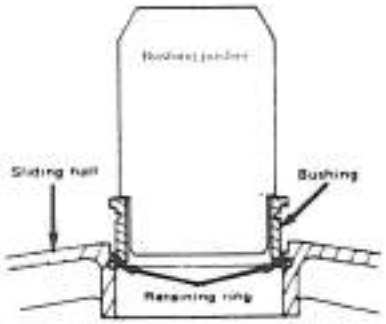
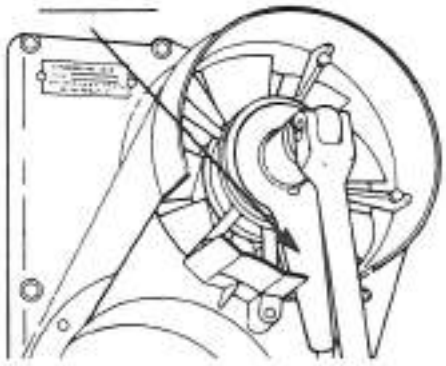
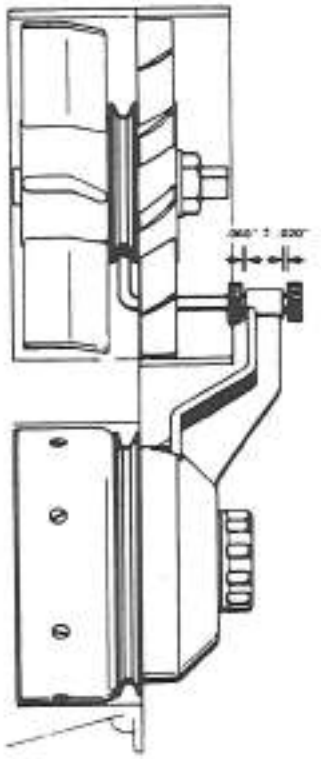
A. Indicator lamp lights: Lighting coil output is up to specifications. Repeat test at least three (3) times to verify reading and consistency.

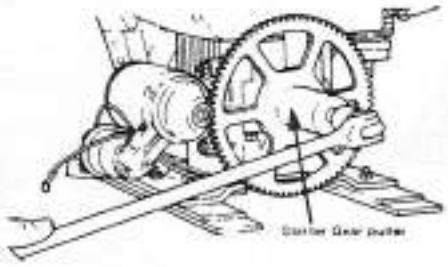
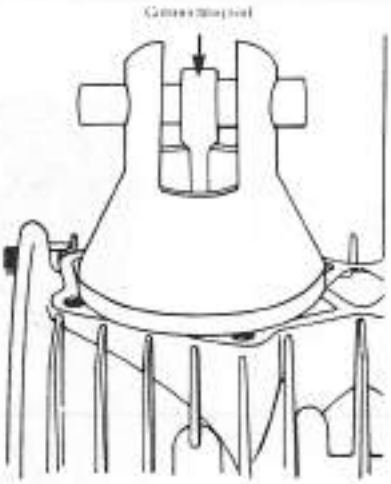
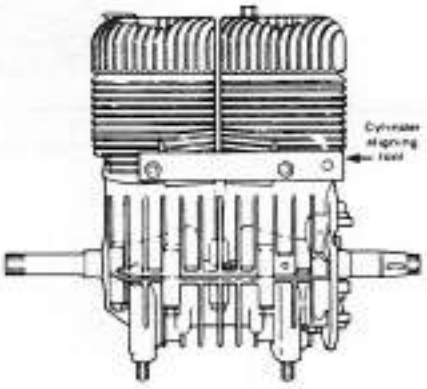
B. Indicator lamp does not light: Lighting coil is defective.

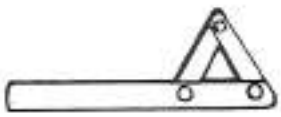
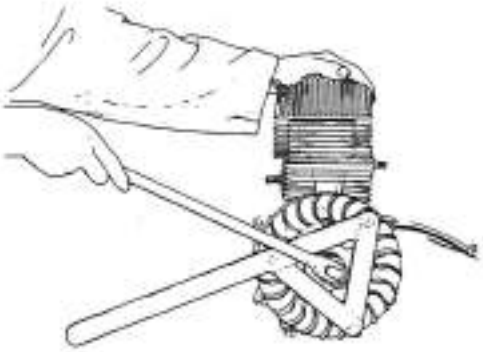
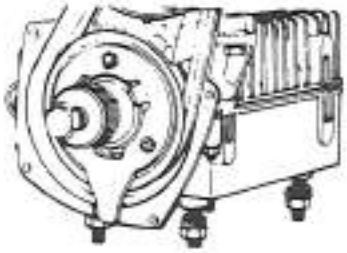
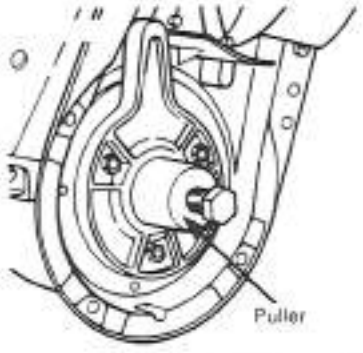
ITEM	USE	APPLICABLE TO
Dial Indicator (T.D.C. gauge) 	Engime timing, to determine T.D.C. 	All Engine types.
Tone Timer 	Engine timing (static)	All Engine types.
Circuit Tester (continuity light) 	Engine timing (static). Continuity tests.	All Engine types.
Magneto Ignition Analyser (Mem-O-Timer) 	Engine electrical components tests.	All Engine types.

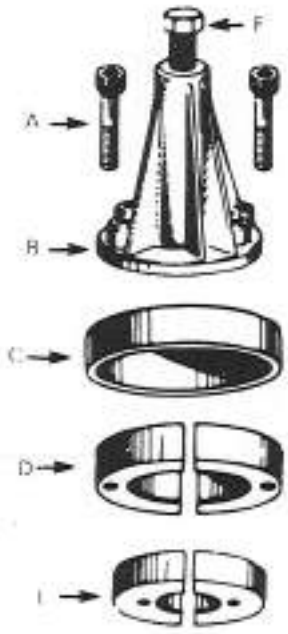
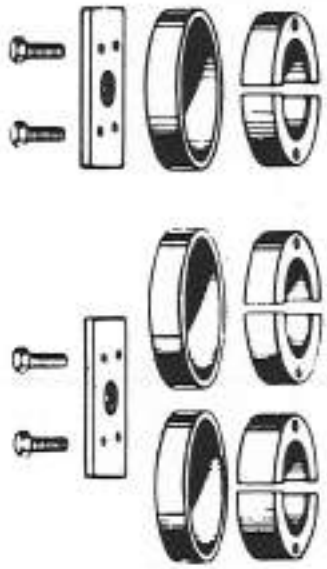
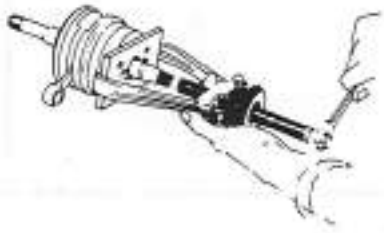
Bombardier Ignition Tester 	Engine electrical components tests.	All engine types.
Carburetor Leak Detector 		All Tillotson carburetors.
Chain Breaking Tool 		All types of chain.
Track Insert Installer  Heavy Duty  Insert Block 		All types of track.

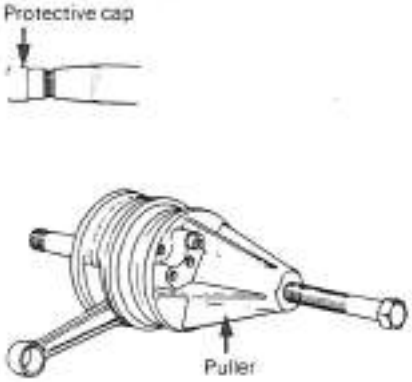
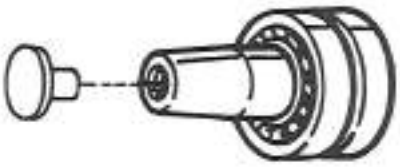
Link Plate Spring Lever 		All models with link plate springs.
Drive Pulley Retainer 	For indexation of governor cup. 	Square shaft drive pulley.
Drive Pulley Puller 	To remove drive pulley from crankshaft. 	Taper shaft engines.

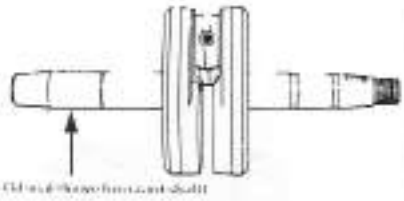
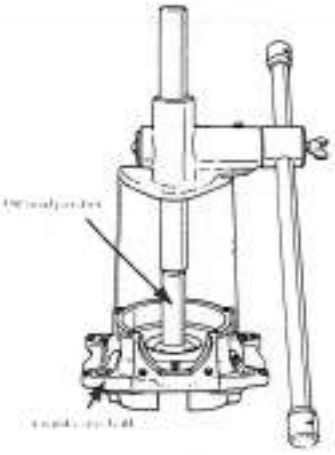
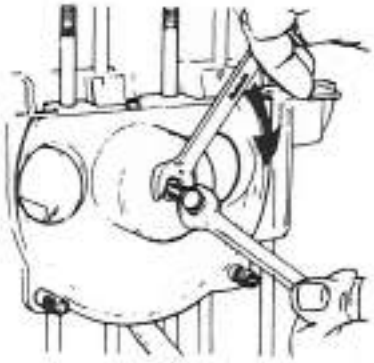
Bushing Pusher 	To install bushing in sliding half. 	High performance drive pulley.
Fan Holder 		Twin cylinders.
Fan Pulley Aligning Tool 		248-249-294 engine types.

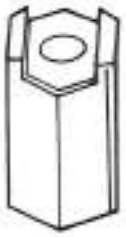
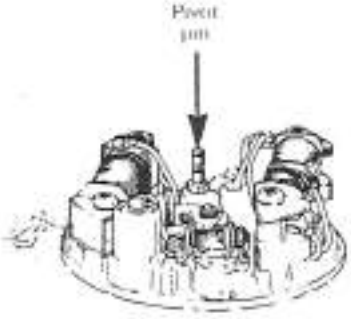
Starter Gear Puller 		Twin cylinders electric start engines.
Connecting Rod Holder 		All single cylinder models, 370 engine type.
Cylinder Aligning Tool  		Twin cylinders engine types.

Magneto Housing Holder. 		Single cylinder engine types.
		Twin cylinders engine types.
		Twin cylinders engine types.
Bearing puller. 	To remove magneto ring from engine.	All engines.

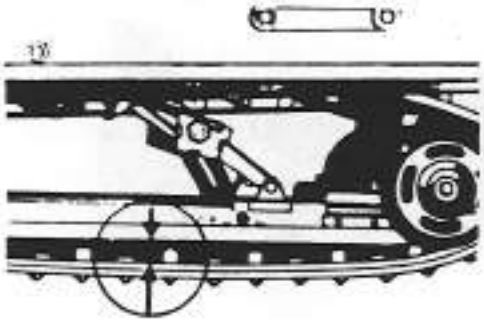
Bearing Puller  A) Ring Screw B) Puller C) Ring for puller D) Ring half for ball bearing E) Ring half for roller bearing F) Puller Screw		All engine types.
Bearing Puller 		All engine types (old).

