

TABLE OF CONTENTS

SECTION	SUB-SECTION
01	SUSPENSION 01 — Bogie wheel (refer to '78 Shop Manual) 02 — Slide suspension 03 — Rear hub (refer to '78 Shop Manual) 04 — Drive axle 05 — Track (refer to '78 Shop Manual)
02	TRANSMISSION 01 — Pulley guard 02 — Drive belt 03 — Drive pulley (refer to '78 Shop Manual) 04 — Driven pulley and countershaft 05 — Pulley alignment 06 — Brake 07 — Chaincase 08 — Gearbox (refer to '78 Shop Manual) 09 — Drive chain
03	STEERING/SKI 01 — Steering system 02 — Ski system
04	ENGINE 01 — Engine tolérances measurement 02 — Engines 03 — Rewind starter (refer to '78 Shop Manual) 04 — Timing 05 — Carburetor 06 — Air intake silencer and fuel tank
05	ELECTRICAL 01 — Electrical charts 02 — Spark plugs 03 — Test procedure 04 — Electric starter (refer to '78 Shop Manual) 05 — Battery (refer to '78 Shop Manual) 06 — Alternator (refer to '78 Shop Manual)
06	CAB & FRAME 01 — Cab 02 — Frame
07	TOOLS
08	TECHNICAL DATA
09	WARRANTY



BOGIE WHEELS

Refer to the 1978 Bombardier Shop Manual

1979 ELAN

refer to ____ 1978 ____ ELAN

1979 ALPINE 640 ER

refer to ____ 1978 ____ ALPINE

SLIDE SUSPENSION

Models covered in this section:

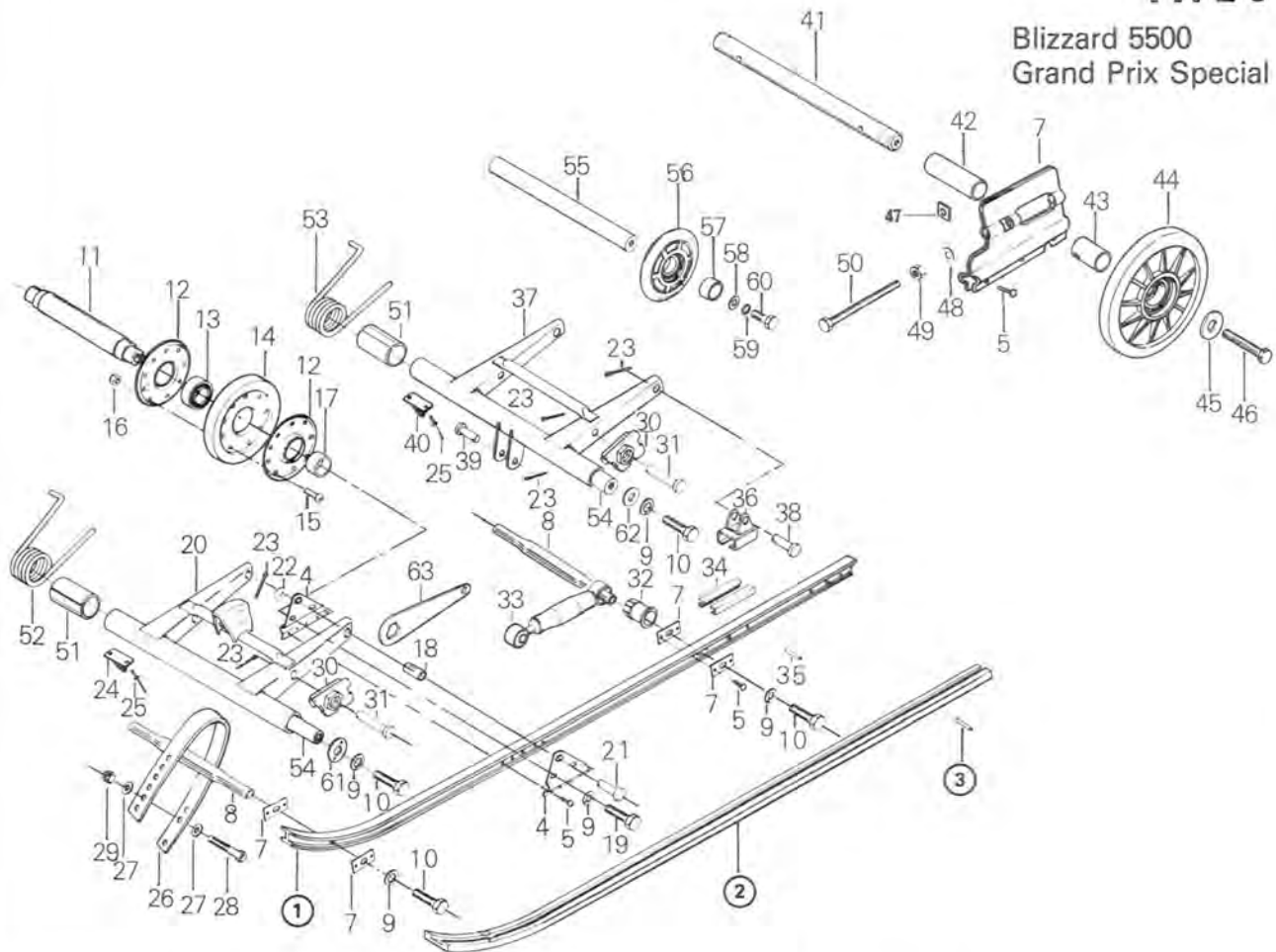
1979 BLIZZARD 5500
1979 GRAND PRIX SPECIAL
1979 BLIZZARD 9500

1979	ELAN	refer to ____ 1978 ____	ELAN
1979	SPIRIT	refer to ____ 1978 ____	SPIRIT
1979	OLYMPIQUE	refer to ____ 1978 ____	OLYMPIQUE
1979	NUVIK	refer to ____ 1978 ____	NUVIK
1979	CITATION	refer to ____ 1978 ____	CITATION
1979	MIRAGE	refer to ____ 1978 ____	MIRAGE
1979	EVEREST	refer to ____ 1978 ____	EVEREST
1979	FUTURA	refer to ____ 1978 ____	FUTURA
1979	BLIZZARD 7500 Plus / CROSS COUNTRY	refer to ____ 1978 ____	BLIZZARD 6500 Plus
1979	SUPER SONIC / CROSS COUNTRY	refer to ____ 1978 ____	BLIZZARD 6500 Plus
1979	ALPINE 640 ER	refer to ____ 1978 ____	ALPINE 640 ER
1979	ELITE 450 LC	refer to ____ 1978 ____	ELITE

SECTION 01
SUB-SECTION 02 (SLIDE SUSPENSION)

TYPE 6

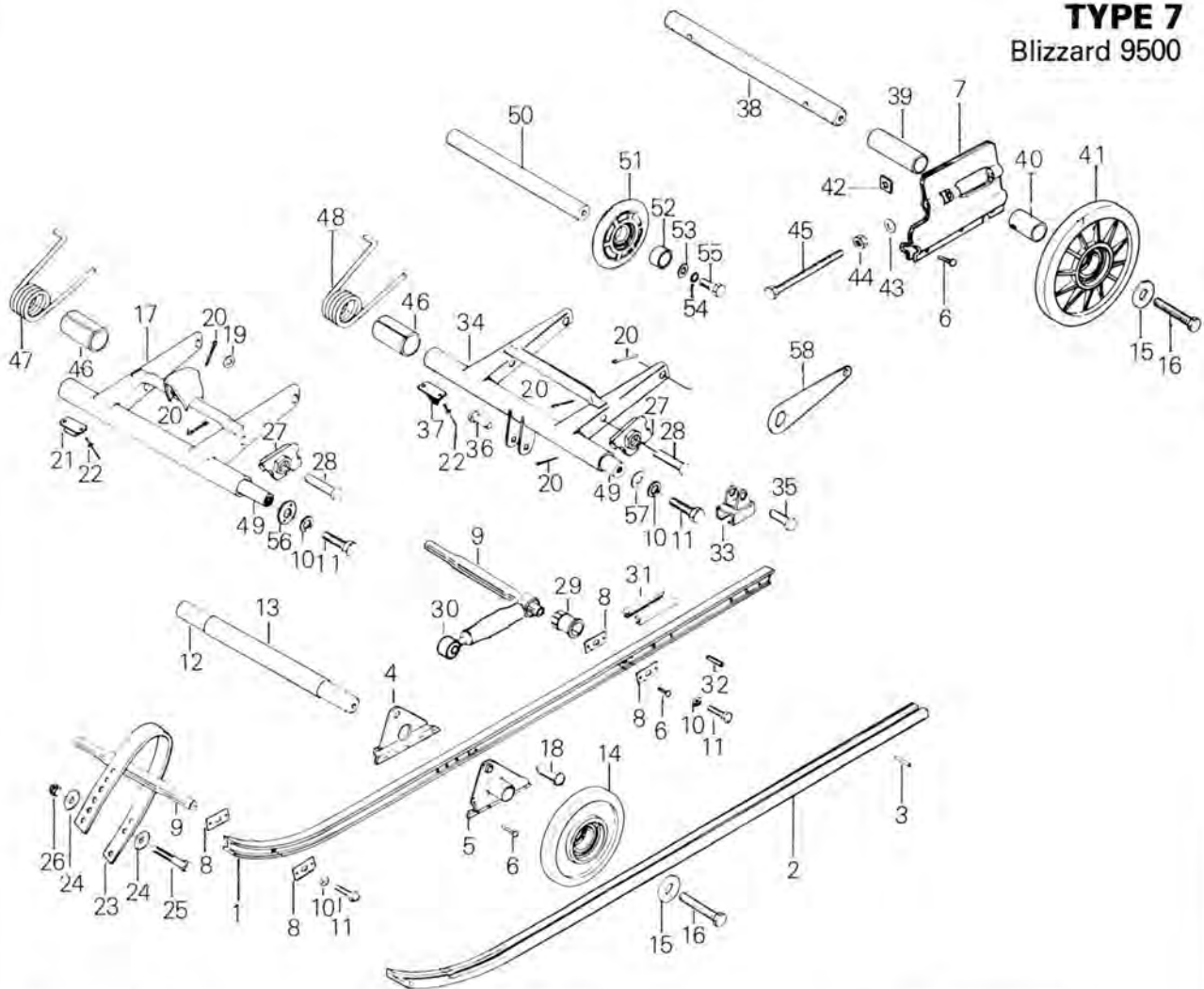
Blizzard 5500
Grand Prix Special



- | | | |
|------------------------------|-----------------------------|---------------------------------------|
| 1. Runner (2) | 23. Cotter pin (9) | 44. Idler (2) |
| 2. Slider shoe (2) | 24. Stop bonding (2) | 45. Washer (2) |
| 3. Spirol pin (2) | 25. Rivet (8) | 46. Screw (2) |
| 4. Front arm bracket (4) | 26. Stopper strap | 47. Square nut (2) |
| 5. Rivet (20) | 27. Washer (2) | 48. Washer (2) |
| 6. Adjustment plate (2) | 28. Screw | 49. Nut (2) |
| 7. Reinforcement bracket (8) | 29. Nut | 50. Adjustment screw (2) |
| 8. Swaged tube (2) | 30. Adjustment cam R.H. (2) | 51. Bushing (4) |
| 9. Lockwasher (10) | 31. Adjustment cam L.H. (2) | 52. R.H. front spring |
| 10. Screw (8) | 32. Clevis pin (4) | 53. L.H. front spring |
| 11. Cross shaft | 33. Bushing clip | 54. R.H. rear spring |
| 12. Flange (4) | 34. Shock | 55. L.H. rear spring |
| 13. Bearing (2) | 35. Sliding pad (4) | 56. Cross shaft (2) |
| 14. Idler (2) | 36. Spirol pin (2) | 57. Idler (2) |
| 15. Screw (18) | 37. Sliding support (2) | 58. Spacer bushing (2) |
| 16. Nut (18) | 38. Rear arm | 59. Washer (2) |
| 17. Spacer (2) | 39. Clevis pin (2) | 60. Lockwasher (2) |
| 18. Spacer bushing (2) | 40. Clevis pin | 61. Screw (2) |
| 19. Screw (2) | 41. Stop bonding (2) | 62. Washer (front axle) (2) |
| 20. Front arm | 42. Rear axle | 63. Washer (rear axle) (2) |
| 21. Clevis pin (2) | 43. Spacer tube | 64. Hexagonal wrench (adjustment cam) |
| 22. Washer (2) | 44. Spacer tube (2) | |

SECTION 01
SUB-SECTION 02 (SLIDE SUSPENSION)

TYPE 7
Blizzard 9500



- | | | |
|----------------------------------|-----------------------------|-----------------------------|
| 1. Runner (2) | 22. Rivet (8) | 42. Square nut (2) |
| 2. Slider shoe (2) | 23. Stopper strap | 43. Washer (2) |
| 3. Spirol pin (2) | 24. Washer (2) | 44. Nut (2) |
| 4. Inside front arm bracket (2) | 25. Screw | 45. Adjustment screw (2) |
| 5. Outside front arm bracket (2) | 26. Nut | 46. Bushing (4) |
| 6. Rivet (20) | 27. Adjustment cam R.H. (2) | 47. R.H. front spring |
| 7. Adjustment plate (2) | 28. Clevis pin (4) | 48. R.H. rear spring |
| 8. Reinforcement bracket (8) | 29. Bushing | 49. Cross shaft (2) |
| 9. Swaged tube (2) | 30. Shock | 50. Cross shaft |
| 10. Lockwasher (8) | 31. Sliding pad (4) | 51. Idler (2) |
| 11. Screw (8) | 32. Spirol pin (2) | 52. Spacer bushing (2) |
| 12. Cross shaft | 33. Sliding support (2) | 53. Washer (2) |
| 13. Spacer | 34. Rear arm | 54. Lockwasher (2) |
| 14. Idler (2) | 35. Clevis pin (2) | 55. Screw (2) |
| 15. Washer (4) | 36. Clevis pin | 56. Washer (front axle) (2) |
| 16. Screw (4) | 37. Stop bonding (2) | 57. Washer (rear axle) (2) |
| 17. Front arm | 38. Rear axle | 58. Hexagonal wrench |
| 18. Clevis pin (2) | 39. Spacer tube | (adjustment cam) |
| 19. Washer (2) | 40. Spacer tube (2) | |
| 20. Cotter pin (9) | 41. Idler (2) | |
| 21. Stop bonding (2) | | |

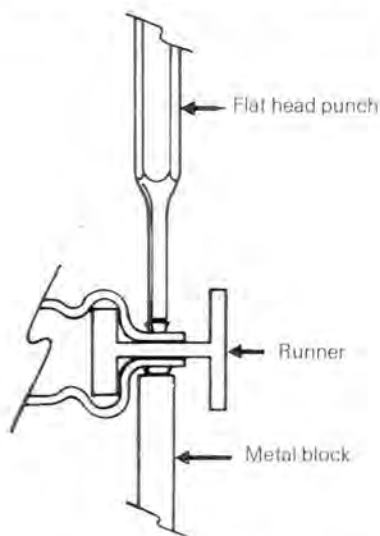
SECTION 01 SUB-SECTION 02 (SLIDE SUSPENSION)

DISASSEMBLY & ASSEMBLY

② ③ To replace a worn slider shoe, remove the rear spirol pin. Slide the shoe rearwards out of the runner.

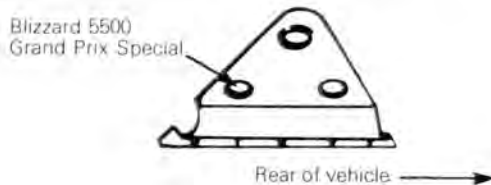
④ ⑤ ⑥ To remove the rivets securing the adjustment plate on the front arm supports, cut off the rivet heads using a cold chisel.

At assembly, position the rivet head on a suitable metal bloc and hold the assembly firmly in place. With a flat head punch and hammer secure the rivet in place.

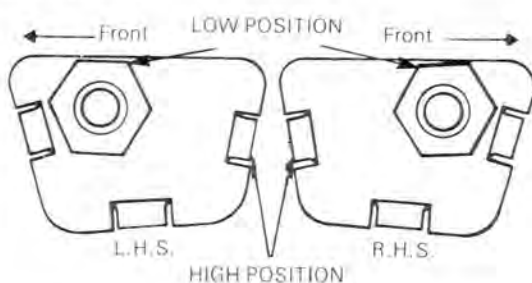


⑦ ⑧ To remove rivet use a 3/16" dia. drill. At assembly, secure reinforcement bracket to runner with two (2) 10-32 x 1/2" bolts and nuts.

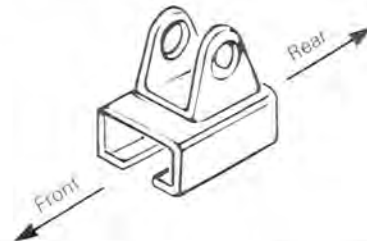
④ ⑪ ⑫ The front idler shaft must be positioned in the front hole of the front arm bracket.



③ ⑰ At assembly, adjustment cam must be installed that hexagonal projection on cam is located toward front of vehicle.



③ ⑱ Sliding support must be installed with offset toward front.



① ④ ⑥ Clean all traces of plastic from threads. Prior to assembly, apply a light coat of "Loctite" thread locking compound or equivalent, on threads.

② ③ ④ ⑦ Prior to assembly, identify front and rear springs. Front spring coil diameter is smaller than rear.

INSTALLATION

Detach front stopper strap and shock absorber of the suspension. Lift the rear of vehicle off the ground.

Place suspension within the track and align front arm of suspension with front holes of frame and secure using bolts and washers. Torque to 43 N•m (32 ft-lbs).

Raise the rear section of the suspension and track into the tunnel and align rear arm with rear holes in frame. Secure to frame using bolts and washers. Torque to 43 N•m (32 ft-lbs).

Reposition vehicle on the ground. Position the adjustment cams at the lowest elevation then apply downward pressure on the seat of vehicle and connect the shock absorber. Attach front stopper strap.



NOTE: There are many installation positions for the stopper strap. The recommended position provides maximum traction and steering efficiency for almost every snow condition. However, for very special purposes or snow condition, it may become necessary to alter this setting. Lengthening the strap (1st hole) has the same effect as shifting the weight toward rear of vehicle; as a result, traction is increased but steering efficiency is decreased. Inversely, by shortening the strap length (last hole), traction is decreased while steering efficiency and effort are increased.

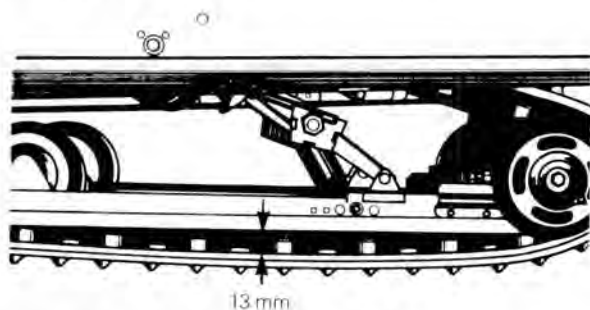
SECTION 01

SUB-SECTION 02 (SLIDE SUSPENSION)

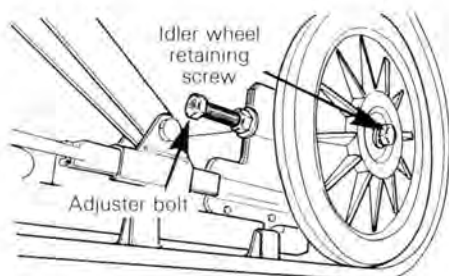
ADJUSTMENT

Track tension

Lift rear of vehicle and support it off the ground. Allow track to extend normally. There must be a gap of 13 mm (1/2") between slider shoe and bottom inside of track, on each side.



To adjust tension, loosen or tighten adjuster bolts located on inner side of rear idler wheels.

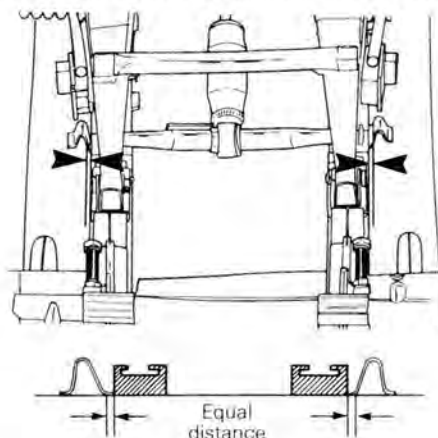


○ **NOTE:** Track tension, track alignment and ride adjustment are interrelated adjustments. The measurement given for ride adjustment is initial. When ride adjustment is finalized for snow condition and driver suitability, it may be necessary to readjust track tension and alignment to specifications.

Track alignment

After track tension has been corrected start the engine and accelerate slightly so that track turns **slowly**. Check that track is well centered.

The distance between the edges of the track guides and the slider shoes should be equal on both sides.



◆ **WARNING:** Before checking track alignment, ensure that the track is free of all particles which could be thrown out while track is rotating. Keep hands, feet, tools and clothing clear of track.

Ride adjustment

The front adjustment cams are used for snow condition, and the rear for driver's weight. The front adjustment cams should be positioned at the lowest elevation for deep snow conditions. A higher elevation is preferred when negotiating icy snow.

The rear adjuster blocks should be adjusted until a distance of 14-16 cm (5 1/2" - 6 1/2") is obtained between rear of footboard and ground when the customer is seated on the vehicle.

▼ **CAUTION:** Always turn left side adjustment cams in a clockwise direction, the right side cams in a counter-clockwise direction. Left and right adjustment cams of each adjustment (front and rear), must always be set at the same elevation.

Refer to the 1978 Bombardier Shop Manual

1979 ELAN
1979 SPIRIT
1979 ALPINE 640 ER

refer to ____ 1978 ____ ELAN
refer to ____ 1978 ____ SPIRIT
refer to ____ 1978 ____ ALPINE 640 ER

DRIVE AXLE

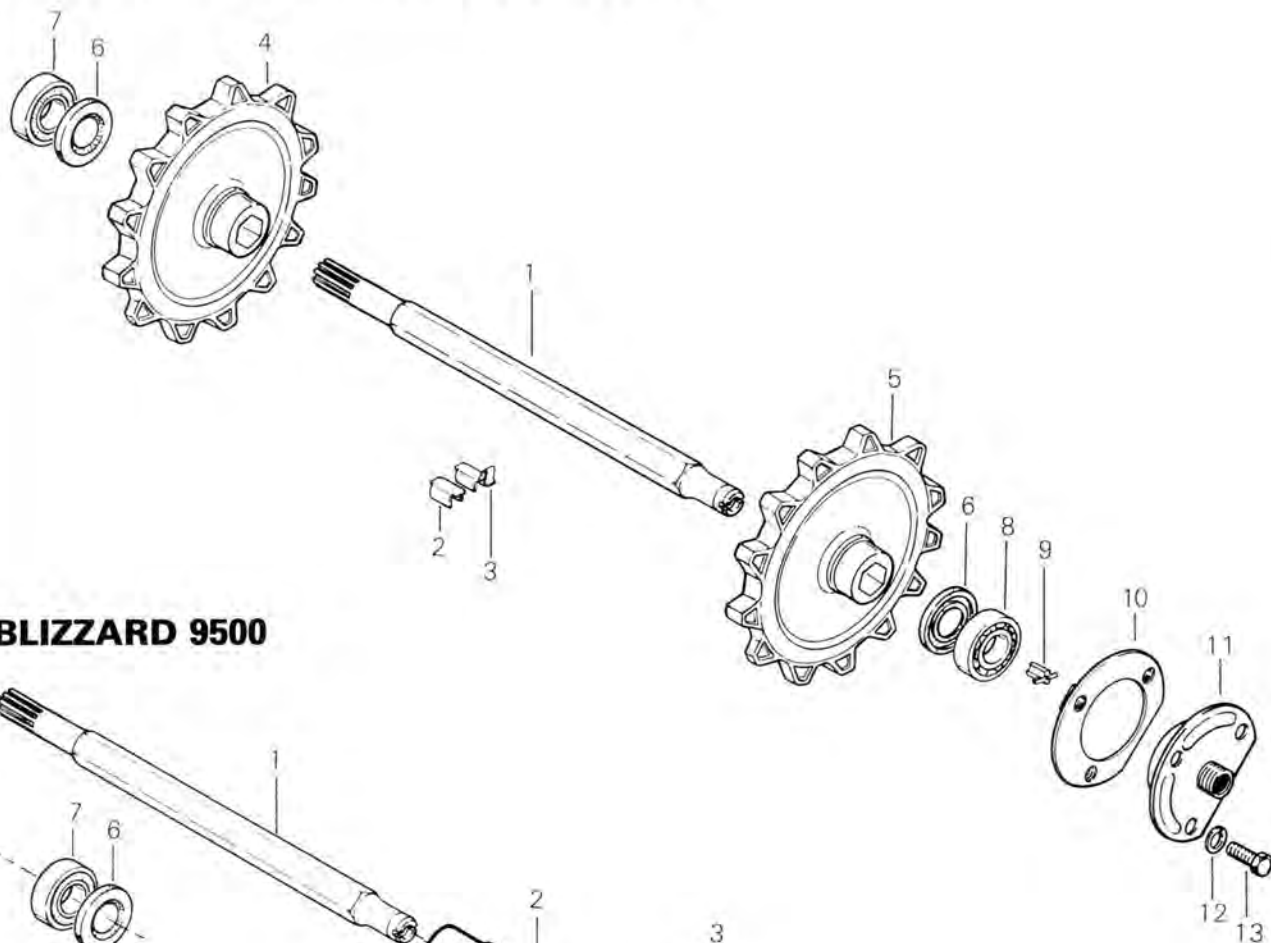
Models covered in this section:

1979 BLIZZARD 5500
1979 GRAND PRIX SPECIAL
1979 BLIZZARD 9500

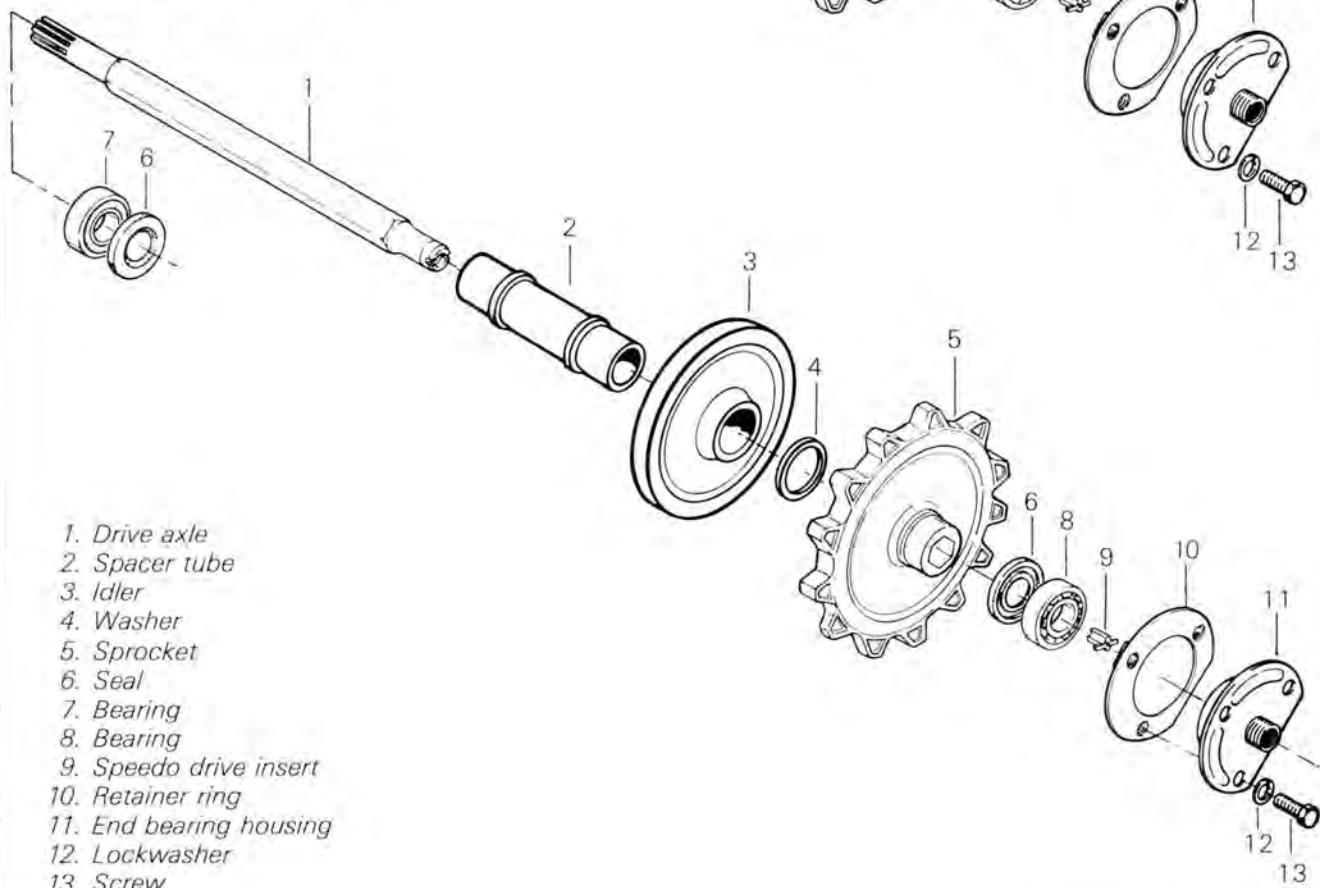
For all other models, refer to the 1978 Bombardier Shop Manual.

1979	ELAN	refer to _____	1978	_____	ELAN
1979	SPIRIT	refer to _____	1978	_____	SPIRIT
1979	OLYMPIQUE	refer to _____	1978	_____	OLYMPIQUE
1979	NUVIK	refer to _____	1978	_____	NUVIK
1979	CITATION	refer to _____	1978	_____	CITATION
1979	MIRAGE	refer to _____	1978	_____	CITATION
1979	EVEREST	refer to _____	1978	_____	EVEREST
1979	FUTURA	refer to _____	1978	_____	FUTURA
1979	BLIZZARD 7500 Plus / CROSS COUNTRY	refer to _____	1978	_____	BLIZZARD 6500 Plus
1979	SUPER SONIC / CROSS COUNTRY	refer to _____	1978	_____	BLIZZARD 6500 Plus
1979	ALPINE 640 ER	refer to _____	1978	_____	ALPINE 640 ER
1979	ELITE 450 LC	refer to _____	1978	_____	ELITE

BLIZZARD 5500 / GRAND PRIX SPECIAL



BLIZZARD 9500



1. Drive axle
2. Spacer tube
3. Idler
4. Washer
5. Sprocket
6. Seal
7. Bearing
8. Bearing
9. Speedo drive insert
10. Retainer ring
11. End bearing housing
12. Lockwasher
13. Screw

REMOVAL

Drain the oil from the chaincase.

Raise and block the rear of the vehicle off the ground.

Remove the suspension.

Remove the oil seals.

Remove the speedometer angle drive unit and coupling cable.

Release the drive sprocket teeth from the track notches, at the same time, pulling the drive axle towards the end bearing housing side of frame.

Remove the drive axle from the vehicle.

ASSEMBLY

⑥ When assembling drive axle, always position a new oil seal on each end of drive axle. The seal lip must face the sprocket.

⑦⑧ Always pull or push bearing by inner race.

The bearing on the splined side of axle must be installed as per given specifications. The bearing housing must be flush with end of drive axle. Each bearing must have its shield facing the sprocket.

⑨ If the drive axle to be installed is a new component, and the vehicle is equipped with a speedometer, a correct size speedometer drive insert must be installed into the axle end. Ensure that the insert is flush with the end of axle.

○ NOTE: Idler wheels must turn freely.

SECTION 01

SUB-SECTION 04 (DRIVE AXLE)

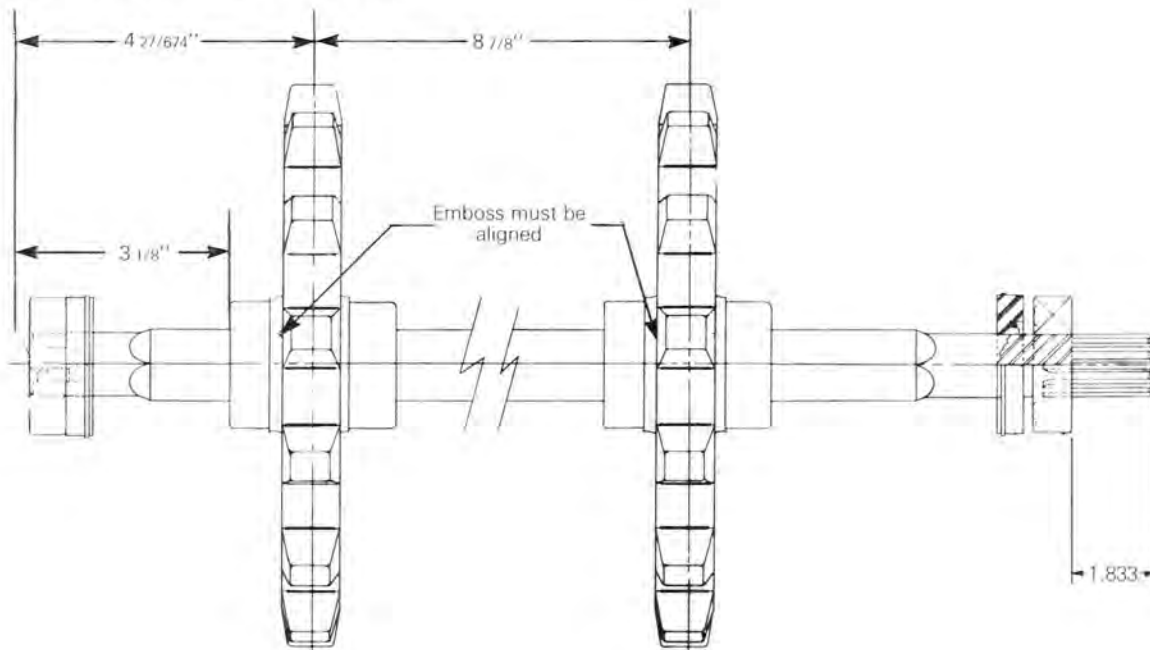
DRIVE SPROCKET REPLACEMENT

Drive sprockets are of press fit design.

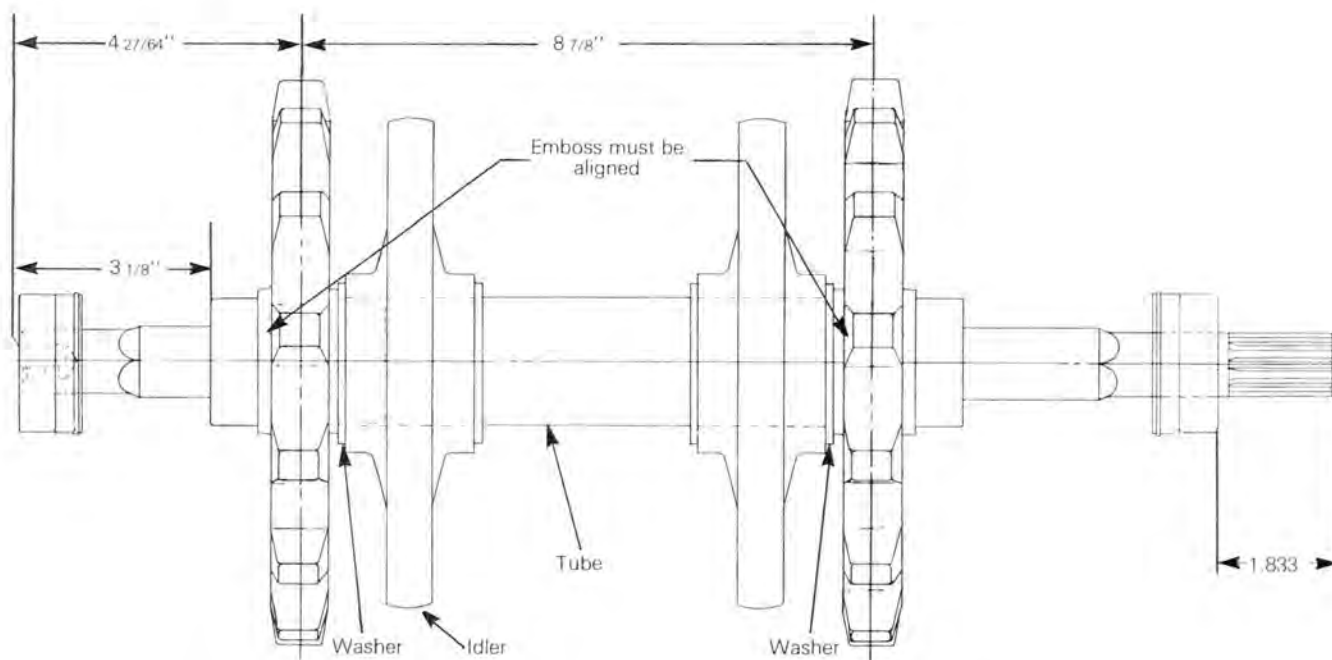
When reassembling, make sure to align the embossments of the sprockets.

The center to center distance of the drive sprockets must be as specified. Refer to illustration for proper installation.

GRAND PRIX SPECIAL BLIZZARD 5500



BLIZZARD 9500



INSTALLATION

Position the drive axle assembly with new oil seals into location.

Install the end bearing housing.

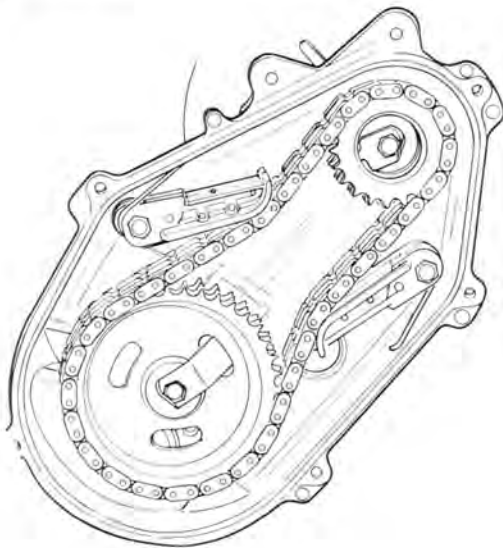
Reinstall the sprockets, chain, flat washers.

Install the tab locks as illustrated.

Install the screws and torque to 9.5 N•m (7 ft-lbs).

Bend the tab locks.

CAUTION: Lock tabs should be replaced if bent more than twice. If in doubt, replace.



Reinstall the chaincase cover.

Refill with chaincase oil.

Install the suspension. Apply track tension and carry out track alignment procedure.