Protection Cap 	Protect crankshaft end, when using bearing puller. 	All engine types.
Protection End Cap 	To protect crankshaft end, when using bearing puller. 	All taper shaft engine type.
Bearing Simulator 	When adjusting crankshaft play.	All engine types.

Oil Seal Sleeve 	To avoid oil seal damage during crankshaft installation. 	All single cylinder engine types and 370 type.
Oil Seal Pusher 		All single cylinder engine type and 370 type.
Rotary valve shaft puller 	To remove rotary valve shaft assembly from crankcase. 	RV engines.

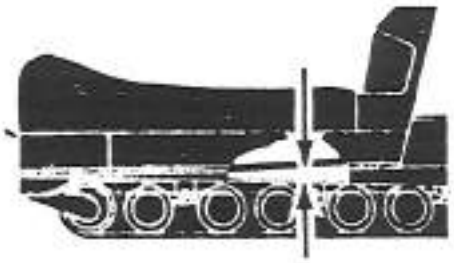
Armature plate contact set pivot pin remover (socket) 	To remove contact set, pivot pin from armature plate 	All engine types using breaker point type ignition.

TRACK TENSION SPECIFICATIONS (TORQUE REACTION SLIDE)



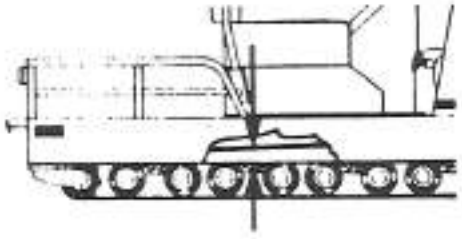
		1974	1975	1976	1977
OLYMPIQUE	340, 340E		10-13 mm (⅜ - ½ '')	10-13 mm (⅜ - ½ '')	10-13 mm (⅜ - ½ '')
	Plus (440)			10-13 mm (⅜ - ½ '')	
	440				10-13 mm (⅜ - ½ '')
EVEREST	340, 340E				19 mm (¾ '')
	440, 440E	19 mm (¾ '')	19 mm (¾ '')	19 mm (¾ '')	19 mm (¾ '')
T'NT F / C	340, 340E	19 mm (¾ '')	19 mm (¾ '')	19 mm (¾ '')	
	440, 440E	19 mm (¾ '')	19 mm (¾ '')		
T'NT F / A	340, 440		19 mm (¾ '')		
T'NT	340, 440				19 mm (¾ '')
T'NT R / V	250		19 mm (¾ '')	19 mm (¾ '')	
	340			19 mm (¾ '')	19 mm (¾ '')

TRACK TENSION SPECIFICATIONS (BOGIE WHEEL SYSTEM)



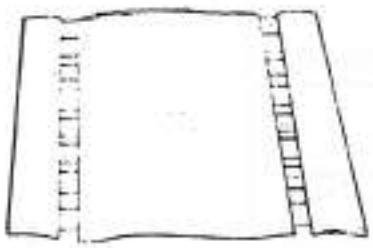
		1974	1975	1976	1977
ELAN	250T, E	35 mm (1 3/8 ")			
	250	35 mm (1 3/8 ")	35 mm (1 3/8 ")	35 mm (1 3/8 ")	35 mm (1 3/8 ")
	250 Deluxe	35 mm (1 3/8 ")	35 mm (1 3/8 ")	35 mm (1 3/8 ")	35 mm (1 3/8 ")
OLYMPIQUE	300 Mono	57 mm (2¼ ")	57 mm (2¼ ")	57 mm (2¼ ")	57 mm (2¼ ")
	300 Twin			57 mm (2¼ ")	57 mm (2¼ ")
	340, 400, 440	57 mm (2¼ ")			
NORDIC	640ER	57 mm (2¼ ")			
ELITE	440ER	*57 mm (2¼ ")	*57 mm (2¼ ")		
ALPINE	440ER	*57 mm (2¼ ")			
	640ER	*57 mm (2¼ ")	*57 mm (2¼ ")	*57 mm (2¼ ")	*57 mm (2¼ ")

*Between top inside edge of track and center of bogie wheel set retaining bolt.

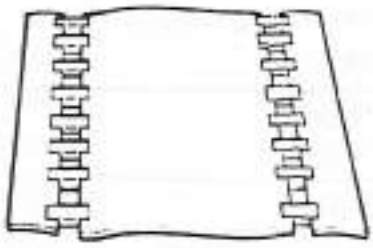


TRACK SPECIFICATIONS

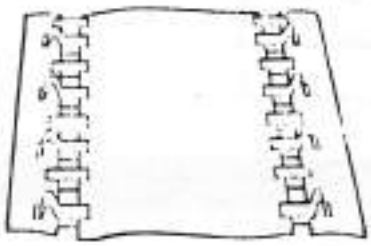
CLEAT AND GUIDE ARRANGEMENT



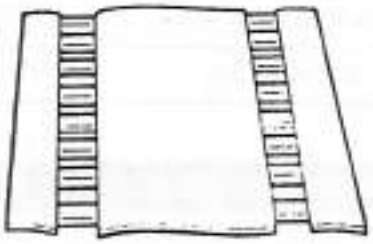
TYPE 1: Narrow insert.



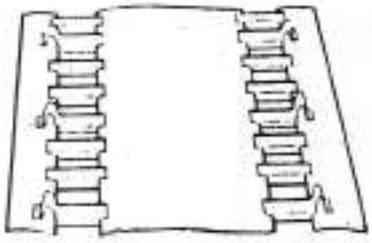
TYPE 2: Narrow insert with shoulder.



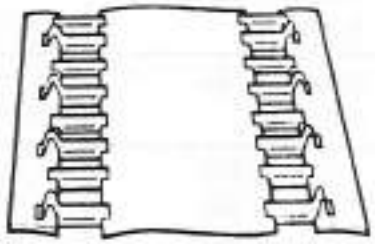
TYPE 3: Narrow guide with shoulder.



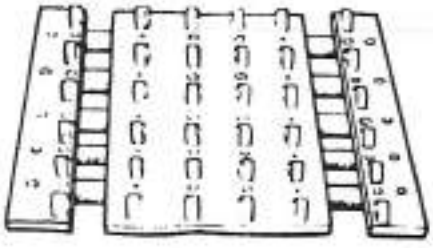
TYPE 4: Wide insert (large track hole).



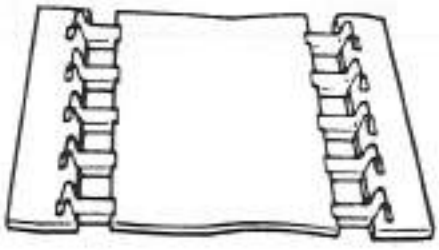
TYPE 5: Wide guide (Large track hole).



TYPE 6: Wide guide (large track hole).



TYPE 7: Internal drive metal link.



TYPE 8: Narrow guide with shoulder.

1974 TRACK SPECIFICATIONS

MODEL		TYPE OF TRACK	
ELAN	250, 250E, 250 Deluxe 294SS	TYPE 1: TYPE 2:	Narrow insert. Narrow insert with shoulder.
OLYMPIQUE	(Bogie) (Slide)	TYPE 1: TYPE 2:	Narrow insert. Narrow insert with shoulder.
NORDIC	640ER	TYPE 4:	Wide insert (large track hole).
T'NT	F / C 300, 340, 440 EVEREST 440 F / A 340, 400, 440	TYPE 6: TYPE 5: TYPE 3:	Wide guide (large track hole). Wide guide (large track hole). Narrow guide with shoulder.
ELITE	440ER	TYPE 1:	Narrow insert.
ALPINE	440ER, 640ER	TYPE 1:	Narrow insert.

1975 TRACK SPECIFICATIONS

MODEL		TYPE OF TRACK	
ELAN	250, 250 Deluxe 300SS	TYPE 1: TYPE 2:	Narrow insert. Narrow insert with shoulder.
OLYMPIQUE	300, 300E Twin 340, 340E	TYPE 1: TYPE 5:	Narrow insert. Wide guide (large track hole).
T'NT	F / C 340, 440 EVEREST 440 F / A 340, 440 R / V 245	TYPE 6: TYPE 5: TYPE 3: TYPE 7:	Wide guide (large track hole). Wide guide (large track hole). Narrow guide with shoulder. Internal drive metal link.
ALPINE	640ER	TYPE 1:	Narrow insert.
ELITE	440ER	TYPE 1:	Narrow insert.

1976 TRACK SPECIFICATIONS

MODEL		TYPE OF TRACK	
ELAN	250, 250 Deluxe	TYPE 1:	Narrow insert.
OLYMPIQUE	300 Mono, Twin	TYPE 1:	Narrow insert.
	340, 440 (Plus)	TYPE 5:	Wide guide (large track hole).
T'NT F / C	340	TYPE 5:	Wide guide (large track hole).
EVEREST	440	TYPE 5:	Wide guide (large track hole).
T'NT R / V	250, 340	TYPE 8:	Narrow guide with shoulder.
ALPINE	640ER	TYPE 1:	Narrow insert.

1977 TRACK SPECIFICATIONS

MODEL		TYPE OF TRACK	
ELAN	250, 250 Deluxe	TYPE 1:	Narrow insert.
OLYMPIQUE	300 Mono, Twin	TYPE 1:	Narrow insert.
	340	TYPE 5:	Wide guide (large track hole).
	440	TYPE 6:	Wide guide (large track hole).
EVEREST	340, 440	TYPE 5:	Wide guide (large track hole).
T'NT	340, 440	TYPE 3:	Narrow guide with shoulder.
R / V	340	TYPE 3:	Narrow guide with shoulder.
ALPINE	640ER	TYPE 1:	Narrow insert.

		1974	WIDTH	1975	WIDTH	1976	WIDTH	1977	WIDTH
ELAN	250	570 0411	30 mm (1 3/16")	570 0411	30 mm (1 3/16")	570 0411	30 mm (1 3/16")	570 0411	30 mm (1 3/16")
	250, 250 Twin	570 0411	30 mm (1 3/16")						
	250 Deluxe	570 0411	30 mm (1 3/16")	570 0411	30 mm (1 3/16")	570 0411	30 mm (1 3/16")	570 0411	30 mm (1 3/16")
	294SS	570 0411	30 mm (1 3/16")						
	300SS			570 0411	30 mm (1 3/16")				
OLYMPIQUE	300 Twin	570 0411	30 mm (1 3/16")	570 0414	30 mm (1 3/16")	414 2327	33 mm (1 5/16")	414 2327	33 mm (1 5/16")
	300E Twin			570 0414	30 mm (1 3/16")	414 2327	33 mm (1 5/16")		
	300 Mono					570 0411	30 mm (1 3/16")	570 0411	30 mm (1 3/16")
	340, 340E	570 0411	30 mm (1 3/16")	570 0414	30 mm (1 3/16")	414 2327	33 mm (1 5/16")	414 2327	33 mm (1 5/16")
	400, 400E	570 0411	30 mm (1 3/16")						
	440	570 0411	30 mm (1 3/16")			414 2417	33 mm (1 5/16")	414 2327	33 mm (1 5/16")
	Plus (440)					570 0414	30 mm (1 3/16")		
T'NT	300SM	570 0411	30 mm (1 3/16")						
	340SM, SE	570 0411	30 mm (1 3/16")	570 0411	30 mm (1 3/16")				
	340, 340E					414 2327	33 mm (1 5/16")		
	440SM, SE	570 0414	30 mm (1 3/16")	570 0414	30 mm (1 3/16")				
T'NT	340 F / A							414 2327	33 mm (1 5/16")
	440 F / A							414 2417	33 mm (1 5/16")
	440 F / C							414 2417	33 mm (1 5/16")
EVEREST	340							414 2327	33 mm (1 5/16")
	440SL	570 0414	30 mm (1 3/16")	570 0414	30 mm (1 3/16")				
	440					414 2417	33 mm (1 5/16")	414 2417	33 mm (1 5/16")
	440E			570 0414	30 mm (1 3/16")	414 2417	33 mm (1 5/16")		
NORDIC	640ER	570 0414	30 mm (1 3/16")						
ALPINE	440ER	570 0411	30 mm (1 3/16")						
	640ER	570 0414	30 mm (1 3/16")	570 0414	30 mm (1 3/16")	414 2277	33 mm (1 5/16")	414 2277	33 mm (1 5/16")
ELITE	440ER	570 0414	30 mm (1 3/16")	570 0414	30 mm (1 3/16")				
T'NT F / A	340, 440	414 1884	30 mm (1 3/16")	414 1884	30 mm (1 3/16")				
	400	414 1884	30 mm (1 3/16")						
R / V	250			414 2277	33 mm (1 5/16")	414 2277	33 mm (1 5/16")		
	340					414 2277	33 mm (1 5/16")	414 2277	33 mm (1 5/16")

		PULLEY TYPE	COUNTERWEIGHT IDENTIFICATION	SPRING NUMBER	SPRING COLOR	SPRING LENGTH mm (inch) ± 1.5 (.060")	RETAINING BOLT TORQUE kg-m (ft-lbs)
ELAN	250, 250E	R.R.S.	E-4	504 2129	Bronze	81.3 (3.200)	*5.1-7.5 (37-54)
	250 Deluxe	R.R.S.	D-4	414 1623	Blue	77.7 (3.060)	*5.1-7.5 (37-54)
	294SS	R.S.S. (L.C.)	B-1-K	414 1995	Yellow	100.1 (3.940)	*11.5-12.7 (83-92)
OLYMPIQUE	All models	P.L.	No hole	414 0013	Black	76.2 (3.0)	*5.1-7.5 (37-54)
T'NT	300SM	R.S.S. (L.C.)	B-1-K	414 1995	Yellow	100.1 (3.940)	*11.5-12.7 (83-92)
	340SM, SE	R.S.S. (L.C.)	C-3-L	414 1967	Light blue	118.9 (4.680)	*11.5-12.7 (83-92)
	440SM, SE	R.S.S. (L.C.)	C-4-L	414 1967	Light blue	118.9 (4.680)	*11.5-12.7 (83-92)
	EVEREST	R.S.S. (L.C.)	C-4-L	414 1967	Light blue	118.9 (4.680)	*11.5-12.7 (83-92)
T'NT F / A	340	H.P.	A-8	414 1572	White	101.6 (4.0)	**8-9.4 (58-68)
	400, 440	H.P.	A-9	414 1572	White	101.6 (4.0)	**8-9.4 (58-68)
NORDIC	640ER	R.S.S. (L.C.)	C-8	414 1966	Pink	122.2 (4.810)	*11.5-12.7 (83-92)
ALPINE	440ER	P.L.	1 rivet, 1 washer	414 1587	Brown	77.7 (3.060)	*5.1-7.5 (37-54)
	640ER	P.L.	1 rivet, 3 washers	414 1587	Brown	77.7 (3.060)	*5.1-7.5 (37-54)
ELITE	440ER	R.S.S. (L.C.)	C-8-N	414 1967	Light blue	118.9 (4.680)	*11.5-12.7 (83-92)

H.P.: High Performance
P.L.: Pressure Lever
R.R.S.: Roller Round Shaft
R.S.S.: Roller Square Shaft
(L.C.): Large Center

* Torque retaining bolt to specification then loosen and retorque to specific value.

** After bolt is torqued, start engine and repeatedly apply throttle and brake. Stop engine and retorque.

		PULLEY TYPE	COUNTERWEIGHT IDENTIFICATION	SPRING NUMBER	SPRING COLOR	SPRING LENGTH mm (inch) ± 1.5 (.060")		RETAINING BOLT TORQUE kg-m	(ft-lbs)
ELAN	250	R.R.S.	E-4	504 2129	Bronze	81.3	(3.200)	*5.1- 7.5	(37-54)
	250 Deluxe, 300SS	R.S.S. (L.C.)	B-1-K	414 1995	Yellow	99.8	(3.930)	*11.5-12.7	(83-92)
OLYMPIQUE	300, 340	R.S.S. (I.C.)	C-3-L	414 2239	Yellow (cut)	88.9	(3.500)	*11.5-12.7	(83-92)
T'NT F / C	340	R.S.S. (L.C.)	C-3-L	414 1967	Light blue	118.9	(4.680)	*11.5-12.7	(83-92)
T'NT F / C	340	R.S.S. (I.C.)	C-3-L	414 2239	Yellow (cut)	88.9	(3.500)	*11.5-12.7	(83-92)
T'NT F / C	440	R.S.S. (L.C.)	C-4-L	414 1967	Light blue	118.9	(4.680)	*11.5-12.7	(83-92)
T'NT F / C	440	R.S.S. (I.C.)	C-4-L	414 2235	Black (cut)	104.6	(4.120)	*11.5-12.7	(83-92)
EVEREST	440	R.S.S. (I.C.)	C-4-L	414 2235	Black (cut)	104.6	(4.120)	*11.5-12.7	(83-92)
T'NT F / A	340	H.P.	B	414 1572	White	101.6	(4.0)	**8- 9.4	(58-68)
	440	H.P.	A	414 1572	White	101.6	(4.0)	**8- 9.4	(58-68)
T'NT	245 RV	▼ R.S.S. (S.C.)	A-3	414 2328	Gold	74.4	(2.930)	**8- 9.4	(58-68)
ALPINE 640ER	Series 000 3307	R.S.S. (L.C.)	C-8	414 1967	Light blue	118.9	(4.680)	*11.5-12.7	(83-92)
	Series 000 3308	R.S.S. (I.C.)	C-8	414 2235	Black (cut)	104.6	(4.120)	*11.5-12.7	(83-92)
ELITE	440ER	R.S.S. (L.C.)	C-8-M	414 1967	Light blue	118.9	(4.680)	*11.5-12.7	(83-92)

H.P.: High Performance
R.R.S.: Roller Round Shaft
R.S.S.: Roller Square Shaft
(S.C.): Small Center
(I.C.): Intermediate Center
(L.C.): Large Center
▼: Hub Plug with Wear pads
* Torque retaining bolt to specification then loosen and retorque to specific value.
** After bolt is torqued, start engine and repeatedly apply throttle and brake. Stop engine and retorque.

		PULLEY TYPE	COUNTERWEIGHT IDENTIFICATION	SPRING NUMBER	SPRING COLOR	SPRING LENGTH mm (inch) ± 1.5 (.060")	RETAINING BOLT TORQUE kg-m (ft-lbs)
ELAN	250	R.R.S.	E-4	504 2129	Bronze	81.3 (3.200)	*5.1- 7.5 (37-54)
	250 Deluxe	R.R.S.	D-2	414 1623	Blue	77.7 (3.060)	*5.1- 7.5 (37-54)
OLYMPIQUE	300 Mono	P.L.	Full flyweight	414 1587	Brown	77.7 (3.060)	*5.1- 7.5 (37-54)
	300 Twin, 340	◆R.S.S. (S.C.)	C-3-L	414 1967	Light blue	118.9 (4.680)	**8 - 9.4 (58-68)
	Plus (440)	R.S.S. (I.C.)	C-8-M	414 2235	Black (cut)	104.6 (4.120)	*11.5-12.7 (83-92)
T'NT	340	◆R.S.S. (S.C.)	C-3-L	414 1967	Light blue	118.9 (4.680)	**8 - 9.4 (58-68)
EVEREST	440	◆R.S.S. (S.C.)	C-4-L	414 1966	Pink	122.2 (4.810)	**8 - 9.4 (58-68)
T'NT R / V	250	◆R.S.S. (S.C.)	A-2	414 2328	Gold	74.4 (2.930)	**8 - 9.4 (58-68)
	340	◆R.S.S. (S.C.)	A-3	414 2610	Purple	73.6 (2.900)	**8 - 9.4 (58-68)
ALPINE	640ER	R.S.S. (bearing)	C-8 double	414 1966	Pink	122.2 (4.810)	*11.5-12.7 (83-92)

P.L.: Pressure Lever

R.R.S.: Roller Square Shaft

R.S.S.: Roller Square Shaft

(S.C.): Small Center

(I.C.): Intermediate Center

(Bearing): With Bearing

◆ Hub Plug with "Duralon" Bushing.

* Torque retaining bolt to specification then loosen and retorque to specific value.

** After bolt is torqued, start engine and repeatedly apply throttle and brake. Stop engine and retorque.

		PULLEY TYPE	COUNTERWEIGHT IDENTIFICATION	SPRING NUMBER	SPRING COLOR	SPRING LENGTH mm (inch) ±1.5 (.060")		RETAINING BOLT TORQUE kg-m	(ft-lbs)
ELAN	250	R.R.S.	E-4	414 2580	Bronze	81.3	(3.200)	*5.1- 7.5	(37-54)
	250 Deluxe	R.R.S.	D-2	414 2581	Blue	77.7	(3.060)	*5.1- 7.5	(37-54)
OLYMPIQUE	300 Mono	R.R.S.	E-4	414 2581	Blue	77.7	(3.060)	*5.1- 7.5	(37-54)
	300 Twin, 340	◆ R.S.S.	C-3-L	414 1967	Light blue	118.9	(4.680)	**8 - 9.4	(58-68)
	440	◆ R.S.S.	C-8-M	414 1967	Light blue	118.9	(4.680)	**8 - 9.4	(58-68)
EVEREST	340	◆ R.S.S.	C-3-L	414 1967	Light blue	118.9	(4.680)	**8 - 9.4	(58-68)
	440	◆ R.S.S.	C-4-L	414 1966	Pink	122.2	(4.810)	**8 - 9.4	(58-68)
T'NT	340	◆ R.S.S.	C-4-L	414 1995	Yellow	100.1	(3.940)	**8 - 9.4	(58-68)
	440 Free Air	◆ R.S.S.	C-4-L ①	414 1967	Light blue	118.9	(4.680)	**8 - 9.4	(58-68)
	440 Fan Cooled	◆ R.S.S.	C-4-L	414 1966	Pink	122.2	(4.810)	**8 - 9.4	(58-68)
RV	340	◆ R.S.S.	A-3	414 2835	Red	88.9	(3.500)	**8 - 9.4	(58-68)
ALPINE	640ER	● R.S.S. (bearing)	C-8 double	414 1966	Pink	122.2	(4.810)	*11.5-12.7	(83-92)

R.R.S.: Roller Round Shaft

R.S.S.: Roller Square Shaft

(Bearing): With Bearing

◆ Hub Plug with "Duralon" Bushing.

● With "Duralon" Bushing.

① With 4 std. washers no. 399 901 500.

* Torque retaining bolt to specification then loosen and retorque to specific value.