TRACK

Refer to the 1978 Bombardier shop manual

PULLEY GUARD

Models covered in this section:

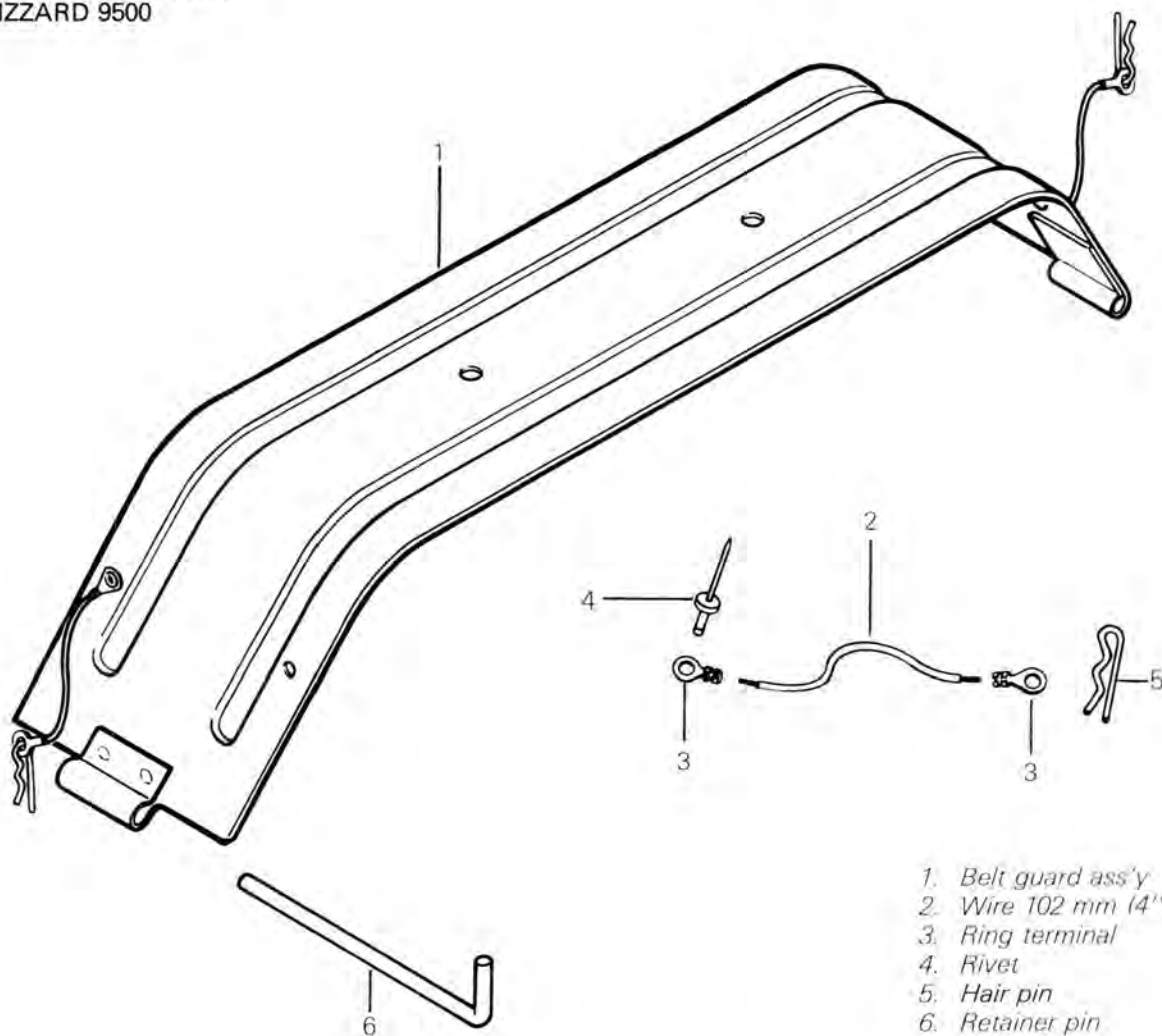
1979 BLIZZARD 5500
1979 GRAND PRIX SPECIAL
1979 BLIZZARD 9500

For all other models, refer to the 1978 Bombardier Shop Manual.

1979	ELAN	refer to ____	1978	____	ELAN
1979	SPIRIT	refer to ____	1978	____	SPIRIT
1979	OLYMPIQUE	refer to ____	1978	____	OLYMPIQUE
1979	NUVIK	refer to ____	1978	____	NUVIK
1979	CITATION	refer to ____	1978	____	CITATION
1979	MIRAGE	refer to ____	1978	____	CITATION
1979	EVEREST	refer to ____	1978	____	EVEREST
1979	FUTURA	refer to ____	1978	____	FUTURA
1979	BLIZZARD 7500 Plus / CROSS COUNTRY	refer to ____	1978	____	BLIZZARD 6500 Plus
1979	SUPER SONIC / CROSS COUNTRY	refer to ____	1978	____	BLIZZARD 6500 Plus
1979	ALPINE 640 ER	refer to ____	1978	____	ALPINE 640 ER
1979	ELITE 450 LC	refer to ____	1978	____	ELITE

SECTION 02
SUB-SECTION 01 (PULLEY GUARD)

BLIZZARD 5500
GRAND PRIX SPECIAL
BLIZZARD 9500



REMOVAL

Remove the two hair pins and the retainer pins, then remove the belt guard.

◆ **WARNING:** Never start the engine without the pulley guard secured in place and the cab closed.

INSPECTION

Check all parts for wear and tear. Replace as required.

DRIVE BELT

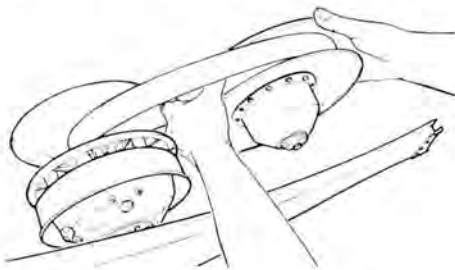
REMOVAL & INSTALLATION

When removing a drive belt, always mark the rotation direction. Reinstall in the same direction.

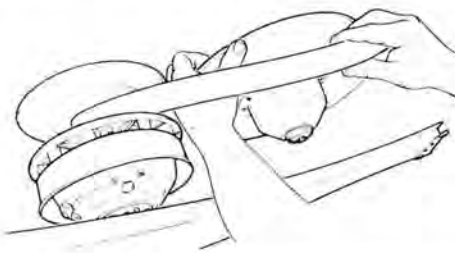
Drive Belt Removal

WARNING: Never start or run engine without the drive belt installed. Running an unloaded engine is dangerous.

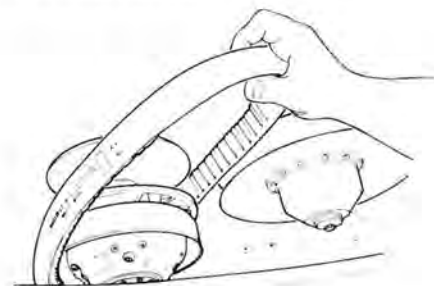
1. Tilt the cab and remove the belt guard.
2. Open the driven pulley by twisting and pushing the sliding half. Hold in fully open position.



3. Slip the belt over the top edge of the sliding half.



4. Slip the belt out from the drive pulley and remove completely from the vehicle. To install the drive belt, reverse the procedure.



TENSION ADJUSTMENT

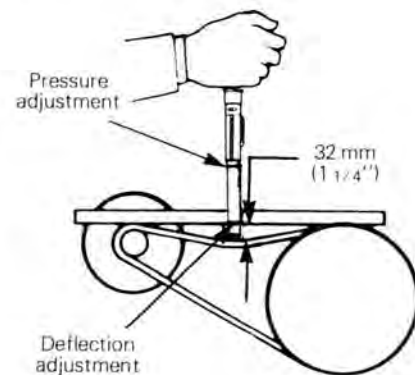
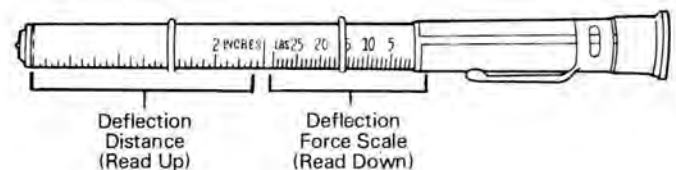
For proper drive belt use, See Technical Data.

If a drive belt does not have the minimum recommended width, performance will be affected.

Adjust belt tension as follows:

"V" Belt tension tester method P / N 414 3482 00

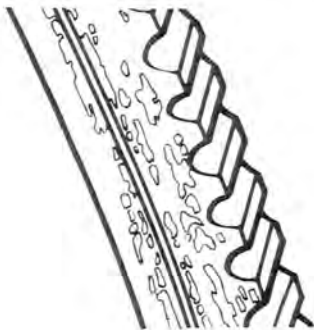
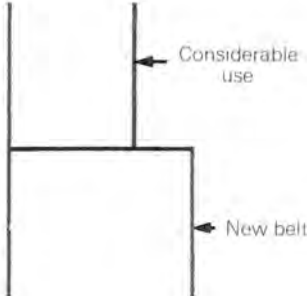
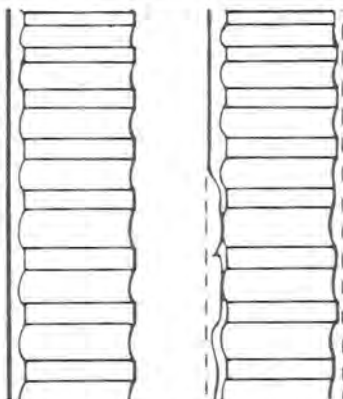
1. Slide lower "O" ring of deflection distance scale to 32 mm (1 1/4").
2. Slide upper "O" ring to zero distance on the deflection force scale.
3. Using wooden rule and tester, apply pressure until lower "O" ring is flush with edge of rule.
4. Read deflection force on the upper scale (at top edge of "O" ring). Reading of 6.8 kg (15 pounds) should be obtained.



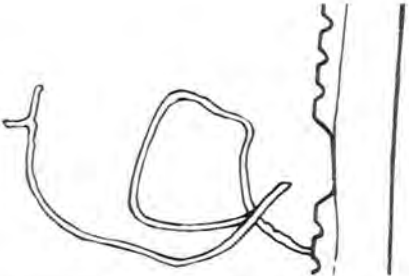
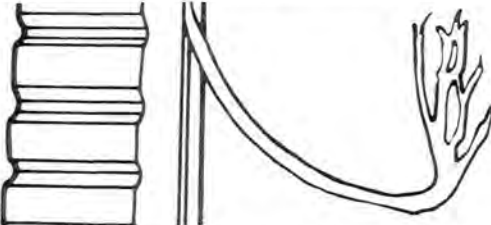
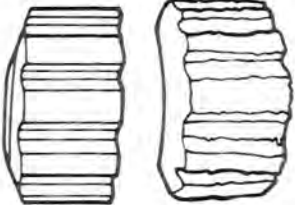
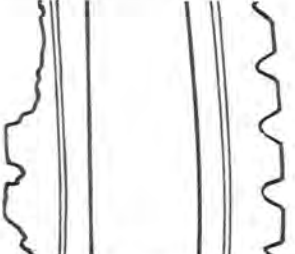
To correct, decrease or increase between pulleys.

SECTION 02
SUB-SECTION 02 (DRIVE BELT)

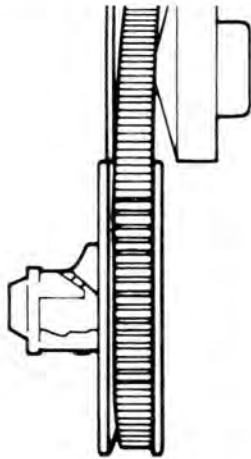
TROUBLE SHOOTING

1. Uneven belt wear on one side only.		
	CAUSE a) Loose engine mount. b) Pulley misalignment. c) Rough or scratched pulley surfaces.	REMEDY a) Tighten engine mount nuts equally. b) Align pulleys. c) Repair or replace pulley half.
2. Belt glazed excessively or having baked appearance.		
	CAUSE Excessive slippage caused by: a) Insufficient pressure on belt sides. b) Rusted drive or driven pulley shafts. c) Oil on pulley surfaces. d) Incorrect centrifugal governor.	REMEDY a) Check drive pulley for worn or missing flyweights/rollers. b) Clean shaft with steel wool. c) Clean pulley surfaces with fine emery cloth and clean cloth. d) Install correct governor.
3. Belt worn excessively in top width.		
	CAUSE a) Excessive slippage due to irregular outward actuation movement of drive pulley. b) Rough or scratched pulley surfaces. c) Improper belt angle. d) Considerable use.	REMEDY a) Carry out inspection. b) Repair or replace pulley. c) Using unspecified type of belt. Replace belt with correct Bombardier belt. d) Replace belt if 3 mm (1/8") less than recommended width (see Technical Data).
4. Belt worn narrow in one section.		
	CAUSE Excessive slippage in drive pulley caused by: a) Frozen or too tight track. b) Drive pulley not functioning properly. c) Engine idle speed too high. d) Incorrect belt length. e) Incorrect pulley distance.	REMEDY a) Liberate track from ice or check track tension and alignment. b) Repair or replace drive pulley. c) Reduce engine RPM. d) Using unspecified type of belt. Replace belt with correct Bombardier belt. e) Readjust to specifications.

SECTION 02
SUB-SECTION 02 (DRIVE BELT)

5. Belt sides worn convave.		
	CAUSE a) Rough or scratched pulley surfaces. b) Unspecified type of belt.	REMEDY a) Repair or replace. b) Replace belt with correct Bombardier belt.
6. Belt desintegration.		
	CAUSE a) Excessive belt speed. b) Oil on pulley surfaces. c) Incorrect gear ratio.	REMEDY a) Using unspecified type of belt. Replace belt with proper type of belt. b) Clean pulley surfaces with fine emery cloth. c) Install specified sprocket (correct gear ratio).
7. Belt edge cord breakage.		
	CAUSE a) Pulley misalignment.	REMEDY a) Align pulleys.
8. Flex cracks between cogs.		
	CAUSE a) Considerable use, belt wearing out.	REMEDY a) Replace belt.
9. Sheared cogs, compression section fracture or torn.		
	CAUSE a) Improper belt installation. b) Belt rubbing stationary object on pulleys. c) Violent engagement of drive pulley.	REMEDY a) Refer to Installation section. b) Check drive components. c) Replace spring or duralon bushing

SECTION 02
SUB-SECTION 02 (DRIVE BELT)

10. Belt "Flip-Over" at high speed		
 A technical line drawing showing a cross-section of a drive belt. The belt is shown in a state of 'flip-over', where the top half of the belt has rotated 180 degrees around its longitudinal axis. The belt is positioned between two pulleys or sprockets. The top pulley is partially visible on the right, and the bottom pulley is partially visible on the left. The belt's teeth are clearly visible on both the top and bottom surfaces.	CAUSE a) Pulley misalignment. b) Belt excessive speed. c) Incorrect sprocket ratio.	REMEDY a) Align pulleys. b) Using unspecified type of belt. Replace belt with correct Bombardier belt. c) Install specified sprocket (correct gear ratio).

DRIVE PULLEY

Refer to the 1978 Bombardier Shop Manual

1979	ELAN	refer to ____ 1978 ____ ELAN
1979	SPIRIT	refer to ____ 1978 ____ SPIRIT
1979	OLYMPIQUE	refer to ____ 1978 ____ OLYMPIQUE
1979	NUVIK	refer to ____ 1978 ____ NUVIK
1979	CITATION	refer to ____ 1978 ____ CITATION
1979	MIRAGE	refer to ____ 1978 ____ CITATION
1979	EVEREST	refer to ____ 1978 ____ EVEREST
1979	FUTURA	refer to ____ 1978 ____ FUTURA
1979	BLIZZARD 5500	refer to ____ 1978 ____ BLIZZARD 6500 Plus
1979	GRAND PRIX Special	refer to ____ 1978 ____ BLIZZARD 6500 Plus
1979	BLIZZARD 7500 Plus / CROSS COUNTRY	refer to ____ 1978 ____ BLIZZARD 6500 Plus
1979	SUPER SONIC / CROSS COUNTRY	refer to ____ 1978 ____ BLIZZARD 6500 Plus
1979	BLIZZARD 9500 Plus	refer to ____ 1978 ____ BLIZZARD 6500 Plus
1979	ALPINE 640 ER	refer to ____ 1978 ____ ALPINE 640 ER
1979	ELITE 450 LC	refer to ____ 1978 ____ ELITE

DRIVEN PULLEY

Models covered in this section:

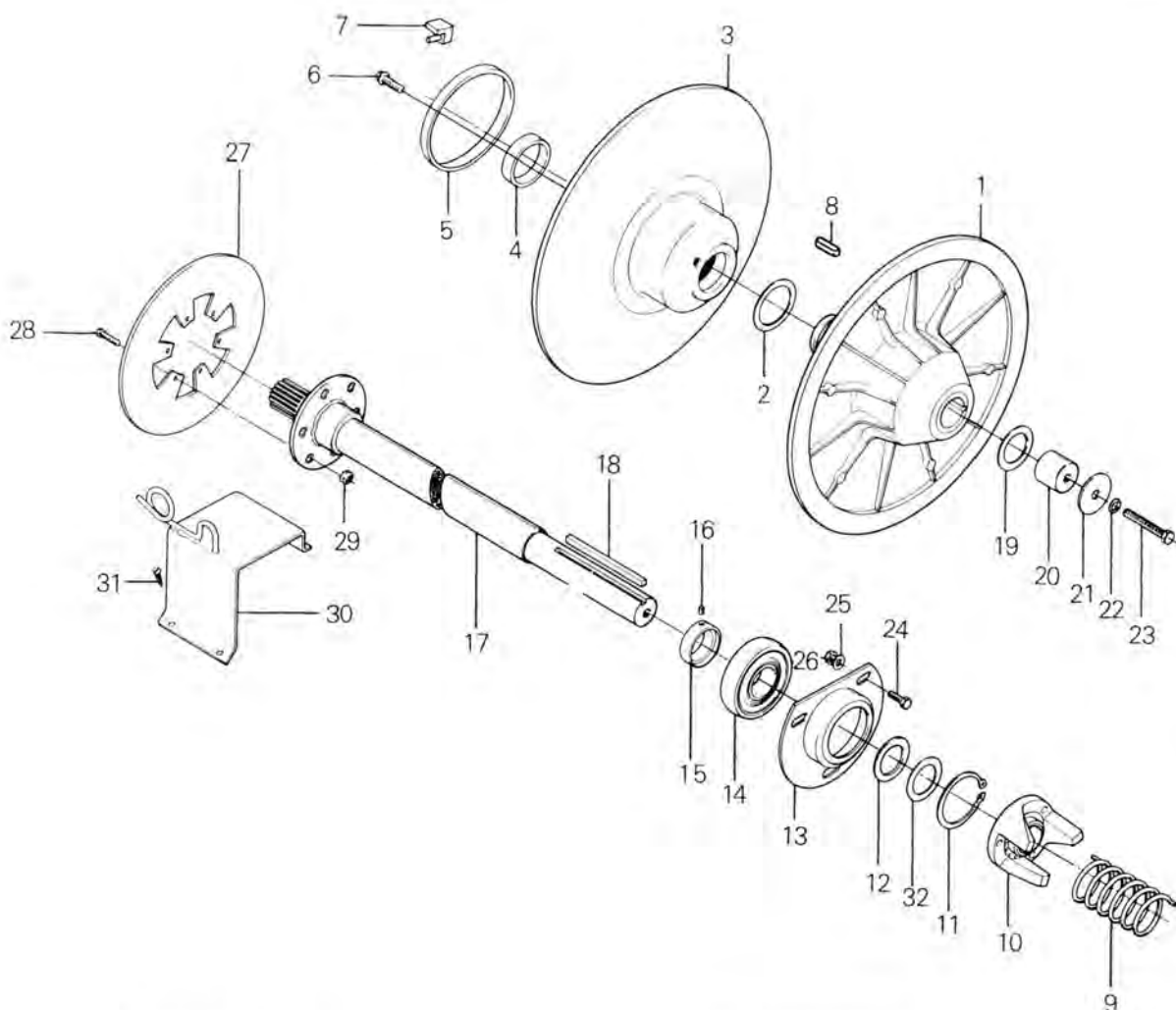
1979 BLIZZARD 5500
1979 GRAND PRIX SPECIAL
1979 BLIZZARD 9500

For all other models, refer to the 1978 Bombardier Shop Manual.

1979	ELAN	refer to ____ 1978 ____ ELAN
1979	SPIRIT	refer to ____ 1978 ____ SPIRIT
1979	OLYMPIQUE	refer to ____ 1978 ____ OLYMPIQUE
1979	NUVIK	refer to ____ 1978 ____ NUVIK
1979	CITATION	refer to ____ 1978 ____ CITATION
1979	MIRAGE	refer to ____ 1978 ____ CITATION
1979	EVEREST	refer to ____ 1978 ____ EVEREST
1979	FUTURA	refer to ____ 1978 ____ FUTURA
1979	BLIZZARD 7500 Plus / CROSS COUNTRY	refer to ____ 1978 ____ BLIZZARD 6500 Plus
1979	SUPER SONIC / CROSS COUNTRY	refer to ____ 1978 ____ BLIZZARD 6500 Plus
1979	ALPINE 640 ER	refer to ____ 1978 ____ ALPINE 640 ER
1979	ELITE 450 LC	refer to ____ 1978 ____ ELITE

SECTION 02
SUB-SECTION 04 (DRIVEN PULLEY)

TYPE 7

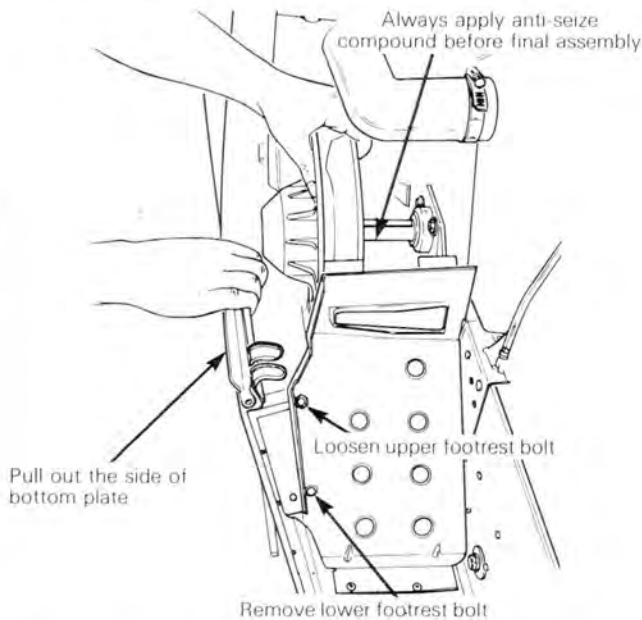


1. Fixed pulley
2. Shim
3. Sliding pulley
4. Bushing
5. Bushing
6. Hexagonal washer head screw
7. Cam slider shoe
8. Key
9. Release spring
10. Cam
11. Snap ring
12. Spacer
13. Bearing flange
14. Bearing
15. Collar
16. Allen Screw

17. Countershaft
18. Key
19. Shim
20. Spacer
21. Washer
22. Lockwasher
23. Screw
24. Hexagonal washer head screw
25. Washer
26. Nut
27. Brake disc
28. Screw
29. Nut
30. Countershaft protector
31. Sheet metal screw
32. Shim

REMOVAL

- Loosen upper footrest bolt and remove lower one.
- Pull out the side of the bottom plate. Remove pulley assembly.



CAUTION: Always apply anti-seize compound on the countershaft before final pulley installation (Loctite anti-seize lubricant P/N 413 7010 00).

DISASSEMBLY & ASSEMBLY

DRIVEN PULLEY BUSHING REPLACEMENT

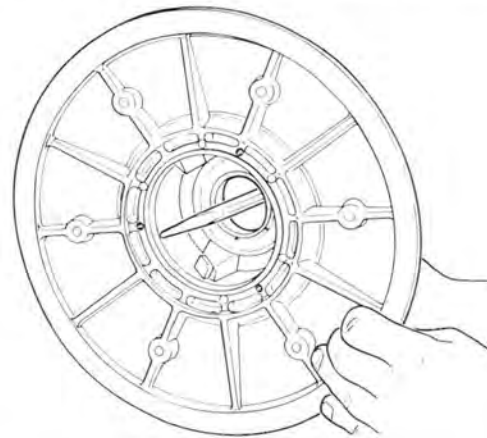
To replace the outer and inner bushings of the floating type driven pulley, proceed as follows:

Remove and disassemble driven pulley assembly.

Outer bushing:

Remove the three (3) screws on sliding half.

Remove the bushing with a pin punch, as illustrated.



Clean the bushing seat with Bombardier Stripper No 57.

Coat the seat with Loctite No 271 (high strength) red.

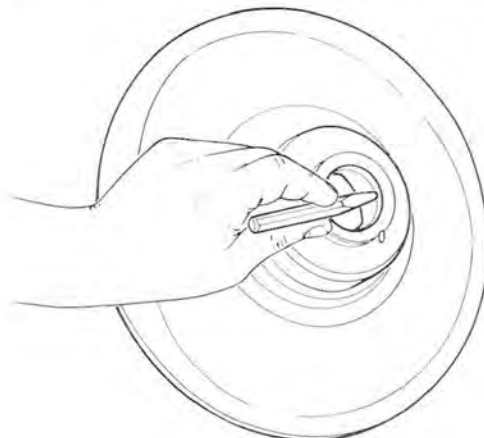
Install the new bushing (gently tap in place).

Reinstall screws, using Loctite 242 (medium strength) blue.

Reassemble pulley.

Inner bushing:

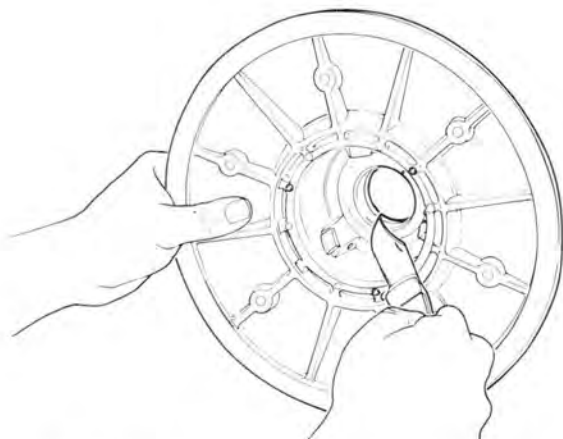
Remove the bushing with a pin punch, as illustrated.



SECTION 02

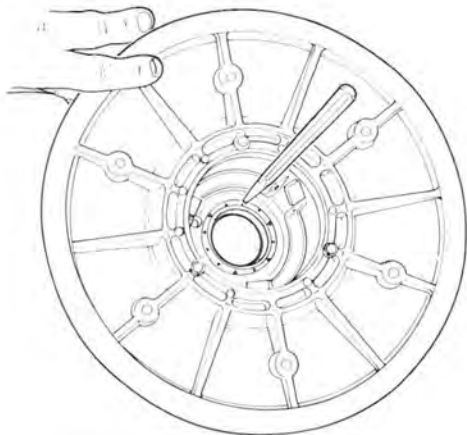
SUB-SECTION 04 (DRIVEN PULLEY)

Round out punch marks to permit new bushing to fit in.



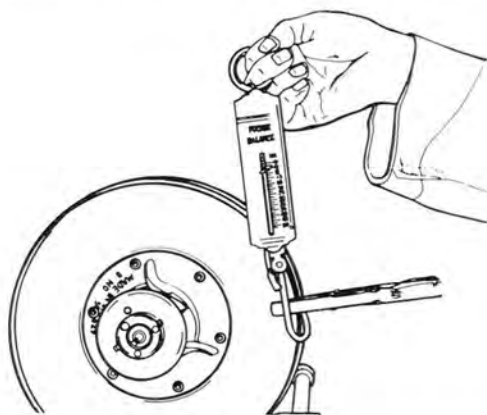
Clean the seat with Bombardier Stripper No 57.
Coat the seat with Loctite No 271 (high strength) red.
Install a new bushing (gently tap in place).

Secure bushing in place by punching the bushing shoulder rib (as illustrated).



Reassemble pulley.

In order to measure driven pulley spring tension, the pulley halves must be separated. To do this, insert a length of 1/8" dia. rod between the halves. Check tension using a fish scale positioned 90° with pulley axle. (Refer to Technical Data for correct spring tension).



To correct spring tension either relocate spring end in sliding pulley half, or gradually rotate outer cam.

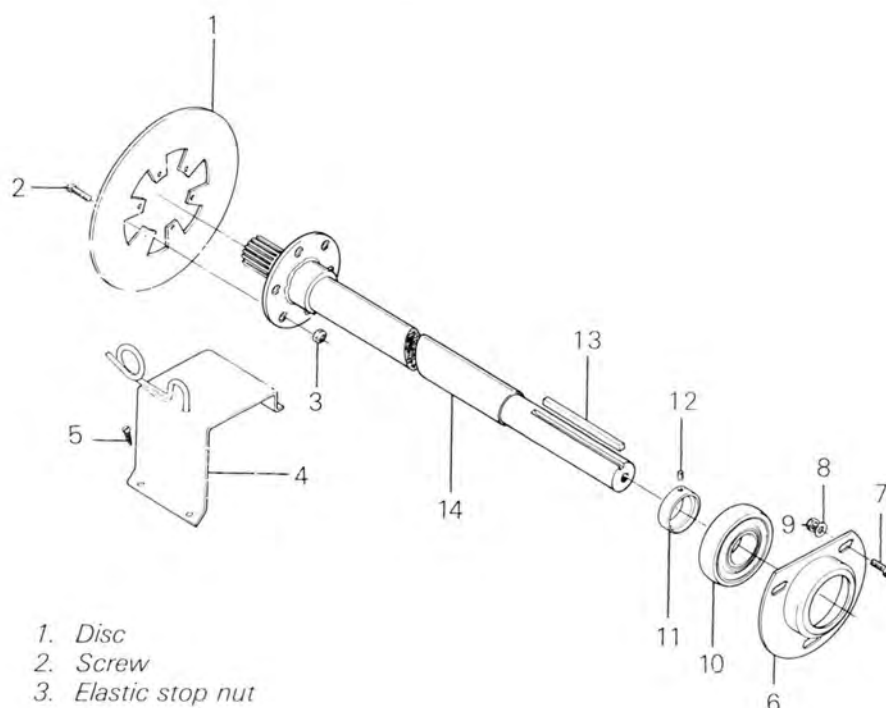
INSTALLATION

Reinstall pulley, outer shims, lockwasher and bolt. Torque to 9 N•m (7 ft-lbs).

IMPORTANT: Maximum free-play should not exceed 3 mm (1/8").

CAUTION: Always apply anti-seize (Loctite anti-seize lubricant P/N 413 7010 00) compound on countershaft before final pulley installation.

COUNTERSHAFT



1. Disc
2. Screw
3. Elastic stop nut
4. Protector
5. Sheet metal screw
6. Bearing flange
7. Hexagonal head screw
8. Washer
9. Nut
10. Bearing
11. Collar
12. Set screw
13. Key
14. Countershaft

REMOVAL

Remove the suspension, brake caliper ass'y, air intake silencer, belt guard and drive belt.

Remove the shaft protector plate.

Remove the chaincase ass'y (chaincase cover, sprockets, chain, drive axle seal, chaincase).

Remove the driven pulley ass'y and all shims.

Unlock the countershaft bearing (loosen the Allen screw then turn counter-clockwise). Disassemble the bearing and the bearing flange and remove.

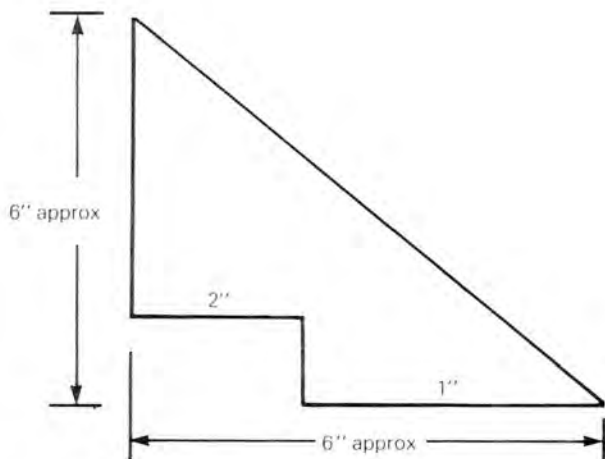
Remove the countershaft and the brake disc ass'y.

SECTION 02

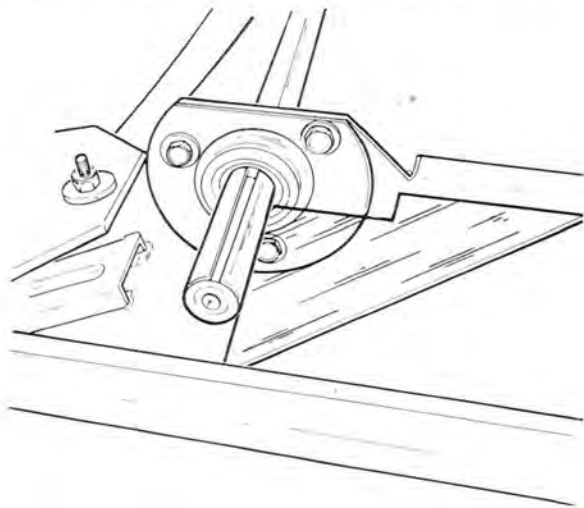
SUB-SECTION 04 (DRIVEN PULLEY)

INSTALLATION

- Reinstall the countershaft and the flange bearing ass'y. (Do not fully tighten the bearing flange until the alignment of the countershaft is completed).
- Reinstall the chaincase, oil seal, sprockets, drive chain, tab locks. Torque sprocket retaining bolts to 9 N•m (7 ft-lbs). Bend tab locks.
- To align the countershaft use a 6" (approx) plastic square. (Cut out a 1" x 2" section as illustrated).



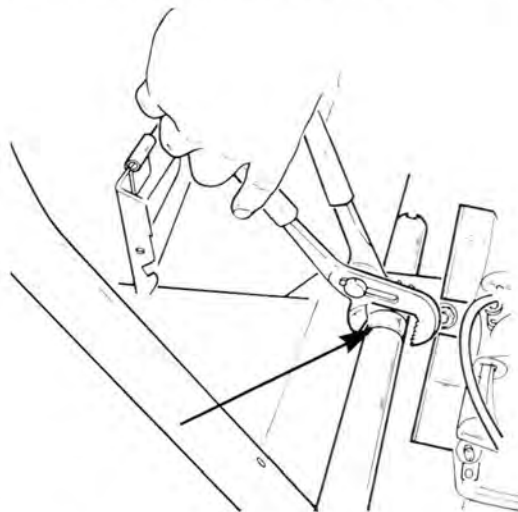
Apply the square on the countershaft and on the side of the frame. The square must be horizontal.



Adjust the countershaft so that it is perpendicular to the frame. (Use a plastic hammer to adjust, to not tap on the keyway).

When the shaft is well adjusted, tighten all nuts.

Tighten bearing collar against bearing seat until well seated, then lock in place by tightening the Allen set screw. (Loctite 242 blue medium strength).



Lubricate the countershaft with antiseize lubricant.

Install the pulley ass'y and shims, chaincase cover, chaincase oil.

Reinstall the countershaft protector plate.

Install the air intake silencer and the brake caliper ass'y.

Check the pulley alignment.

Install the drive belt.

CAUTION: When adjusting the pulley alignment, never tamper or modify the countershaft adjustment. Use the engine support bolts to obtain correct pulley distance.

Install the belt guard.

Install the suspension.

Check the track tension and alignment.

PULLEY ALIGNMENT

Models covered in this section:

1979 BLIZZARD 5500
1979 GRAND PRIX SPECIAL
1979 BLIZZARD 9500

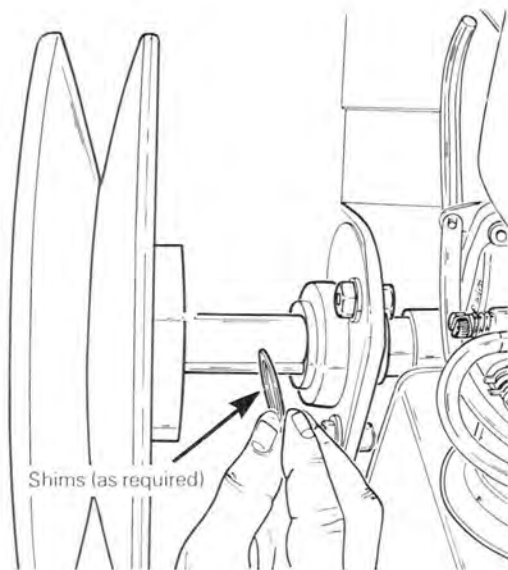
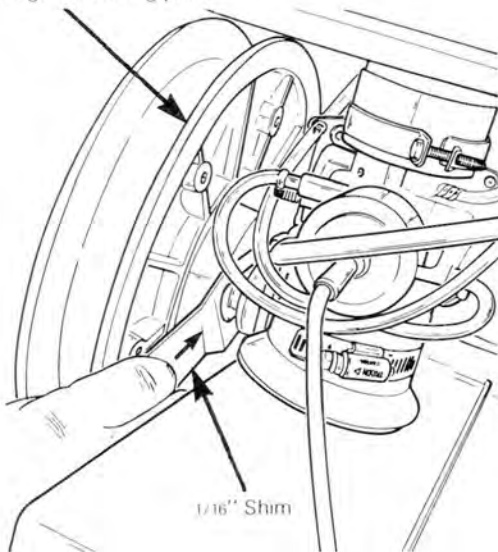
For all other models, refer to the 1978 Bombardier Shop Manual.

1979	ELAN	refer to	_____	1978	_____	ELAN
1979	SPIRIT	refer to	_____	1978	_____	SPIRIT
1979	OLYMPIQUE	refer to	_____	1978	_____	OLYMPIQUE
1979	NUVIK	refer to	_____	1978	_____	NUVIK
1979	CITATION	refer to	_____	1978	_____	CITATION
1979	MIRAGE	refer to	_____	1978	_____	CITATION
1979	EVEREST	refer to	_____	1978	_____	EVEREST
1979	FUTURA	refer to	_____	1978	_____	FUTURA
1979	BLIZZARD 7500 Plus / CROSS COUNTRY	refer to	_____	1978	_____	BLIZZARD 6500 Plus
1979	SUPER SONIC / CROSS COUNTRY	refer to	_____	1978	_____	BLIZZARD 6500 Plus
1979	ALPINE 640 ER	refer to	_____	1978	_____	ALPINE 640 ER
1979	ELITE 450 LC	refer to	_____	1978	_____	ELITE

SECTION 02
SUB-SECTION 05 (PULLEY ALIGNMENT)

PULLEY ALIGNMENT PROCEDURE

With 1/16" shim in place, push assembly
in against bearing plate



OFFSET

— dimension x & y (offset)	34 mm (1 11/32")
-------------------------------	------------------

Floating type driven pulley requires a special procedure to correctly measure offset.

- Install a 1/16" gauge between pulley and bearing plate.
- Then measure offset (usual method).

IMPORTANT: Make sure driven pulley assembly is fully seated against bearing flange when measuring offset.

- Adjust the offset by adding or removing shims.

NOTE: To add or remove shims, pulley assembly must be removed as per driven pulley removal procedure.

- When alignment is completed, remove 1/16" gauge.

If pulley was removed:

Reinstall the pulley, outer shims, lockwasher and bolt. Torque to 9 N•m (7 ft-lbs).

IMPORTANT: Maximum free-play should not exceed 3 mm (1/8").

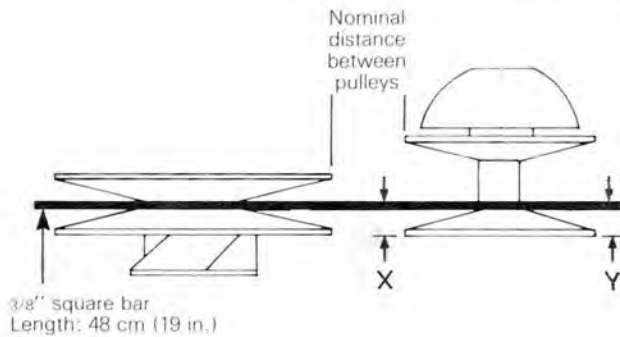
CAUTION: Always apply anti-seize compound (Loctite anti-seize lubricant P/N 413 7010 00) on the countershaft before final assembly.

SECTION 02

SUB-SECTION 05 (PULLEY ALIGNMENT)

NOMINAL DISTANCE

— nominal distance (between pulleys)	35 mm (1 3/8")
---	----------------



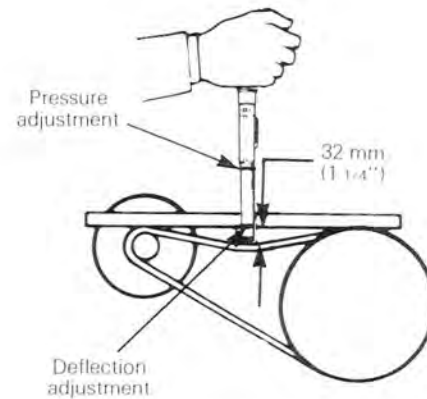
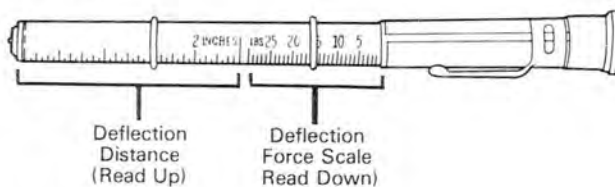
- Dimension "X" must never exceed dimension "Y".
- Dimension "Y" can exceed dimension "X" by 1.6 mm (1/16").