** After bolt is torqued, start engine and repeatedly apply throttle and brake. Stop engine and retorque.

WEAR PADS

WEAR PAD PART NO.	APPLICATION		VEHICLE MODEL
	INNER HALF PART NO.	SHAFT CLASSIFICATION	
504 2207 00	504 2217 00	Forged	'75 Elan 250 Deluxe and 300SS
504 2207 00	504 2211 00	Forged	'75 Alpine (1st series), '74 '75 T'NT 440, '74 Everest
504 2207 00	504 2204 00	Forged	'74 '75 T'NT 340
504 2277 00	504 2233 00	Machined	'75 Alpine (2nd series), '75 T'NT 440 and Everest
504 2277 00	504 2245 00	Machined	'75 T'NT 340 '75 Olympique 300 340
504 2250 00	504 2247 00	Machined	'75 T'NT R / V 245
504 2207 00	504 2279 00		'76 Alpine
504 2207 00	504 2233 00		'76 Olympique PLUS

DRIVEN PULLEY SPRING TENSION

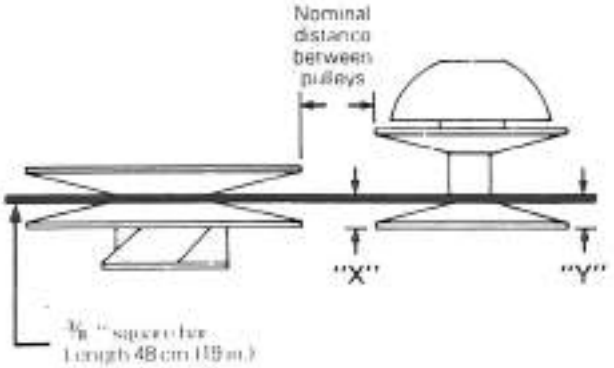
		1974 kg ± 1 (lbs ± 2)	1975 kg ± 1 (lbs ± 2)	1976 kg ± 1 (lbs ± 2)	1977 kg ± 1 (lbs ± 2)
ELAN	All models	3.6 (8)	3.6 (8)	3.6 (8)	3.6 (8)
OLYMPIQUE	All models	3.6 (8)	3.6 (8)	3.6 (8)	3.6 (8)
NORDIC	640ER	3.6 (8)			
T'NT F / A		5.9 (13)	5.9 (13)		
T'NT F / C		3.6 (8)	5 (11)	3.6 (8)	
EVEREST		3.6 (8)	5 (11)	3.6 (8)	3.6 (8)
T'NT					3.6 (8)
RV	250		5.9 (13)	5.9 (13)	
	340			5.9 (13)	5.9 (13)
ALPINE	440ER	3.6 (8)			
	640ER	3.6 (8)	5.4 (12)	5.4 (12)	5.4 (12)
ELITE		3.6 (8)	3.6 (8)		

1974 75 PULLEY ALIGNMENT SPECIFICATIONS

		OFFSET * (Simulator rod dia.)		DISTANCE ** (Between pulleys)	
		1974	1975	1974	1975
ELAN	250	14 mm (9/16")	14 mm (9/16")	47 mm (1 7/8 ")	47 mm (1 7/8 ")
	250E, 250T	14 mm (9/16")	14 mm (9/16")	47 mm (1 7/8 ")	
	250 Deluxe	14 mm (9/16")	14 mm (9/16")	47 mm (1 7/8 ")	38 mm (1½ ")
	294SS, 300SS	13 mm (½ ")	13 mm (½ ")	38 mm (1½ ")	
OLYMPIQUE	300 Mono, Twin 340, 400, 440	14 mm (9/16")	13 mm (½ ")	47 mm (1 7/8 ")	35 mm (1 3/8 ")
NORDIC	640ER	13 mm (½ ")		41 mm (1 5/8 ")	
EVEREST T'NT F / C	440 300, 340, 440	13 mm (½ ")	13 mm (½ ")	35 mm (1 3/8 ")	35 mm (1 3/8 ")
T'NT F / A	340, 400, 440	Self-adjusting	Self-adjusting	● 31 mm (1¼ ")	31 mm (1¼ ")
ALPINE	440ER	14 mm (9/16")		● 47 mm (1 7/8 ")	
	640ER		14 mm (9/16")		● 41 mm (1 5/8 ")
ELITE	440ER	14 mm (9/16")	14 mm (9/16")	● 38 mm (1½ ")	● 38 mm (1½ ")
RV	245		13 mm (½ ")		35 mm (1 3/8 ")

* Tolerance: ± .8 mm (± 1/32 ")
** Tolerance: ± 1.6 mm (± 1/16 ")
● Non adjustable

1976 AND UP PULLEY ALIGNMENT SPECIFICATIONS



— Dimension "X" must never exceed dimension "Y".
— Dimension "Y" can exceed dimension "X" by 1.6 mm (1/16 ").

		DIMENSION X & Y (Offset)		NOMINAL DISTANCE (Between pulleys)	
		1976	1977	1976	1977
ELAN	250, 250 Deluxe	32-34 mm (1 9/32-1 11/32")	33-35 mm (1 5/16 -1 3/8 ")	43-44 mm (1 1/16 -1 3/4 ")	43-44 mm (1 1/16-1 3/4 ")
OLYMPIQUE	300 Mono	32-34 mm (1 9/32-1 11/32")	same	47 mm (1 3/8 ")	47 mm (1 3/8 ")
	300 Twin, 340	33-35 mm (1 5/16 -1 3/8 ")	same	36 mm (1 3/8 ")	35 mm (1 3/8 ")
	Plus (440)	32-34 mm (1 9/32-1 11/32")		36 mm (1 3/8 ")	
	440				35 mm (1 3/8 ")
EVEREST	340		same		35 mm (1 3/8 ")
	440	33-35 mm (1 5/16 -1 3/8 ")	same	35 mm (1 3/8 ")	
T'NT F / C	340	33-35 mm (1 5/16 -1 3/8 ")		35 mm (1 3/8 ")	
T'NT	340, 440		same		35 mm (1 3/8 ")
RV	250	33-35 mm (1 5/16 -1 3/8 ")		36 mm (1 3/8 ")	
	340				35 mm (1 3/8 ")
ALPINE	640ER	32-34 mm (1 9/32-1 11/32")	same	44 mm (1 3/4 ")	44 mm (1 3/4 ")

1974 SPROCKET AND CHAIN SPECIFICATIONS

		UPPER / LOWER	CHAIN PITCH
ELAN	250	10 / 25	½ " single
	250E	10 / 25	½ " single
	250T	14 / 35	⅜ " double
	250 Deluxe	14 / 35	⅜ " double
	294SS	15 / 34	⅜ " double
OLYMPIQUE	300	15 / 35	⅜ " double
	340	15 / 34	⅜ " double
	340E	15 / 34	⅜ " double
	400	16 / 34	⅜ " double
	400E	16 / 34	⅜ " double
	440	16 / 33	⅜ " double
NORDIC	640ER	18 / 33	⅜ " triple
T'NT	300SM	14 / 34	⅜ " double
	340SM	15 / 34	⅜ " double
	340SE	15 / 34	⅜ " double
	440SM	19 / 38	⅜ " triple
	440SE	19 / 38	⅜ " triple
EVEREST	440SL	19 / 38	⅜ " triple
T'NT F / A	340	*14-15-16 / 44	⅜ " triple
	400	*15-16-17 / 44	⅜ " triple
	440	*15-16-17 / 44	⅜ " triple
ALPINE	440ER	17 / 46	⅜ " triple
	640ER	17 / 38	⅜ " triple
ELITE	440ER	17 / 46	⅜ " triple

* Maximum engine revolutions 8300 RPM.

1975 76 SPROCKET AND CHAIN SPECIFICATIONS

		UPPER / LOWER		CHAIN PITCH	
		1975	1976	1975	1976
ELAN	250	10 / 25	10 / 25	½ " single	½ " single
	250 Deluxe	14 / 35	14 / 35	⅜ " double	⅜" double
	300SS	15 / 34		⅜ " double	
OLYMPIQUE	300 Mono		15 / 35		⅜ " double
	300 Twin	14 / 35	16 / 35	⅜ " double	⅜ " double
	300E Twin	14 / 35	16 / 35	⅜ " double	⅜ " double
	340	15 / 34	17 / 34	⅜ " double	⅜ " double
	340E	15 / 34	17 / 34	⅜ " double	⅜ " double
	440 Plus		17 / 34		⅜ " double
T'NT	340	15 / 34	16 / 34	⅜ " double	⅜ " double
	340E	15 / 34	16 / 34	⅜ " double	⅜ " double
	440	19 / 38		⅜ " triple	
	440E	19 / 38		⅜ " triple	
EVEREST	440	19 / 38	21 / 38	⅜ " triple	⅜ " triple
	440E	19 / 38	21 / 38	⅜ " triple	⅜ " triple
T'NT F / A	340	15 / 44		⅜ " triple	
	440	16 / 44		⅜ " triple	
T'NT R / V	250	16 / 40	15 / 38	⅜ " double	⅜ " double
	340		18 / 38		⅜ " triple
ALPINE	640ER	17 / 38	17 / 34	⅜ " triple	⅜ " triple
ELITE	440ER	17 / 46		⅜ " triple	

1977 SPROCKET AND CHAIN SPECIFICATIONS

		UPPER / LOWER	CHAIN PITCH
ELAN	250	10 / 25	½ " single
	250 Deluxe	14 / 35	⅜ " double
OLYMPIQUE	300 Mono	15 / 35	⅜ " double
	300 Twin	16 / 35	⅜ " double
	340	17 / 34	⅜ " double
	440	20 / 34	⅜ " triple
EVEREST	340	16 / 34	⅜ " double
	440	21 / 38	⅜ " triple
T'NT	340	15 / 34	⅜ " double
	440 Free Air	18 / 38	⅜ " triple
	440 Fan cooled	18 / 38	⅜ " triple
RV	340	18 / 38	⅜ " triple
ALPINE	640ER	17 / 38	⅜ " triple

1974 STEERING SYSTEM TORQUE SPECIFICATIONS

		STEERING SYSTEM TYPE	HANDLE BAR RETAINING BOLT kg-m	(ft-lbs)	STEERING ARM TO SKI LEG kg-m	(ft-lbs)	TIE ROD END TO STEERING ARM kg-m	(ft-lbs)
ELAN	(All models)	1	Welded		2.5-3.2	(18-23)	2.5-3.2	(18-23)
OLYMPIQUE	(All except 300 Mono)	2	3.8-4.8	(28-35)	2.5-3.2	(18-23)	2.5-3.2	(18-23)
	300 Mono	2	3.8-4.8	(28-35)	6 - 7.6	(44-55)	2.5-3.2	(18-23)
NORDIC	640ER	3	3.8-4.8	(28-35)	2.5-3.2	(18-23)	2.5-3.2	(18-23)
T'NT F / C		4	3.8-4.8	(28-35)	2.5-3.2	(18-23)	2.5-3.2	(18-23)
EVEREST		4	3.8-4.8	(28-35)	2.5-3.2	(18-23)	2.5-3.2	(18-23)
T'NT F / A		5	3.8-4.8	(28-35)	2.5-3.2	(18-23)	2.5-3.2	(18-23)
ALPINE		6	3.8-4.8	(28-35)	2.5-3.2	(18-23)	*5.5-6.9	(40-50)
ELITE		7	3.8-4.8	(28-35)	2.5-3.2	(18-23)	2.5-3.2	(18-23)

1975-1976 STEERING SYSTEM TORQUE SPECIFICATIONS

		STEERING SYSTEM TYPE	HANDLE BAR RETAINING BOLT kg-m	(ft-lbs)	STEERING ARM TO SKI LEG kg-m	(ft-lbs)	TIE ROD END TO STEERING ARM kg-m	(ft-lbs)
ELAN	(All models)	1	Welded		2.5-3.2	(18-23)	2.5-3.2	(18-23)
OLYMPIQUE	(All models)	10	Welded		2.5-3.2	(18-23)	2.5-3.2	(18-23)
T'NT F / C		4	3.8-4.8	(28-35)	2.5-3.2	(18-23)	2.5-3.2	(18-23)
EVEREST		4	3.8-4.8	(28-35)	2.5-3.2	(18-23)	2.5-3.2	(18-23)
F / A		9	Welded		2.5-3.2	(18-23)	2.5-3.2	(18-23)
RV		8	Welded		2.5-3.2	(18-23)	2.5-3.2	(18-23)
ALPINE		6	3.8-4.8	(28-35)	2.5-3.2	(18-23)	*5.5-6.9	(40-50)

* Steering arm ball bushing torque value.

1977 STEERING SYSTEM TORQUE SPECIFICATIONS

	STEERING SYSTEM TYPE	HANDLE BAR RETAINING BOLT		STEERING ARM TO SKI LEG		TIE ROD END TO STEERING ARM	
		kg-m	(ft-lbs)	kg-m	(ft-lbs)	kg-m	(ft-lbs)
ELAN	1	Welded		2.5-3.2	(18-23)	2.5-3.2	(18-23)
OLYMPIQUE T'NT EVEREST	10	Welded		2.5-3.2	(18-23)	2.5-3.2	(18-23)
RV	12	Welded		2.5-3.2	(18-23)	2.5-3.2	(18-23)
ALPINE	11	3.8-4.8	(28-35)	2.5-3.2	(18-23)	*5.5-6.9	(40-50)

* Steering arm ball bushing torque value.

1974 SKI SYSTEM TORQUE SPECIFICATIONS

	SKI SYSTEM TYPE	LEAF SPRING / SPRING COUPLER RETAINING BOLT kg-m	(ft-lbs)	RUNNER SHOE kg-m	(ft-lbs)	SPRING COUPLER TO SKI LEG
ELAN (All models except 294SS)	1	4.8-5.5	(35-40)	0.5-0.7	(4-5)	Tighten bolt, move ski by hand to check that it pivotes easily on ski-leg. Then tighten locking nut to 6-7.6 kg-m (44-55 ft-lbs).
294SS	1			1.2-1.6	(9-12)	
OLYMPIQUE	2	4.8-5.5	(35-40)	1.2-1.6	(9-12)	
NORDIC	5	4.8-5.5	(35-40)	1.2-1.6	(9-12)	
T'NT F / C EVEREST F / A	3	4.8-5.5	(35-40)	1.2-1.6	(9-12)	
ALPINE	4	4.8-5.5	(35-40)	1.2-1.6	(9-12)	
ELITE	6	4.8-5.5	(35-40)	1.2-1.6	(9-12)	

1975-1976-1977 SKI SYSTEM TORQUE SPECIFICATIONS

	SKI SYSTEM TYPE	LEAF SPRING / SPRING COUPLER RETAINING BOLT kg-m	(ft-lbs)	RUNNER SHOE kg-m	(ft-lbs)	SPRING COUPLER TO SKI LEG
ELAN (All models except 300SS)	7	4.8-5.5	(35-40)	0.5-0.7	(4-5)	Tighten bolt, move ski by hand to check that it pivotes easily on ski-leg. Then tighten locking nut to 6-7.6 kg-m (45-55 ft-lbs).
300SS 1975	7			1.2-1.6	(9-12)	
OLYMPIQUE	8	4.8-5.5	(35-40)	1.2-1.6	(9-12)	
T'NT F / C EVEREST 1975-76 T'NT & EVEREST 1977	9	4.8-5.5	(35-40)	1.2-1.6	(9-12)	
T'NT F / A 1975	10	4.8-5.5	(35-40)	1.2-1.6	(9-12)	
T'NT RV	11	4.8-5.5	(35-40)	1.2-1.6	(9-12)	
ELITE 1975	6	4.8-5.5	(35-40)	1.2-1.6	(9-12)	
ALPINE 1975-76	12	4.8-5.5	(35-40)	1.2-1.6	(9-12)	
1977	13	4.8-5.5	(35-40)	1.2-1.6	(9-12)	

TOLERANCE AND WEAR LIMIT

Year	Engine Type	Cylinder bore (nominal)			Piston to wall clearance		Ring End gap	Crankshaft End play
		std.	1st o.s.	2nd o.s.	Fitted tolerance	Wear limit		
1974	247	69.0 mm (2.7165")	69.5 mm (2.7362")	N.A.	0.065-0.100 mm (.0026-.0039")	0.165 mm (.0065")	0.25-1.60 mm (.010-.063")	0.10-0.40 mm (.004-.016")
1974	302	76.0 mm (2.9921")	76.5 mm (3.0118")	77 mm (3.0315")	0.080-0.115 mm (.0031-.0045")	0.195 mm (.0076")	0.30-1.60 mm (.012-.063")	0.10-0.40 mm (.004-.016")
1975	247	69.0 mm (2.7165")	69.5 mm (2.7362")	N.A.	0.065-0.100 mm (.0026-.0039")	0.165 mm (.0065")	0.25-1.60 mm (.010-.063")	0.10-0.40 mm (.004-.016")
1976	247	69.0 mm (2.7165")	69.5 mm (2.7362")	N.A.	0.065-0.100 mm (.0026-.0039")	0.165 mm (.0065")	0.25-1.60 mm (.010-.063")	0.10-0.40 mm (.004-.016")
1976	302	76.0 mm (2.9921")	76.5 mm (3.0118")	77.0 mm (3.0315")	0.080-0.115 mm (.0031-.0045")	0.195 mm (.0076")	0.30-1.60 mm (.012-.063")	0.10-0.40 mm (.004-.016")
1977	247	69.0 mm (2.7165")	69.5 mm (2.7362")	N.A.	0.063-0.099 mm (.0025-.0039")	0.162 mm (.0064")	0.25-1.60 mm (.010-.063")	0.10-0.40 mm (.004-.016")
1977	302	76.0 mm (2.9921")	76.5 mm (3.0118")	77.0 mm (3.0315")	0.078-0.114 mm (.0031-.0045")	0.198 mm (.0078")	0.25-1.60 mm (.010-.063")	0.10-0.40 mm (.004-.016")

Year	Engine type	Cyl. bore nominal dimension		- Piston to wall clearance		Ring end-gap	Crankshaft end-play
		Standard	Oversize	Fitted tolerance	Wear limit		
1974	248	54.0 mm (2.1260")	54.5 mm (2.1457")	0.050-0.085 mm (.0020-.0034")	0.135 mm (.0054")	0.20-1.60 mm (.008-.063")	0.10-0.40 mm (.004-.016")
1974	294	57.0 mm (2.2441")	57.5 mm (2.2638")	0.050-0.085 mm (.0020-.0034")	0.135 mm (.0054")	0.20-1.60 mm (.008-.063")	0.10-0.40 mm (.004-.016")
1974	338	59.5 mm (2.3425")	60.0 mm (2.3622")	0.080-0.115 mm (.0031-.0045")	0.195 mm (.0076")	0.20-1.60 mm (.008-.063")	0.10-0.40 mm (.004-.016")
1974	343	59.5 mm (2.3425")	60.0 mm (2.3622")	0.080-0.115 mm (.0031-.0045")	0.195 mm (.0076")	0.20-1.60 mm (.008-.063")	0.10-0.40 mm (.004-.016")
1974	346	59.5 mm (2.3425")	59.75 mm (2.3524")	0.100-0.135 mm (.0039-.0053")	0.235 mm (.0092")	0.20-1.60 mm (.008-.063")	N.A.
1974	396	64.5 mm (2.5394")	64.75 mm (2.5492")	0.090-0.125 mm (.0035-.0049")	0.215 mm (.0084")	0.25-1.60 mm (.010-.063")	N.A.
1974	401	64.5 mm (2.5394")	65.0 mm (2.5591")	0.080-0.115 mm (.0031-.0045")	0.195 mm (.0076")	0.25-1.60 mm (.010-.063")	0.10-0.40 mm (.004-.016")
1974	434	67.5 mm (2.6575")	68.0 mm (2.6772")	0.080-0.115 mm (.0031-.0045")	0.195 mm (.0076")	0.25-1.60 mm (.010-.063")	N.A.
1974	436	67.5 mm (2.6575")	67.75 mm (2.6673")	0.110-0.145 mm (.0043-.0057")	0.255 mm (.010")	0.25-1.60 mm (.010-.063")	N.A.
1974	440	67.5 mm (2.6575")	N.A.	0.053-0.153 mm (.0021-.006")	0.216 mm (.0086")	0.25-1.60 mm (.010-.063")	N.A.
1974	640	76.0 mm (2.9921")	76.5 mm (3.0118")	0.090-0.125 mm (.0043-.0057")	0.215 mm (.0084")	0.30-1.60 mm (.012-.063")	0.10-0.40 mm (.004-.016")

N.A.: Not applicable

TOLERANCE AND WEAR LIMIT (TWO CYLINDER ENGINE)