To obtain maximum vehicle performance, adjust pulley distance as follows:

1. Adjust pulley distance to nominal distance.
2. Prior to final adjustment, the drive belt must have a break-in period time of one to two minutes.
3. The final adjustment of pulley distance should be performed by using the belt deflection method that follows:

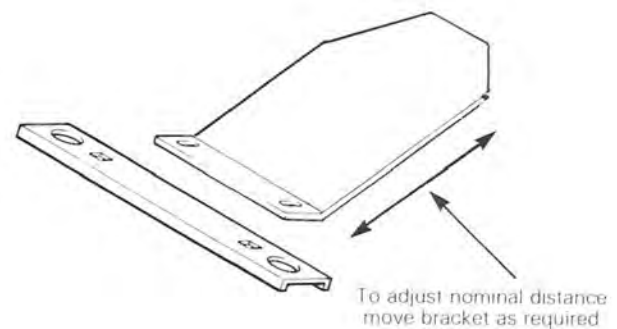
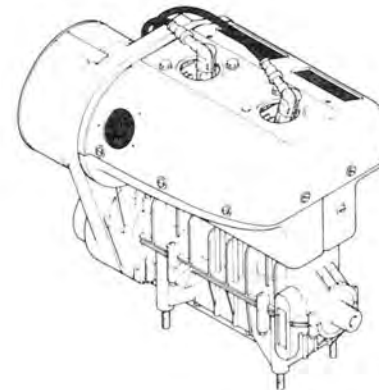
V-Belt tension tester (part no. 414 3482 00).

1. Slide lower "O" ring of deflection distance scale to 32 mm (1 1/4").
2. Slide upper "O" ring to zero distance on the deflection force scale.
3. Using wooden rule and tester, apply pressure until lower "O" ring is flush with edge of rule.
4. Read deflection force on the upper scale (at top edge of "O" ring). Reading of 6.8 kg (15 lbs) should be obtained.



To correct, decrease or increase distance between pulleys by moving engine bracket as required.

IMPORTANT: If engine bracket was moved, offset alignment should be rechecked.





BRAKE

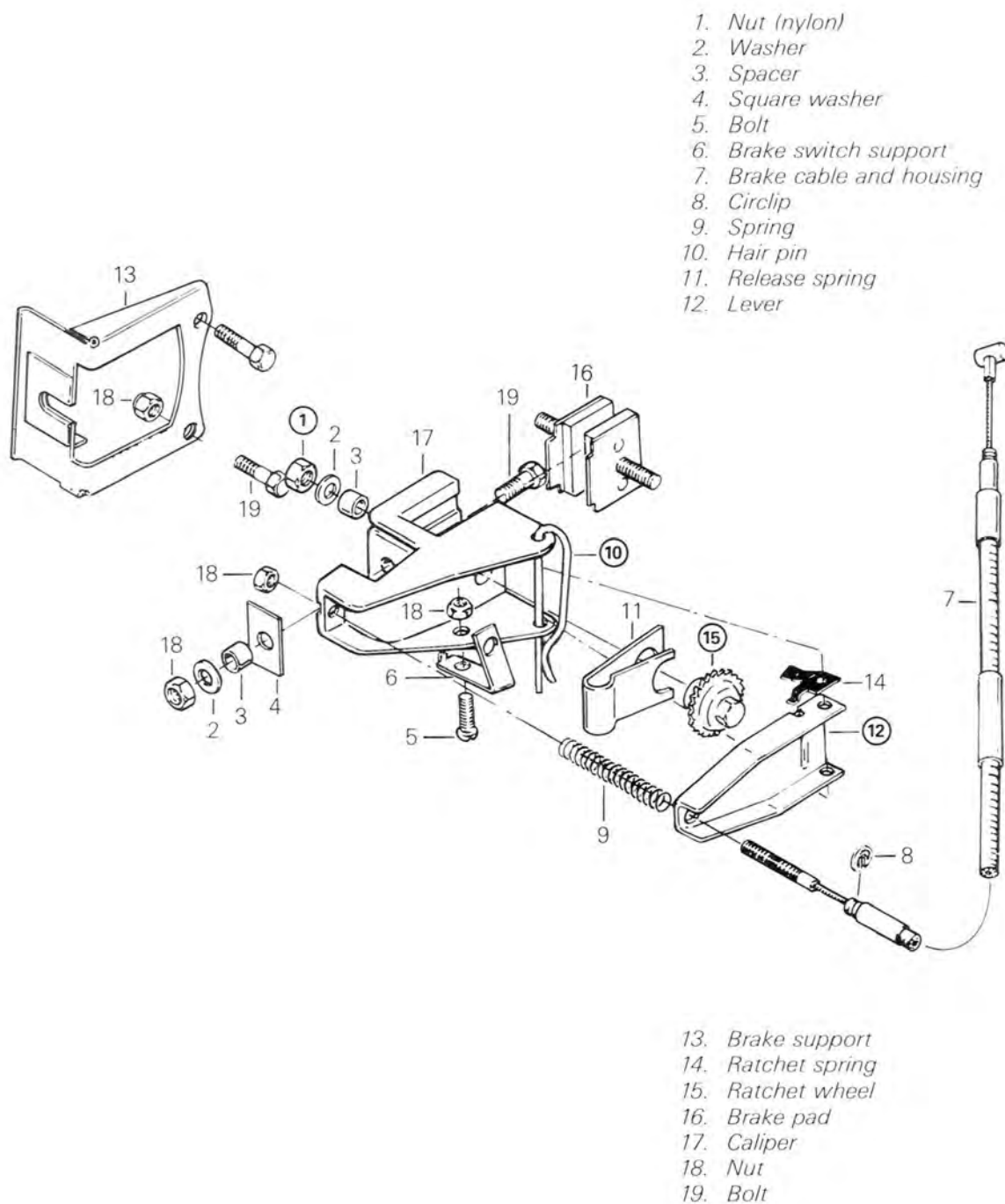
Models covered in this section:

1979 BLIZZARD 5500
1979 GRAND PRIX SPECIAL
1979 BLIZZARD 9500

For all other models, refer to the 1978 Bombardier Shop Manual.

1979	ELAN	refer to	_____	1978	_____	ELAN
1979	SPIRIT	refer to	_____	1978	_____	SPIRIT
1979	OLYMPIQUE	refer to	_____	1978	_____	OLYMPIQUE
1979	NUVIK	refer to	_____	1978	_____	NUVIK
1979	CITATION	refer to	_____	1978	_____	CITATION
1979	MIRAGE	refer to	_____	1978	_____	CITATION
1979	EVEREST	refer to	_____	1978	_____	EVEREST
1979	FUTURA	refer to	_____	1978	_____	FUTURA
1979	BLIZZARD 7500 Plus / CROSS COUNTRY	refer to	_____	1978	_____	BLIZZARD 6500 Plus
1979	SUPER SONIC / CROSS COUNTRY	refer to	_____	1978	_____	BLIZZARD 6500 Plus
1979	ALPINE 640 ER	refer to	_____	1978	_____	ALPINE 640 ER
1979	ELITE 450 LC	refer to	_____	1978	_____	ELITE

BOMBARDIER SELF-ADJUSTING TYPE



REMOVAL

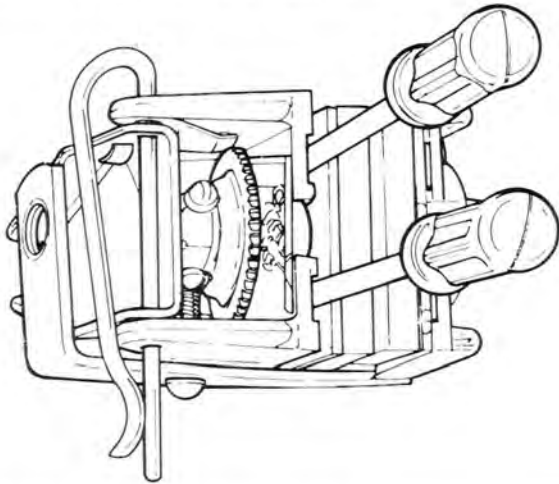
Disconnect brake switch and brake cable.

Remove nuts and/or bolts securing brake support to chaincase.

Slide brake caliper ass'y from brake support.

DISASSEMBLY & ASSEMBLY

⑩ ⑫ To ease hair pin assembly, activate lever and wedge two (2) screwdriver blades between caliper and brake pad to release lever tension.



⑮ Apply low temperature grease on threads and spring seat prior to installation. At assembly, fully tighten then back off 1/2 turn.

① At assembly, torque to 20 N•m (15 ft-lbs).

CLEANING AND INSPECTION

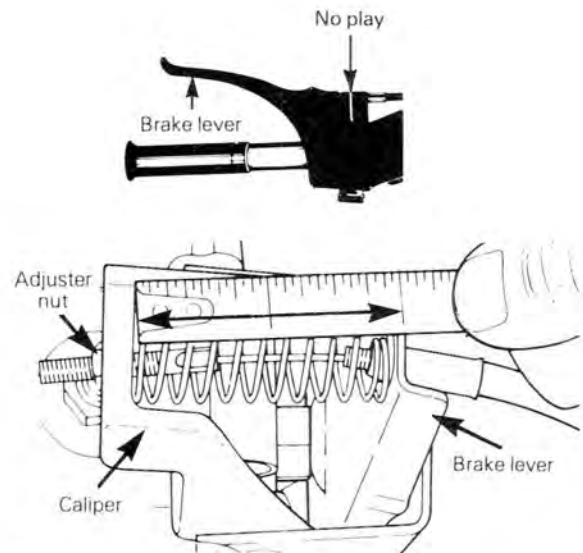
Measure thickness of brake pad. If less than 3 mm (1/8"), the pad should be replaced.

Clean all metal components in a general purpose solvent. Dry using clean cloth.

INSTALLATION & ADJUSTMENT

Slide caliper ass'y onto its support then secure support to vehicle.

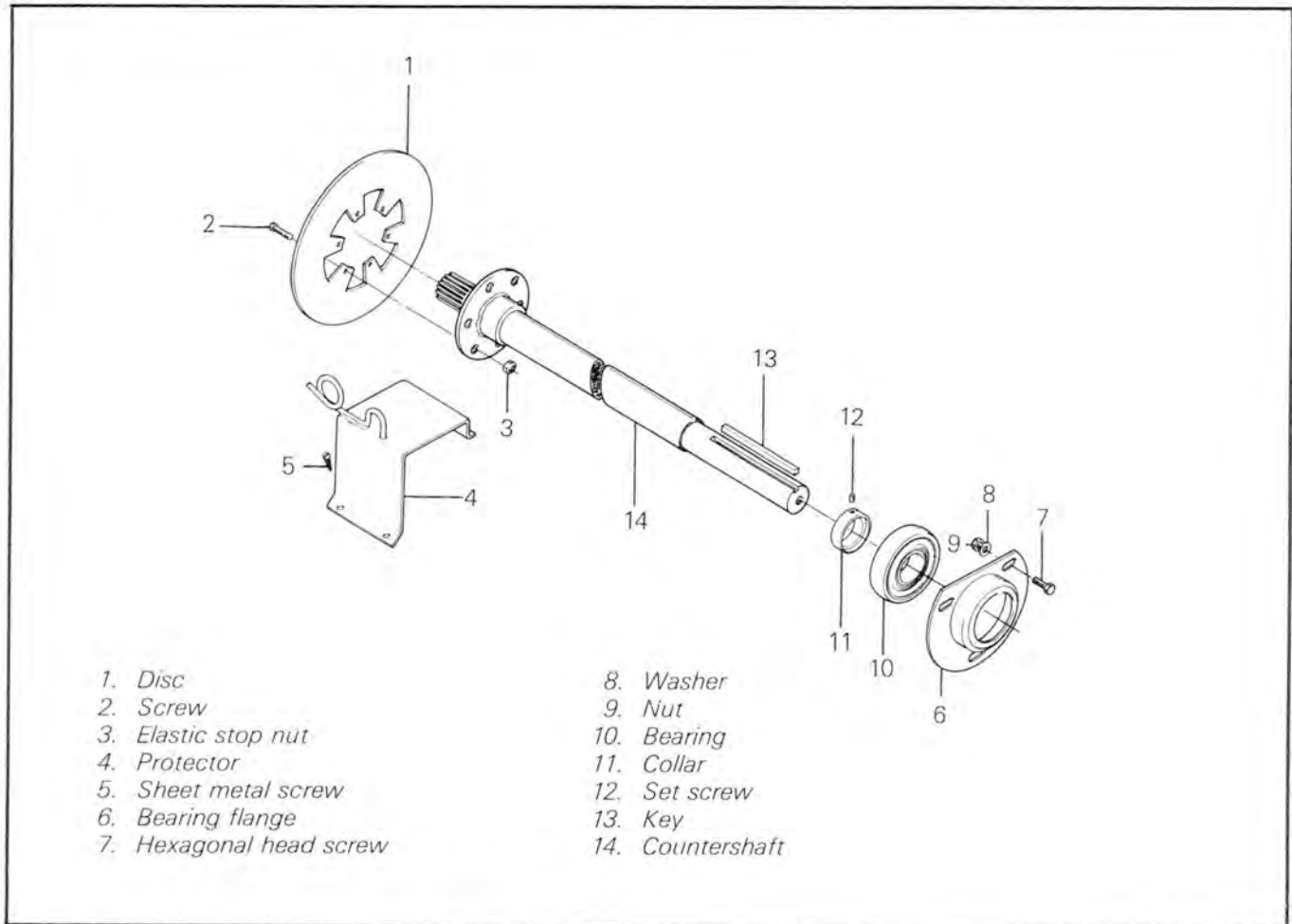
- Activate lever by hand until ratchet click is no longer heard.
- Secure brake cable housing to lever, slide spring over cable then attach cable to housing with adjuster nut.
- Using adjuster nut, adjust until there is no free-play between the brake lever and its housing, and there is a gap of 50 mm $\pm$ 3 (2" $\pm$ 1/8") between lever and caliper.



○ **NOTE:** It may be necessary to change brake light switch support position to obtain recommended gap between lever and caliper housing.

Connect brake light switch and check operation. Adjust if necessary using two (2) adjuster nuts.

COUNTERSHAFT AND BRAKE DISC



COUNTERSHAFT REMOVAL PROCEDURE:

Procedure:

Remove the suspension, brake caliper ass'y, air intake silencer, belt guard and drive belt.

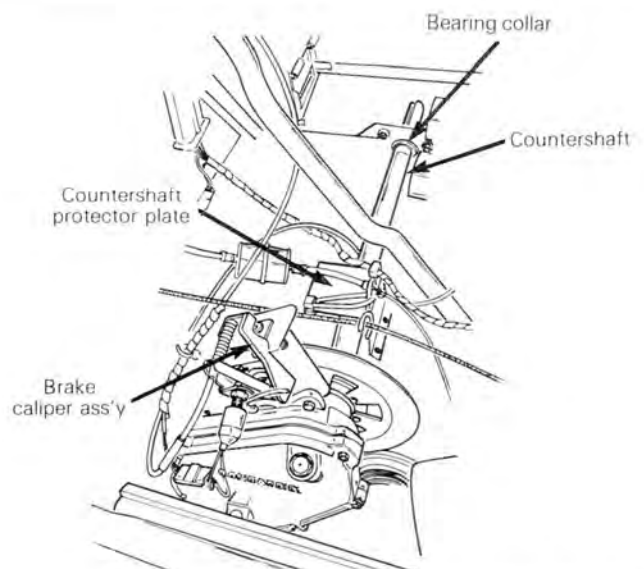
Remove the shaft protector plate.

Remove the chaincase ass'y (chaincase cover, sprockets, chain, drive axle seal, chaincase).

Remove the driven pulley ass'y and all shims.

Unlock the countershaft bearing (loosen the Allen screw then turn counter-clockwise). Disassemble the bearing and the bearing flange and remove.

Remove the countershaft and the brake disc ass'y.

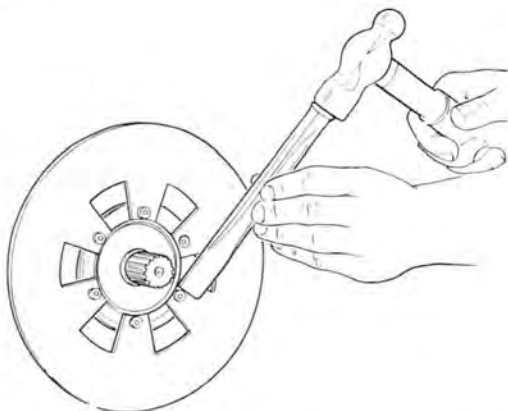


SECTION 02

SUB-SECTION 06 (BRAKE)

BRAKE DISC REPLACEMENT PROCEDURE:

To remove the disc, shear off the rivets (from disc side) using a cold chisel.



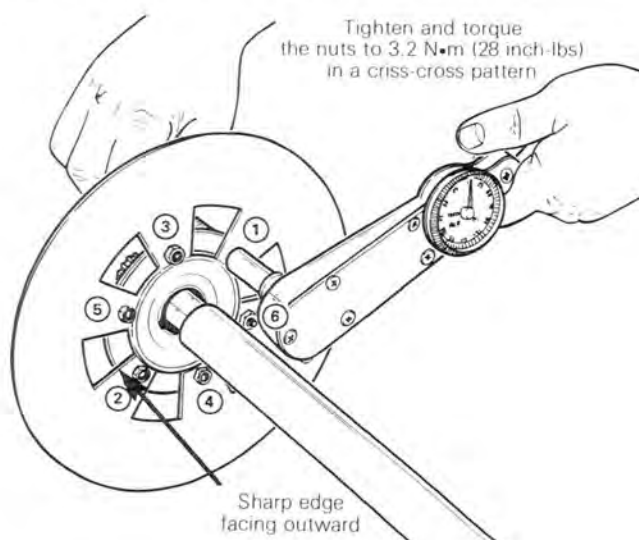
▼ **CAUTION:** To prevent damage to the hub ass'y always shear off the rivets on the disc side.

- Punch out the rivets with a pin punch.

▼ **CAUTION:** To prevent enlarging the holes do not drill out the rivets.

- Reassemble the new disc using 6 screws P/N 345 7063 00) and elastic stop nuts (P/N 398 2113 00).

▼ **CAUTION:** The disc must be installed with the sharp edges facing outward from the hub.



Tighten and torque the nuts to 3.2 N•m (28 inch-lbs), in a criss-cross pattern.

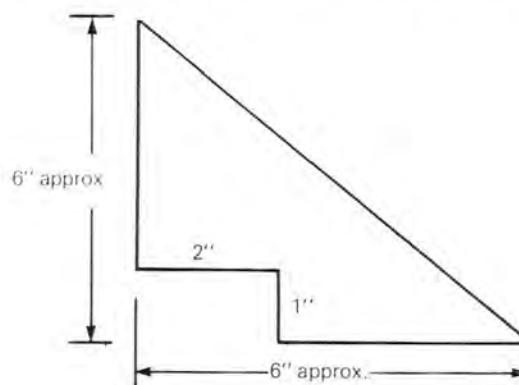
IMPORTANT: Do not overtighten.

○ **NOTE:** Brake hubs and countershafts are not available as separate units.

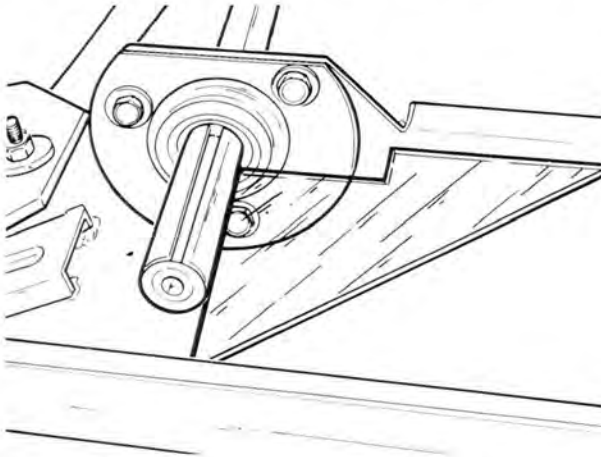
IMPORTANT: Whenever servicing the disc brake ass'y always check components for excessive wear or looseness.

INSTALLATION

- Reinstall the countershaft and the flange bearing ass'y. (Do not fully tighten the bearing flange until the alignment of the countershaft is completed).
- Reinstall the chaincase, oil seal, sprockets, drive chain, tab locks. Torque sprocket retaining bolts to 9 N•m (7 ft-lbs). Bend tab locks.
- To align the countershaft use a 6" (approx) plastic square. (Cut out a 1" x 2" section as illustrated).



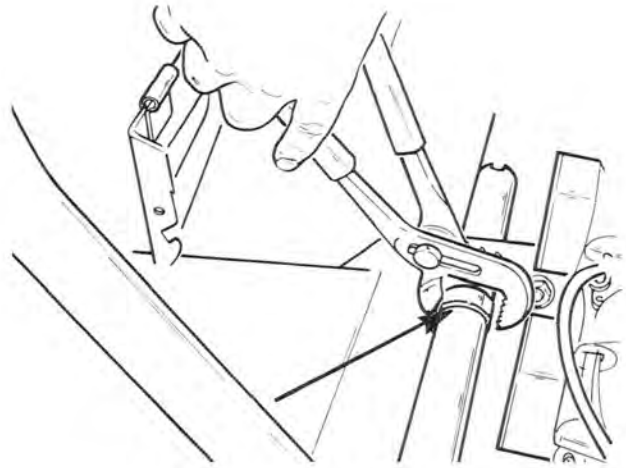
Apply the square on the countershaft and on the side of the frame. The square must be horizontal.



Adjust the countershaft so that it is perpendicular to the frame. (Use a plastic hammer to adjust, do not tap on the keyway).

When the shaft is well adjusted, tighten all nuts.

Tighten bearing collar against bearing seat until well seated, then lock in place by tightening the Allen set screw. (Loctite 242 blue medium strength).



Lubricate the countershaft with antiseize lubricant.

Install the pulley ass'y and shims, chaincase cover, chaincase oil.

Reinstall the countershaft protector plate.

Install the air intake silencer and the brake caliper ass'y.

Check the pulley alignment.

Install the drive belt.

CAUTION: When adjusting the pulley alignment, never tamper or modify the countershaft adjustment. Use the engine support bolts to obtain correct pulley distance.

Install the belt guard.

Install the suspension.

Check the track tension and alignment.



CHAINCASE

Models covered in this section:

1979 BLIZZARD 5500
1979 GRAND PRIX SPECIAL
1979 BLIZZARD 9500

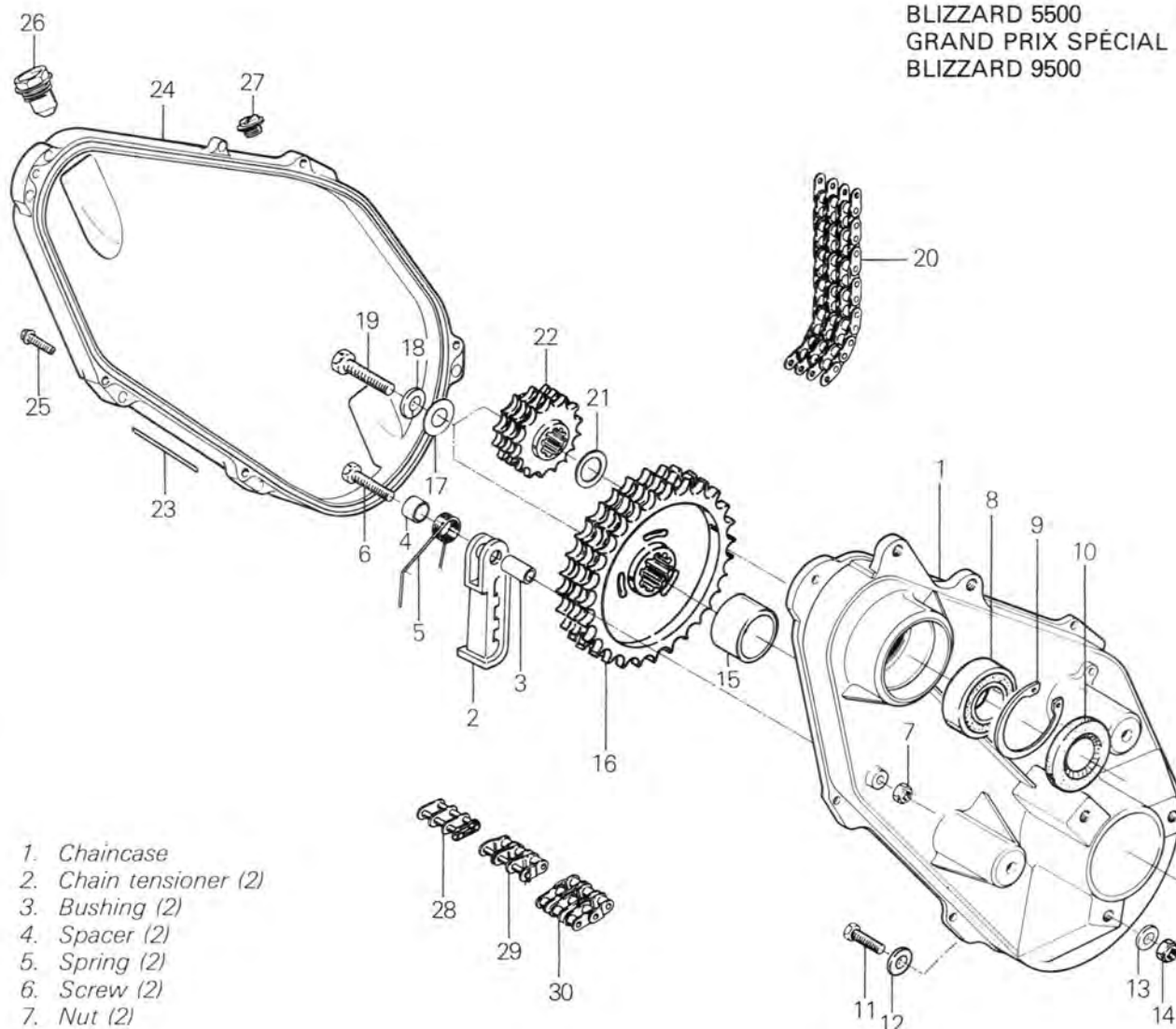
For all other models, refer to the 1978 Bombardier Shop Manual.

1979	ELAN	refer to ____	1978 ____	ELAN
1979	SPIRIT	refer to ____	1978 ____	SPIRIT
1979	OLYMPIQUE	refer to ____	1978 ____	OLYMPIQUE
1979	NUVIK	refer to ____	1978 ____	NUVIK
1979	CITATION	refer to ____	1978 ____	CITATION
1979	MIRAGE	refer to ____	1978 ____	CITATION
1979	EVEREST	refer to ____	1978 ____	EVEREST
1979	FUTURA	refer to ____	1978 ____	FUTURA
1979	BLIZZARD 7500 Plus / CROSS COUNTRY	refer to ____	1978 ____	BLIZZARD 6500 Plus
1979	SUPER SONIC / CROSS COUNTRY	refer to ____	1978 ____	BLIZZARD 6500 Plus
1979	ALPINE 640 ER	refer to ____	1978 ____	ALPINE 640 ER
1979	ELITE 450 LC	refer to ____	1978 ____	ELITE

SECTION 02
SUB-SECTION 07 (CHAINCASE)

CHAINCASE

BLIZZARD 5500
GRAND PRIX SPÉCIAL
BLIZZARD 9500



1. Chaincase
2. Chain tensioner (2)
3. Bushing (2)
4. Spacer (2)
5. Spring (2)
6. Screw (2)
7. Nut (2)
8. Bearing
9. Snap ring
10. Seal
11. Screw (5)
12. Washer (5)
13. Washer (5)
14. Nut (5)
15. Lower spacer
16. Sprocket 38 teeth triple, 1" shaft, 3/8" pitch, 10 splines
17. Washer (2)
18. Lockwasher (2)
19. Screw (2)
20. Driving chain, 3/8" pitch triple, 68 links

21. Upper spacer
22. Sprocket 21 teeth triple, 1" shaft, 3/8" pitch, 15 splines
23. O'ring
24. Chain case cover
25. Washer head hexagonal screw (5)
26. Breather
27. Plug
28. Connecting link single, 3/8" pitch triple (AR)
29. Cranked link single, 3/8" pitch triple (AR)
30. Cranked link double, 3/8" pitch triple (AR)

REMOVAL

Remove the suspension.

○ **NOTE:** On the Blizzard 9500, disconnect the muffler and push it aside underneath the exhaust pipes.

Remove the chaincase cover and drain the oil.

Slacken the end bearing housing.

Pry out the drive axle oil seal from the chaincase.

Release chain tension then open the tab locks locking the sprockets. Remove the screws, washers, sprockets and chain.

Remove bolts and/or nuts securing the chaincase to the frame.

INSPECTION

Visually inspect the chain for cracked, damaged or missing link rollers. Inspect for defective bearing, sprockets.

DISASSEMBLY & ASSEMBLY

Remove the oil seal, snap ring and bearing from the chaincase.

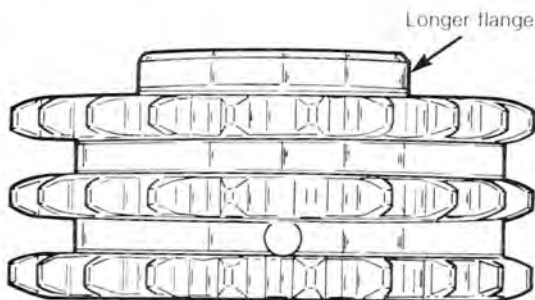
Using an appropriate pusher, press the oil seal into chaincase hub. Oil seal must fit flush with the case hub edge.

INSTALLATION

Install the chaincase to the frame (do not tighten). Position the drive axle into location. Tighten the end bearing housing. Prior to lower sprocket installation ensure that the spacer is on the drive axle.

Reinstall the sprockets, chain, flat washers.

Position the sprockets with the longer flanges facing inside the chaincase. (For proper sprocket and chain use, see Technical Data).

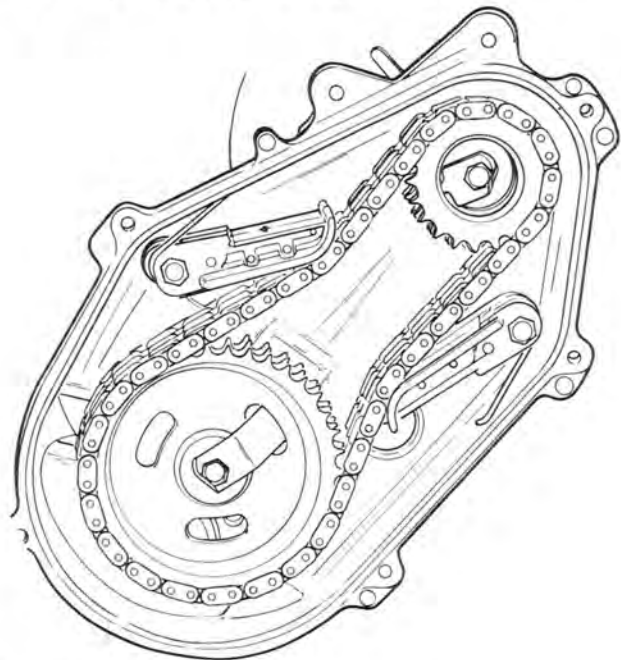


Install the tab locks as illustrated.

Install the screws and torque to 9.5 N•m (7 ft-lbs).

Bend the tab locks.

▼ **CAUTION:** Lock tabs should be replaced if bent more than twice. If in doubt, replace.



Reinstall the chaincase cover.

Refill with chaincase oil.



GEARBOX

Refer to the 1978 Bombardier Shop Manual

1979 ALPINE 640 ER	_____	_____	1978 ALPINE 640 ER
1979 ELITE 450 LC	_____	_____	1978 ELITE

DRIVE CHAIN

Refer to the 1978 Bombardier Shop Manual



STEERING SYSTEM

Models covered in this section:

1979 BLIZZARD 5500
1979 GRAND PRIX SPECIAL
1979 BLIZZARD 9500

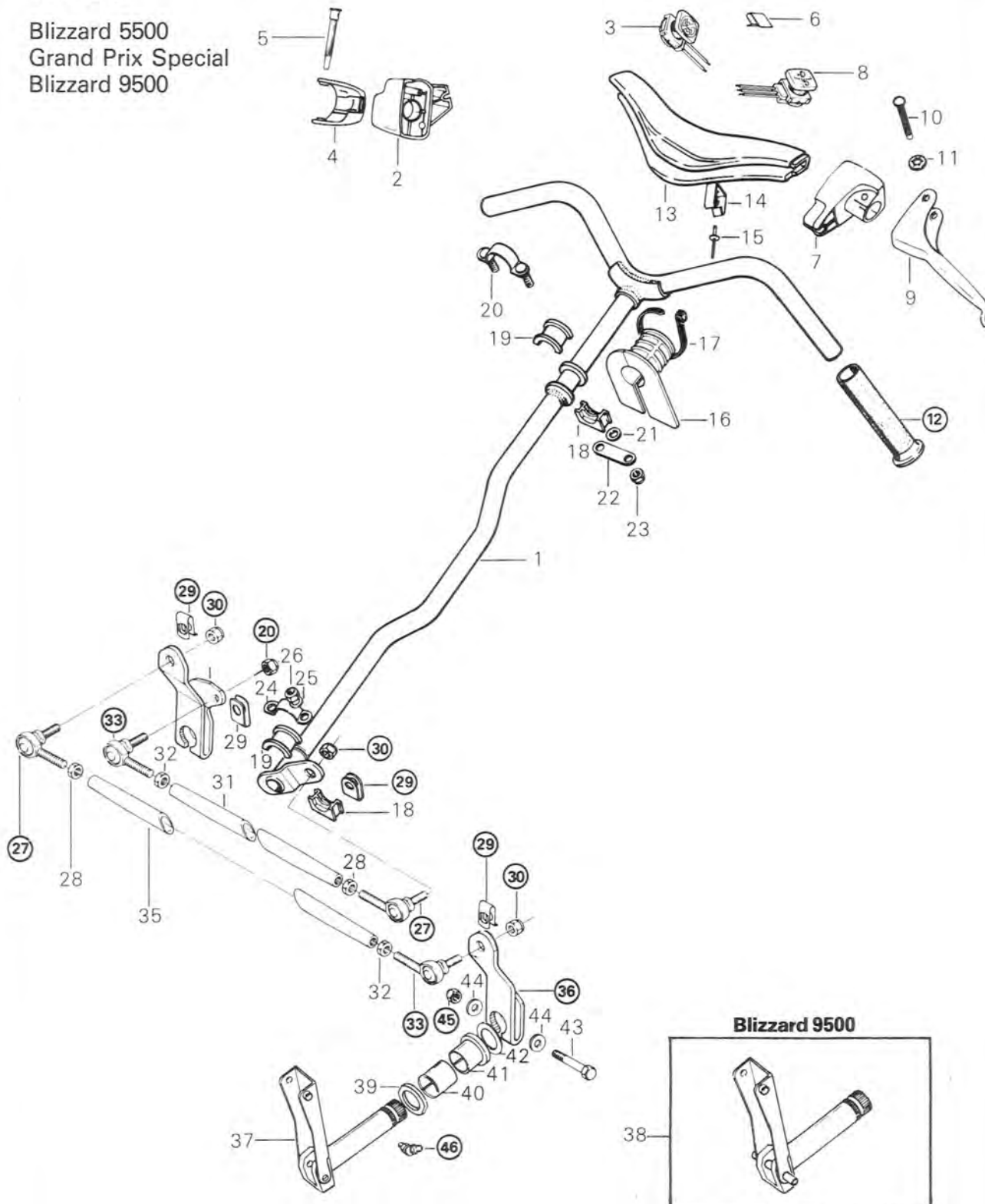
For all other models, refer to the 1978 Bombardier Shop Manual.

1979	ELAN _____	refer to _____	1978	ELAN
1979	SPIRIT _____	refer to _____	1978	SPIRIT
1979	OLYMPIQUE _____	refer to _____	1978	OLYMPIQUE
1979	NUVIK _____	refer to _____	1978	NUVIK
1979	CITATION _____	refer to _____	1978	CITATION
1979	MIRAGE _____	refer to _____	1978	CITATION
1979	EVEREST _____	refer to _____	1978	EVEREST
1979	FUTURA _____	refer to _____	1978	FUTURA
1979	BLIZZARD 7500 Plus _____	refer to _____	1978	BLIZZARD 6500 Plus
	CROSS COUNTRY			
1979	SUPER SONIC / _____	refer to _____	1978	BLIZZARD 6500 Plus
	CROSS COUNTRY			
1979	ALPINE 640 ER _____	refer to _____	1978	ALPINE 640 ER
1979	ELITE 450 LC _____	refer to _____	1978	ELITE

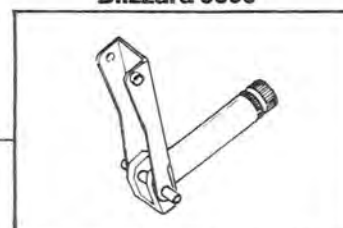
SECTION 03
SUB-SECTION 01 (STEERING SYSTEM)

TYPE 8

Blizzard 5500
Grand Prix Special
Blizzard 9500



Blizzard 9500



- | | |
|---|--|
| <ol style="list-style-type: none"> 1. Handle Bar 2. Throttle Handle Housing 3. Kill Switch 4. Throttle Handle 5. Pin 6. Retainer (Cable Barrel) 7. Brake Handle Housing 8. Dimmer Switch 9. Brake Handle 10. Pin 11. Push Nut 12. Grip (2) 13. Steering Padding 14. Clip (2) 15. Rivet (2) 16. Cable Protector 17. Tie Rap (2) 18. Lower Bushing (2) 19. Upper Bushing (2) 20. Retainer Bracket with Screw 21. Washer (2) 22. Tab Lock 23. Nut (2) | <ol style="list-style-type: none"> 24. Retainer Bracket 25. Washer (2) 26. Nut (2) 27. Ball Joint L.H. (2) 28. Jam Nut L.H. (2) 29. Tab Lock (4) 30. Nut (4) 31. Tie Rod 32. Jam Nut R.H. (2) 33. Ball Joint R.H. (2) 34. Steering Arm 35. Tie Rod 36. Steering Arm 37. Ski Leg (2) 38. Ski Leg (Blizzard 9500) (2) 39. Washer (2) 40. Bushing (2) 41. Bushing (2) 42. Shim (2) 43. Screw (2) 44. Washer (4) 45. Nut (2) 46. Grease Fitting (2) |
|---|--|

INSPECTION

Check skis and runner shoes for excessive wear, replace if necessary. (See section 03-02).

Make sure steering arm and ski leg splines interlock.

Check general condition of steering system.

Check general condition of steering system components for wear and replace if necessary.

DISASSEMBLY & ASSEMBLY

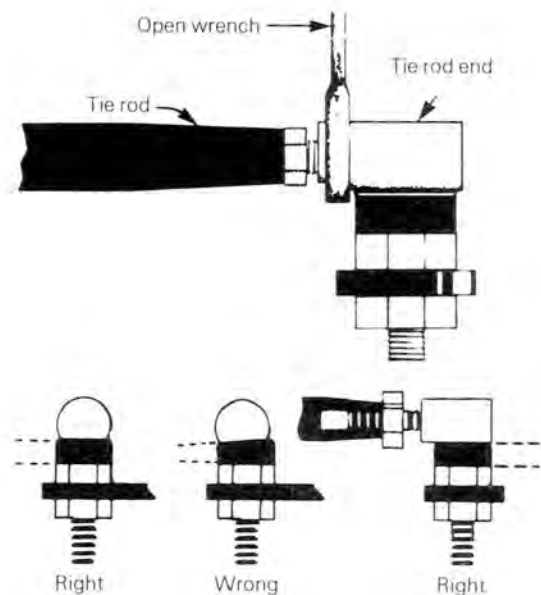
⑫ Grips can be removed and installed without any damage by injecting compressed air into the handlebar.

Another way to install grips consists in soaking them in soapy water (detergent for dishes) and in pushing them onto the handlebar with a soft hammer.

②⑦③③ Inspect ball joint ends for wear or looseness, if excessive, replace.

○ **NOTE:** Screw the longest threaded end of ball joint into the tie rod, ensure that half of the total number of threads are inserted into the tie rod.

The cut-off section of the tie rod end must run parallel with the horizontal line of the steering arm when assembled on vehicle. The tie rod end should be restrained when tightening tie rod end lock nut. For torque specifications see Technical Data.