Year	Engine Type	Cyl. bore nominal dimension		Piston to wall clearance		Ring end-gap	Crankshaft end-play
		Standard	Oversize	Fitted tolerance	Wear limit		
1975	245	54.0 mm (2.1260")	54.25 mm (2.1358")	0.070-0.105 mm (.0028-.0041")	0.175 mm (.0069")	0.20-0.50 mm (.008-.020")	0.10-0.40 mm (.004-.016")
1975	248	54.0 mm (2.1260")	54.5 mm (2.1457")	0.050-0.085 mm (.0020-.0033")	0.135 mm (.0053")	0.20-1.60 mm (.008-.063")	0.10-0.40 mm (.004-.016")
1975	294	62.0 mm (2.2441")	57.5 mm (2.2638")	0.050-0.085 mm (.0020-.0033")	0.135 mm (.0053")	0.20-1.60 mm (.008-.063")	0.10-0.40 mm (.004-.016")
1975	305	55.5 mm (2.1850")	56.0 mm (2.2047")	0.050-0.085 mm (.0020-.0033")	0.135 mm (.0053")	0.20-1.60 mm (.008-.063")	0.10-0.40 mm (.004-.016")
1975	343	59.5 mm (2.3425")	60.0 mm (2.3622")	0.080-.0115 mm (.0031-.0045")	0.195 mm (.0077")	0.20-1.60 mm (.008-.063")	0.10-0.40 mm (.004-.016")
1975	346	59.5 mm (2.3425")	59.75 mm (2.3524")	0.100-0.135 mm (.0039-.0053")	0.235 mm (.0093")	0.20-1.60 mm (.008-.063")	N.A.
1975	434	67.5 mm (2.6575")	68.0 mm (2.6772")	0.080-.0115 mm (.0031-.0045")	0.195 mm (.0077")	0.25-1.60 mm (.010-.063")	N.A.
1975	436	67.5 mm (2.6575")	67.75 mm (2.6673")	0.090-0.125 mm (.0035-.0049")	0.215 mm (.0085")	0.25-1.60 mm (.010-.063")	N.A.
1975	440	67.5 mm (2.6575")	N.A.	0.063-0.153 mm (.0025-.006")	0.216 mm (.0086")	0.25-1.60 mm (.010-.063")	N.A.
1975	640	76.0 mm (2.9921")	76.5 mm (3.0118")	0.090-0.110 mm (.0035-.0043")	0.215 mm (.0085")	0.30-1.60 mm (.012-.063")	0.10-0.40 mm (.004-.016")
1976	245	54.0 mm (2.1260")	54.25 mm (2.1358")	0.070-0.105 mm (.0028-.0041")	0.175 mm (.0069")	0.20-0.50 mm (.008-.020")	N.A.
1976	248	54.0 mm (2.1260")	54.5 mm (2.1457")	0.050-0.085 mm (.0020-.0033")	0.135 mm (.0053")	0.20-1.60 mm (.008-.063")	0.10-0.40 mm (.004-.016")
1976	305	55.5 mm (2.1850")	56.0 mm (2.2047")	0.070-0.105 mm (.0028-.0041")	0.175 mm (.0069")	0.20-1.60 mm (.008-.063")	0.10-0.40 mm (.004-.016")
1976	343	59.5 mm (2.3425")	60.0 mm (2.3622")	0.080-0.115 mm (.0031-.0045")	0.195 mm (.0077")	0.20-1.60 mm (.008-.063")	0.10-0.40 mm (.004-.016")
1976	345	63.0 mm (2.4803")	63.25 mm (2.4902")	0.050-0.085 mm (.0020-.0033")	0.135 mm (.0053")	0.20-0.50 mm (.008-.020")	N.A.
1976	434	67.5 mm (2.6575")	68.0 mm (2.6772")	0.080-0.115 mm (.0031-.0045")	0.195 mm (.0077")	0.25-1.60 mm (.010-.063")	N.A.
1976	440	67.5 mm (2.6575")	N.A.	0.033-0.153 mm (.0013-.006")	0.216 mm (.0086")	0.25-1.60 mm (.010-.063")	N.A.
1976	640	76.0 mm (2.9921")	76.5 mm (3.0118")	0.070-0.105 mm (.0028-.0041")	0.175 mm (.0069")	0.30-1.60 mm (.012-.063")	0.10-0.40 mm (.004-.016")

N.A.: Not applicable

TOLERANCE AND WEAR LIMIT (TWO CYLINDER ENGINE)

Year	Engine Type	Cyl. bore nominal dimension		Piston to wall clearance		Ring end-gap	Crankshaft end-play
		Standard	Oversize	Fitted tolerance	Wear limit		
1977	248	54.0 mm (2.1259")	54.5 mm (2.1456")	0.048-0.083 mm (.0019-.0033")	0.132 mm (.0052")	0.20-1.60 mm (.008-.063")	0.10-0.40 mm (.004-.016")
1977	305	55.5 mm (2.1850")	56.0 mm (2.2047")	0.069-0.104 mm (.0027-.0041")	0.173 mm (.0068")	0.20-1.60 mm (.008-.063")	0.10-0.40 mm (.004-.016")
1977	343	59.5 mm (2.3425")	60.0 mm (2.3622")	0.079-0.114 mm (.0031"-.0045")	0.198 mm (.0078")	0.20-1.60 mm (.008-.063")	0.10-0.40 mm (.004-.016")
1977	345	63.0 mm (2.4803")	63.25 mm (2.4901")	0.046-0.063 mm (.0019-.0033")	0.132 mm (.0052")	0.20-0.51 mm (.008-.020")	N.A.
1977	346	59.5 mm (2.3425")	59.75 mm (2.3524")	0.099-0.134 mm (.0039-.0053")	0.233 mm (.0092")	0.20-1.60 mm (.008-.063")	N.A.
1977	436	67.5 mm (2.6574")	67.75 mm (2.6673")	0.089-0.124 mm (.0035-.0049")	0.213 mm (.0084")	0.25-1.60 mm (.010-.063")	N.A.
1977	440*	67.5 mm (2.6574")	68.0 mm (2.6771")	0.068-0.114 mm (.0027-.0045")	0.183 mm (.0072")	0.25-1.60 mm (.010-.063")	0.10-0.40 mm (.004-.016")
1977	440**	67.5 mm (2.6574")	N.A.	0.078 mm (.0031")	0.156 mm (.0062")	0.25-1.60 mm (.010-.063")	0.10-0.40 mm (.004-.016")
1977	640	76.0 mm (2.9921")	76.5 mm (3.0118")	0.068-0.104 mm (.0027-.0041")	0.173 mm (.0068")	0.30-1.60 mm (.012-.063")	0.10-0.40 mm (.004-.016")

N.A.: Not applicable
* Cast iron sleeve cylinder
** Nikasil coated cylinder

1974 IGNITION TIMING SPECIFICATIONS

Engine Type	Ignition Type	Direct measurement B.T.D.C. 	Indirect measurement B.T.D.C. 	Edge gap 
247	BK PT	3.98 mm ± 0.25 (.157" ± .010)	N.A.	6.5 mm ± 1.5 (.260" ± .060)
248	BK PT	2.22 mm ± 0.25 (.087" ± .010)	2.29 mm ± 0.25 (.090" ± .010)	9.0 mm ± 2.0 (.354" ± .080)
294	BK PT	2.39 mm ± 0.25 (.094" ± .010)	2.49 mm ± 0.30 (.098" ± .012)	9.0 mm ± 2.0 (.354" ± .080)
302	BK PT	3.98 mm ± 0.25 (.157" ± .010)	5.79 mm ± 0.41 (.228" ± .016)	6.5 mm ± 1.5 (.260" ± .060)
338	BK PT	3.07 mm ± 0.25 (.121" ± .010)	3.62 mm ± 0.27 (.143" ± .011)	6.5 mm ± 1.5 (.260" ± .060)
343	BK PT	3.07 mm ± 0.25 (.121" ± .010)	3.73 mm ± 0.30 (.147" ± .012)	6.5 mm ± 1.5 (.260" ± .060)
346	CD	2.07 mm ± 0.25 (.081" ± .010)	N.A.	N.A.
396	CD	2.07 mm ± 0.25 (.081" ± .010)	N.A.	N.A.
401	BK PT	3.07 mm ± 0.25 (.121" ± .010)	3.73 mm ± 0.30 (.147" ± .012)	6.5 mm ± 1.5 (.260" ± .060)
434	BK PT	3.07 mm ± 0.25 (.121" ± .010)	3.30 mm ± 0.25 (.130" ± .010)	6.5 mm ± 1.5 (.260" ± .060)
436	CD	2.07 mm ± 0.25 (.081" ± .010)	N.A.	N.A.
440	BK PT	3.07 mm ± 0.25 (.121" ± .010)	3.30 mm ± 0.25 (.130" ± .010)	6.5 mm ± 1.5 (.260" ± .060)
640	CD	3.35 mm ± 0.25 (.132" ± .010)	3.48 mm ± 0.25 (.137" ± .010)	N.A.
640	BK PT	3.95 mm ± 0.25 (.156" ± .010)	4.11 mm ± 0.25 (.162" ± .010)	6.5 mm ± 1.5 (.260" ± .060)

N.A.: Not applicable

1975 IGNITION TIMING SPECIFICATIONS

Engine Type	Ignition Type	Direct measurement B.T.D.C. 	Indirect measurement B.T.D.C. 	Edge gap 
245	CD	1.20 mm ± 0.25 (.047" ± .010)	N.A.	N.A.
247	BK PT	3.98 mm ± 0.25 (.157" ± .010)	N.A.	6.5 mm ± 1.5 (.260" ± .060)
248	BK PT	2.22 mm ± 0.25 (.087" ± .010)	2.29 mm ± 0.25 (.090" ± .010)	9.0 mm ± 2.0 (.276" ± .060)
294	BK PT	2.39 mm ± 0.25 (.094" ± .010)	2.49 mm ± 0.30 (.098" ± .012)	9.0 mm ± 2.0 (.276" ± .060)
305	BK PT	3.07 mm ± 0.25 (.121" ± .010)	3.73 mm ± 0.30 (.147" ± .012)	6.5 mm ± 1.5 (.260" ± .060)
343	BK PT	3.07 mm ± 0.25 (.121" ± .010)	3.73 mm ± 0.30 (.147" ± .012)	6.5 mm ± 1.5 (.260" ± .060)
346	CD	2.07 mm ± 0.25 (.081" ± .010)	N.A.	N.A.
434	BK PT	3.07 mm ± 0.25 (.121" ± .010)	3.30 mm ± 0.25 (.130" ± .010)	6.5 mm ± 1.5 (.260" ± .060)
436	CD	2.07 mm ± 0.25 (.081" ± .010)	N.A.	N.A.
440	BK PT	3.07 mm ± 0.25 (.121" ± .010)	3.30 mm ± 0.25 (.130" ± .010)	6.5 mm ± 1.5 (.260" ± .060)
440	CD	2.07 mm ± 0.25 (.081" ± .010)	2.21 mm ± 0.25 (.087" ± .010)	N.A.
640	BK PT	3.96 mm ± 0.25 (.156" ± .010)	4.11 mm ± 0.25 (.162" ± .010)	6.5 mm ± 1.5 (.260" ± .060)

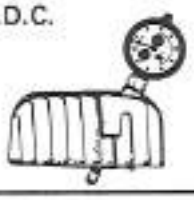
N.A.: Not applicable

1976 IGNITION TIMING SPECIFICATIONS

Engine Type	Ignition Type	Direct measurement B.T.D.C. 	Indirect measurement B.T.D.C. 	Edge gap 
245	CD	1.15 mm ± 0.25 (.045" ± .010)	N.A.	N.A.
247	BK PT	3.98 mm ± 0.25 (.157" ± .010)	N.A.	6.5 mm ± 1.5 (.260" ± .060)
248	BK PT	2.22 mm ± 0.25 (.087" ± .010)	2.29 mm ± 0.25 (.090" ± .010)	9.0 mm ± 2.0 (0.354" ± .079)
302	BK PT	3.98 mm ± 0.25 (.157" ± .010)	N.A.	6.5 mm ± 1.5 (.260" ± .060)
305	BK PT	3.07 mm ± 0.25 (.121" ± .010)	3.73 mm ± 0.30 (.147" ± .012)	6.5 mm ± 1.5 (.260" ± .060)
343	BK PT	3.07 mm ± 0.25 (.121" ± .010)	3.73 mm ± 0.30 (.147" ± .012)	6.5 mm ± 1.5 (.260" ± .060)
345	CD	1.0 mm ± 0.25 (.039" ± .010)	N.A.	N.A.
434	BK PT	3.07 mm ± 0.25 (.121" ± .010)	3.30 mm ± 0.25 (.130" ± .010)	6.5 mm ± 1.5 (.260" ± .060)
440	BK PT	3.07 mm ± 0.25 (.121" ± .010)	3.30 mm ± 0.25 (.130" ± .010)	6.5 mm ± 1.5 (.260" ± .060)
640	BK PT	3.95 mm ± 0.25 (.156" ± .010)	4.11 mm ± 0.25 (.162" ± .010)	6.5 mm ± 1.5 (.260" ± .060)

N.A.: Not applicable

1977 IGNITION TIMING SPECIFICATIONS

Engine Type	Ignition Type	Direct measurement B.T.D.C. 	Indirect measurement B.T.D.C. 	Edge gap 
247	BK PT	3.98 mm ± 0.25 (.157" ± .010)	N.A.	6.6 mm ± 1.5 (.260" ± .060)
248	BK PT	2.22 mm ± 0.25 (.087" ± .010)	2.29 mm ± 0.25 (.090" ± .010)	9.0 mm ± 2.0 (0.354" ± .079)
302	BK PT	3.98 mm ± 0.25 (.157" ± .010)	N.A.	6.6 mm ± 1.5 (.260" ± .060)
305	BK PT	① 3.07 mm ± 0.25 (.121" ± .010)	① 3.73 mm ± 0.30 (.147" ± .012)	6.6 mm ± 1.5 (.260" ± .060)
343	BK PT	② 3.07 mm ± 0.25 (.121" ± .010)	② 3.73 mm ± 0.30 (.147" ± .012)	6.6 mm ± 1.5 (.260" ± .060)
345	CD	1.0 mm ± 0.25 (.039" ± .010)	N.A.	N.A.
346	BK PT	2.52 mm ± 0.25 (.100" ± .010)	N.A.	6.6 mm ± 1.5 (.260" ± .060)
436	BK PT	2.52 mm ± 0.25 (.100" ± .010)	N.A.	6.6 mm ± 1.5 (.260" ± .060)
440	BK PT	3.07 mm ± 0.25 (.121" ± .010)	3.30 mm ± 0.25 (.130" ± .010)	6.6 mm ± 1.5 (.260" ± .060)
640	BK PT	3.95 mm ± 0.25 (.156" ± .010)	4.11 mm ± 0.25 (.162" ± .010)	6.6 mm ± 1.5 (.260" ± .060)

N.A.: Not applicable

① From engine serial No. 2 852 346 and up, use 2.11 mm (.083") for direct timing and 2.46 mm (.097") for indirect timing.

② From engine serial No. 2 930 685 and up, use 2.11 mm (.083") for direct timing and 2.46 mm (.097") for indirect timing.

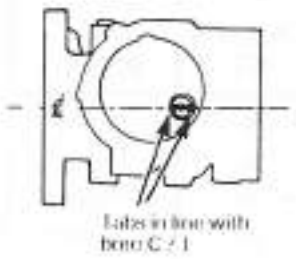
CARBURETOR SPECIFICATIONS

YEAR	MODEL		ENGINE TYPE	CARBURETOR	MAIN FUEL JET DIA.	LOW SPEED ADJ. + ⅛ - 0	HIGH SPEED ADJ. + ¼ - 0	IDLE SPEED R.P.M.
1974	ELAN	250	247	HR-133-A	.042"	¾	fixed	1800-2200
1974	ELAN	250 2 cyl.	248	HR-155-A	.044"	1	fixed	1800-2200
1974	ELAN	250DL	248	HR-155-A	.044"	1	fixed	1800-2200
1974	ELAN	294SS	294	HR-161-A	.051"	¾	fixed	1800-2200
1974	OLYMPIQUE	300	302	HR-132-A	–	¾	1	1800-2200
1974	OLYMPIQUE	340	338	HR-131-A	.050"	¾	fixed	1800-2200
1974	OLYMPIQUE	400	401	HR-134-A	.052"	¾	fixed	1800-2200
1974	OLYMPIQUE	440	434	HR-135-A	.045"	⅞	fixed	1800-2200
1974	T'NT	300	294	HR-164-A	–	1	1	1800-2200
1974	T'NT	340	343	HD-134-A	–	1	1	1800-2200
1974	T'NT	440	440	HD-138-A	–	1	1	1800-2200
1974	EVEREST	440	440	HD-138-A	-	1	1	1800-2200
1974	NORDIC	640	640	HD-133-A	.067"	1	fixed	1800-2200
1974	ALPINE	440	434	HD-108-A	.054"	¾	fixed	1800-2200
1974	ALPINE	640	640	HD-124-A	.073"	¾	fixed	1800-2200
1974	ELITE	440	434	HD-140-A	.058"	1	fixed	1800-2200
1974	T'NT	340 F / A	346	2 x HR-149-A	–	1	1 ⅛	1800-2200
1974	T'NT	400 F / A	396	2 x HD-123-A	–	1	⅝	1800-2200
1974	T'NT	440 F / A	436	2 x HRM-3A	–	1	1⅛	1800-2200
1975	ELAN	250	247	HR-133-A	.042"	¾	fixed	1800-2000
1975	ELAN	250 Deluxe	248	HR-165-A	.044"	1	fixed	1800-2000
1975	ELAN	300SS	294	HR-166-A	.051"	¾	fixed	1800-2000
1975	OLYMPIQUE	300, 300E	305	HR-169-A	.051"	1	fixed	1500-1800
1975	OLYMPIQUE	340, 340E	343	HR-170-A	.054"	1	fixed	1500-1800
1975	T'NT	340, 340E	343	HD-134-A	–	1	1	1800-2200
1975	T'NT	440, 440E	440	HD-138-A	–	1	1	1800-2200
1975	EVEREST	440, 440E	440	HD-138-A	–	1	1	1800-2200
1975	T'NT F / A	340	346	2 x HR-168-A	-	1	1⅛	1800-2000
1975	T'NT F / A	440	436	2 x HRM-5-A	-	1	1	1800-2000
1975	T'NT F / A	245 R / V	245	2 x VM-34-72	260	1	fixed	3000
1975	ALPINE	640ER	640	HD-142-A	.060"	1	fixed or 1	1500-1800
1975	ELITE	440ER	434	HD-140-A	.058"	1	fixed	1800-2200

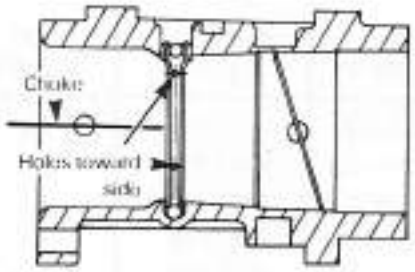
CARBURETOR SPECIFICATIONS

YEAR	MODEL		ENGINE TYPE	CARBURETOR	MAIN FUEL JET DIA.	LOW SPEED ADJ. + ¾ - 0	HIGH SPEED ADJ. + ¾ - 0	IDLE SPEED R.P.M.
1976	ELAN	250	247	HR-173-A	.046"	1	fixed	1500-1800
1976	ELAN	250SS	248	HR-172-A	.042"	1	fixed	1800-2200
1976	OLYMPIQUE	300 Mono	302	HR-174-A	.045"	1	fixed	1200-1500
1976	OLYMPIQUE	300 300E, Twin	305	HR-169-A	.051"	1	fixed	1500-1800
1976	OLYMPIQUE	340, 340E	343	HR-170-B	.054"	1	fixed	1500-1800
1976	OLYMPIQUE	Plus 440	434	HR-176-A	.049"	1	fixed	1500-1800
1976	T'NT	340, 340E	343	HD-148-A	–	1	1	1500 1800
1976	T'NT EVEREST	440, 440E	440	HD-147-A	–	1	1	1500-1800
1976	T'NT R / V	250	245	2 x VM 34-93	no. 300	1	fixed	3000
1976	T'NT R / V	340	345	2 x VM 34-94	no. 320	1	fixed	2500
1976	ALPINE	640ER	640	HRM-7-A	–	1 ⅛	1	1500-1800
1977	ELAN	250	247	HR-173-A	.046"	1	fixed	1500-1800
1977	ELAN	250 Deluxe	248	HR-172-A	.042"	1	fixed	1800-2200
1977	OLYMPIQUE	300 Mono	302	HR-174-A	.045"	1	fixed	1200-1500
1977	OLYMPIQUE	300 Twin	305	VM 30-90	no. 280	1⅛ ± 0	fixed	1500-1800
1977	OLYMPIQUE	340	343	VM 30-91	no. 260	1⅛ ± 0	fixed	1500-1800
1977	OLYMPIQUE	440	440	VM 32-113	no. 280	1⅛ ± 0	fixed	1500-1800
1977	EVEREST	340	343	HD-148-A	–	1	1	1500-1800
				OPTIONAL VM 30-98	no. 250	1⅛ ± 0	fixed	1500-1800
1977	EVEREST	440	440	VM 34-110	no. 340	1⅛ ± 0	fixed	1500-1800
1977	T'NT	340	346	VM 34-118	no. 300	1 ± 0	fixed	1800-2000
1977	T'NT	440	436	VM 36-53	no. 350	1 ± 0	fixed	1800-2000
1977	T'NT	440	440	VM 34-110	no. 340	1⅛ ± 0	fixed	1500-1800
1977	RV	340	345	2 x VM 34-135	no. 320	1 ± 0	fixed	3000-3200
1977	ALPINE	640ER	640	HRM-7-A	–	1 ⅛	1	1500-1800

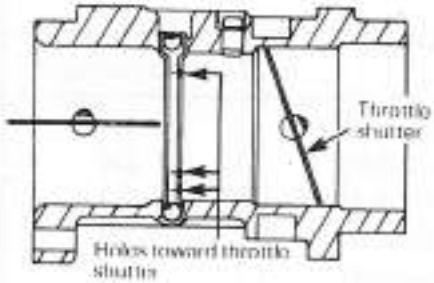
NOZZLE CHECK VALVE INSTALLATION POSITION



Applicable on:
HD-124-A
HD-133-A
HD-138-A
HD-147-A

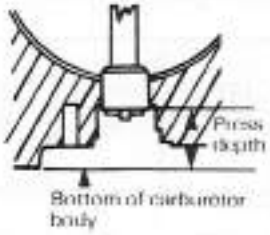


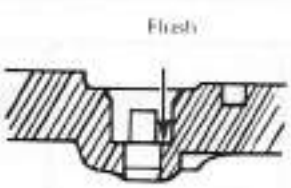
Applicable on:
HD-124-A
HD-133-A

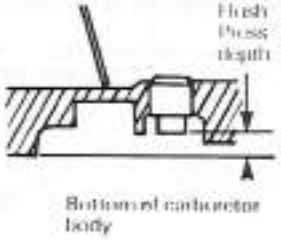


Applicable on:
HD-138-A
HD-147-A

NOZZLE CHECK VALVE PRESS DEPTH SPECIFICATIONS







MODEL	Main Nozzle / Discharge Tube	Main Nozzle	Intermediate Nozzle
HD-108-A HD-134-A HD-123-A HD-148-A HD-140-A HD-142-A	Not applicable	Nozzle shoulder flush with well floor	Not applicable
HD-124-A HD-133-A	.343" *	Not applicable	Not applicable
HD-138-A HD-147-A	.343" *	Not applicable	.156"

* Measurement taken between lowest point of nozzle and bottom of carburetor body.