②⑨ When assembling components, always position new tab locks.

③④③⑥ The steering arm angles should be equal on both sides when skis are parallel with vehicle.

②⑨③⑦ Tighten to 27 N•m (20 ft-lbs) and bend locking tabs over nuts.

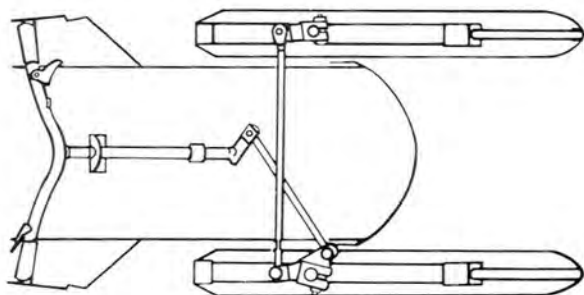
③⑧ Grease ski leg at grease fitting ④⑥.

④⑤ Torque to 42 N•m (31 ft-lbs).

SECTION 03
SUB-SECTION 01 (STEERING SYSTEM)

STEERING ADJUSTMENT (SKIS)

Type 5



Skis should have a toe out of 3 mm (1/8"). To check, measure distance between each ski at front and rear of spring leaves. The front distance should be 3 mm (1/8") more than the rear when the handlebar is horizontal. If adjustment is required:

Loosen the jam nuts locking the longer tie rod in place. Turn tie rod manually until alignment is correct. Tighten jam nuts firmly.

IMPORTANT: Close front of skis manually to take all slack from steering mechanism.

Check that handlebar is horizontal. To correct, loosen shorter tie rod jam nuts.

Turn tie rod manually until handlebar is horizontal.

Tighten jam nuts firmly.

SKI SYSTEM

Models covered in this section:

1979 BLIZZARD 9500

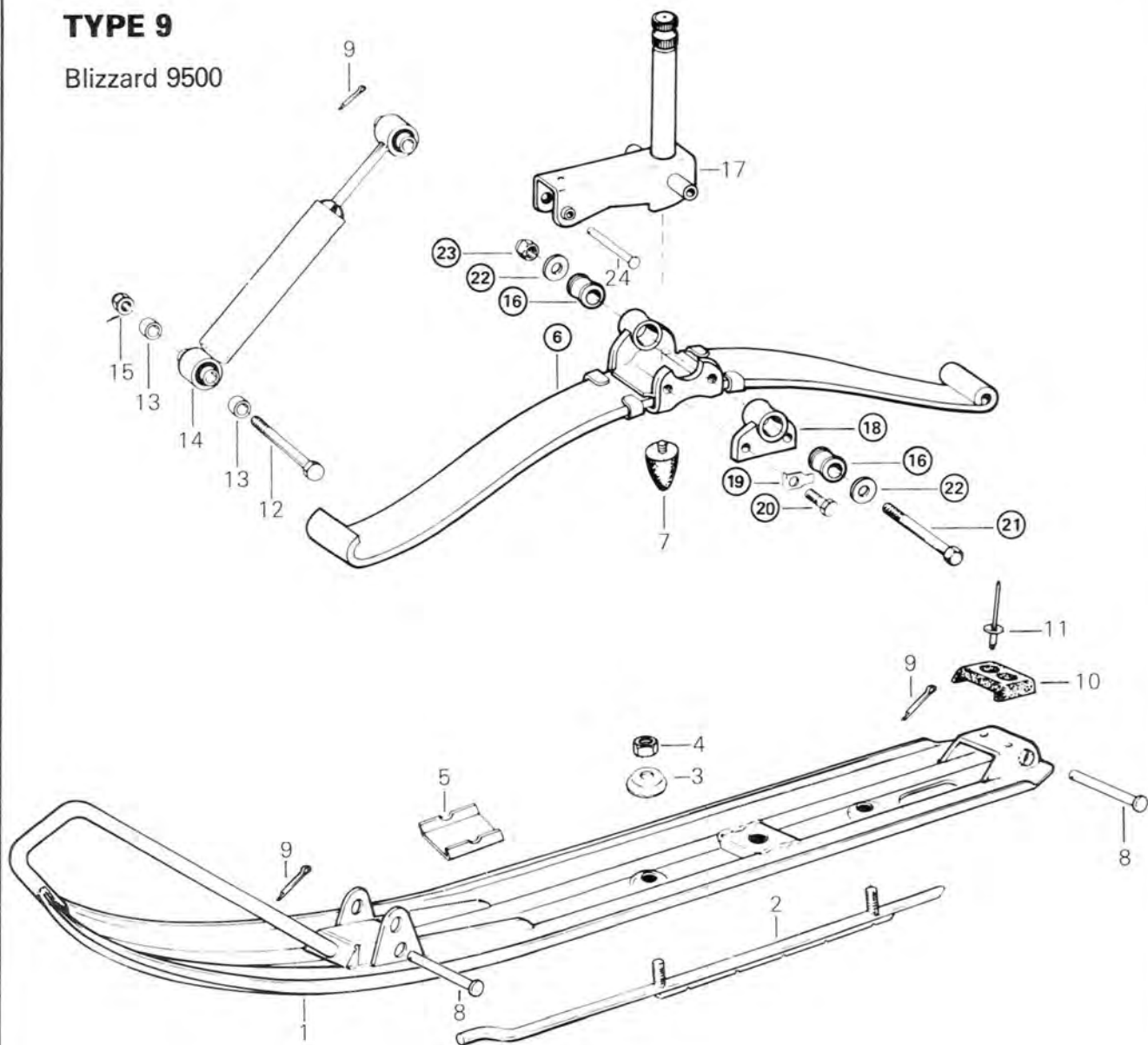
For all other models, refer to the 1978 Bombardier Shop Manual.

1979	ELAN _____	refer to _____	1978	ELAN
1979	SPIRIT _____	refer to _____	1978	SPIRIT
1979	OLYMPIQUE _____	refer to _____	1978	OLYMPIQUE
1979	NUVIK _____	refer to _____	1978	NUVIK
1979	CITATION _____	refer to _____	1978	CITATION
1979	MIRAGE _____	refer to _____	1978	CITATION
1979	EVEREST _____	refer to _____	1978	EVEREST
1979	FUTURA _____	refer to _____	1978	FUTURA
1979	BLIZZARD 5500 / _____	refer to _____	1978	BLIZZARD 6500 Plus
	GRAND PRIX Special			
1979	BLIZZARD 7500 Plus _____	refer to _____	1978	BLIZZARD 6500 Plus
	CROSS COUNTRY			
1979	SUPER SONIC / _____	refer to _____	1978	BLIZZARD 6500 Plus
	CROSS COUNTRY			
1979	ALPINE 640 ER _____	refer to _____	1978	ALPINE 640 ER
1979	ELITE 450 LC _____	refer to _____	1978	ELITE

SECTION 03
SUB-SECTION 02 (SKI SYSTEM)

TYPE 9

Blizzard 9500



- 1. Ski (2)
- 2. Carbide runner (2)
- 3. Cup (4)
- 4. Nut (4)
- 5. Spring slider cushion (2)
- 6. Tapered leaf spring R.H.
- 7. Tapered leaf spring L.H.
- 8. Retainer pin (4)

- 9. Cotter pin (6)
- 10. Protector (2)
- 11. Rivet (4)
- 12. Screw (2)
- 13. Spacer (4)
- 14. Shock (2)
- 15. Nut (2)

- 16. Rubber bushing (4)
- 17. Ski leg (2)
- 18. Bushing holder (2)
- 19. Tab lock (4)
- 20. Screw (4)
- 21. Screw (2)
- 22. Washer (4)
- 23. Nut (2)
- 24. Retainer pin (2)

INSPECTION

Check the skis and runner shoes for excessive wear, replace if necessary.

Make sure the steering arm and the ski leg splines interlock.

Check the general condition of the steering components for wear and replace if necessary.

DISASSEMBLY AND ASSEMBLY

WARNING: Be careful when removing the steel runner shoes from the ski slots, as the shoes are under tension. Check that the ski runner shoes are not worn more than half their original thickness.

INSTALLATION

⑥ ⑫ ⑮ Install the rubber bushings ⑫ on the bushing weldment and on the leaf spring (use liquid soap).

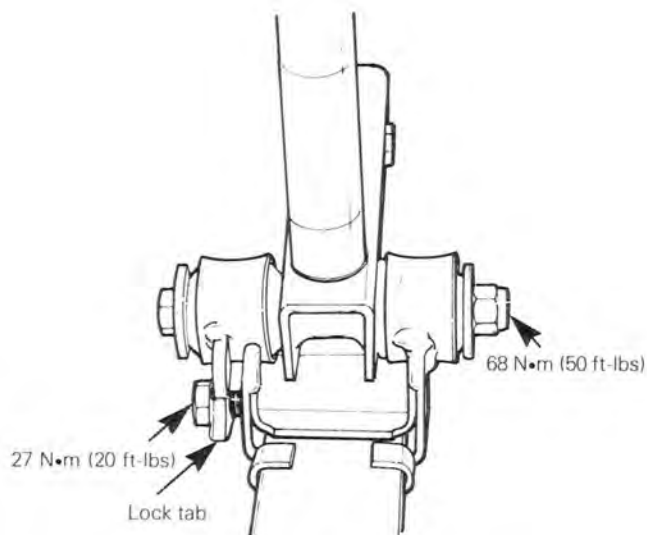
Install the ski ass'y on the ski leg.

CAUTION: Make sure the bushing weldment ⑮ is properly installed as illustrated. The longest portion of the bushing must be facing the ski leg.

②② ②① ②③ Install the two flat washers and coupler bolt, making sure the nut is secured from inside the ski leg. Torque to 68 N•m (50 ft-lbs).

⑲ ⑳ Install the lock tabs and small spring coupler bolts. Torque to 27 N•m (20 ft-lbs).

⑲ Bend lock tabs.



Secure shock absorber to ski leg bracket using retainer and cotter pins.

Set ski adjustment to obtain a toe-out of 3 mm (1/8").



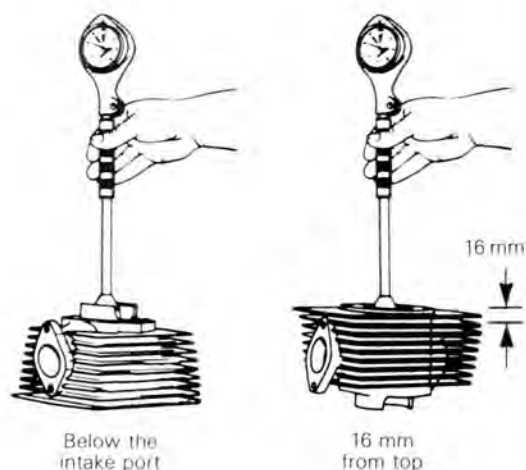
ENGINE TOLERANCES MEASUREMENT

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.

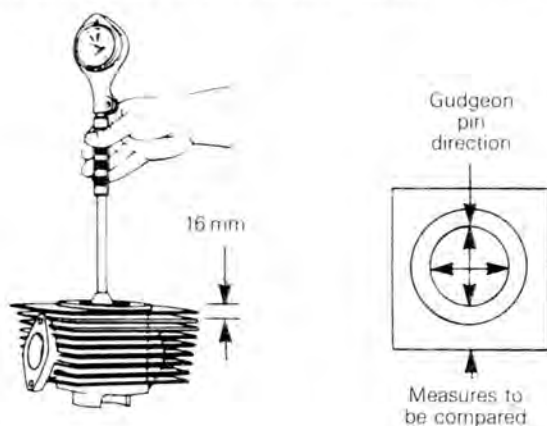
On rotary valve engines, measure just below auxiliary transfer port, facing exhaust port. If the difference exceeds 0.08 mm (.003") the cylinder should be rebored and honed or should be replaced.



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.



PISTON TO WALL CLEARANCE

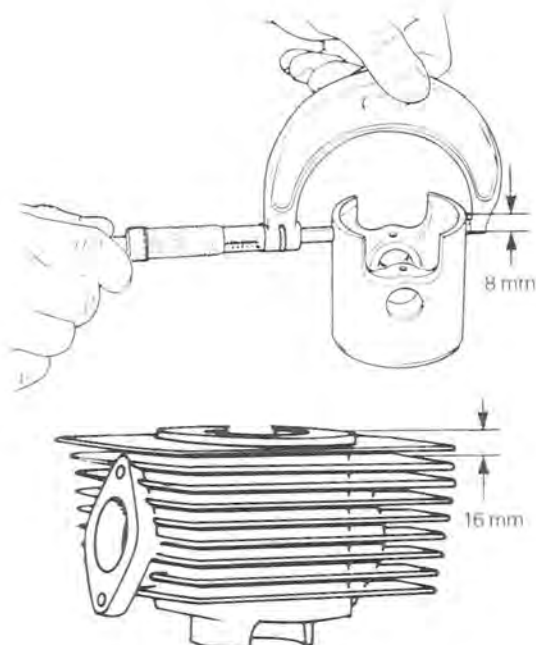
ENGINE TYPE	PISTON TO WALL CLEARANCE MINIMUM — MAXIMUM
247	0.065 — 0.170 mm (.0026 — .0067")
248	0.050 — 0.140 mm (.0020 — .0055")
294	0.050 — 0.140 mm (.0020 — .0055")
343	0.080 — 0.200 mm (.0031 — .0079")
354	0.080 — 0.200 mm (.0031 — .0079")
402	0.070 — 0.180 mm (.0028 — .0071")
440	0.070 — 0.180 mm (.0028 — .0071")
444	0.070 — 0.180 mm (.0028 — .0071")
454	0.090 — 0.220 mm (.0035 — .0087")
503	0.060 — 0.160 mm (.0024 — .0063")
640	0.070 — 0.180 mm (.0028 — .0071")

SECTION 04

SUB-SECTION 01 (ENGINE TOLERANCES MEASUREMENT)

Accurate measurement

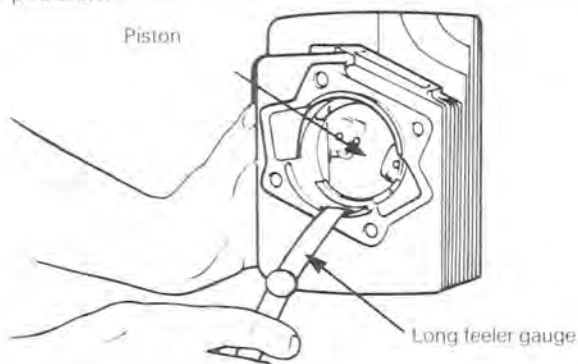
To determine piston to wall clearance, the piston should be measured 8 mm (5/16") above its bottom edge and the cylinder should be measured 16 mm (5/8") below its top edge.



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.

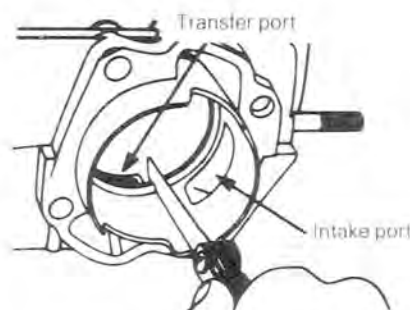
RING END GAP

ENGINE TYPE	RING END GAP
248, 294, 343 354	0.15 — 0.35 mm (.006 — .014")
247, 402, 440 444, 454, 503	0.20 — 0.40 mm (.008" — .016")
640	0.25 — 0.45 mm (.010 — .018")

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")

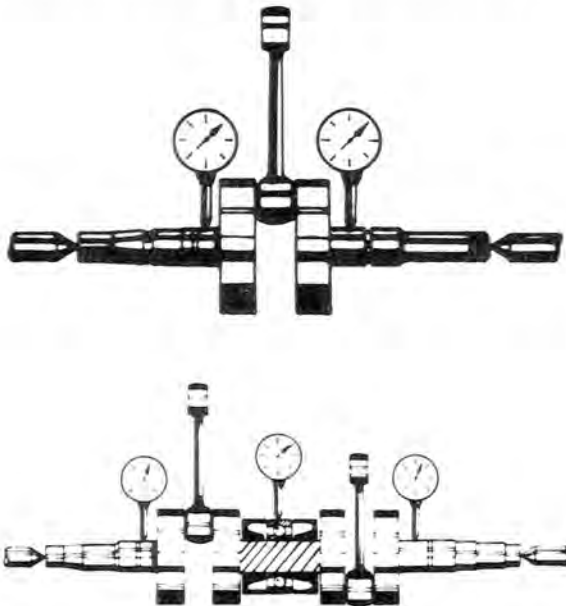
Using a feeler gauge check clearance between rectangular ring and groove. If clearance exceeds 0.20 mm (.008"), replace piston.



CRANKSHAFT DEFLECTION

Maximum: 0.06 mm (.0024")

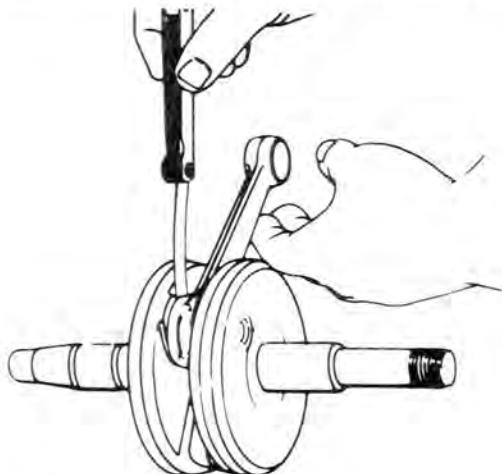
With the crankshaft positioned between a center lathe, install a dial indicator as close as possible to crankshaft blade then measure deflection on each side. If deflection exceeds 0.06 mm (.0024") the crankshaft should be repaired by a specialized shop or it should be replaced.



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.



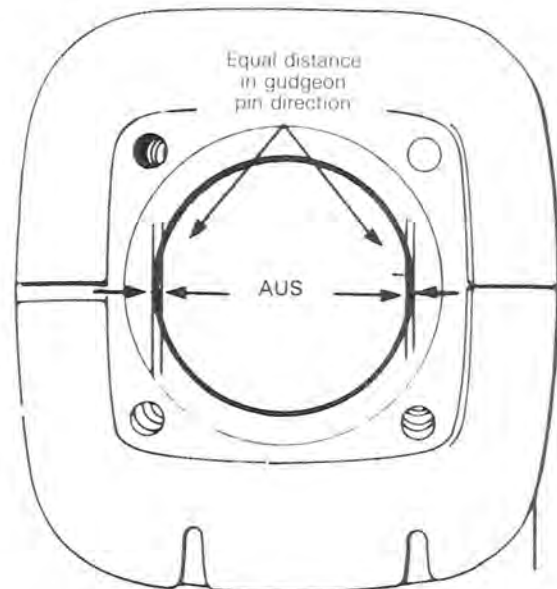
CONNECTING ROD ALIGNMENT

Check if connecting rod is bent as follows:

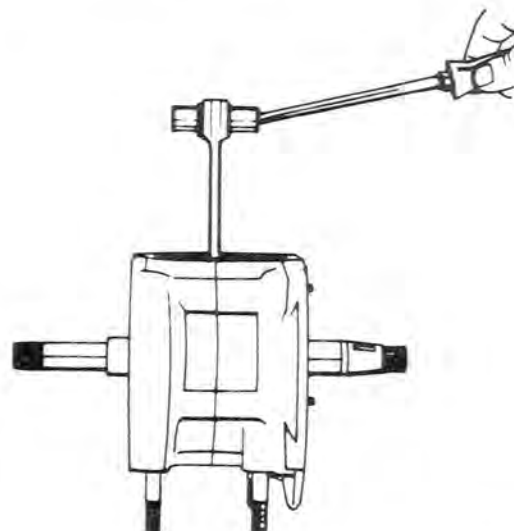
- Once engine crankcase is assembled with the piston mounted on connecting rod without its piston rings, position cylinder on piston.

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 bears 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.



SECTION 04

SUB-SECTION 01 (ENGINE TOLERANCES MEASUREMENT)

CRANKSHAFT END-PLAY

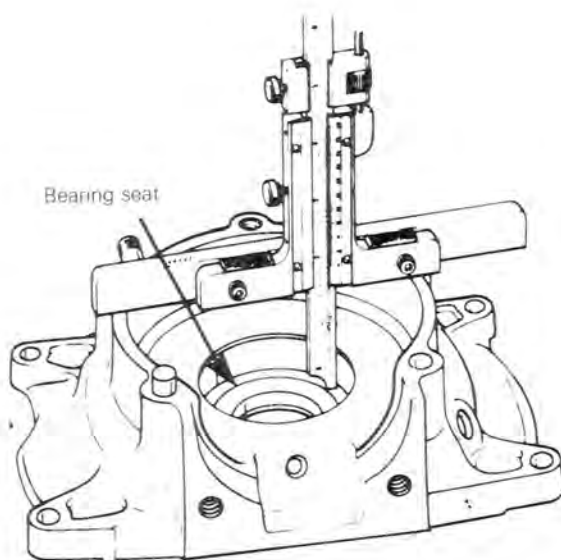
Maximum: 0.10 mm (.004")

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

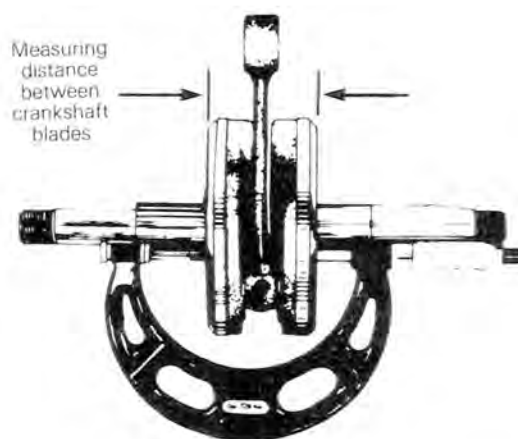
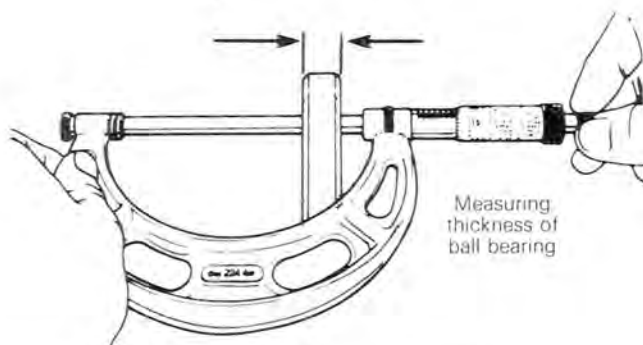
One cylinder engine (247)

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

- 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.



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



- 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.

Two cylinder engines (248, 294, 343, 402, 440, 640)

ENGINE TYPE	BEARING SIMULATOR NO.	AVAILABLE SHIMS
248, 294	420 876 380	0.1 mm (.004"), 0.2 mm (.008"), 0.3 mm (.012"), 0.5 mm (.020"), 1 mm (.040")
343, 402, 440	420 876 155	0.15 mm (.006"), 0.2 mm (.008"), 0.3 mm (.012")
640	420 876 160	0.15 mm (.006"), 0.2 mm (.008"), 0.3 mm (.012")

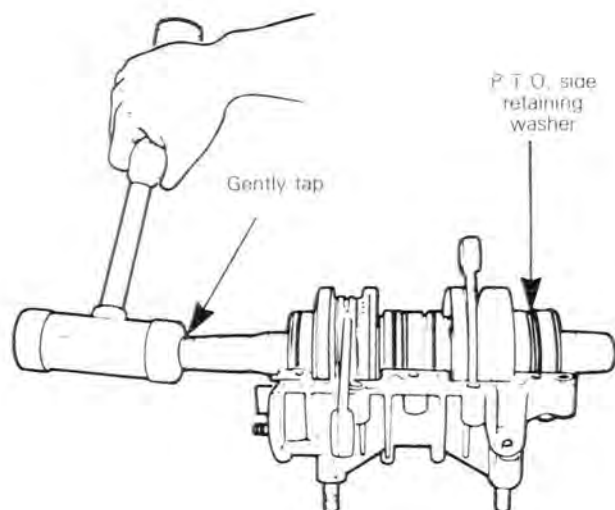
Crankshaft end-play (0.1 mm (.004") maximum) is adjusted with shim(s) located between crankshaft and magneto side bearing. To determine correct amount of shims, proceed as follows.

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

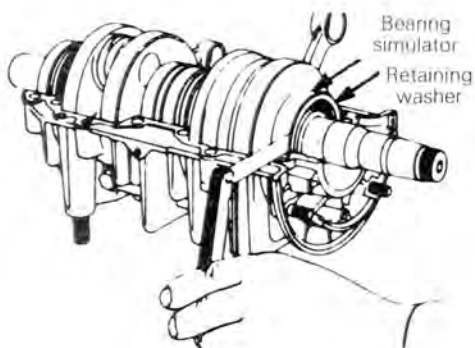
SECTION 04 SUB-SECTION 01 (ENGINE TOLERANCES MEASUREMENT)

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 mag-neto 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.



ENGINES

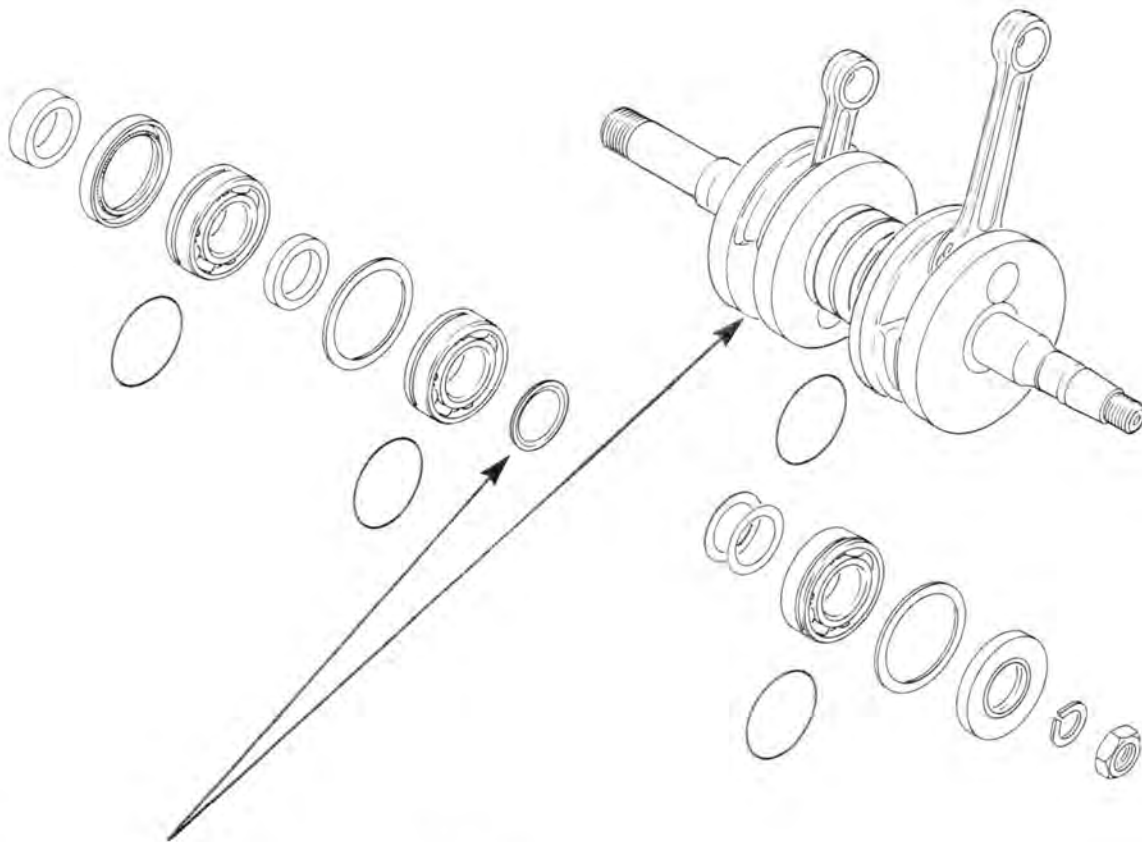
These sub-section apply to the following engine types:

- 294** Citation et Mirage
- 354-454** Blizzard 7500 Plus et Super Sonic (354)
Blizzard 9500 Plus (454)
- 444** Everest et Futura 444 L/C
Elite 450 L/C
- 503** Blizzard 5500 et Grand Prix Special

*For all other engine types, refer to 1978
Bombardier Shop Manual.*



294 ENGINE TYPE



From serial no 2 746 622 and up, crankshaft is different and there is a distance ring (P/N 420 827 720) on P.T.O. side between inner bearing and crankshaft blade.

*For any other information on 294 engine type,
refer to 1978 Bombardier Shop Manual.*

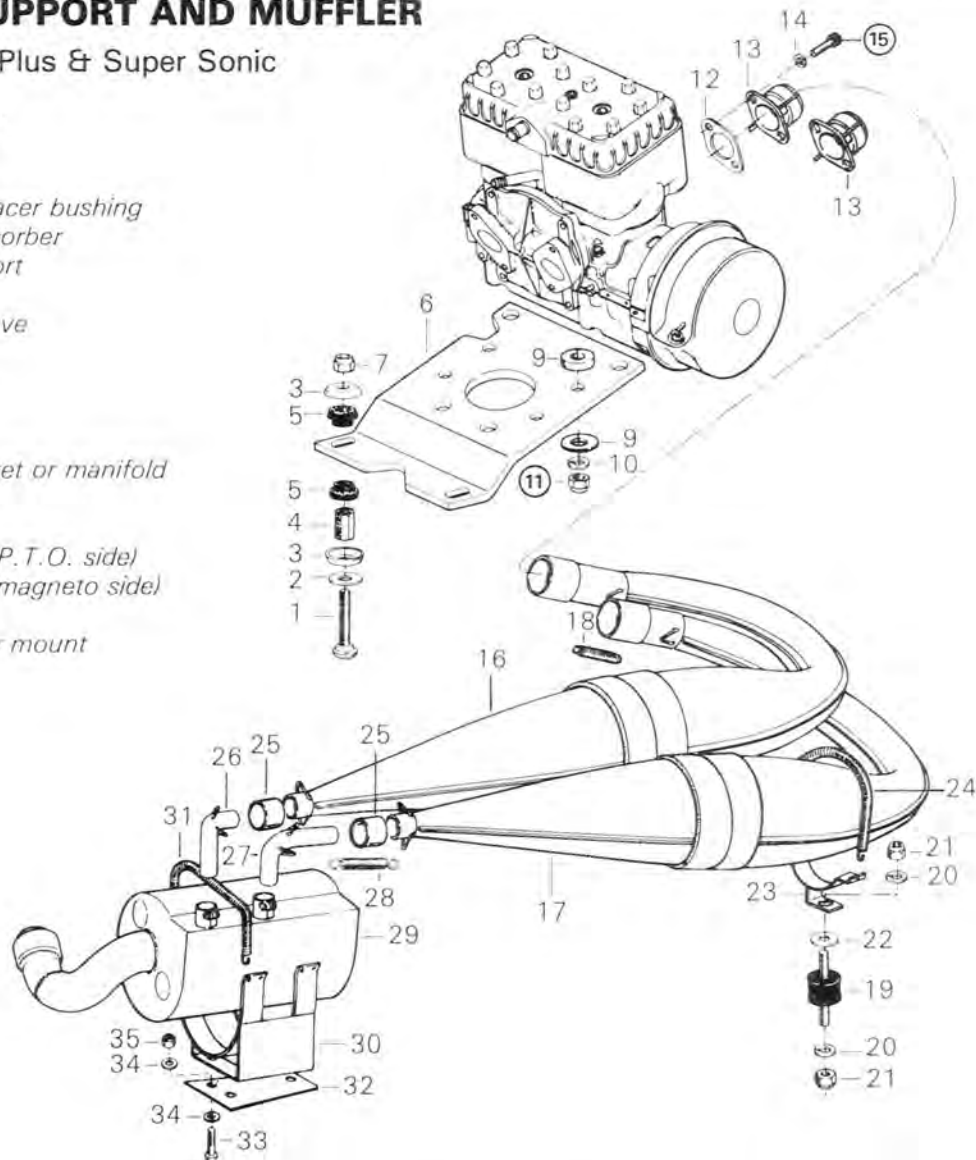


354, 454 ENGINE TYPES

ENGINE SUPPORT AND MUFFLER

Blizzard 7500 Plus & Super Sonic

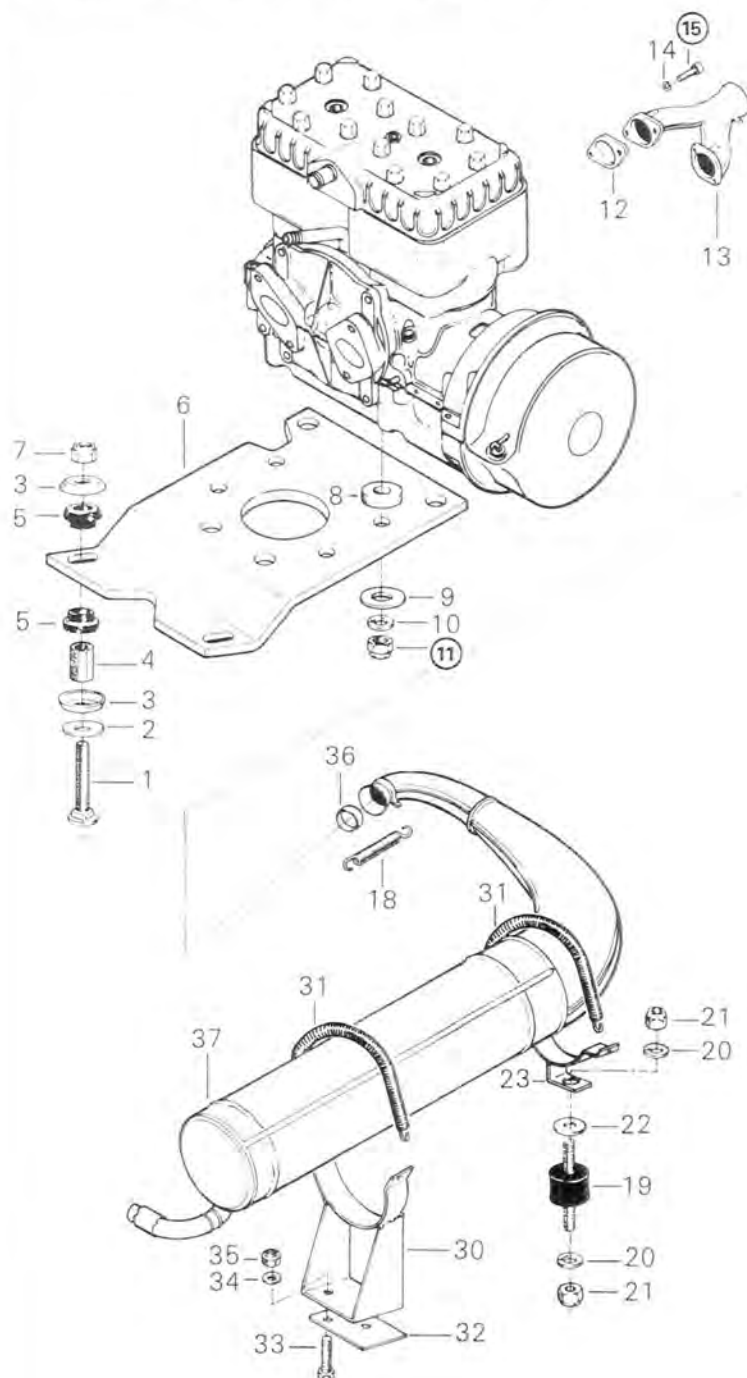
1. Carriage bolt
2. Flat washer
3. Cup washer
4. Threaded spacer bushing
5. Vibration absorber
6. Engine support
7. Nut
8. Distance sleeve
9. Washer
10. Lockwasher
11. Nut
12. Gasket
13. Exhaust socket or manifold
14. Lockwasher
15. Allen bolt
16. Tuned pipe (P.T.O. side)
17. Tuned pipe (magneto side)
18. Spring
19. Rubber shear mount
20. Washer
21. Nut



22. Insulating washer
23. Tuned pipe support (magneto side)
24. Spring
25. Coupler
26. Tail pipe (P.T.O. side)
27. Tail pipe (magneto side)
28. Spring
29. Swirl chamber
30. Support (swirl chamber)
31. Spring
32. Reinforcement plate
33. Bolt
34. Washer
35. Nut

ENGINE SUPPORT & MUFFLER

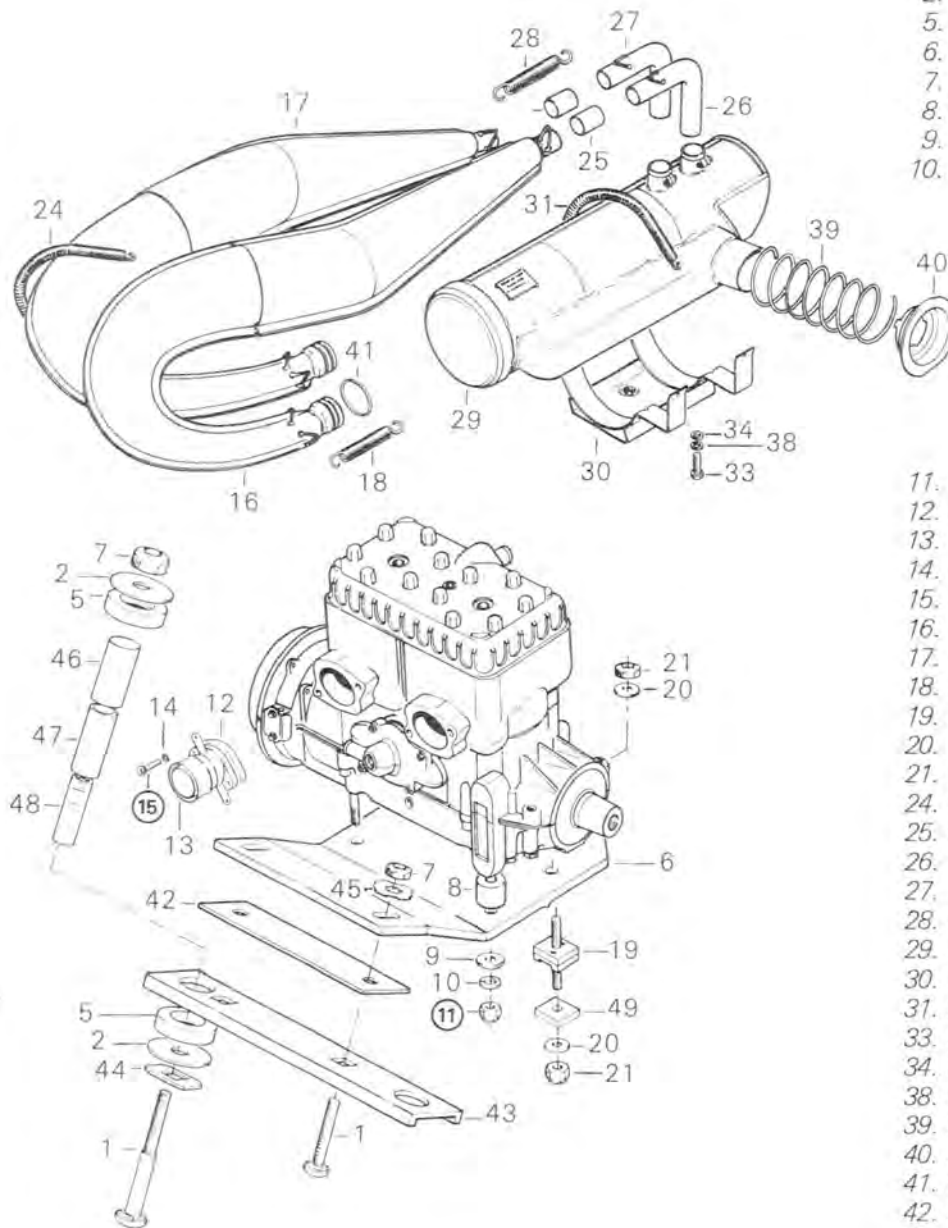
Blizzard & Super Sonic Cross Country



1. Carriage bolt
2. Flat washer
3. Cup washer
4. Threaded spacer bushing
5. Vibration absorber
6. Engine support
7. Nut
8. Distance sleeve
9. Washer
10. Lockwasher
11. Nut
12. Gasket
13. Exhaust socket or manifold
14. Lockwasher
15. Allen bolt
18. Spring
19. Rubber shear mount
20. Washer
21. Nut
22. Insulating washer
23. Tuned pipe support (magneto side)
30. Support
31. Spring
32. Reinforcement plate
33. Bolt
34. Washer
35. Nut
36. Muffler spacer
37. Muffler

ENGINE SUPPORT & MUFFLER

Blizzard 9500 Plus



1. Carriage bolt
2. Flat washer
5. Vibration absorber
6. Engine support
7. Nut
8. Distance sleeve
9. Washer
10. Lockwasher

11. Nut
12. Gasket
13. Exhaust socket or manifold
14. Lockwasher
15. Allen bolt
16. Tuned pipe (P.T.O. side)
17. Tuned pipe (magneto side)
18. Spring
19. Rubber shear mount
20. Washer
21. Nut
24. Spring
25. Coupler
26. Tail pipe (P.T.O. side)
27. Tail pipe (magneto side)
28. Spring
29. Swirl chamber
30. Support
31. Spring
33. Bolt
34. Washer
38. Lockwasher
39. Spring
40. Spring seat
41. Seal ring
42. Spacer
43. Reinforcing cross support
44. Retainer plate
45. Internal tooth dished washer
46. Bushing
47. Rubber bushing
48. Threaded bushing
49. Spacer

ENGINE SUPPORT & MUFFLER

REMOVAL FROM VEHICLE

Disconnect or remove the followings from vehicle:

- Pulley guard and drive belt
- Air silencer and throttle cable
- Fuel lines, primer and pulsation lines
- Muffler and rewind starter
- Electric wires
- Drain the cooling system and disconnect hoses at engine
- Rotary valve oil reservoir
- Disconnect rewind starter at engine

DISASSEMBLY & ASSEMBLY

⑪ Torque to 35 N•m (26 ft-lbs).

⑮ Torque to 22 N•m (16 ft-lbs).

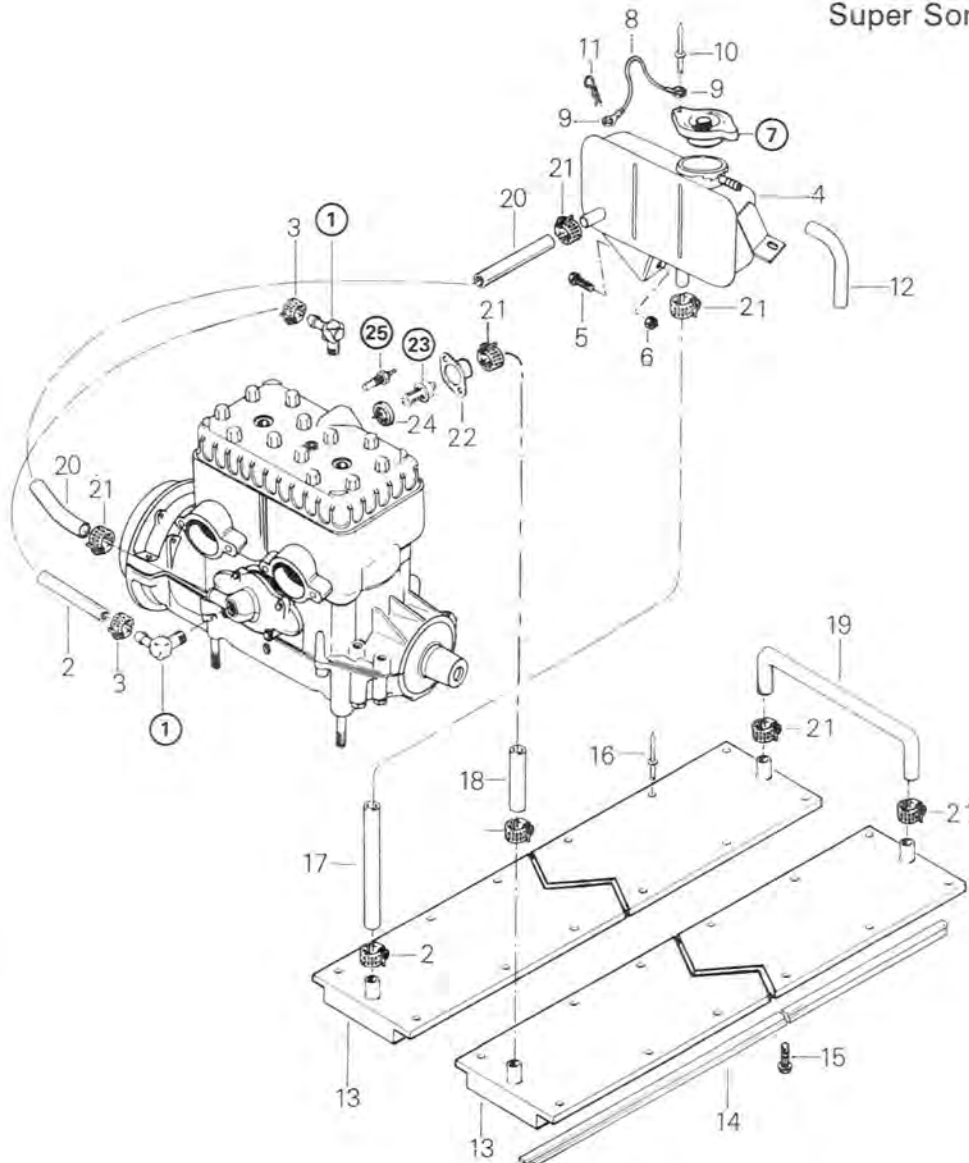
INSTALLATION ON VEHICLE

To install engine on vehicle, reverse removal procedure.
However, pay attention to the followings:

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

COOLING SYSTEM

Blizzard 7500,
Super Sonic & Cross Country



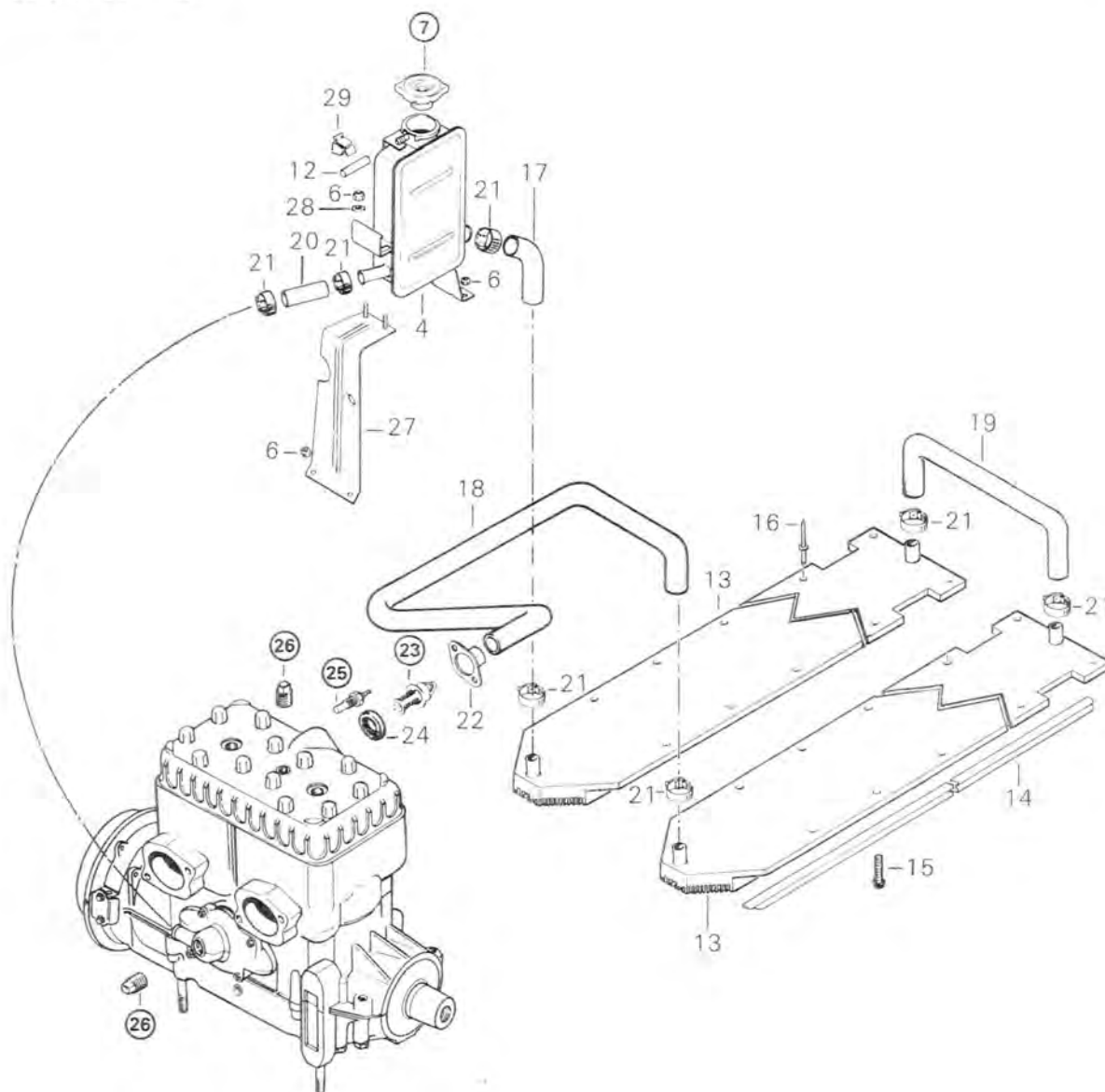
- 1. Fitting
- 2. By-pass hose (560 mm)
- 3. Hose clamp
- 4. Tank
- 5. Bolt
- 6. Nut
- 7. Plug
- 8. Wire
- 9. Terminal

- 10. Pop rivet
- 11. Hair pin
- 12. Overflow tube (380 mm)
- 13. Radiator
- 14. Radiator protector
- 15. Screw
- 16. Pop rivet
- 17. Hose (130 mm)
- 18. Hose (660 mm)

- 19. "U" hose
- 20. Hose (660 mm)
- 21. Hose clamp
- 22. Coolant outlet collar
- 23. Thermostat
- 24. Sealing ring
- 25. Temperature gauge sender

COOLING SYSTEM

Blizzard 9500 Plus



- 4. Tank
- 6. Nut
- 7. Plug
- 12. Overflow tube (343 mm)
- 13. Radiator
- 14. Radiator protector
- 15. Screw
- 16. Pop rivet
- 17. Elbow hose
- 18. Outlet hose
- 19. "U" hose

- 20. Hose (560 mm)
- 21. Hose clamp
- 22. Coolant outlet collar
- 23. Thermostat
- 24. Sealing ring
- 25. Temperature gauge sender
- 26. Plug
- 27. Tank support
- 28. Washer
- 29. Clip

COOLING SYSTEM

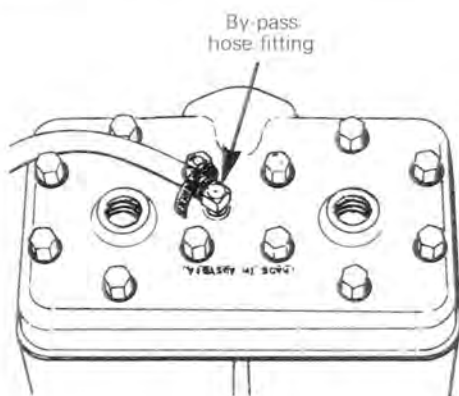
INSPECTION

Check general condition of hoses and clamp tightness.

DRAINING THE SYSTEM

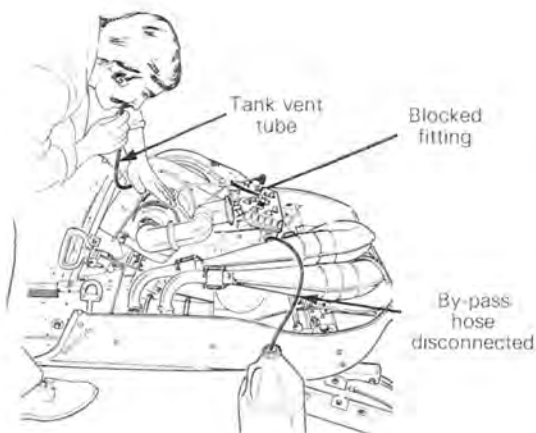
Blizzard 7500 & Super Sonic

To drain the cooling system, remove the coolant tank cap and disconnect the by-pass hose from fitting on cylinder head.



Block fitting and keep hose as low as possible to drain the system.

However, to completely drain the system, it is necessary to blow into the tank through the vent tube, while maintaining the hand over the filler neck to prevent air leakage.



Blizzard 9500 Plus

To drain the cooling system, remove the coolant tank cap.

WARNING: Never drain or refill the cooling system when engine is hot.

Connect a drain hose to a drain valve at pump housing. Open valve and drain system.



NOTE: Open end of drain hose should be lower than engine base.

However, to completely drain the system, blow into the tank through the vent tube while blocking the tank filler neck with one hand to prevent air leakage.



DISASSEMBLY & ASSEMBLY

- ① ②⑤ ②⑥ Apply pipe thread sealant to avoid leaks.
- ⑦ See if the cap pressurizes the system. If not, install a new 13 lbs cap, do not exceed 13 lbs of pressure.
- ②③ To check thermostat, put it in water and heat water. Thermostat should open when water temperature reaches 43°C (110°F).

REFILLING THE SYSTEM

Blizzard 7500 & Super Sonic

Capacity:

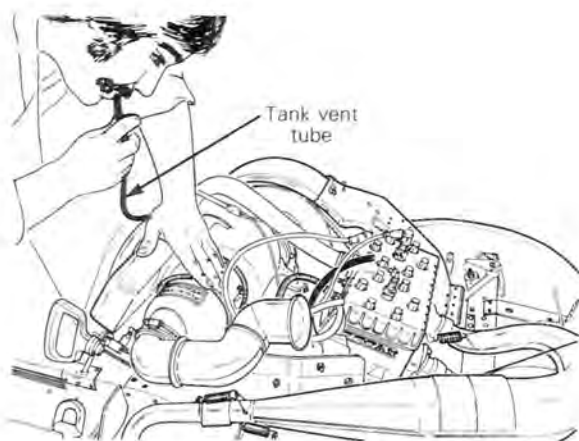
Approximately 4 liters

(0.9 Imp. gal.) (1 U.S. gal.)

55% concentrated antifreeze + 45% water

To refill the cooling system, disconnect by-pass hose and keep it near fitting on cylinder head; refill tank and blow into it through the vent tube, while maintaining the hand over the filler neck until the liquid comes out at the by-pass hose and the fitting on cylinder head.

○ **NOTE:** It is necessary to refill tank as soon as it becomes empty.



Reconnect by-pass hose and continue to pour the liquid in the coolant tank until the coolant level reaches 25 mm (1") below filler neck.

Reinstall tank cap and start engine; let engine run until it reaches its operating temperature and thermostat opens. Allow it to run a few minutes more. Stop engine and check coolant level; refill as necessary.

◆ **WARNING:** Always unscrew cap to the first step with a cloth to release pressure, before removing it.

Blizzard 9500 Plus

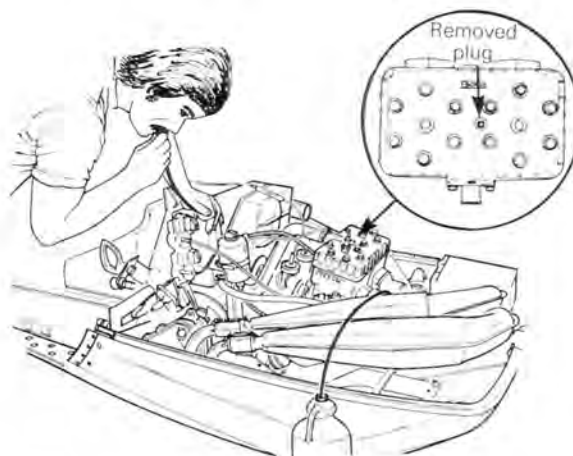
Capacity:

Approximately 5 liters

(1.1 Imp. gal.) (1.3 U.S. gal.)

55% antifreeze + 45% water

To refill the cooling system, unscrews plug on top of cylinder head.



Refill tank and blow into it through the vent tube, while maintaining the hand over the filler neck, until the liquid comes out at the plug hole on the cylinder head.

○ **NOTE:** It is necessary to refill tank as soon as it becomes empty.

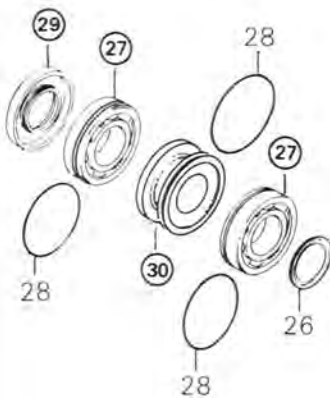
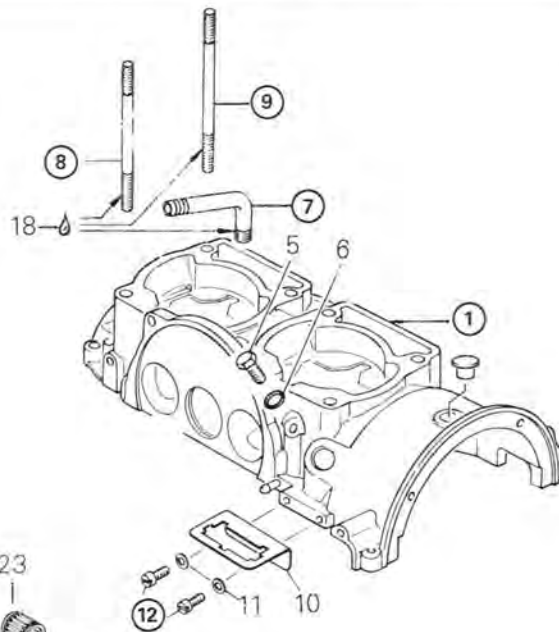
Screw plug on cylinder head and continue to pour the liquid in the coolant tank until the coolant level reaches 25 mm (1") below filler neck.

Reinstall tank cap and start engine; let engine run until it reaches its operating temperature and thermostat opens. Allow it to run a few minutes more. Stop engine and check coolant level; refill as necessary.

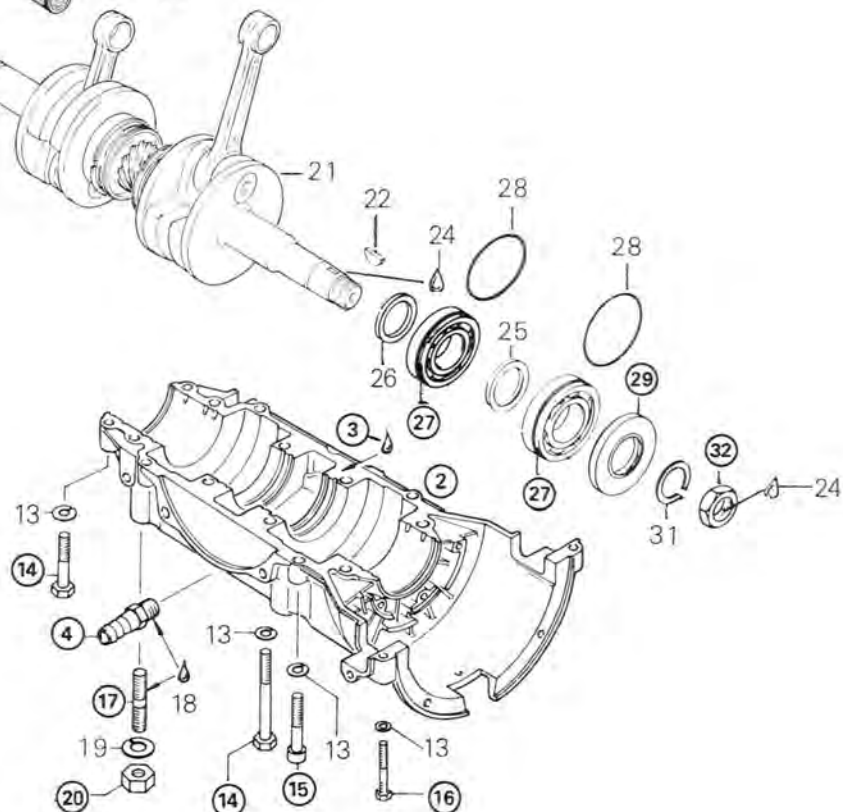
◆ **WARNING:** Always unscrew cap to the first step with a cloth to release pressure, before removing it.

BOTTOM END

1. Crankcase upper half
2. Crankcase lower half
3. "Loctite 515"
4. Oil fitting
5. Bolt M8 x 16
6. Sealing ring
7. Angular tube (oil)
8. Cylinder stud (79 mm)
9. Cylinder stud (104 mm)
10. Junction block support



11. Lockwasher
12. Screw
13. Lockwasher
14. Bolt
15. Allen bolt
16. Bolt M6 x 35
17. Stud M10 x 45
18. "Loctite 242"
19. Lockwasher
20. Nut
21. Crankshaft
22. Woodruff key
23. Needle cage bearing
24. "Loctite 242"
25. Shim (1 mm)
26. Distance ring
27. Bearing
28. "O" ring
29. Oil seal
30. Labyrinth sleeve
31. Lockwasher
32. Nut



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 "Loctite" from crankcase mating surfaces with Bombardier sealant stripper.

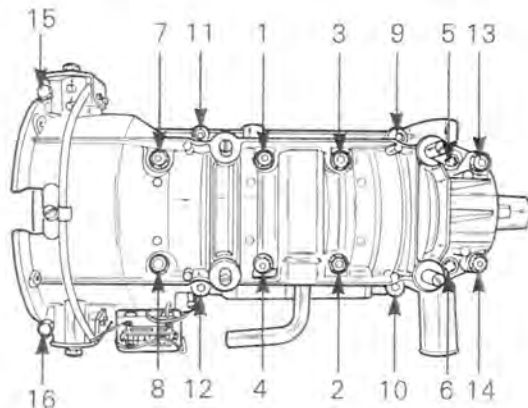
CAUTION: Never use a sharp object to scrape away old sealant as score marks incurred are detrimental to crankcase sealing.

DISASSEMBLY & ASSEMBLY

①②③ 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 515" (413 7027 00) on mating surfaces.

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

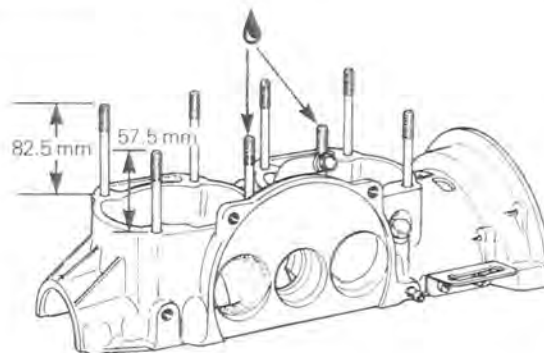
Position the crankcase halves together and torque bolts by hand, then install armature plate (tighten) on magneto side to correctly align crankcase halves. Torque bolts to 22 N•m (16 ft-lbs) following illustrated sequence.



NOTE: Torque the two smaller bolts (15 and 16) on magneto side to 13 N•m (10 ft-lbs).

④⑦⑫ Apply "Loctite 242" on threads prior to assembly.

⑧⑨ Because of cap nuts, cylinder studs have to be screwed into the crankcase so that they do not exceed further than 82.5 mm (3.250") on exhaust side and 57.5 mm (2.260") on intake side.



Apply "Loctite 242" on the threads of the two studs screwed above the intake ports.

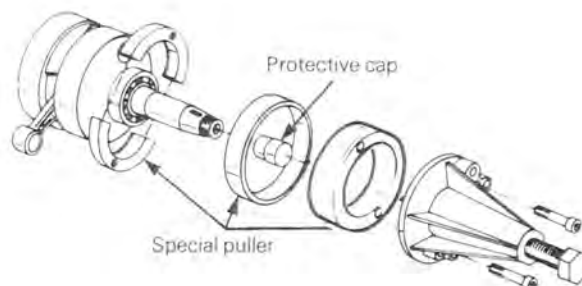
⑭⑮ Torque to 22 N•m (16 ft-lbs).

⑯ Torque to 14 N•m (10 ft-lbs).

⑰ At assembly on crankcase, apply "Loctite 242" on threads.

⑳ Torque to 35 N•m (26 ft-lbs).

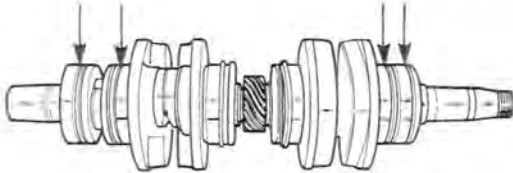
㉗㉘㉙ To remove bearings from crankshaft, use a protective cap and special puller as illustrated.



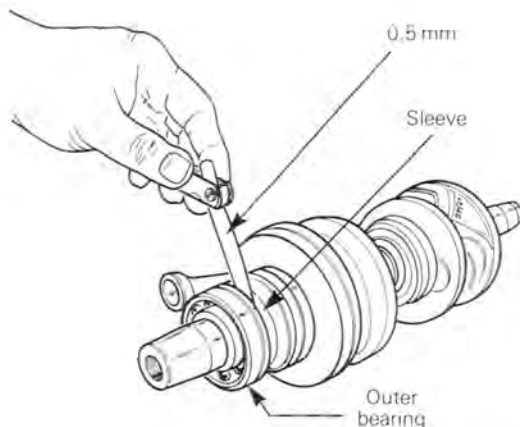
SECTION 04

SUB-SECTION 02 (ENGINES)

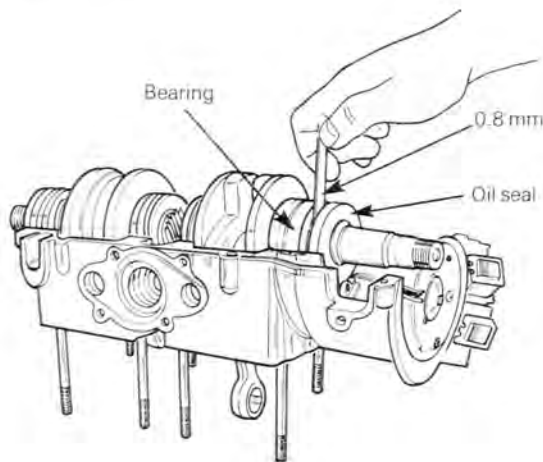
Prior to installation, place bearings into an oil container and heat the oil to 100°C (212°F). This will expand bearing and ease installation. Install bearings with groove as per the following illustration.



When positioning P.T.O. outer bearing on crankshaft, a gap of 0.5 mm (.020") must be left between bearing and labyrinth sleeve to avoid axial forces to the bearing.



②⑨ At assembly, apply a light coat of lithium grease on seal lips.



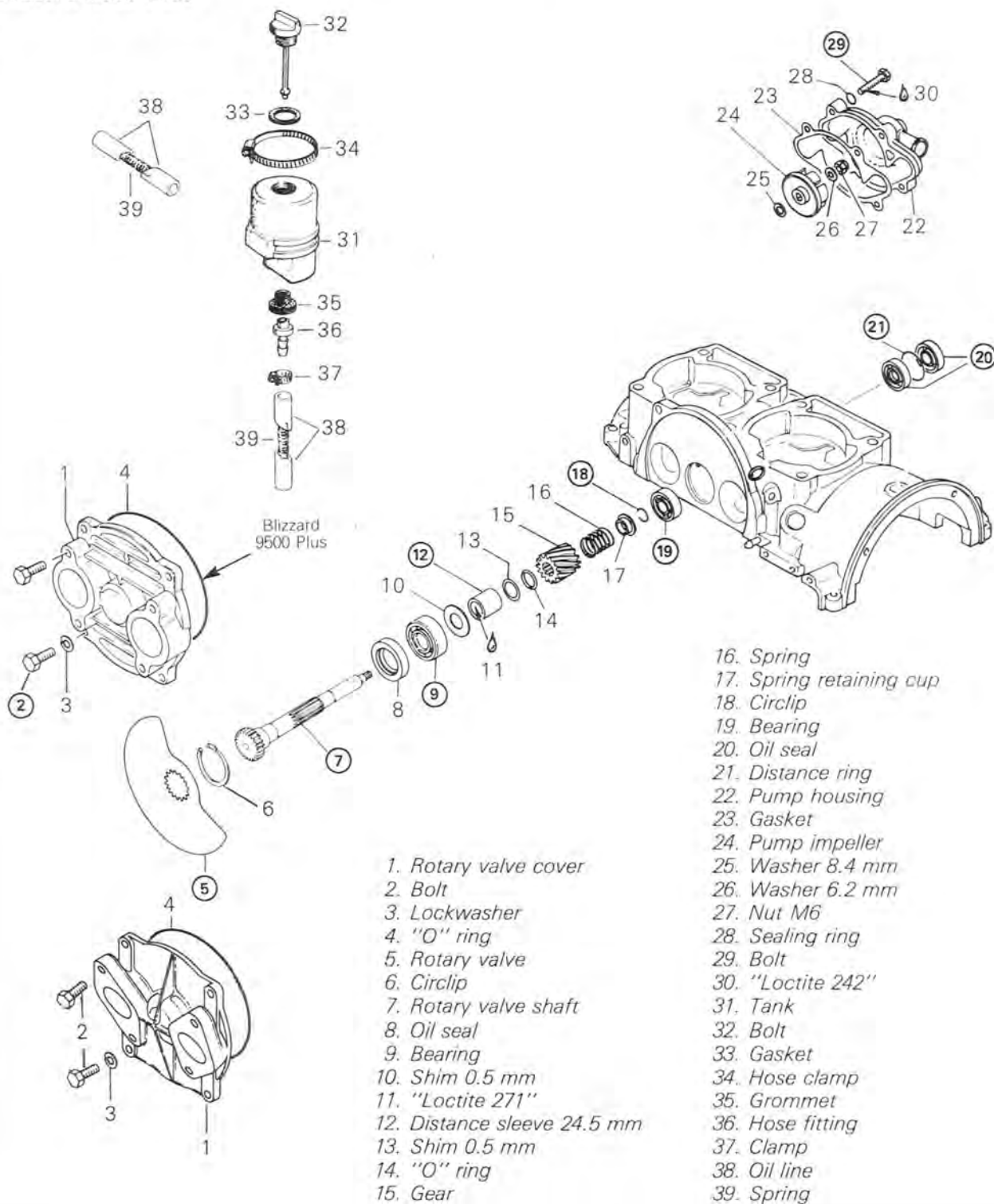
To insure adequate oil supply to the bearing on the **magneto side**, install oil seal with a gap of at least 0.8 mm (.030") with bearing.

On **P.T.O. side**, install oil seal **flush** with crankcase; do not push furthermore, there will be a gap of 0.5 mm (.020").

③② Apply "Loctite 242" on threads then torque to 80 N•m (60 ft-lbs).

ROTARY VALVE AND COOLANT PUMP

Blizzard 9500 Plus



ROTARY VALVE & COOLANT PUMP

CLEANING

Discard all oil seals and "O" rings.

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

DISASSEMBLY & ASSEMBLY

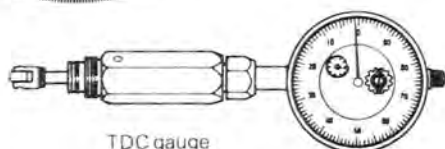
② Torque to 20 N•m (15 ft-lbs).

⑤ Rotary valve adjustment when replacing crankcase having no timing marks.

REQUIRED TOOLS



Angle finder
(414 3529 00)

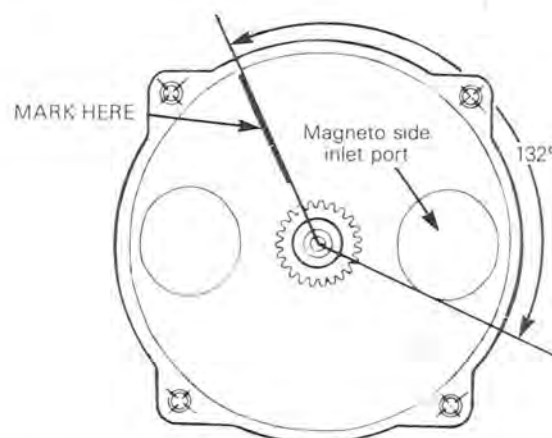


TDC gauge
(414 1047 00)

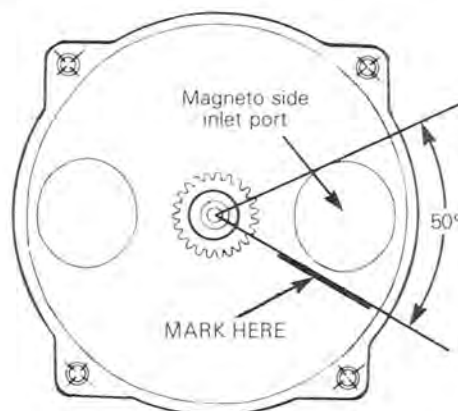
ENGINE TYPE	TIMING MARKS opening, closing
354, Blizzard 7500 and Super Sonic	132°, 50°
454, Blizzard 9500 Plus	137°, 65°

For example: 132° opening
50° closing

Using angle finder, mark crankcase at 132° from bottom edge of magneto side inlet port.



From top edge of magneto side inlet port, mark crankcase at 50°.



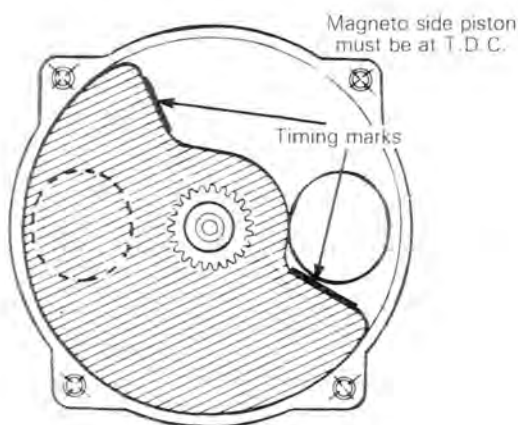
SECTION 04

SUB-SECTION 02 (ENGINES)

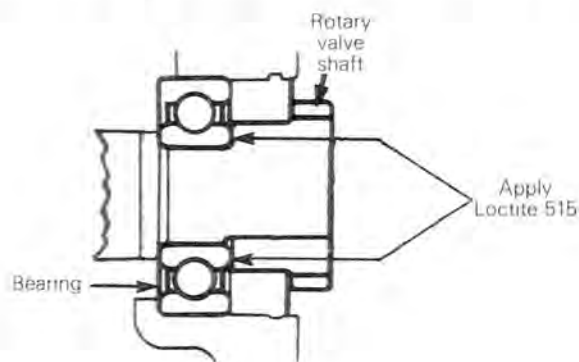
To correctly install the rotary valve disc proceed as follows:

- 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 asymmetrical, therefore, at assembly try positioning each side of disc on gear to determine best installation position.

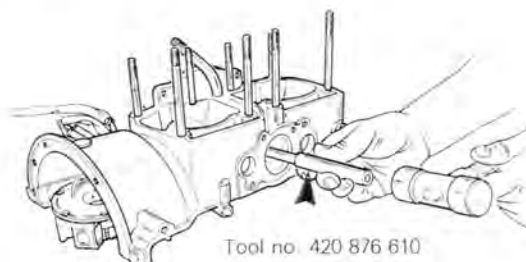


⑦⑨ At assembly, apply crankcase sealant "Loctite 515" on bearing and rotary valve shaft mating surfaces.

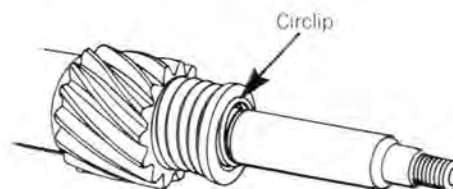


⑦ through ⑱ Rotary valve shaft assembly

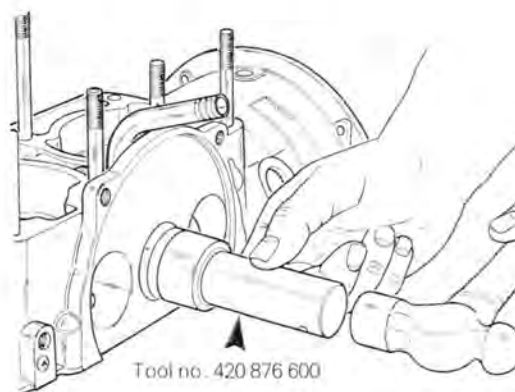
To remove rotary valve shaft assembly from crankcase, first remove coolant pump impeller ⑳ and circlip ⑥. Using the suitable pusher (P/N 420 876 610) and a fiber hammer, push shaft assembly.



If it is necessary to disassemble components of rotary valve shaft assembly, compress spring retaining cup ⑰ in order to remove circlip ⑱.



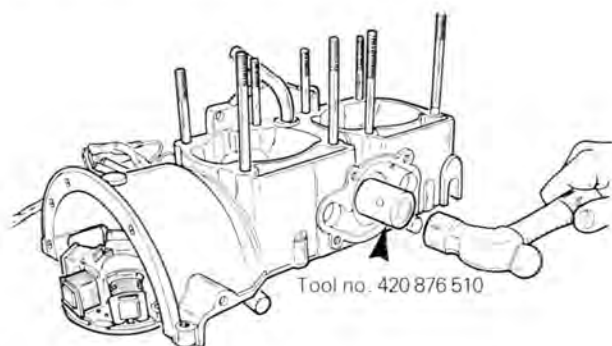
To install shaft assembly and oil seal, use pusher no. 420 876 600.



⑫ Clean rotary valve shaft and inside of distance sleeve. At assembly apply "Loctite 271" inside of distance sleeve.

⑲ Using a suitable pusher, push coolant pump bearing with shield opposite to rotary valve disc.

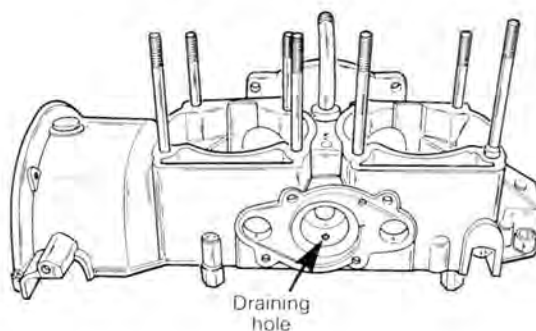
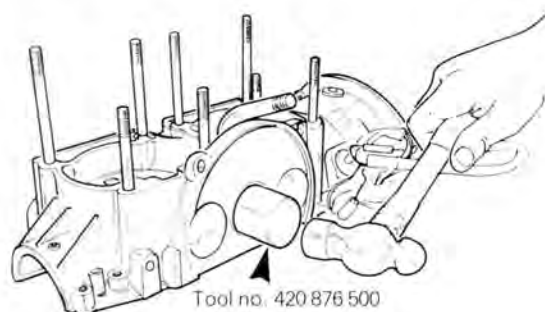
To remove bearing



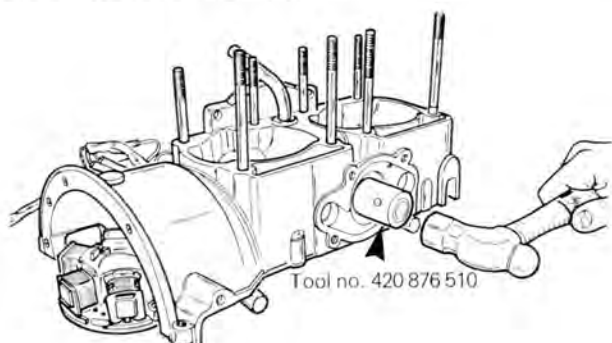
Distance ring opening must be in line with crankcase half draining hole.



To install bearing



②① Using no. 420 876 510 pusher, install oil seals (with lithium grease on seal lips).



②⑨ Apply "Loctite 242" on threads.

D



- 

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.

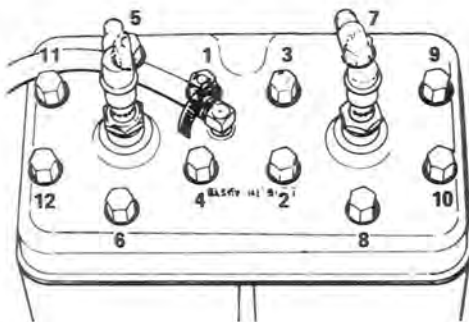
NOTE: The letters "AUS" (over an arrow on the piston dome) must be visible after cleaning.