All mesurements ± .005"

MIKUNI CARBURETOR SPECIFICATIONS

CARBURETOR	MAIN JET (Production)	JET NEEDLE*	NEEDLE JET	CUT AWAY	PILOT JET	AIR SCREW
VM 34-72	260	6DH4-2	P-4 (159)	2.5	35	1 turn
VM 34-93	300	6DH4-2	P-0 (159)	1.5	35	1 turn
VM 34-94	320	6DH4-2	P-2 (159)	1.5	30	1 turn
VM 30-90	260	6DH2-3	P-6 (159)	1.5	25	1½ turn
VM 30-91	260	6DH2-3	Q-0 (159)	2.0	25	-1½ turn
VM 30-98	250	6F9-3	Q-2 (159)	3.5	35	1½ turn
VM 34-110	340	6F9-3	P-2 (159)	1.5	20	1½ turn
VM 34-118	300	6F9-3	Q-2 (159)	3.5	35	1 turn
VM 32-113	290	6F9-4	Q-2 (159)	3.5	35	1½ turn
VM 36-53	350	6I1-2	P-2 (159)	3.5	40	1 turn
VM 34-135	320	6DH2-4	P-0 (159)	1.5	30	1 turn

*6DH4, -3 indicates specific slot of the needle from top.

1975 RV 250 MAIN JET APPLICATION CHART

TEMPERATURE ° C (° F) / Meters (Feet) ALTITUDE	-45° C (-50)	-35° C (-30)	-25° C (-10)	-15° C (10)	0° C (30)	10° C (50)	20° C (70)	30° C (90)
0 Sea level	300	290	280	270	260	250	240	230
600 m (2,000)	290	280	270	260	250	240	230	220
1200 m (4,000)	270	260	250	240	230	220	210	200
1800 m (6,000)	260	250	240	230	220	210	200	190
2400 m (8,000)	240	230	220	210	200	190	180	170
3,000 m (10,000)	230	220	210	200	190	180	170	160

CAUTION: These adjustments are guideline only, specific adjustments vary with temperature, altitude, atmospheric pressure and humidity. Always observe spark plug condition for proper jetting.

1976 RV 250 MAIN JET APPLICATION CHART

TEMPERATURE ° C (° F) / Meters (feet) ALTITUDE	-45° C (-50)	-35° C (-30)	-25° C (-10)	-15° C (10)	0° C (30)	10° C (50)	20° C (70)	30° C (90)
0 (sea level	350	330	320	310	300	290	280	270
600 m (2,000)	330	320	310	300	280	270	260	250
1,200 m (4,000)	310	300	290	280	270	260	250	240
1,800 m (6,000)	300	290	270	260	250	240	230	220
2,400 m (8,000)	280	270	260	250	240	220	210	200
3,000 m (10,000)	260	250	240	230	220	210	200	190

CAUTION: These adjustments are guideline only, specific adjustments vary with temperature, altitude, atmospheric pressure and humidity. Always observe spark plug condition for proper jetting.

1976 RV 340 MAIN JET APPLICATION CHART

TEMPERATURE ° C (° F) / Meters (feet) ALTITUDE	-45° C (-50)	-35° C (-30)	-25° C (-10)	-15° C (10)	0° C (30)	10° C (50)	20° C (70)	30° C (90)
0 Sea level	370	360	350	330	320	310	300	290
600 m (2,000)	350	340	330	320	300	290	280	270
1,200 m (4,000)	330	320	310	300	290	270	260	250
1,800 m (6,000)	320	300	290	280	270	260	240	230
2,400 m (8,000)	300	290	280	260	250	240	230	210
3,000 m (10,000)	280	270	260	250	230	220	210	200

CAUTION: These adjustments are guideline only, specific adjustments vary with temperature, altitude, atmospheric pressure and humidity. Always observe spark plug condition for proper jetting.

1977 RV 340 MAIN JET APPLICATION CHART

TEMPERATURE ° C (° F) / Meters (feet) ALTITUDE	-45° C (-50)	-35° C (-30)	-25° C (-10)	-15° C (10)	0° C (30)	10° C (50)	20° C (70)	30° C (90)
0 Sea level	350	340	330	320	310	300	280	270
600 m (2,000)	340	330	310	300	290	280	270	250
1,200 m (4,000)	320	310	300	290	270	260	250	240
1,800 m (6,000)	310	290	280	270	260	240	230	220
2,400 m (8,000)	290	280	260	250	240	230	220	200
3,000 m (10, 000)	270	260	250	240	220	210	200	190

CAUTION: These adjustments are guideline only, specific adjustments vary with temperature, altitude, atmospheric pressure and humidity. Always observe spark plug condition for proper jetting.

		Engine type	74 ①	74 ②	73 ①	73 ②	72 ①	72 ②	71 ①	71 ②
ELAN	250	(247)	M175T1	M145T1	M175T1	M145T1	M175T1	M145T1	M175T1	M145T1
	250E	(247)								
	250T	(248)								
	250 Deluxe	(248)	W240T1	W225T1	W240T1	W225T1				
	250SS	(249)								
	294SS	(294)	W260T1	W260T1	W260T1	W260T1				
OLYMPIQUE	300	(302)	M175T1	M145T1	M175T1	M145T1	M175T1	M145T1	M175T1	M145T1
	335	(337)								
SKANDIC	335	(337)			M225T1	M175T1	M225T1	M175T1	M225T1	M175T1
									(same on 1970)	
OLYMPIQUE	340	(338)	W240T1	W225T1	W240T1	W225T1				
	399	(401)	W240T1	W240T1	W240T1	W240T1	W240T1	W225T1	W240T1	W225T1
	440	(434)	M225T1	M175T1	M225T1	M175T1				
T'NT	290 1 cyl.	(292)					M280T31	M260T1	M280T31	M260T1
	300 2 cyl.	(294)	W260T1	W260T1	W260T1	W240T1				
	340 1 cyl.	(342)							M280T31	M280T31
	340 2 cyl.	(343)	W260T1	W260T1	W280M1	W260T1	W280M1	W260T1		
	440	(434)	M260T1	M260T1	M280T31	M280T31	M280T31	M280T31	M260T1	M260T1
	640	(641)					M280T31	M260T1	M280T31	M260T1
	775	(775)					M310T31S	M280T1	M310T31S	M280T1
T'NT F / A	340	(346)								
	440	(436)	W280M2	W280M2	W280M2	W280M2				
	400	(396)	W280M2	W280M2	W280M2	W280M2	TYPE: 396			
		(398)					W280T30	W280T30		
NORDIC	399	(401)					(440)		(401)	
	440	(434)					M240T1	M225T1	W240T1	W225T1
	640	(640)	M225T1	M225T1	M225T1	M225T1	M225T1	M225T1	M225T1	M225T1
ALP. VAL.	399	(401)							(401)	
									W240T1	W225T1
	440	(434)	M225T1	M175T1	M225T1	M175T1	M240T1	M225T1		
	640	(640)	M225T1	M175T1	M225T1	M175T1	M225T1	M175T1	M225T1	M175T1
ELITE	440	(434)	M240T1	M225T1	M225T1	M175T1				

① Engine full load. ② Engine part load.

1975 76 77 BOSCH SPARK PLUG CHART

		Engine type	1975 ①	1975 ②	1976 ①	1976 ②	1977 ①	1977 ②
ELAN	250 250 Deluxe 300SS	(247) (248) (294)	M175T1 W240T1 W260T1	M145T1 W225T1 W240T1	M175T1 W240T1	M175T1 W240T1	M175T1 W240T1	M175T1 W240T1
OLYMPIQUE	300 Mono 300 Twin 340 Plus 440 440	(302) (305) (343) (434) (440)	W240T1 W260T1	W225T1 W260T1	M225T1 W260T1 W260T1 M240T1	M175T1 W240T1 W240T1 M225T1	M175T1 W260MZ1 W260MZ1 M260T1	M175T1 W240MZ1 W240MZ1 M260T1
EVEREST	340 440	(343) (440)	M260T1	M260T1	M260T1	M260T1	W260MZ1 M260T1	W260MZ1 M260T1
T'NT F/C	340 440	(343) (440)	W260T1 M260T1	W260T1 M260T1	W260T1	W260T1		
T'NT	340 440 440	(346) (436) (440)					W260MZ2 W260MZ2 M260T1	W260MZ2 W260MZ2 M260T1
T'NT F/A	340 440	(346) (436)	W280M2 W280M2	W280M2 W280M2				
T'NT RV	250 340	(245) (345)	W280MZ2	W280MZ2	W280MZ2 W280MZ2	W280MZ2 W280MZ2	W280MZ2	W280MZ2
ELITE	440	(434)	M240T1	M225T1				
ALPINE	640	(640)	M225T1	M225T1	M225T1	M175T1	M240T1	M240T1

① Engine full load. ② Engine part load.

IGNITION GENERATING COIL, LIGHTING COIL & BRAKE LIGHT COIL RESISTANCE CHART

1974-75 MODELS		ENGINE TYPE	IGNITION GENERATING COIL		LIGHTING COIL		BRAKE LIGHT COIL	
			1974	1975	1974	1975	1974	1975
ELAN	250	247	3.4	3.4	0.45	0.45	1.85	1.85
	250T	248	1.15		0.45		1.90	
	250 Deluxe	248	1.15	1.15	0.45	0.45	1.90	1.90
	294SS,300SS	294	1.15	1.15	0.45	0.45	1.90	1.90
OLYMPIQUE	300	302	3.4		0.45		1.85	
	300	305		3.3		0.23		
	340	338	2.35		0.40		1.70	
	340	343		3.3		0.23		
	400	401	2.35		0.40		1.70	
	440	434	2.35		0.40		1.70	
EVEREST	440	440	3.4		0.40	0.23 ①		2.15 ②
T'NT F / C	300	294	1.15		0.45		1.90	
	340	343	3.4	3.3	0.40	0.23		
	440	440	3.4	3.3	0.40	0.23		
T'NT F / A	340	346			0.23	0.23		
	400	396			0.23			
	440	435			0.23	0.23		
	245 RV	245				0.23		
NORDIC	640	640			0.14			
ELITE	440	434	2.35	2.35	0.14	0.14	1.70	1.70
ALPINE	440	434	2.35		0.40		1.70	
	640	640	2.35	3.3	0.14	0.23		

All values are given in ohms, with a tolerance of ± 20%.

① ± .025 ohms

② additional lighting coil 30W

IGNITION GENERATING COIL, LIGHTING COIL & BRAKE LIGHT COIL RESISTANCE CHART

1976-77 MODELS		ENGINE TYPE	IGNITION GENERATING COIL		LIGHTING COIL		BRAKE LIGHT COIL	
			1976	1977	1976	1977	1976	1977
ELAN	250	247	3.4	3.4	0.45	0.45	1.85	1.85
	250 Deluxe	248	1.15	1.15	0.45	0.45	1.90	1.90
OLYMPIQUE	300 Mono	302	3.4	3.4	0.45	0.45	1.85	1.85
	300 Twin	305	3.3	3.3	0.23	0.23		
	340	343	3.3	3.3	0.23	0.23		
	Plus (440)	434	2.35		0.45		1.70	
	440			3.3		0.23		
EVEREST	340	343		3.3		0.23		
	440	440	3.3	3.3	0.23	0.23		
T'NT F / C	340	343	3.3					
T'NT	340	346		3.3		0.23		
	440	436		3.3		0.23		
	440	440		3.3		0.23		
T'NT R / V	250	245	① 355		② 0.23		③ 2.15	
	340	345	① 355	355 ①	② 0.23	0.23 ②	③ 2.15	2.15 ③
ALPINE	640	640	3.3	3.3	② 0.23	0.23 ②	③ 2.15	2.15 ③

All values are given in ohms, with a tolerance of ± 20%.

① ± 15 ohms

② ± 0.025 ohms

③ additional lighting coil 30W.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