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

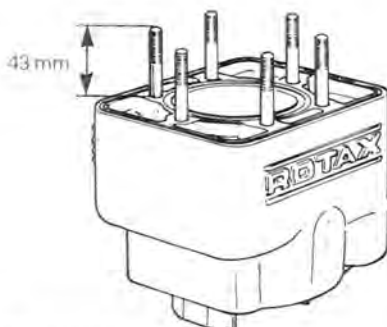
DISASSEMBLY & ASSEMBLY

①②③ Prior to washer installation, apply silicone sealant around studs.

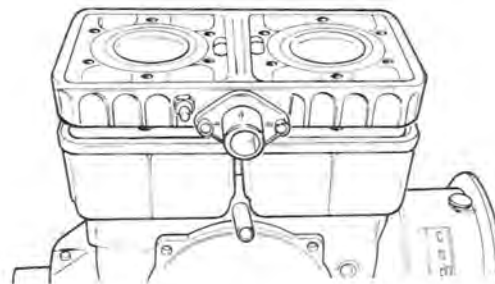
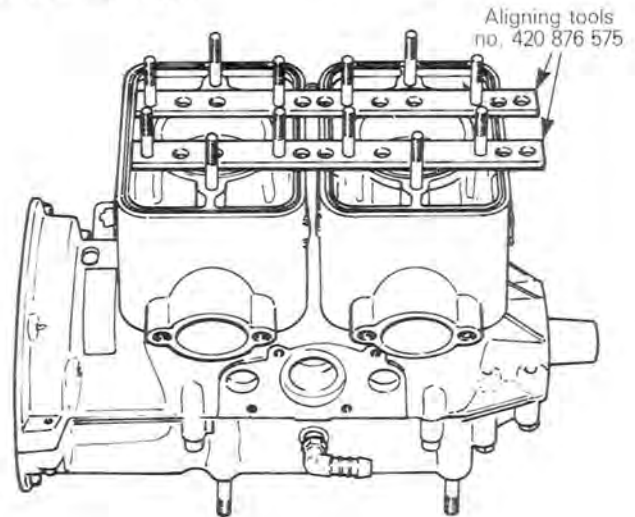
Torque cylinder head nuts to 16 N•m (12 ft-lbs) following illustrated sequence.



⑥⑨ Because of cap nuts, cylinder head studs have to be screwed into the cylinder so that they do not protrude by more than 43 mm (1.700"). If it is not possible to obtain this length, add a washer between cylinder head and cap nut. Shorter threaded part of stud should be screwed into cylinder.



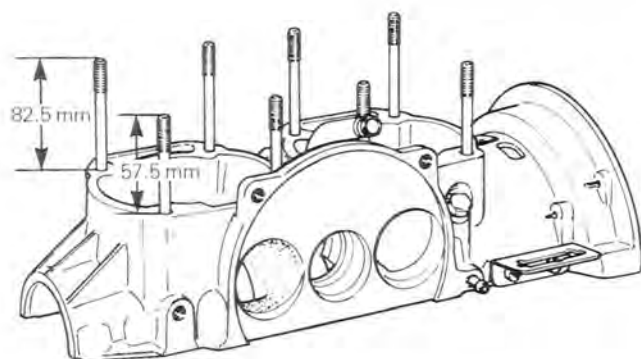
When reassembling the cylinders to the crankcase, it is important to have them properly aligned so that the cylinder head holes will match up with the studs. A special tool (as per illustration) (or cylinder head itself) can be used to align the cylinders. Cross torque cylinder nuts to 16 N•m (12 ft-lbs).



⑭⑮ Because of cap nuts, cylinder studs have to be screwed into the crankcase so that they do not protrude by more than 82.5 mm (3.250") on exhaust side and 57.5 mm (2.260") on intake side.

SECTION 04

SUB-SECTION 02 (ENGINES)



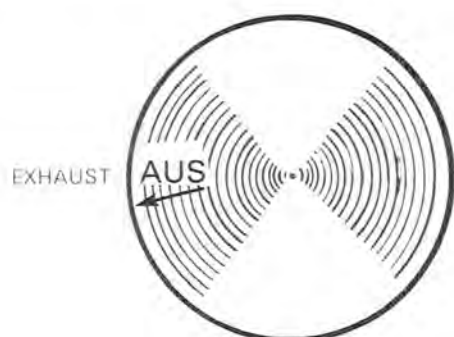
Apply "Loctite 242" on the threads of the two studs screwed above the intake ports.

⑱ ⑲ ⑳ Place a clean cloth over crankcase to prevent circlips from falling into crankcase then use a pointed tool to remove circlips from piston.

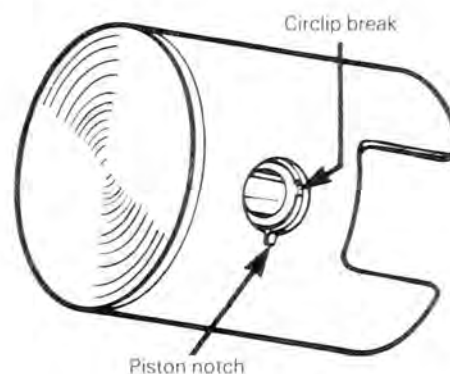
Drive the gudgeon pins in or out using a suitable drive punch and hammer.

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 the direction of the exhaust port.



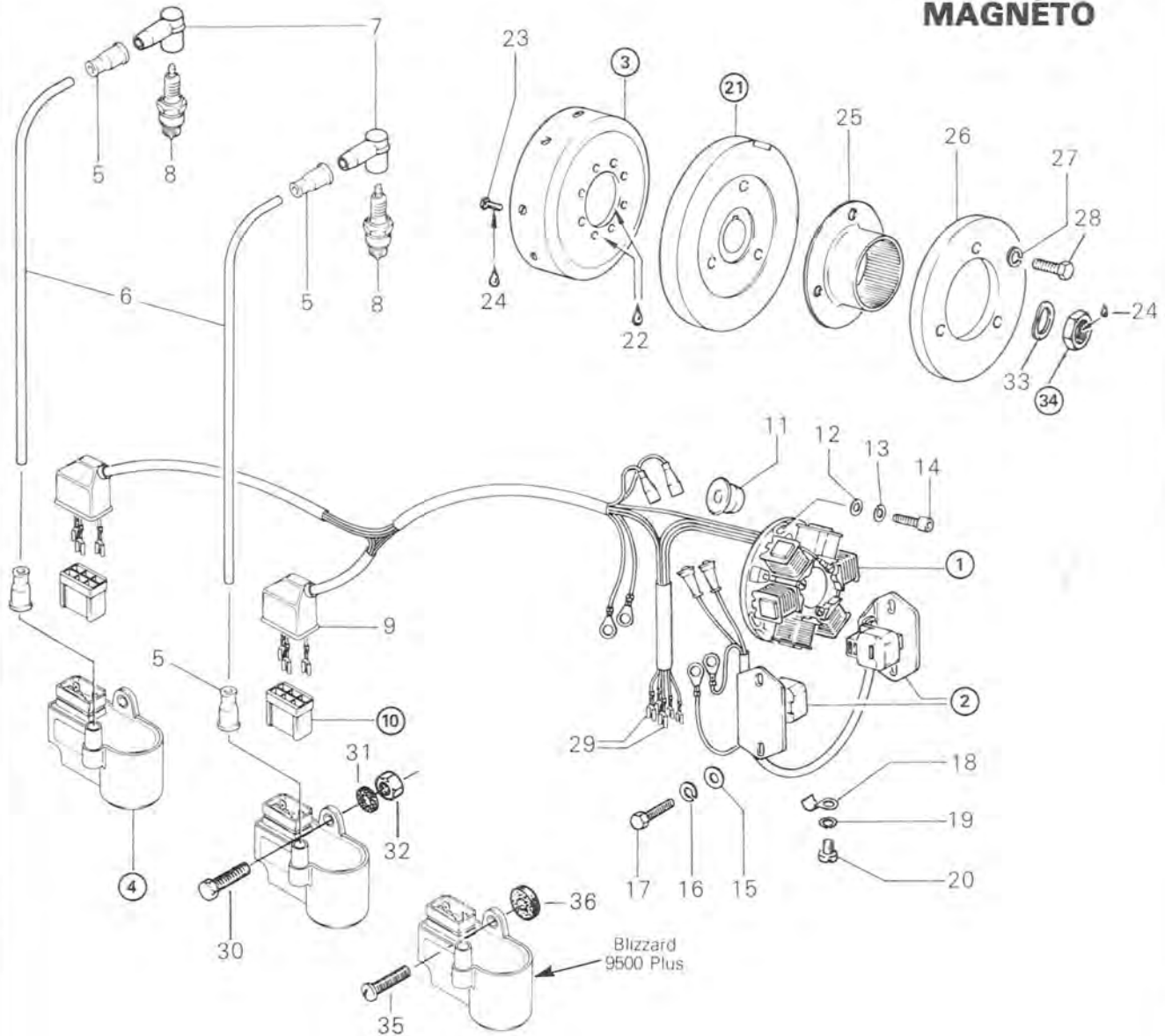
Once the circlips are installed, turn each circlip so that the circlip break is not directly in line with piston notch. Using very fine emery cloth, remove any burrs on piston caused through circlip installation.



Piston to wall clearance should be:

TYPE	MINIMUM	MAXIMUM
354	0.080 mm (.0031")	0.200 mm (.0079")
454	0.090 mm (.0079")	0.220 mm (.0087")

MAGNÉTO



1. Armature plate
2. Trigger coil
3. Magneto ring
4. Electronic box
5. Protection cap
6. Ignition cable
7. Spark plug protector
8. Spark plug
9. Protection cap
10. Female connector housing
11. Plug
12. Washer

13. Lockwasher
14. Allen screw M5 x 18
15. Washer
16. Lockwasher
17. Bolt M6 x 20
18. Clip
19. Lockwasher
20. Screw M6 x 8
21. Magneto housing
22. "Loctite 271"
23. Bolt M5 x 10
24. "Loctite 242"

25. Starting pulley
26. Flywheel
27. Lockwasher
28. Bolt M8 x 25
29. Female connector
30. Bolt
31. Rubber spacer
32. Nut
33. Lockwasher
34. Nut
35. Screw
36. Rubber spacer

MAGNETO

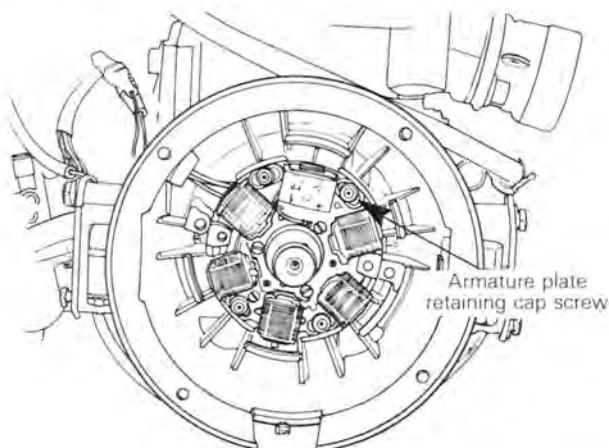
CLEANING

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

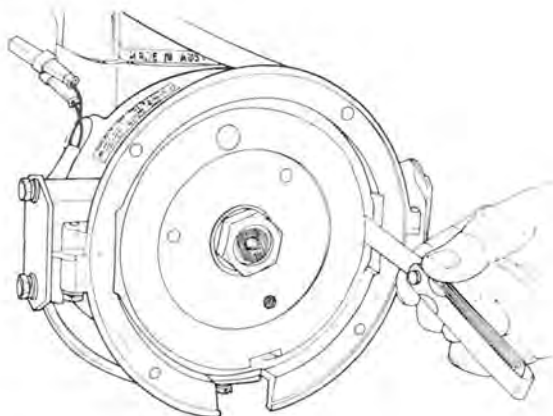
▼ **CAUTION:** Clean armature and magneto using only a clean cloth.

DISASSEMBLY & ASSEMBLY

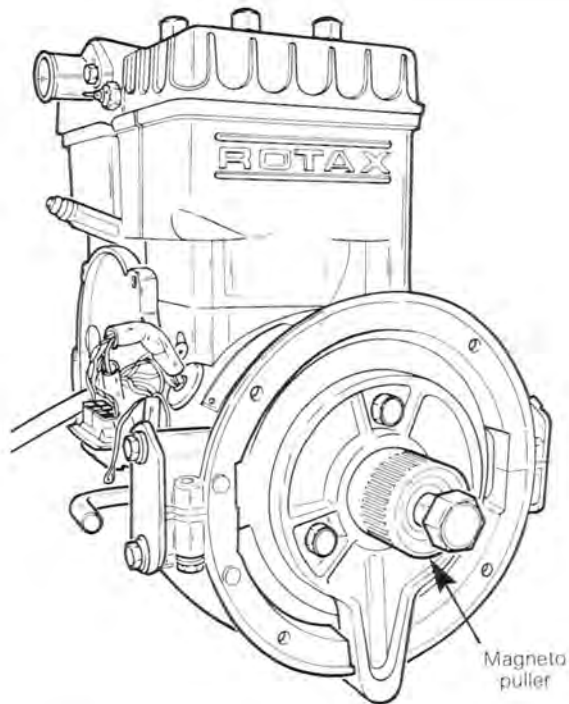
① To obtain best generator coil performance, position the armature plate on the crankcase with the retaining cap screws in the middle of the plate slots.



② Check air gap between magneto ring and trigger coil. The gap should be 0.8 - 1.2 mm (.031 - .047").



③ ② To remove magneto, use special puller as illustrated. 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 242".

④ ⑩ At the re-installation or verification of the ignition system electric connections, all the connections must be coated with lithium grease or dielectric grease to prevent corrosion.

▼ **CAUTION:** To prevent moisture, ensure no air is trapped within the connections. Do not use silicone sealant as contacts will corrode.

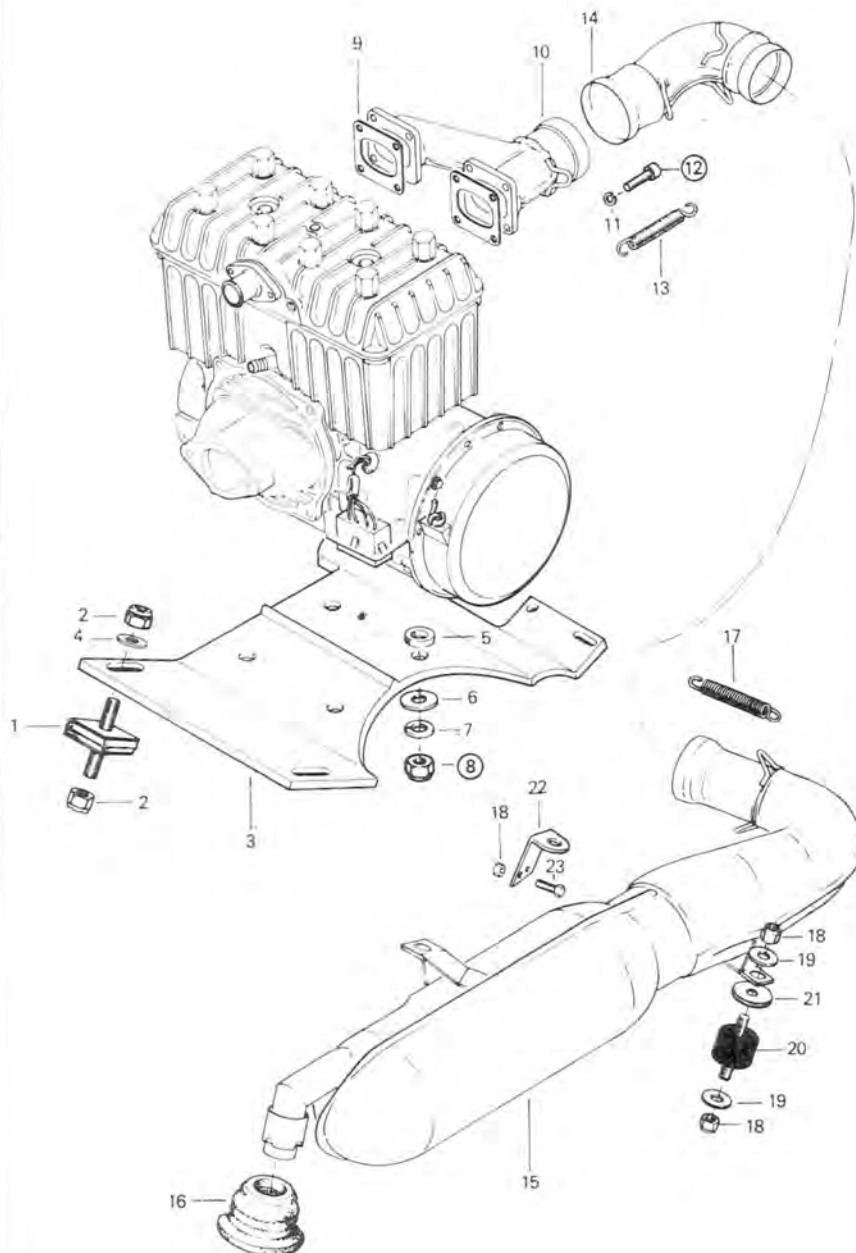
③ ④ Prior to assembly, clean threads then apply "Loctite 242".

Torque to 80 N•m (60 ft-lbs).

444 TYPE ENGINE

ENGINE SUPPORT & MUFFLER

Everest and Futura



1. Engine shear mount
2. Nut
3. Engine support
4. Flat washer
5. Distance sleeve
6. Flat washer
7. Lockwasher
8. Nut
9. Exhaust gasket
10. Exhaust manifold
11. Lockwasher
12. Bolt
13. Spring
14. Exhaust elbow
15. Muffler
16. Exhaust grommet
17. Spring
18. Nut
19. Washer
20. Shear mount
21. Insulating washer
22. Bracket
23. Bolt

ENGINE SUPPORT & MUFFLER

REMOVAL FROM VEHICLE

Disconnect or remove the followings from vehicle:

- Pulley guard and drive belt.
- Air silencer, throttle cable.
- Fuel lines, primer and pulsation lines.
- Muffler and rewind starter.
- Electrical wires (junction block, main ground wire, starter wires).

◆ **WARNING:** Before disconnecting any electrical wire in starter system always first disconnect the battery cable.

- Drain the cooling system and disconnect hoses at engine.

○ **NOTE:** It is not necessary to remove rotary valve oil hoses to remove engine from vehicle, it is easier to drain the system on the workshop bench.

- Remove engine mount nuts then lift engine from vehicle.

DISASSEMBLY & ASSEMBLY

⑧ Torque to 35 N•m (26 ft-lbs).

⑫ Torque to 14 N•m (10 ft-lbs)).

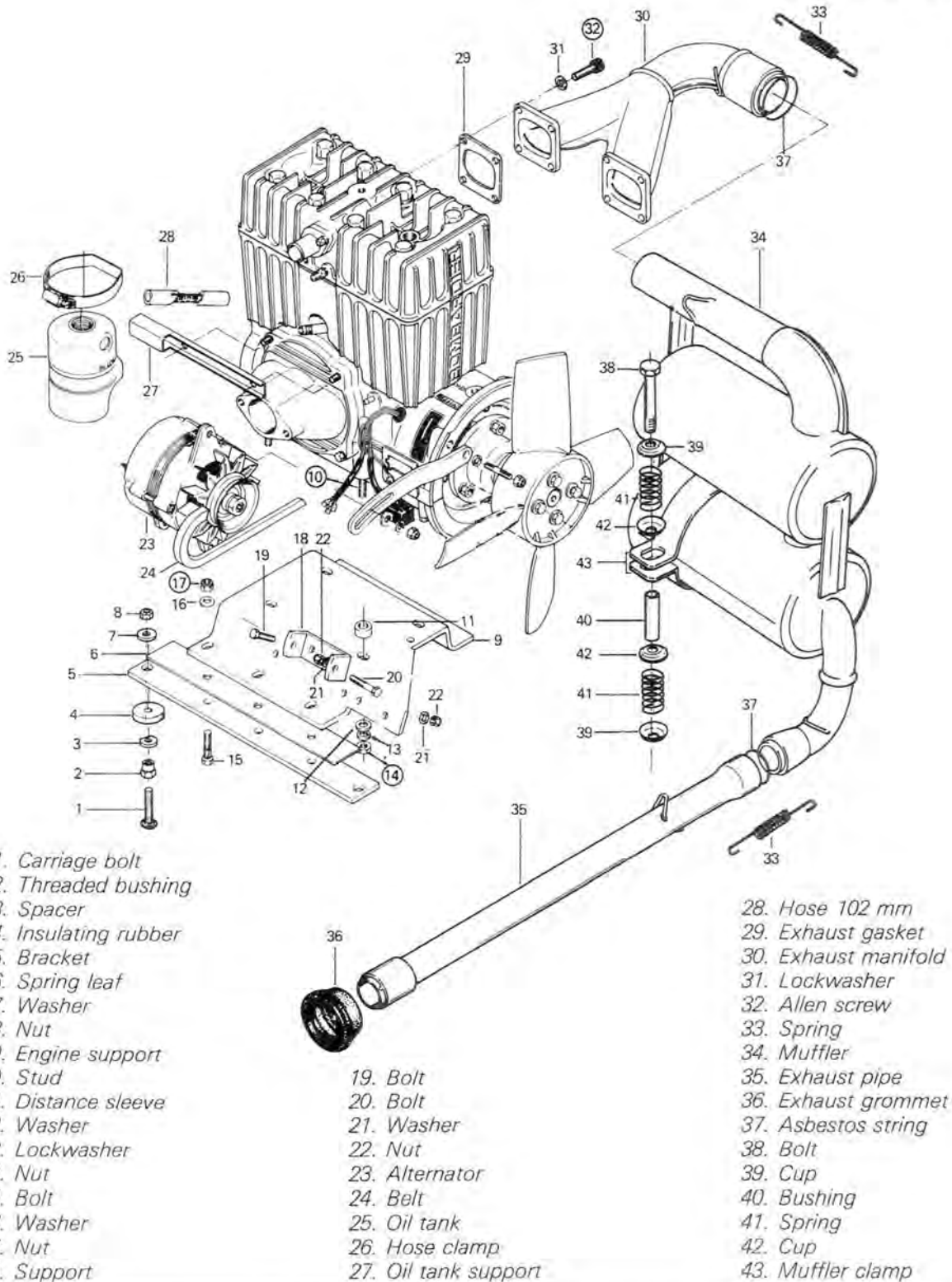
INSTALLATION ON VEHICLE

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

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

ENGINE SUPPORT & MUFFLER

Elite 450 LC



1. Carriage bolt
2. Threaded bushing
3. Spacer
4. Insulating rubber
5. Bracket
6. Spring leaf
7. Washer
8. Nut
9. Engine support
10. Stud
11. Distance sleeve
12. Washer
13. Lockwasher
14. Nut
15. Bolt
16. Washer
17. Nut
18. Support

19. Bolt
20. Bolt
21. Washer
22. Nut
23. Alternator
24. Belt
25. Oil tank
26. Hose clamp
27. Oil tank support

28. Hose 102 mm
29. Exhaust gasket
30. Exhaust manifold
31. Lockwasher
32. Allen screw
33. Spring
34. Muffler
35. Exhaust pipe
36. Exhaust grommet
37. Asbestos string
38. Bolt
39. Cup
40. Bushing
41. Spring
42. Cup
43. Muffler clamp

ENGINE SUPPORT AND MUFFLER REMOVAL FROM VEHICLE

Disconnect or remove the followings from vehicle:

- Pulley guard and drive belt.
- Intake silencer and throttle cable.
- Fuel lines, primer and pulsation lines, fuel tank.
- Electrical wires (at engine, alternator, starter).



WARNING: Before disconnecting any electrical wire in starter system, always first disconnect the battery cable.

- Drain the cooling system and disconnect hoses at engine.
- Remove engine mount nuts then lift engine from vehicle.

DISASSEMBLY AND ASSEMBLY

⑩ At assembly on crankcase, apply "Loctite 242" on threads.

⑭ Torque to 36 N•m (26 ft-lbs).

⑰ Torque to 32 N•m (23 ft-lbs).

⑳ Torque to 14 N•m (10 ft-lbs).

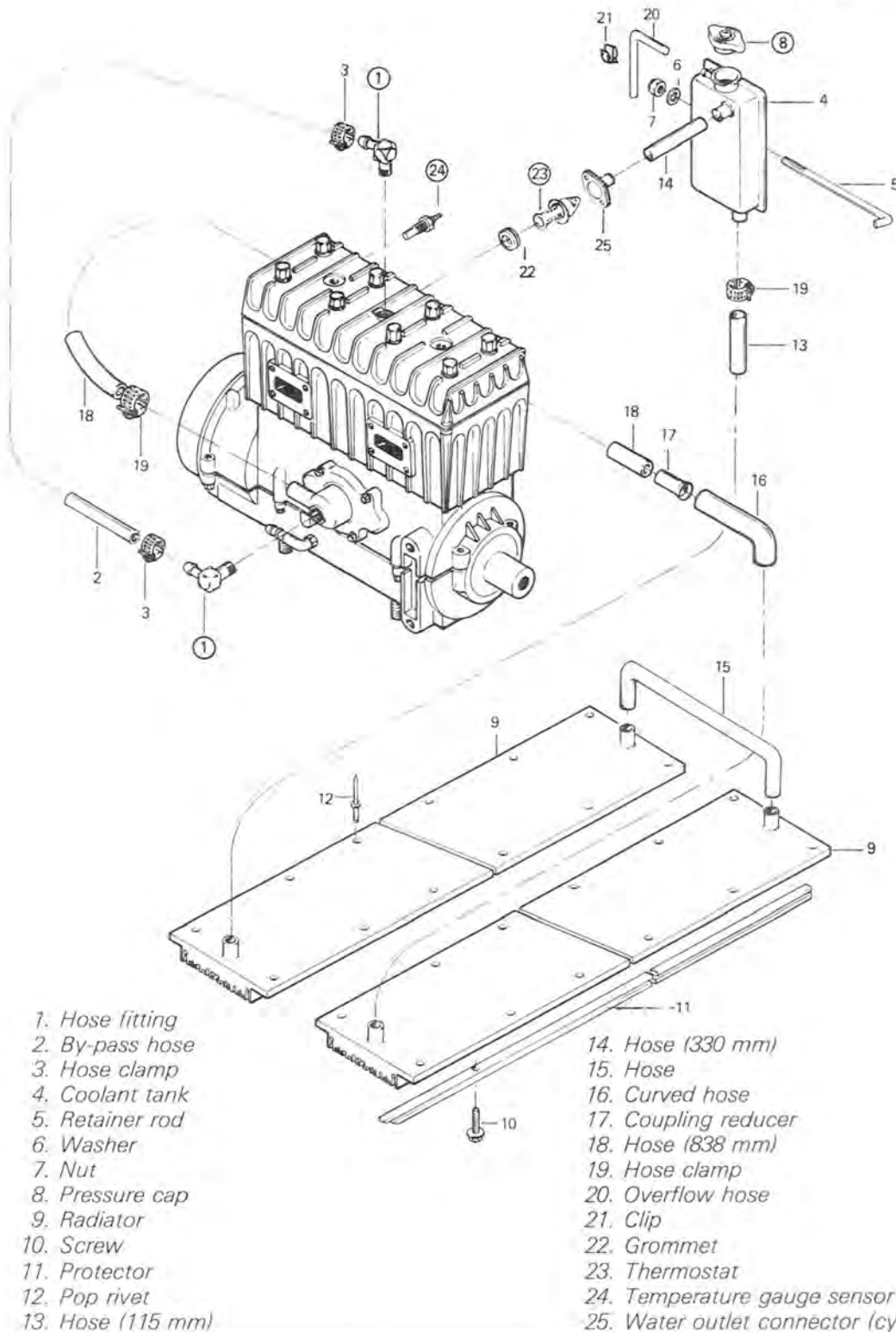
INSTALLATION ON VEHICLE

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

- Check tightness of engine mount nuts.
- After throttle cable installation, check carburetor maximum throttle slide opening.
- Check pulley alignment and alternator belt tension.

COOLING SYSTEM

Everest and Futura



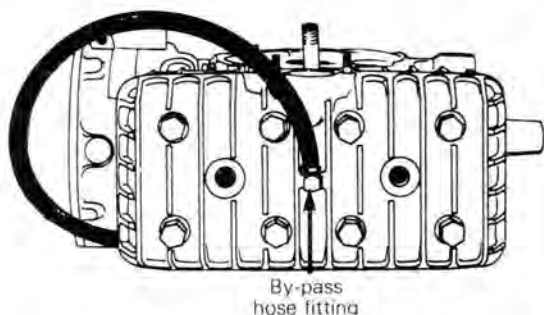
COOLING SYSTEM (Everest & Futura)

INSPECTION

Check general condition of hoses and clamps tightness.

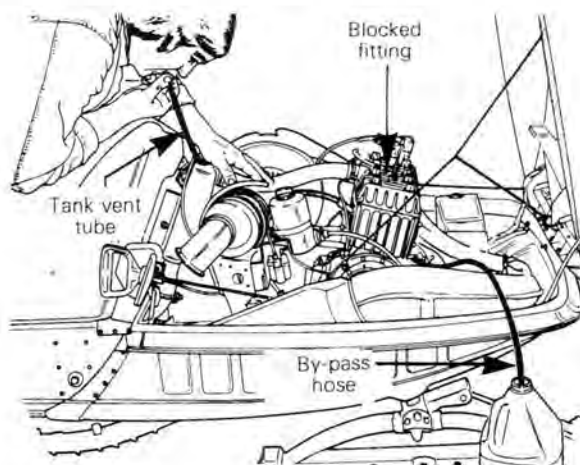
DRAINING THE SYSTEM

To drain the cooling system, remove the coolant tank cap and disconnect the by-pass hose from fitting on cylinder head.



Block fitting and keep hose as low as possible to drain the system.

However, to completely drain the system, it is necessary to blow into the tank through the vent tube, while maintaining the hand over the filler neck to prevent air leak.



DISASSEMBLY & ASSEMBLY

- ① ②④ Apply pipe thread sealant to avoid leaks.
- ⑧ See if the cap pressurizes the system. If not, install a new 13 lbs cap, (do not exceed 13 lbs of pressure).
- ②③ To check thermostat, put it in water and heat water. Thermostat should open when water temperature reaches 43°C (110°F).

REFILLING THE SYSTEM

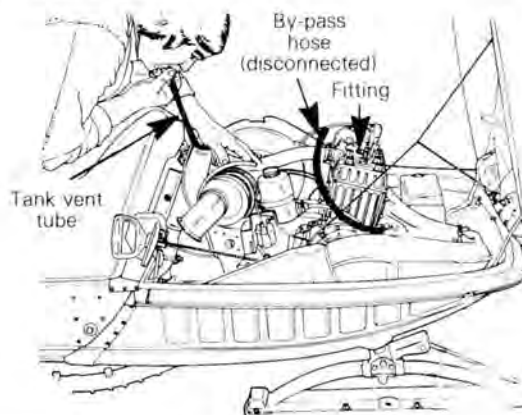
Capacity:

4.5 liters approximately
(0.9 Imp. gal.) (1.1 U.S. gal.)

55% concentrated antifreeze + 45% water

To refill the cooling system, disconnect by-pass hose and keep it near fitting on cylinder head; refill tank and blow into it through the vent tube, while maintaining the hand over the filler neck until the liquid comes out at the by-pass hose and the fitting on cylinder head.

○ **NOTE:** It is necessary to refill tank as soon as it becomes empty.



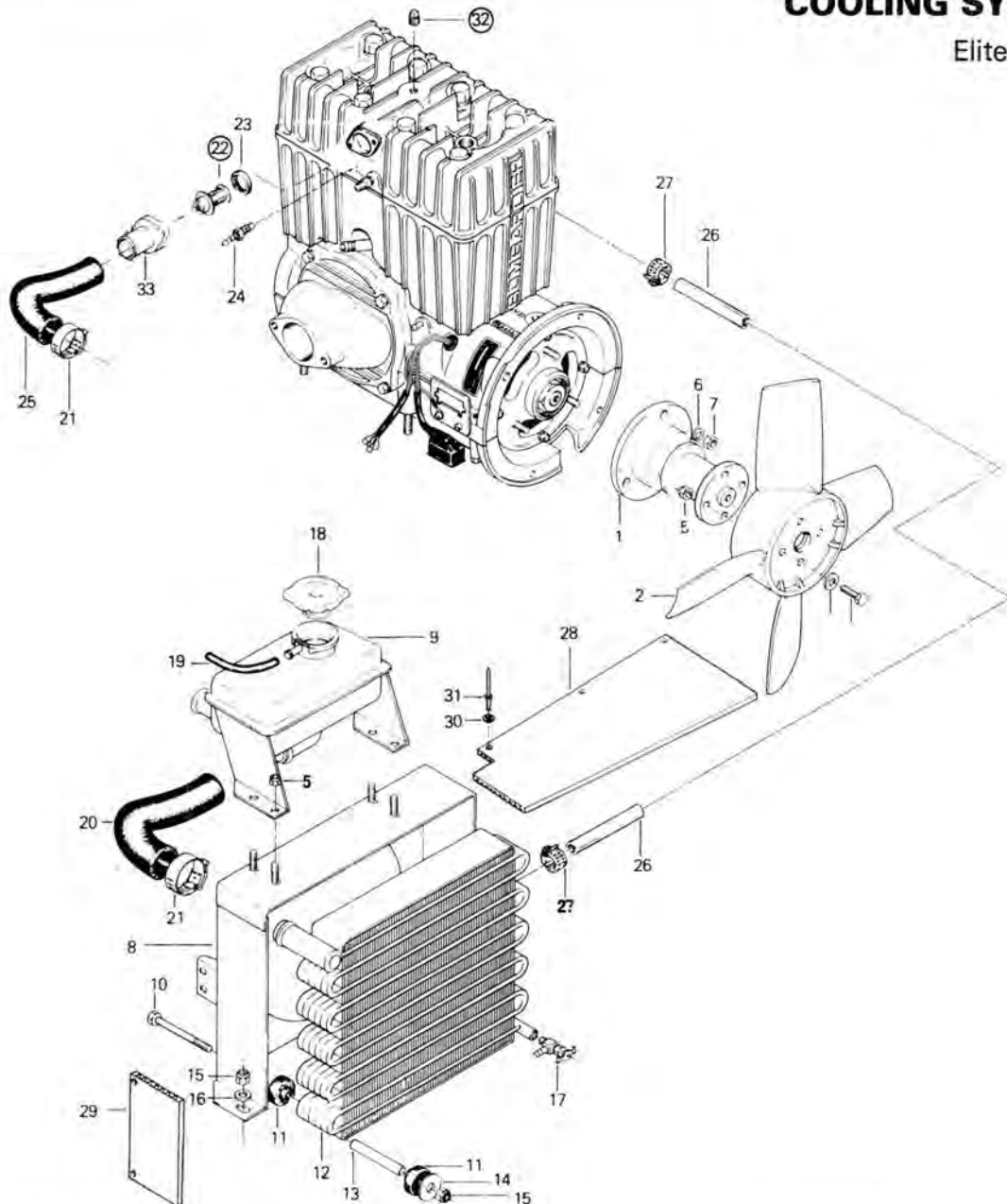
Reconnect by-pass hose and continue to pour the liquid in the coolant tank until the coolant level reaches 25 mm (1") below filler neck.

Reinstall tank cap and start engine; let engine run until it reaches its operating temperature and thermostat opens. Allow it to run a few minutes more. Stop engine and check coolant level; refill as necessary.

◆ **WARNING:** Always unscrew cap to the first step with a cloth to release pressure, before removing it.

COOLING SYSTEM

Elite 450 LC



1. Fan adapter
2. Fan
3. Bolt
4. Lockwasher
5. Nut
6. Lockwasher
7. Nut
8. Grille (radiator)
9. Coolant tank
10. Bolt
11. Rubber bumper

23. Sealing ring
24. Sensor
25. Outlet hose (engine)
26. Hose (380 mm)
27. Hose clamp
28. Upper deflector
29. Side deflector
30. Washer
31. Pop rivet
32. Plug
33. Cylinder head outlet collar

12. Radiator
13. Bushing
14. Washer
15. Nut
16. Washer
17. Drain valve
18. Plug
19. Overflow hose (635 mm)
20. Inlet hose (radiator)
21. Hose clamp
22. Thermostat

COOLING SYSTEM (Elite 450)

INSPECTION

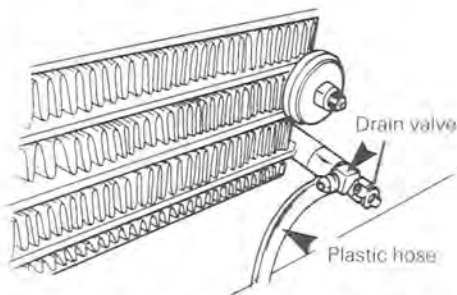
Check general condition of hoses and clamps tightness.

DRAINING THE SYSTEM

To drain the cooling system, remove the coolant tank cap.

Remove the R.H. access grill, and connect a length of plastic hose to the radiator drain valve in order to drain the cooling system outside of the body.

Open the drain valve.



DISASSEMBLY & ASSEMBLY

②② To check thermostat, put it in water and heat water. Thermostat should open when water temperature reaches 43°C (110°F).

②④ ③② Apply pipe thread sealant to avoid leaks.

REFILLING THE SYSTEM

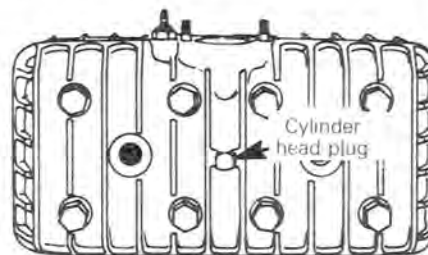
Capacity:

6.25 liters

(1.4 Imp. gal.) (1.7 U.S. gal.)

60% concentrated antifreeze + 40% water

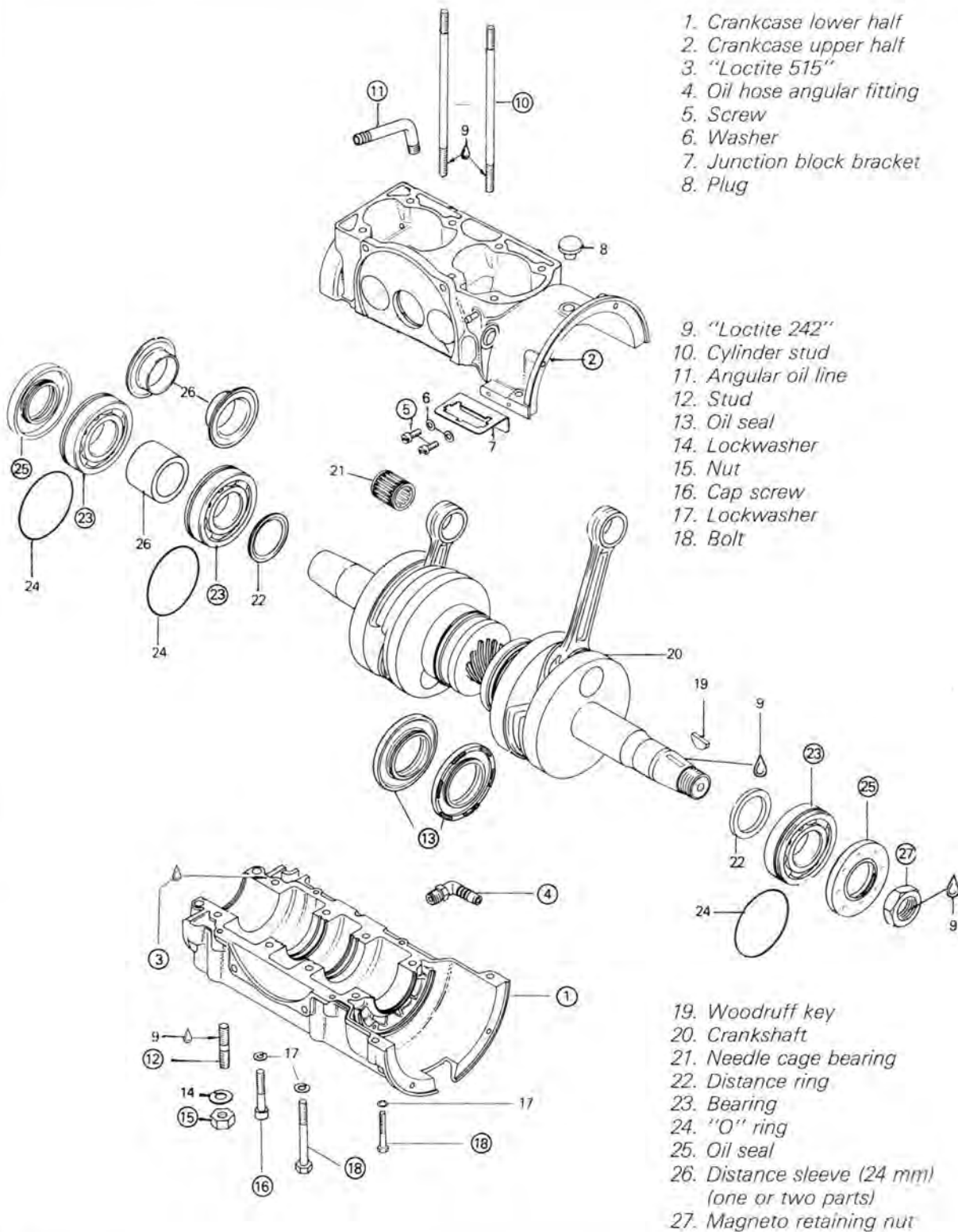
To refill the cooling system, unscrew the plug on top of the cylinder head, then slowly pour the liquid into the coolant tank until it reaches the plug hole in the cylinder head. Reinstall the plug. Continue to pour the liquid in the coolant tank until the coolant level reaches 25 mm (1") below filler neck of reservoir.



With the pressure cap removed, start engine to allow the coolant to circulate and let it run until normal temperature is reached. Stop engine.

Then recheck coolant level, ensuring that it is 25 mm (1") below filler neck of reservoir.

BOTTOM END



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.

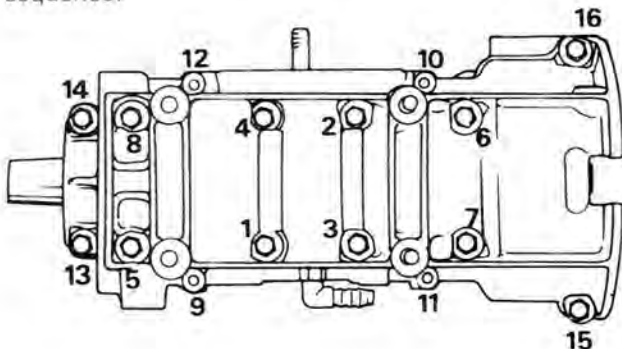
DISASSEMBLY & ASSEMBLY

① ② ③ Crankcase halves are factory matched and therefore, are not interchangeable or available as single halves. Prior to joining of crankcase halves, apply "Loctite 515" (no. 413 7027 00) on mating surfaces.

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

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

Torque bolts to 22 N•m (16 ft-lbs) following illustrated sequence.

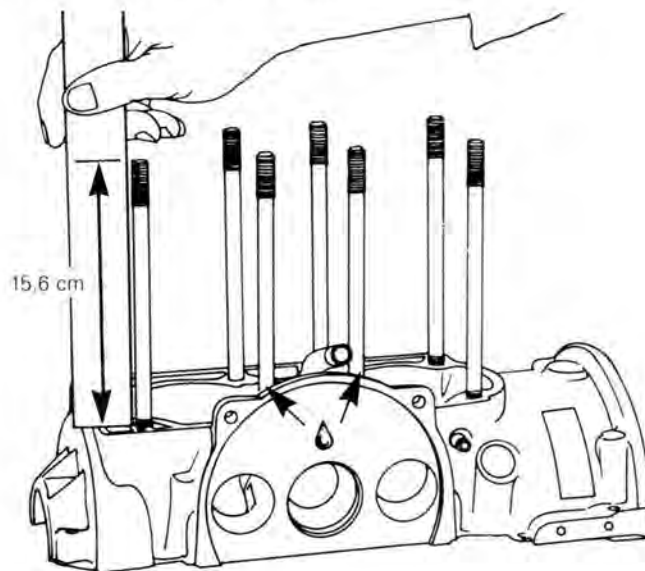


④ It is recommended to wrap "Teflon" pipe tape around threads.

⑤ ⑪ Apply "Loctite 242" on threads prior to assembly.

⑩ Because of cap nuts, cylinder studs have to be screwed into crankcase so that they do not protrude further than 15.6 cm (6.140"). If it is not possible to obtain this length, a washer must be added between cylinder head cap and cap nut.

Apply "Loctite 242" on the threads of the two studs screwed above the intake ports.



Longer threaded part of stud should be screwed into crankcase.

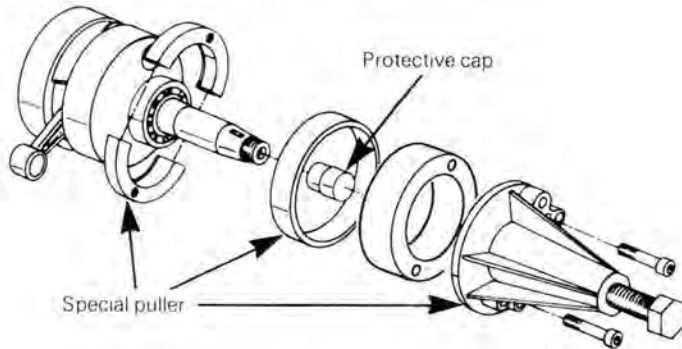
⑫ At assembly on crankcase, apply "Loctite 242" on threads.

⑬ Crankshaft center oil seals may be replaced at a crankshaft rebuild shop.

⑮ Torque to 35 N•m (26 ft-lbs).

⑯ ⑰ Torque to 22 N•m (16 ft-lbs).

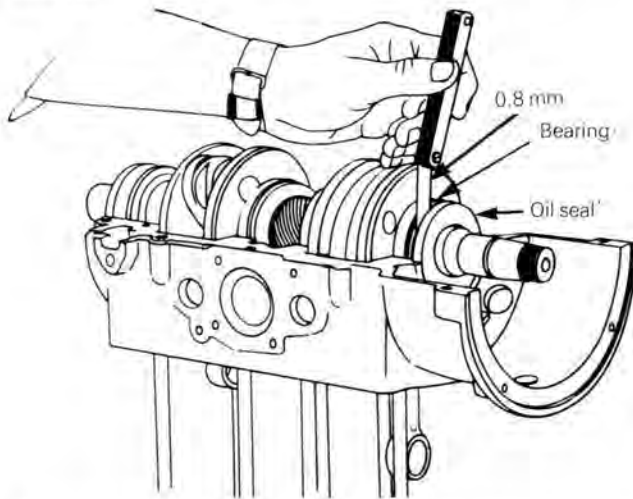
②③ To remove bearings from crankshaft, use a protective cap and special puller as illustrated.



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

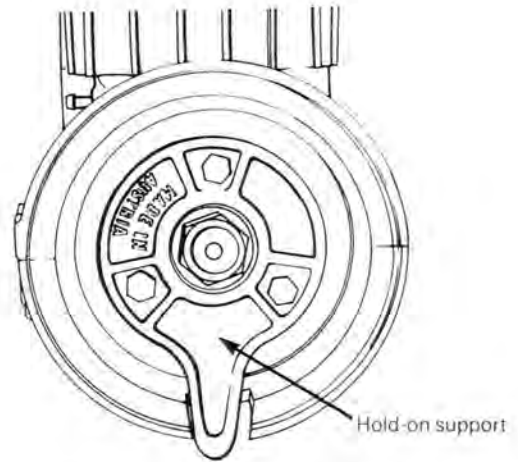
Install bearings with groove outward.

②⑤ At assembly, apply a light coat of lithium grease on seal lips.



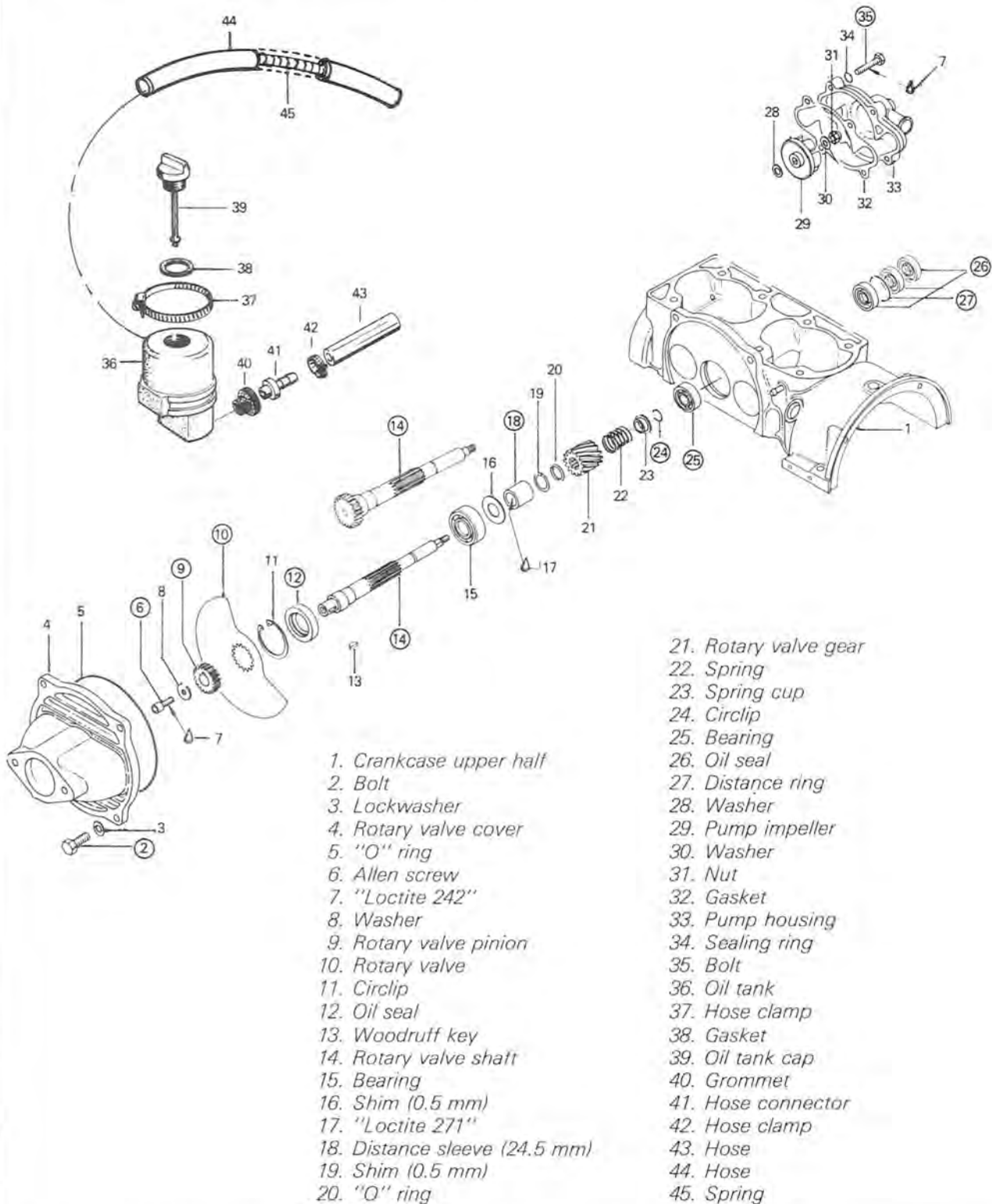
To insure adequate oil supply to the bearing on the **magneto side**, install oil seal with a gap of at least 0.8 mm (.030") with bearing. On **P.T.O. side** install oil seal flush with crankcase, no more in.

②⑦



To remove or install magneto retaining nut, lock crankshaft in position with special hold-on support, as illustrated.

ROTARY VALVE & COOLANT PUMP



ROTARY VALVE & COOLANT PUMP

CLEANING

Discard all oil seals and "O" rings.

Remove old crankcase sealant from rotary valve gear, adjacent bearing and cap mating surface.

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

DISASSEMBLY & ASSEMBLY

② Torque to 20 N•m (15 ft-lbs).

⑥ Apply "Loctite 242" on threads.

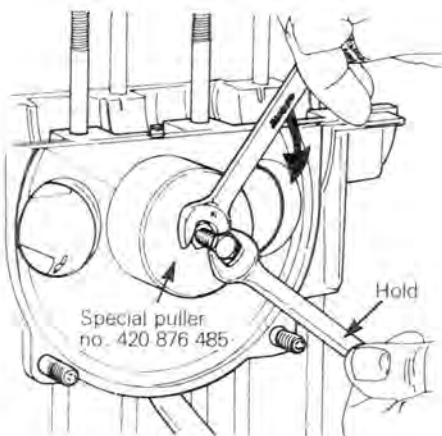
⑨ ⑫ ⑭ There are two interchangeable types of rotary valve shaft. The **first one** is made of a shaft with a pinion attached to it by means of a key and Allen screw. On the **second type**, the pinion and the shaft are machined together as a single part.

First type

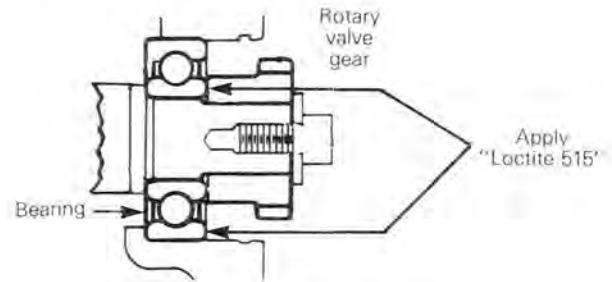


To remove rotary valve shaft assembly from crankcase, first remove pump impeller ⑳ and circlip ⑪.

Position special puller over shaft bore (with pinion removed) and screw puller bolt into rotary valve shaft. While holding puller bolt, turn puller nut clockwise until shaft comes out.



At assembly, apply "Loctite 515" on bearing and rotary valve gear mating surfaces.

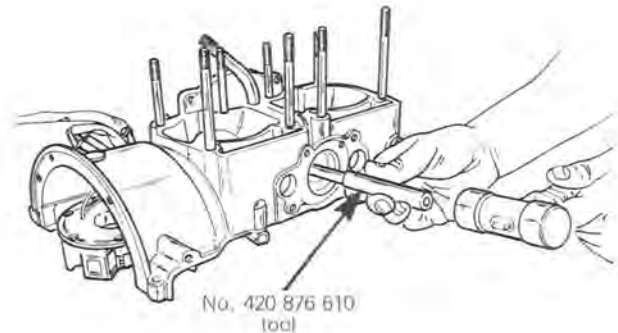


To install shaft assembly, use a fiber hammer. Use a no. 420 876 505 pusher to insert oil seal with lithium grease on seal lip.

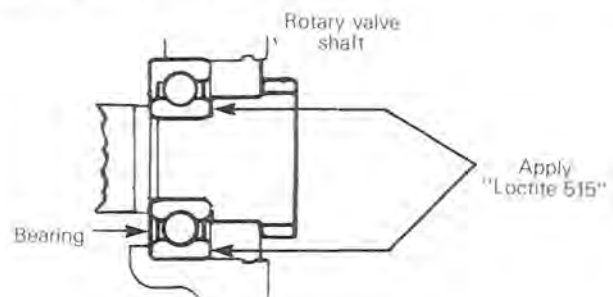
Second type



To remove rotary valve shaft assembly from crankcase, first remove pump impeller ⑳ and circlip ⑪. Using an appropriate pusher (P/N 420 876 610) and a fiber hammer, drive out shaft assembly.



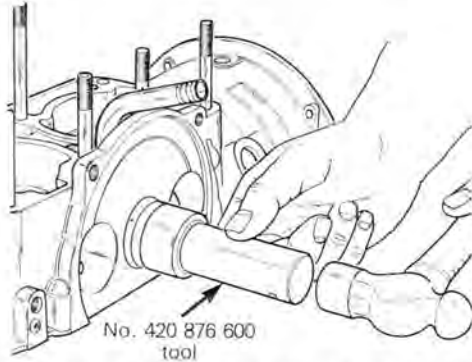
At assembly, apply "Loctite 515" on bearing and rotary valve shaft mating surfaces.



SECTION 04

SUB-SECTION 02 (ENGINES)

To install shaft assembly and oil seal, use no. 420 876 600 pusher.



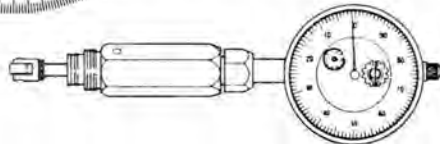
⑩ Rotary valve adjustment with replaced crankcase having to timing marks.



REQUIRED TOOLS

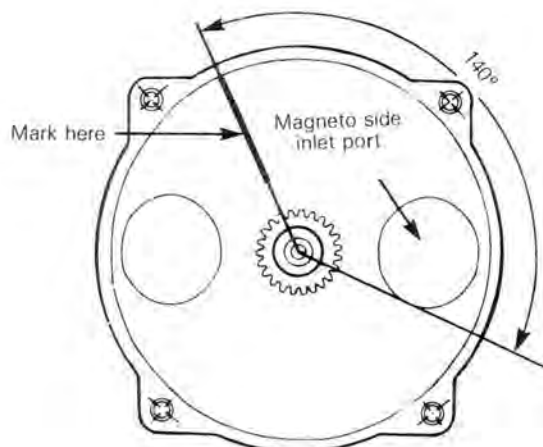
Angle finder
(414 3529)

TDC gauge
(414 1047)

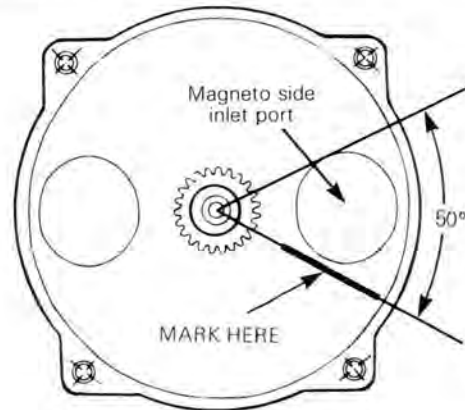


1979 444 type: 140° BTDC opening
50° ATDC closing

Using angle finder, mark crankcase at 140° from bottom edge of magneto side inlet port.



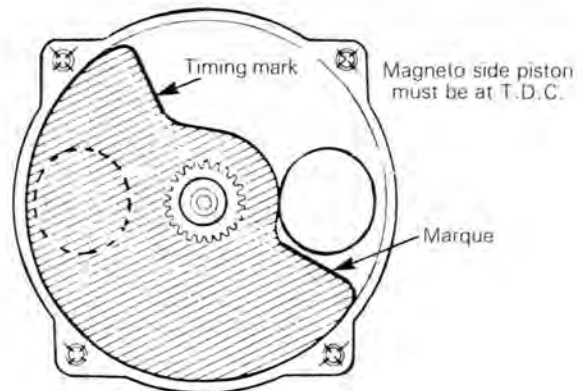
From top edge of magneto side inlet port, mark crankcase at 50°.



To correctly install the rotary valve 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 on gear to have edges as close as possible to the marks.

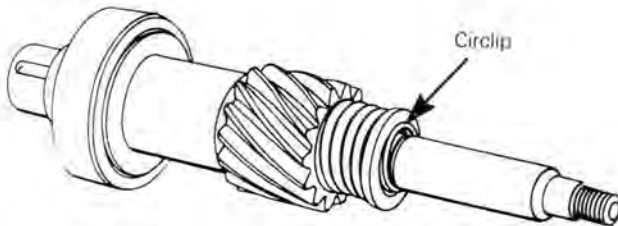
○ **NOTE:** The rotary valve is asymmetrical, therefore, at assembly try positioning each side of disc on gear to determine best installation position.



SECTION 04 SUB-SECTION 02 (ENGINES)

⑭ Through ②④ Rotary valve shaft assembly.

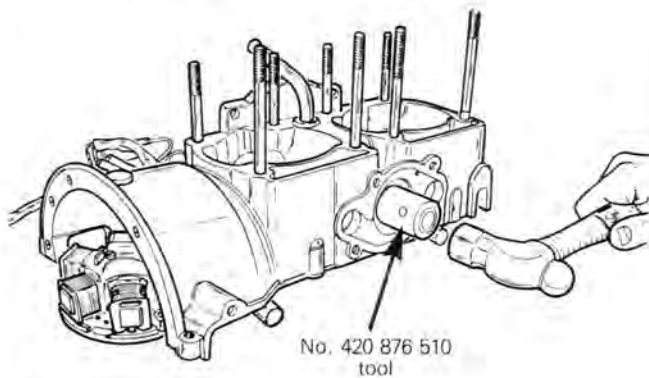
If it is necessary to disassemble components of rotary valve shaft assembly, compress spring cup ②③ in order to remove circlip ②④.



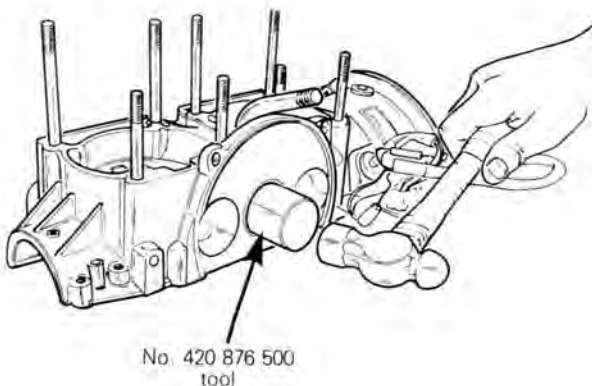
⑮ Clean rotary valve shaft and inside of distance sleeve. At assembly, apply "Loctite 271" inside of distance sleeve.

⑯ Using a suitable pusher, push pump bearing with shield facing rotary valve.

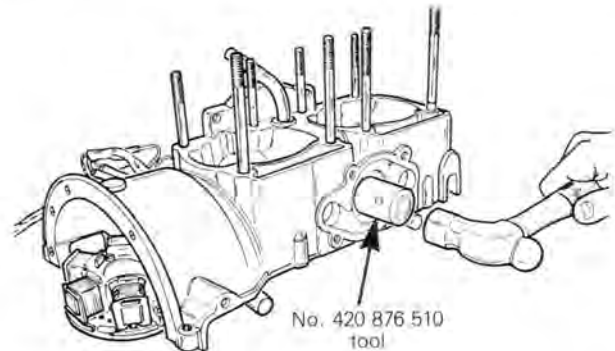
To remove bearing



To install bearing

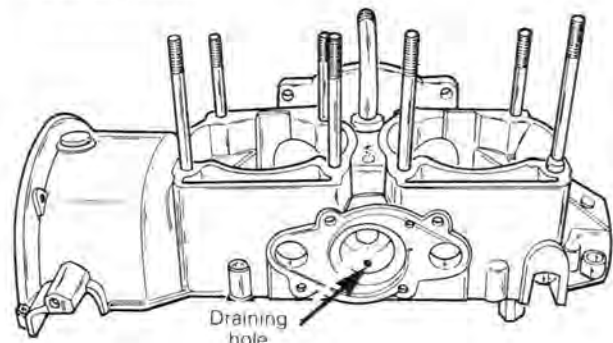


⑰ ⑱ From pump side, using no. 420 876 510 pusher, install oil seals (with lithium grease on lips) as per illustrations.

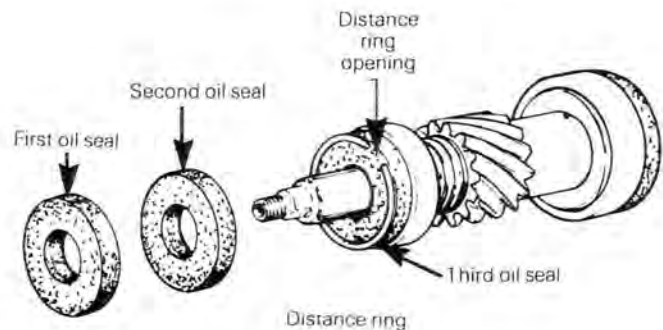


Keep in mind that:

— distance ring opening must be in line with crankcase draining hole.



35% of the area between first and second oil seal (first oil seal being flush with crankcase) must be filled with lithium grease or equivalent.

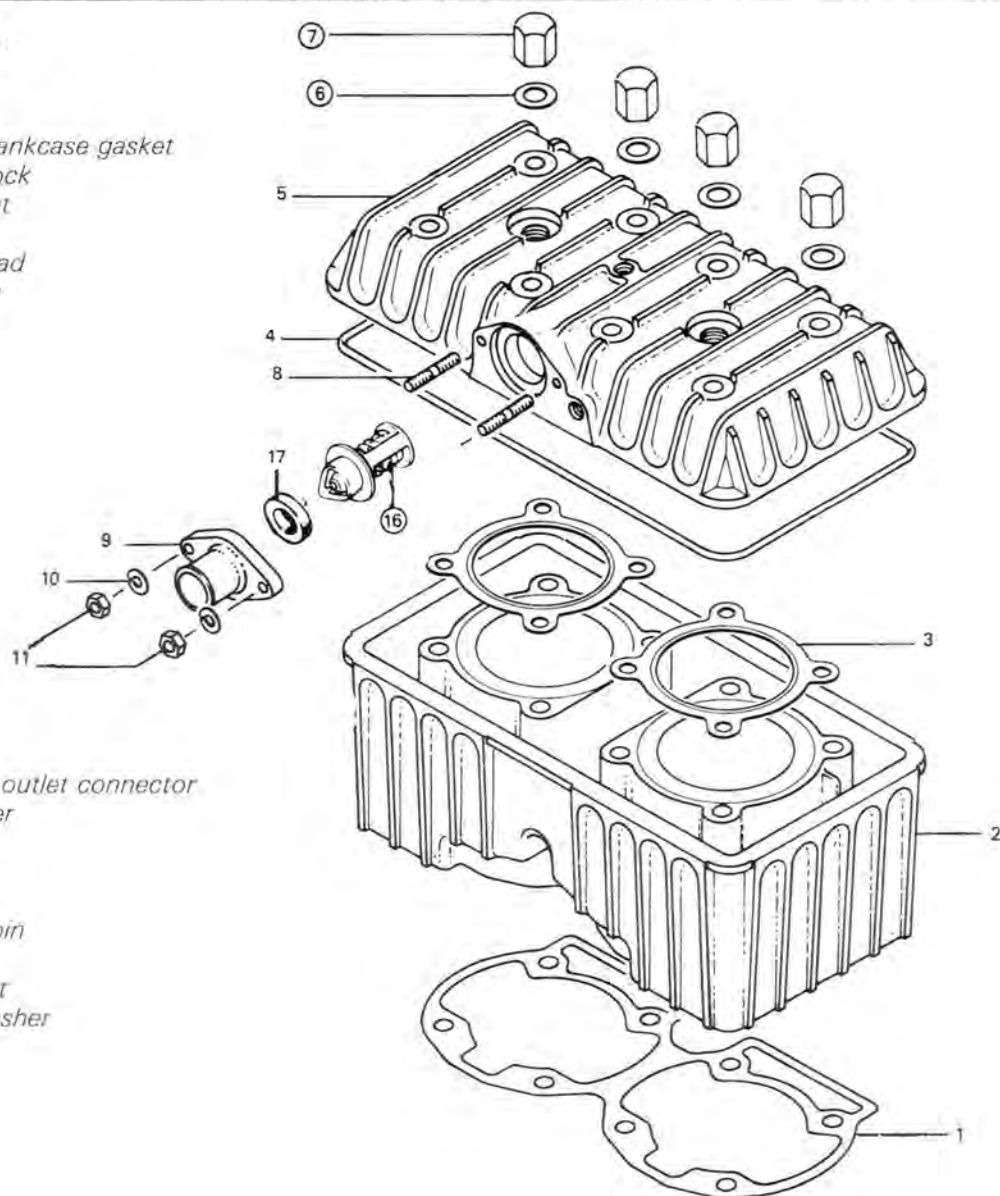


Apply "Loctite 242" on threads.

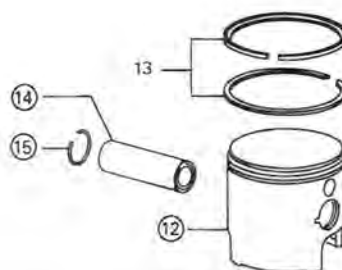
SECTION 04
SUB-SECTION 02 (ENGINES)

TOP END

1. Cylinder/crankcase gasket
2. Cylinder block
3. Head gasket
4. Gasket
5. Cylinder head
6. Flat washer
7. Cap nut
8. Stud



9. Antifreeze outlet connector
10. Lockwasher
11. Nut
12. Piston
13. Ring
14. Gudgeon pin
15. Circlip
16. Thermostat
17. Rubber washer



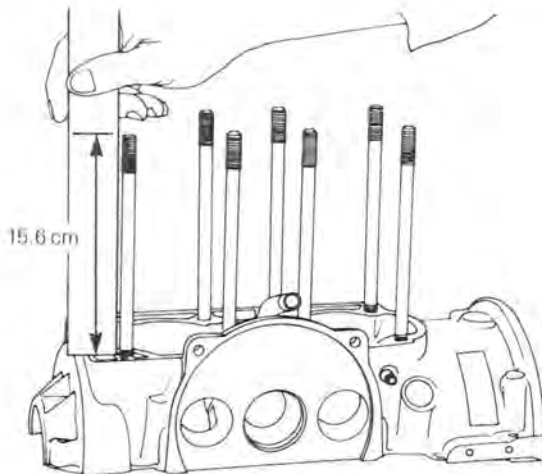
TOP END CLEANING

Discard all gaskets.

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

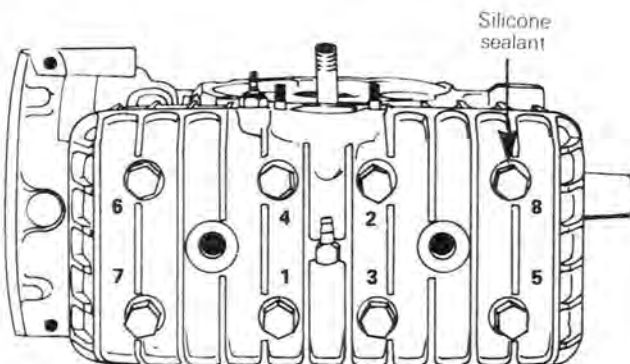
DISASSEMBLY & ASSEMBLY

⑥ ⑦ Because of cap nuts, cylinder studs have to be screwed into crankcase so they do not protrude further than 15.6 cm (6.140"). If it is not possible to obtain this length, a washer must be added between cylinder head and cap nut.



Prior to washers ⑥ installation, apply silicone sealant on washer seat of cylinder head, around stud.

Torque cylinder head nuts to 38 N•m (28 ft-lbs) following illustrated sequence.



⑫ ⑭ ⑮ 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.

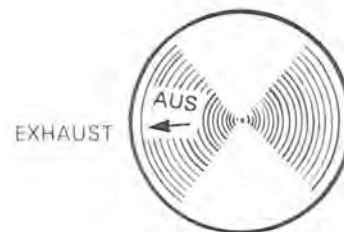
Scrape off carbon formation from cylinder exhaust port, cylinder head and piston dome using a wooden spatula.

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

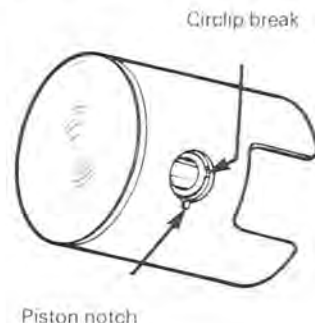
Clean the piston ring with a groove cleaner tool, or with a piece of broken ring.

▼ **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.

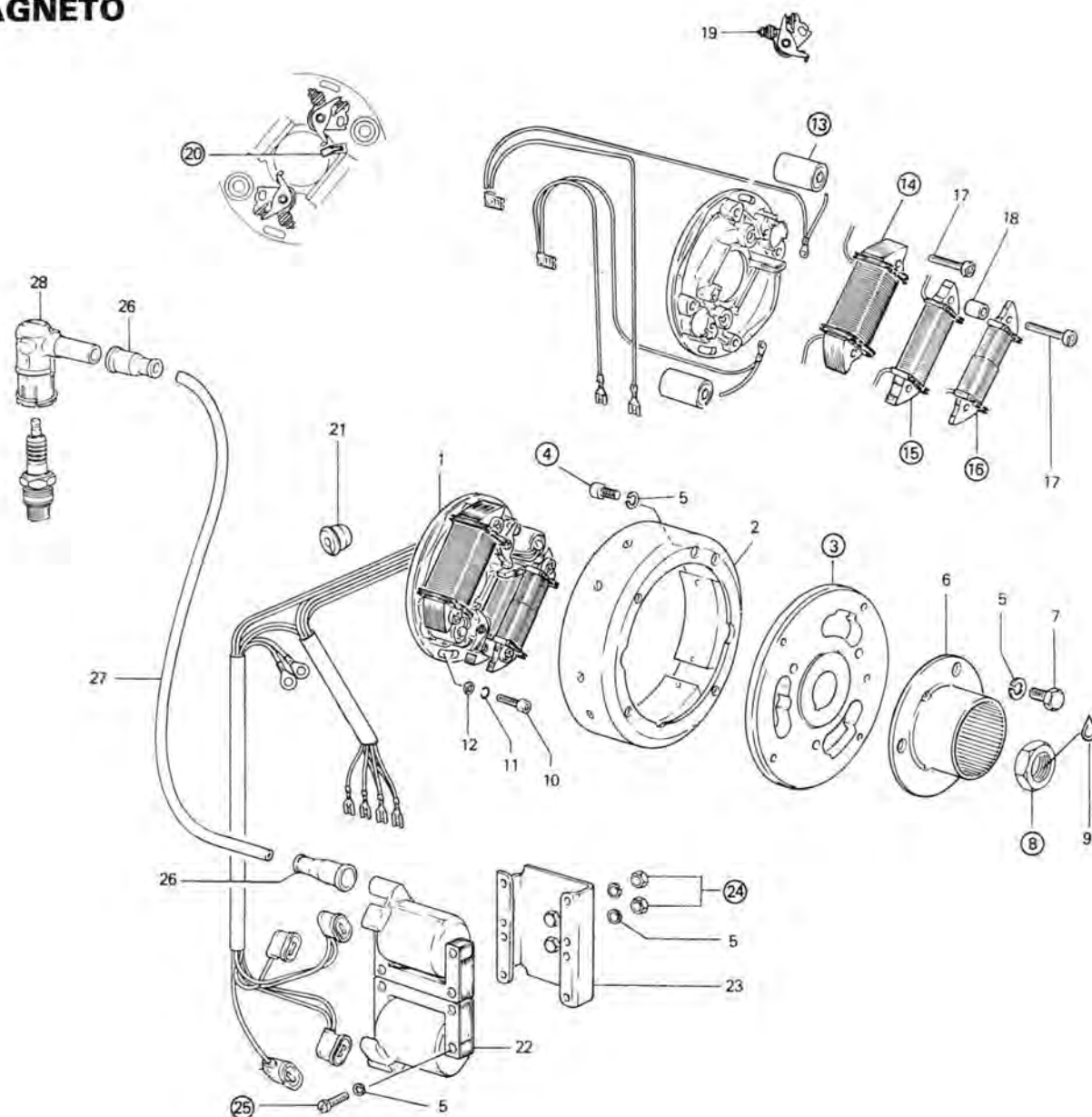


Once the circlips are installed, turn each circlip so that the circlip break is not directly in line with piston notch. Using very fine emery cloth, remove any burrs on piston caused through circlip installation.



⑯ To check thermostat put it in water and heat water, thermostat should open when water temperature reaches 43°C (110°F).

MAGNETO



1. Armature plate
2. Magneto ring
3. Magneto housing
4. Screw
- *5. Lockwasher
- *6. Starting pulley
- *7. Bolt
8. Magneto retaining nut
9. "Loctite 242"
10. Screw

11. Lockwasher
12. Flat washer
13. Capacitor
14. Lighting coil 110 W
15. Generator coil
- *16. Lighting coil 30 W
- *17. Screw
- *18. Distance sleeve (11 mm)
19. Contact breaker
20. Lubricating wick

21. Wire grommet
 22. Ignition coil
 23. Coil support
 24. Nut
 25. Screw
 26. Protection cap
 27. H.T. cable
 28. Spark plug protector
- * Everest & Futura only

MAGNETO

CLEANING

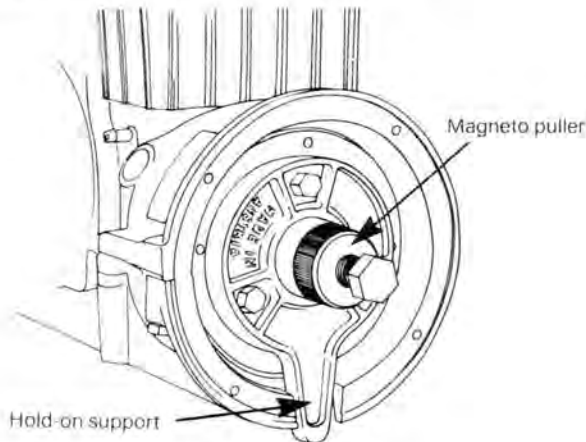
Clean all metal components in a non-ferrous metal cleaner.

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

DISASSEMBLY & ASSEMBLY

③ ⑧ 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.



At assembly, clean crankshaft extension (taper) then apply "Loctite 242".

Install magneto retaining nut (with "Loctite 242" on threads) and torque to 80 N•m (60 ft-lbs).

④ ②④ ②⑤ Apply "Loctite 242" on threads.

⑬ To replace a capacitor, it is first necessary to unsolder the black lead using soldering iron. The capacitor can then be driven out of the armature plate using a suitable pusher and hammer. To reinstall, inverse procedure.

⑭ ⑮ ⑯ 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.

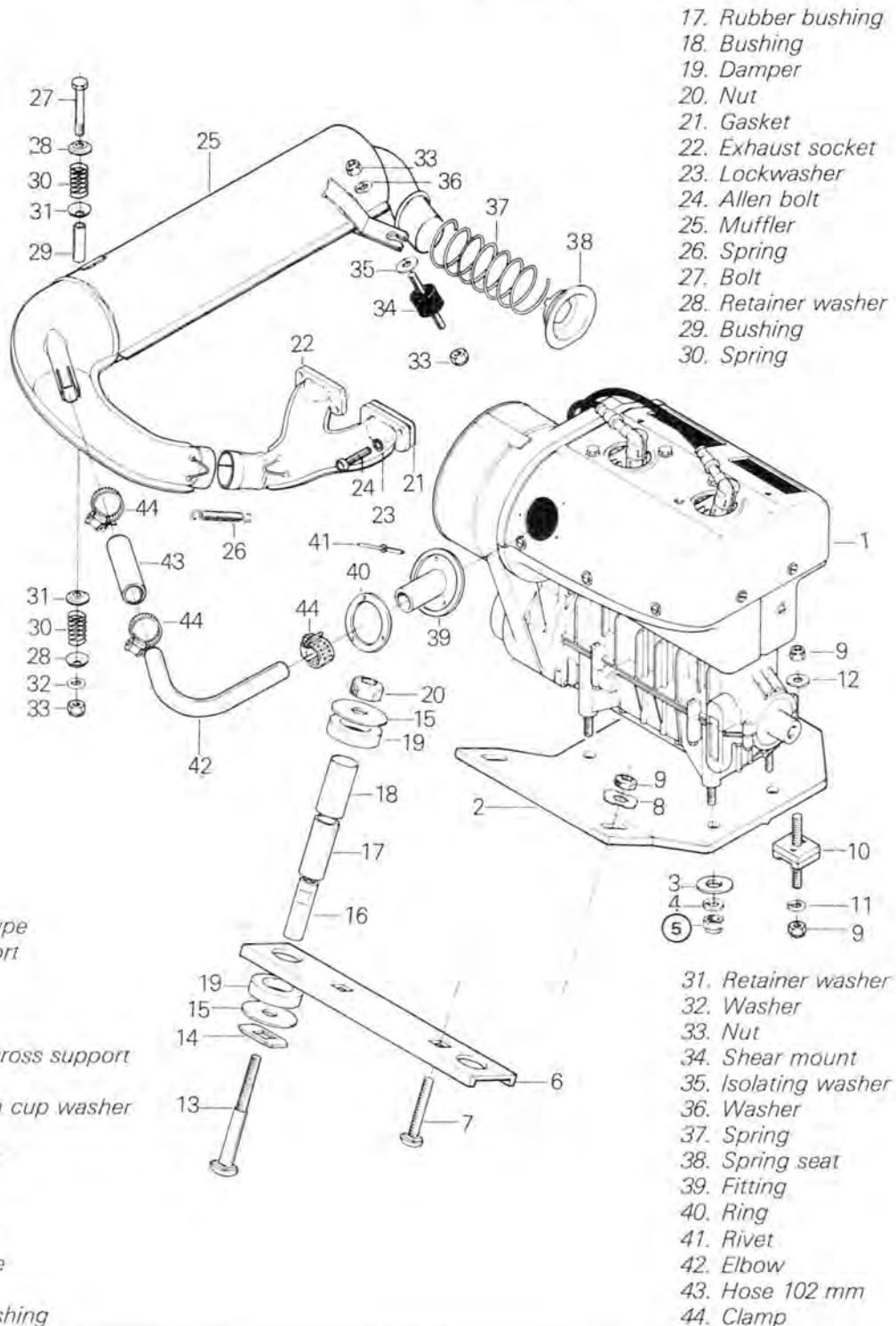


⑳ When replacing contact breakers, apply a light coat of grease on lubricating wick.



503 ENGINE TYPE

ENGINE SUPPORT AND MUFFLER



ENGINE SUPPORT AND MUFFLER

REMOVAL FROM VEHICLE

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

- Pulley guard, drive belt.
- Muffler.
- Air intake silencer.
- Throttle cable at carburetor.
- Fuel lines and pulsation line.

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

- Cab retaining cable.
- Rewind starter cable.
- Wiring harness.
- Engine support and reinforcing cross support nuts.

DISASSEMBLY AND ASSEMBLY

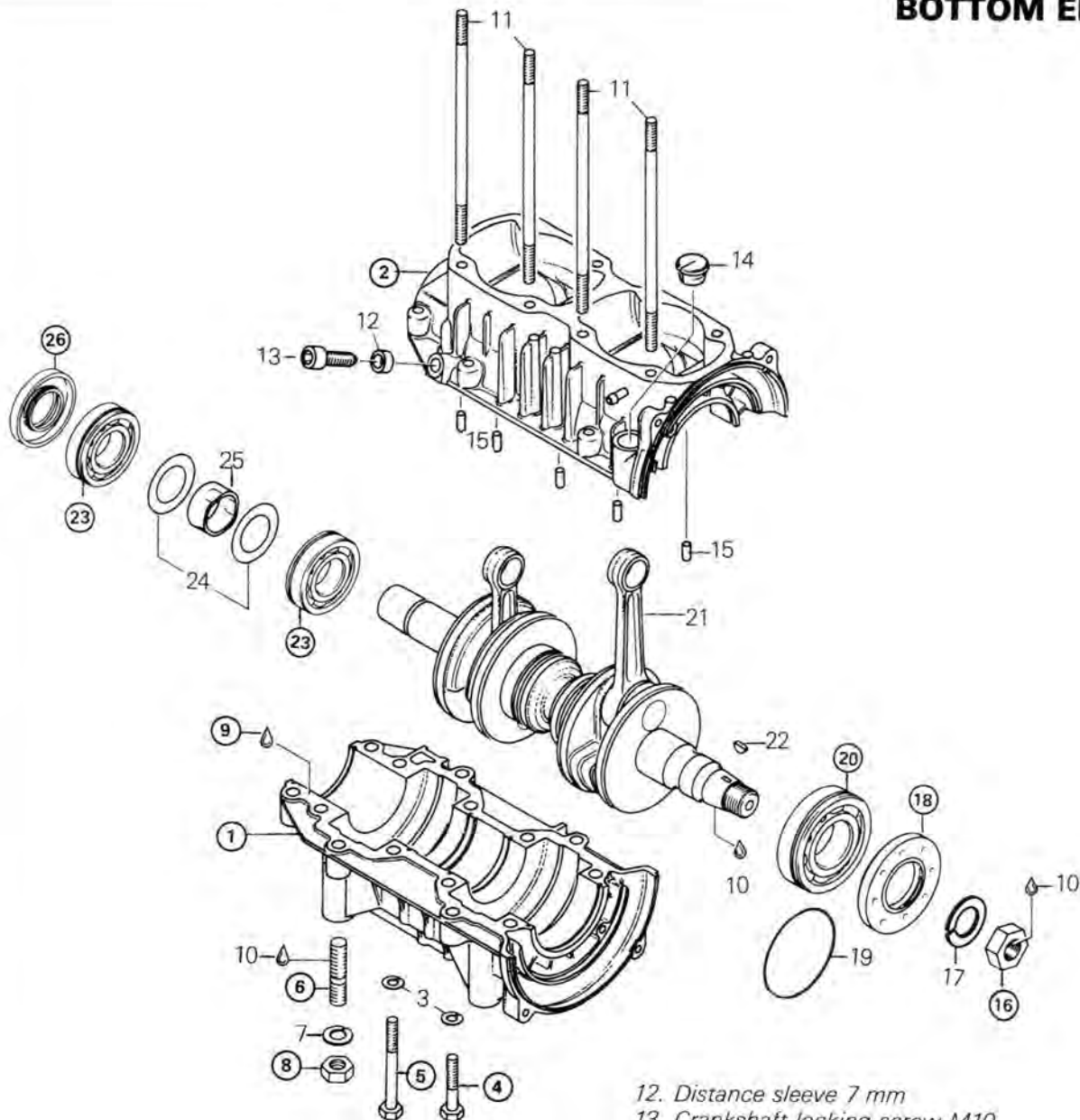
⑤ Torque to 36 N•m (26 ft-lbs).

INSTALLATION IN VEHICLE

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

- Check tightness of engine mount and cross support nuts.
- After throttle cable installation, check maximum throttle slide opening.
- Check pulley alignment.

BOTTOM END



1. Crankcase lower half
2. Crankcase upper half
3. Lockwasher
4. Hexagonal head capscREW M8 x 45
5. Hexagonal head capscREW M8 x 70
6. Stud M10 x 25
7. Lockwasher
8. Nut M10
9. "Loctite 515"
10. "Loctite 242"
11. Stud M8 x 173

12. Distance sleeve 7 mm
13. Crankshaft locking screw M10
14. Cable grommet
15. Bearing stopper
16. Nut M22 x 1.5
17. Lockwasher
18. Oil seal
19. "O" ring
20. Ball bearing 6207
21. Crankshaft
22. Woodruff key
23. Ball bearing 6206
24. Shim 1 mm
25. Spacer
26. Oil seal

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.

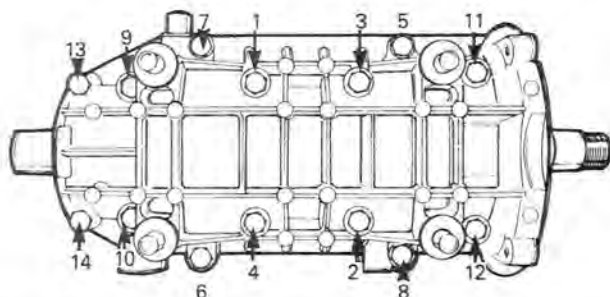
DISASSEMBLY AND ASSEMBLY

①②⑨ Crankcase halves are factory matched and therefore, are not interchangeable as single halves.

Prior to joining of crankcase halves, apply Loctite 515 (no. 413 7027) on mating surfaces.

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 21 N•m (15 ft-lbs) following illustrated sequence.

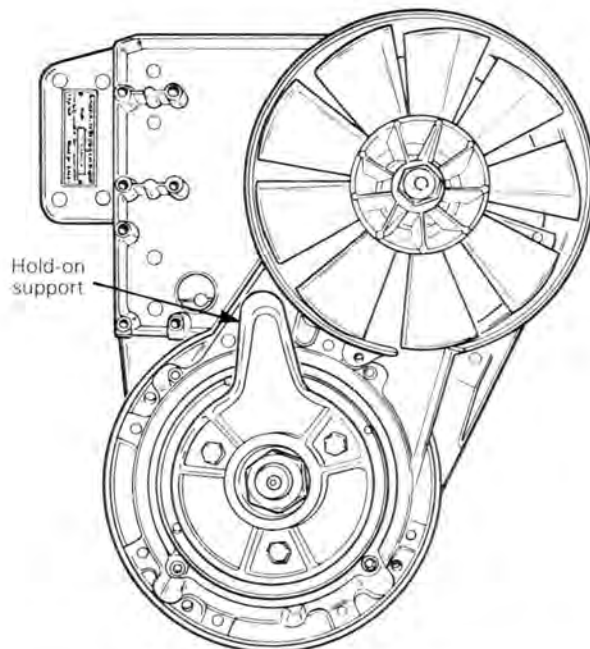


④⑤ Torque to 21 N•m (15 ft-lbs).

⑥ At assembly on crankcase, apply "Loctite 242" or equivalent on threads.

⑧ Torque to 36 N•m (26 ft-lbs).

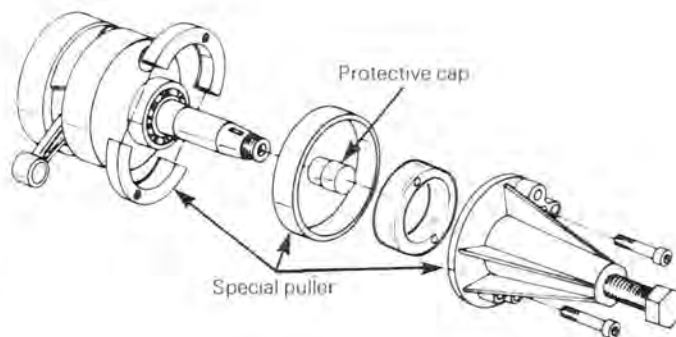
⑩ To remove or install magneto retaining nut, lock crankshaft in position with special hold-on support as illustrated. (See Tools Section).



At assembly, apply "Loctite 242" or equivalent on threads, then torque to 80 N•m (60 ft-lbs).

⑪ At assembly, apply a light coat of lithium grease on seal lip. Seal outer surface should be flush with crankcase.

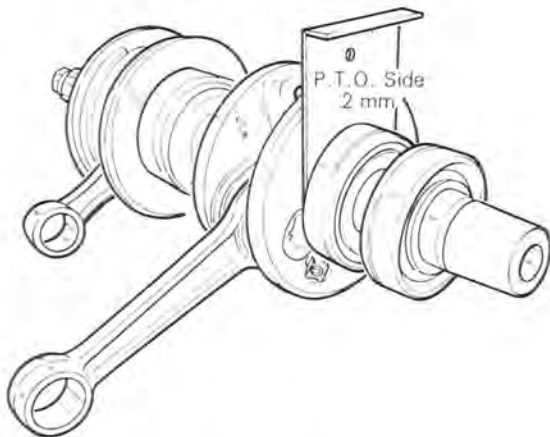
⑫⑬ To remove bearing from crankshaft use a protective cap and special puller, as illustrated. (See Tools Section).



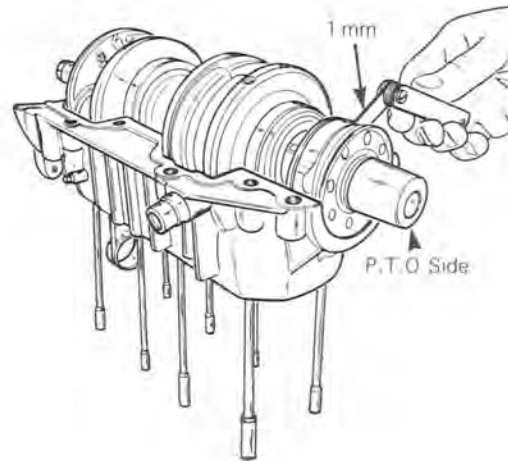
Prior to installation, place bearings into an oil container and heat the oil to 100°C (210°F) for 5 to 10 minutes. This will expand bearings and ease installation. Install bearings with groove as per exploded view.

P.T.O. side

At inner bearing installation, provide a free play of 2 mm (.080'') for lubrication between bearing and crankshaft blade, using P/N 420 876 620 tool.

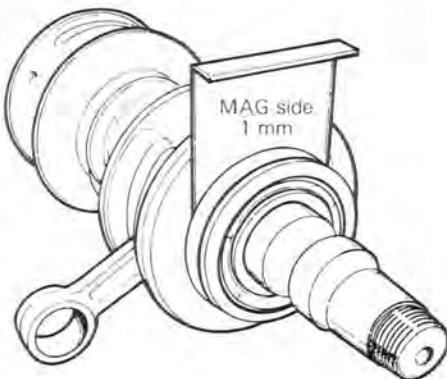


②⑥ For P.T.O. side outer bearing lubrication, it is necessary to provide a free play of 1 mm (.040'') between oil seal and bearing.

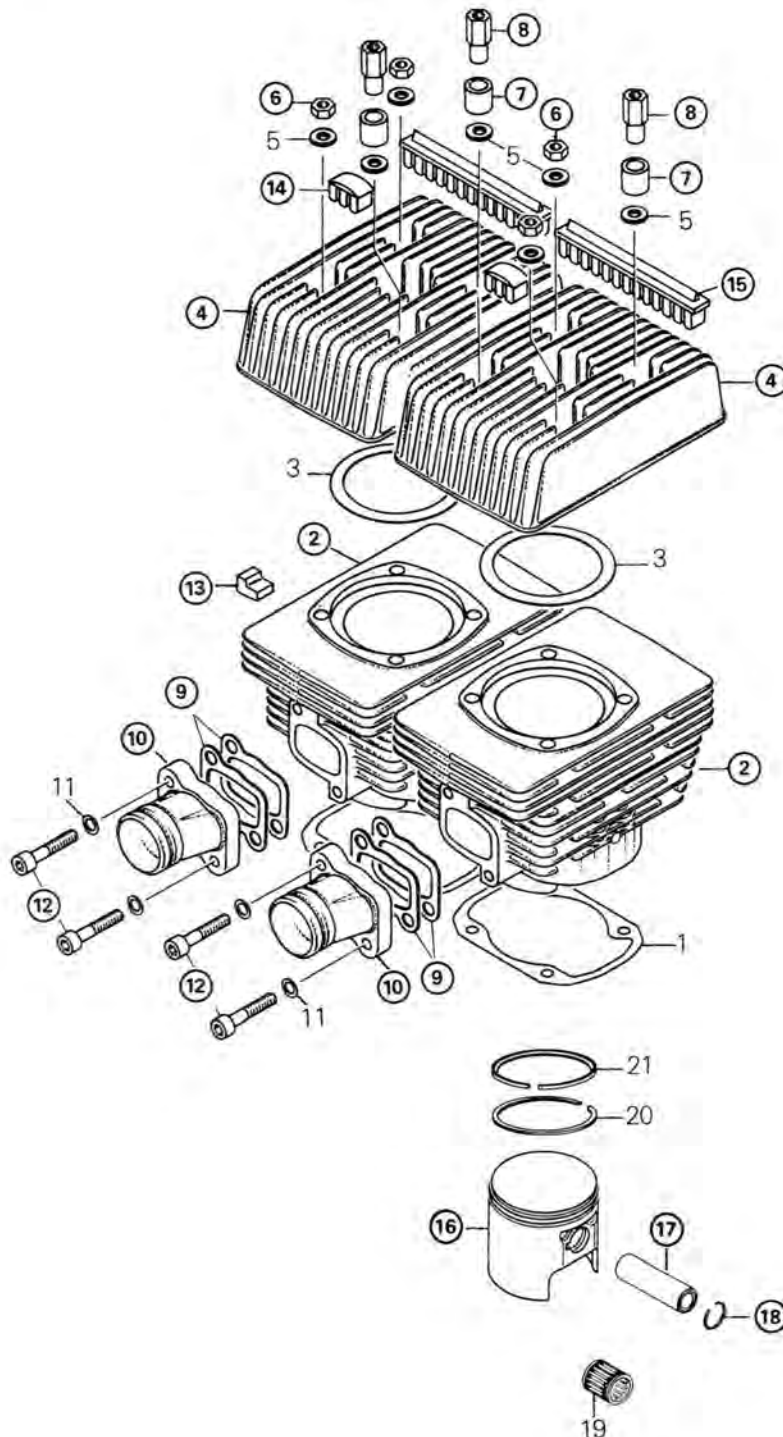


MAG side

At bearing installation, provide a free play of 1 mm (.040'') for lubrication between bearing and crankshaft blade, using P/N 420 876 625 tool.



TOP END



1. Cylinder flange gasket
2. Cylinder
3. Cylinder head gasket
4. Cylinder head
5. Washer 8.4 mm
6. Nut
7. Distance sleeve
8. Distance nut M8 x 35
9. Intake manifold gasket
10. Intake manifold
11. Lockwasher M8
12. Allen screw M8 x 40
13. Noise damper
14. Noise damper (short)
15. Noise damper (long)
16. Piston
17. Gudgeon pin
18. Circlip
19. Needle bearing
20. Rectangular ring
21. Semi-trapez ring

TOP END

CLEANING

Discard all gaskets.

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

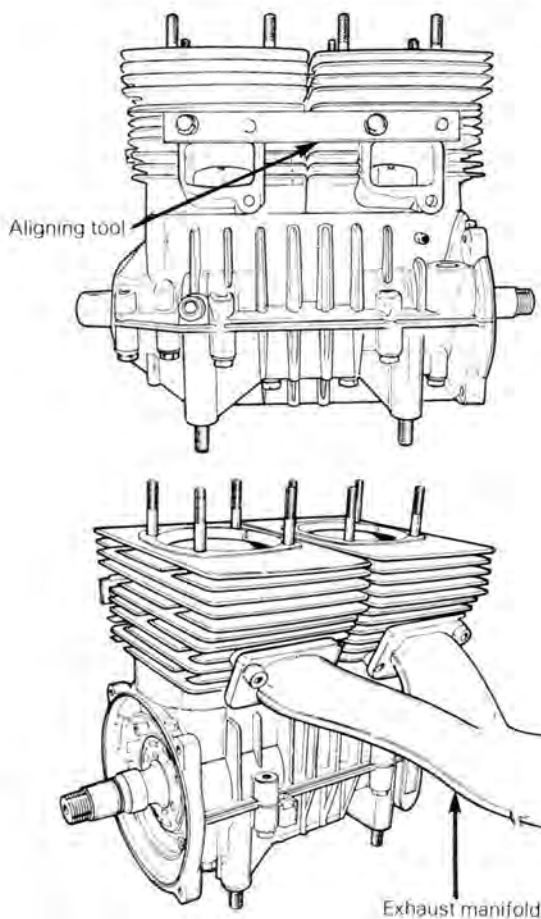
Scrape off carbon formation from cylinder exhaust port, cylinder head and piston dome using a wooden spatula.

○ **NOTE:** The letters "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.

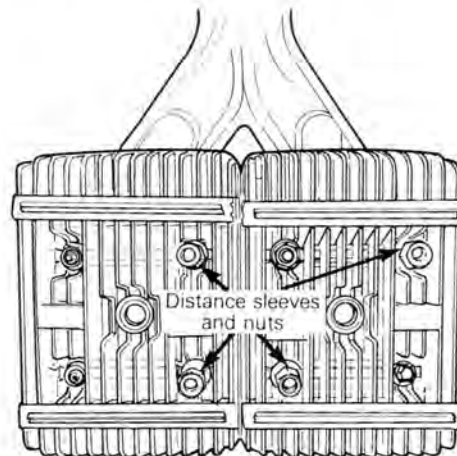
DISASSEMBLY AND ASSEMBLY

②④ At cylinder and/or cylinder head installation, use P/N 420 876 171 aligning tool (or exhaust manifold) to ensure sealing of intake manifold and exhaust (See Tools Section), before tightening cylinder head nuts.



Cross torque cylinder head nuts to 20 N•m (15 ft-lbs); torque each cylinder head individually.

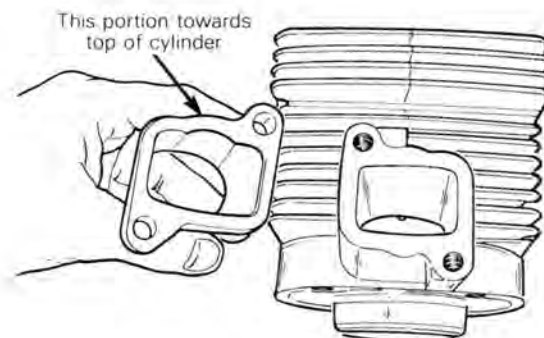
⑥⑦⑧ Position nuts, distance nuts and distance sleeves as illustrated.



Torque nuts to 20 N•m (15 ft-lbs).

⑨ Install a gasket on each side of the air deflector.

⑩ Install intake manifold as per the following illustration.

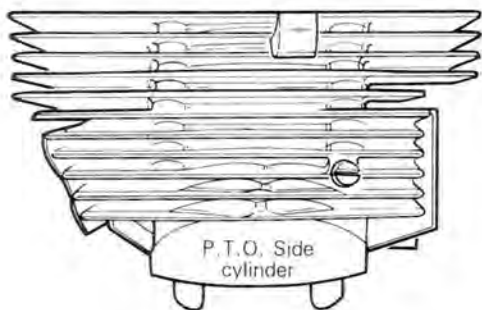
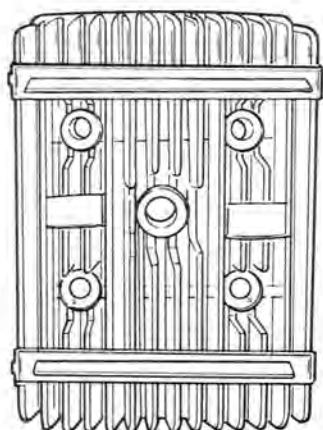


⑫ Torque to 20 N•m (15 ft-lbs).

SECTION 04

SUB-SECTION 02 (ENGINE)

⑬ ⑭ ⑮ For proper position of noise dampers, refer to the following illustrations.

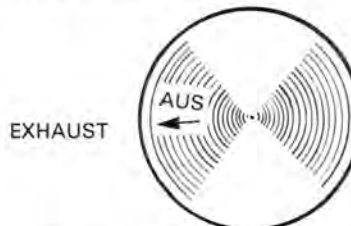


⑯ ⑰ ⑱ Place a clean cloth over crankcase to prevent circlips from falling into crankcase. Use a pointed tool to remove circlips from piston.



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 the direction of the exhaust port.

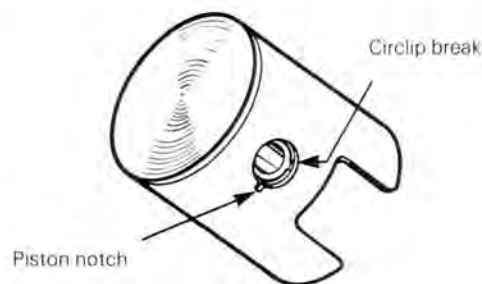


Piston to wall clearance should be:

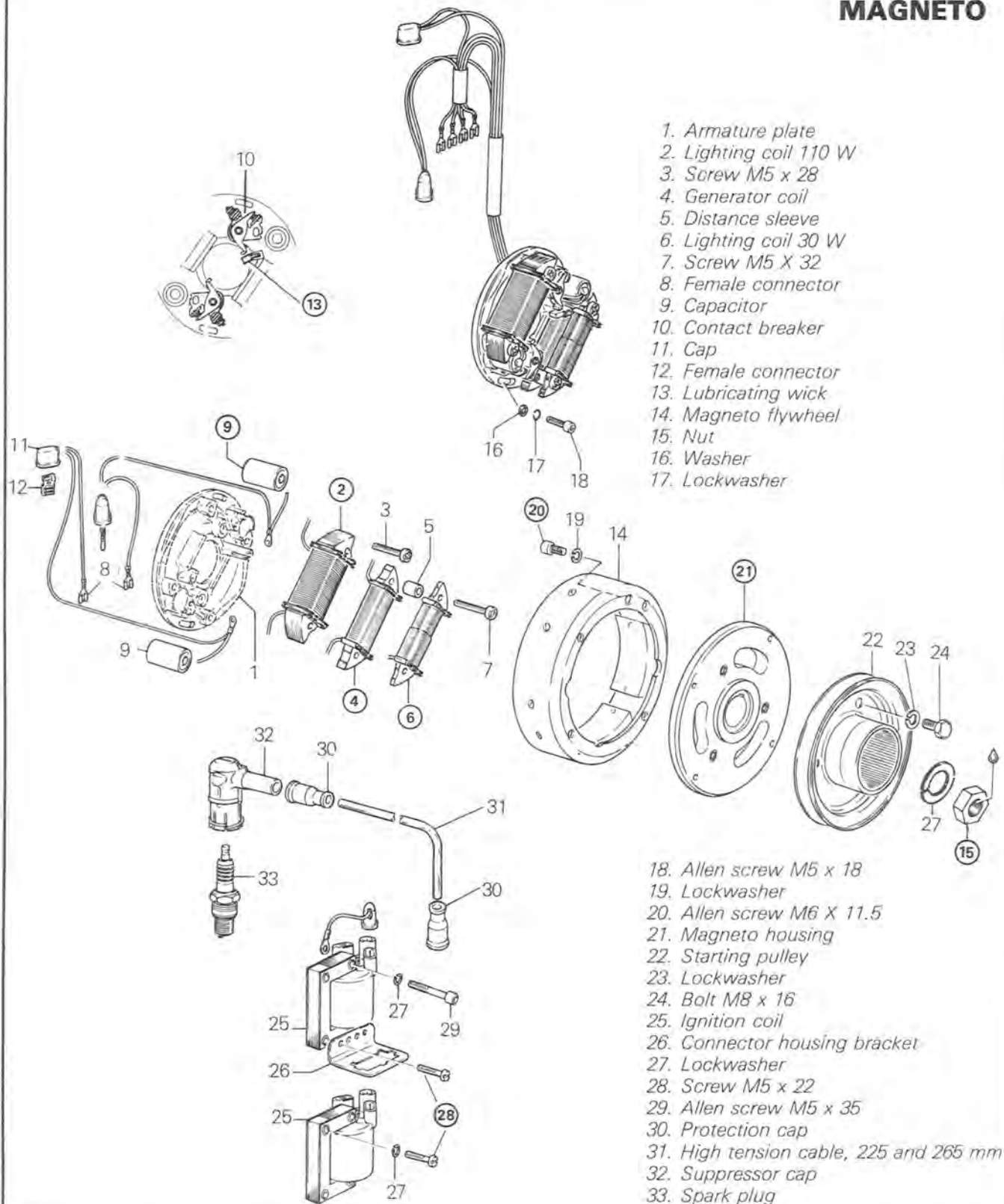
MINIMUM: 0.060 mm (.0024")

MAXIMUM: 0.160 mm (.0063")

○ **NOTE:** Once 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. Armature plate
2. Lighting coil 110 W
3. Screw M5 x 28
4. Generator coil
5. Distance sleeve
6. Lighting coil 30 W
7. Screw M5 X 32
8. Female connector
9. Capacitor
10. Contact breaker
11. Cap
12. Female connector
13. Lubricating wick
14. Magneto flywheel
15. Nut
16. Washer
17. Lockwasher

18. Allen screw M5 x 18
19. Lockwasher
20. Allen screw M6 X 11.5
21. Magneto housing
22. Starting pulley
23. Lockwasher
24. Bolt M8 x 16
25. Ignition coil
26. Connector housing bracket
27. Lockwasher
28. Screw M5 x 22
29. Allen screw M5 x 35
30. Protection cap
31. High tension cable, 225 and 265 mm
32. Suppressor cap
33. Spark plug

MAGNETO

CLEANING

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

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

DISASSEMBLY AND ASSEMBLY

② ④ ⑥ Whenever a coil is replaced, the air gap (distance between coil end and magnet) must be adjusted.

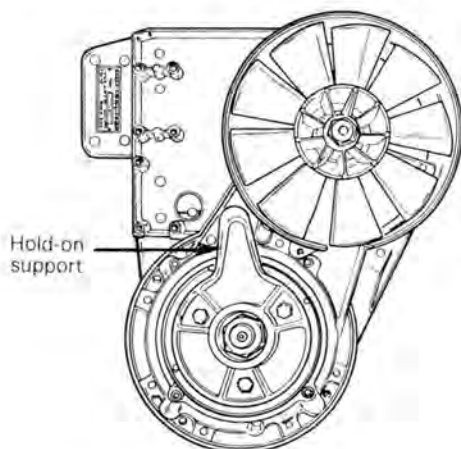
To check air gap, insert a feeler gauge of 0.30-0.45 mm (.012"-.018") between magnet and coil ends. If necessary to adjust, slacken coil retaining screws and relocate coil.



⑨ 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 pusher and hammer. To reinstall, inverse procedure.

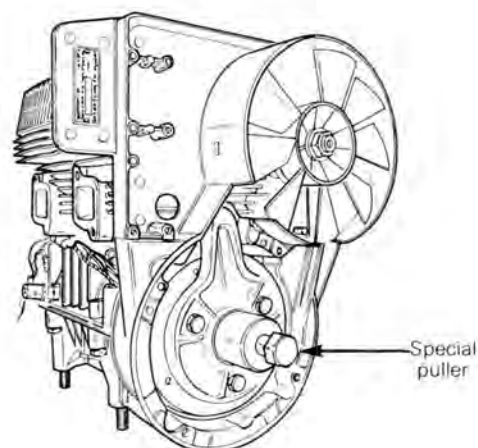
⑬ When replacing contact breakers, apply a light coat of grease on lubricating wick.

⑮ ⑳ To remove or install magneto retaining nut, lock crankshaft in position with special hold-on support as illustrated. (See Tools section).



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

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

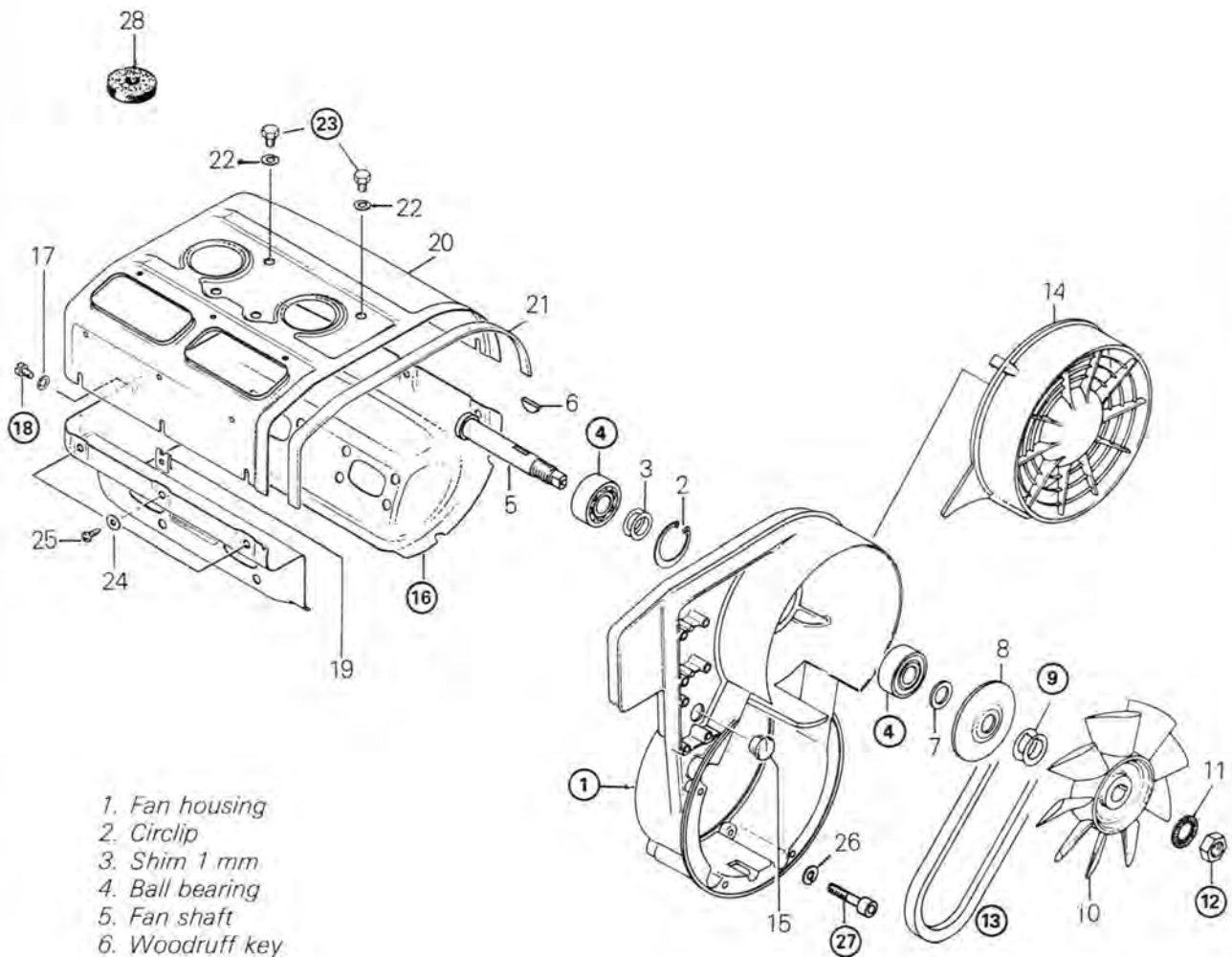


At assembly, clean crankshaft extension (taper) then apply "Loctite 242" or equivalent.

Install magneto retaining nut (with "Loctite 242" on threads) and torque to 80 N•m (60 ft-lbs).

⑳ ㉑ At assembly, apply "Loctite 242" on retaining screw threads.

COOLING SYSTEM



1. Fan housing
2. Circlip
3. Shim 1 mm
4. Ball bearing
5. Fan shaft
6. Woodruff key
7. Distance sleeve
8. Pulley half
9. Shim 0.5 mm
10. Fan
11. Lockwasher
12. Nut M16 x 1.5
13. Belt
14. Protector
15. Cable grommet
16. Lower air deflector
17. Lockwasher M6
18. Screw M6 x 12
19. Speed nut

20. Upper air deflector
21. Deflector gasket
22. Lockwasher M8
23. Screw M8 x 16
24. Washer
25. Screw
26. Lockwasher M6
27. Allen screw M6 x 30
28. Spark plug grommet



COOLING SYSTEM

CLEANING

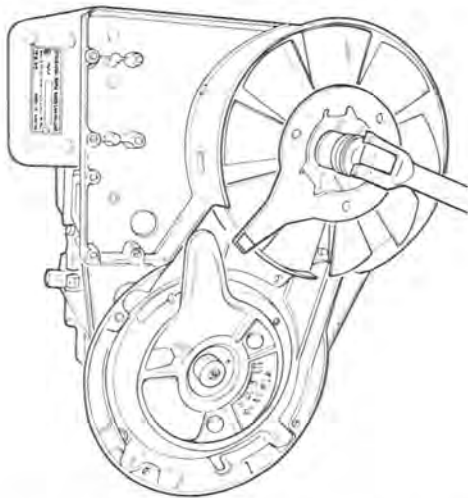
Clean all metal components in a non-ferrous metal cleaner.

DISASSEMBLY AND ASSEMBLY

①④ It is first necessary to heat bearing housing to 65°C (150°F) to remove or install bearing.

⑨⑬ Fan belt free-play must be 6 mm (1/4"). To adjust, install or remove shim (s) between pulley halves. Install excess shim (s) between fan and lockwasher.

⑫ To remove or install fan pulley retaining nut, lock fan pulley with special holder wrench. (See Tools section). At assembly, torque nut to 62 N•m (46 ft-lbs).



⑯ A gasket must be placed on both sides (inner and outer) of intake and exhaust holes.

⑱⑳㉑ At assembly, apply a light coat of "Loctite 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.



IGNITION TIMING

These sub-section apply to the following 1979 engine types:

248

294

343

354

402

440

444

454

503

640

For 247 engine type, refer to 1978 Bombardier Shop Manual.

IGNITION TIMING — TWO CYLINDER ENGINES) (248, 294, 343, 402, 440, 444, 503, 640 TYPES)

FOREWORD

For timing purposes, it is necessary to separate the twin cylinder engines into two groups.

GROUP 1: 248, 294, 343 (no. 3021123 and above) engine types

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: 343 (up to no. 3021122), 402, 440 444, 503, 640 engine types

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**.

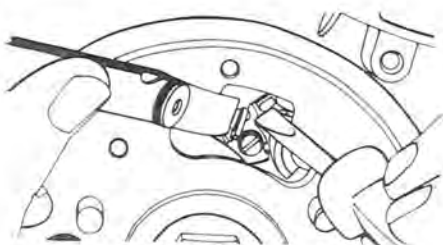
Two methods are detailed in this section; the first using the timing marks stamped on the engine, the second using a Top Dead Center gauge.

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.

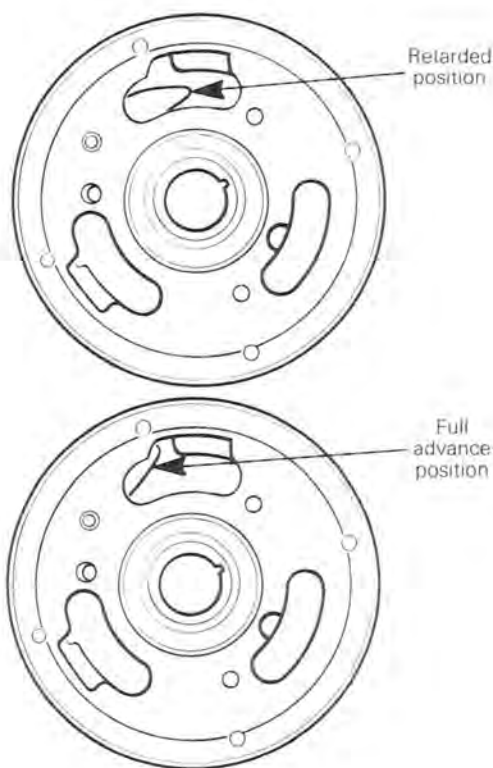
○ **NOTE:** The **upper** breaker point set controls the timing of the **magneto side** piston and the **lower** breaker point set controls the **P.T.O. side** piston.

3. Rotate crankshaft until breaker points, visible through magneto ring opening, are fully opened. Adjust point setting to $0.40 \text{ mm} \pm 0.05$ ($.016'' \pm .002$) using a feeler gauge and screwdriver, as illustrated. Repeat procedure for other set of points. **Adjust both side equally.**



○ **NOTE:** Breaker point 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).
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 (while holding centrifugal lever in the open position, toward magneto rim).

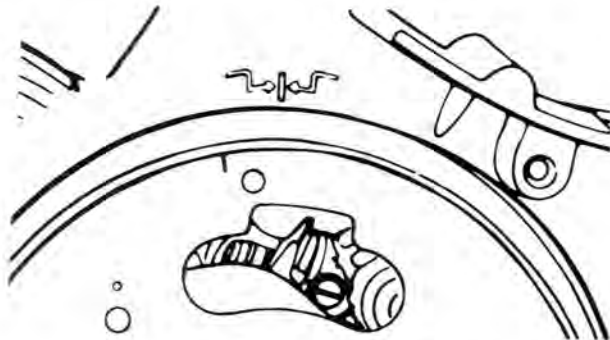


Rotate armature plate until timing light fluctuates or tone signal level varies. Retighten retaining screws.

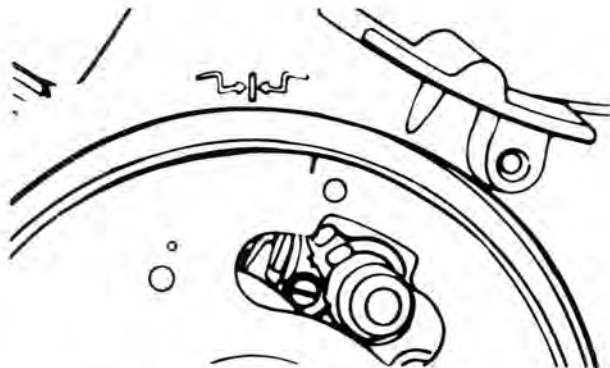
SECTION 04

SUB-SECTION 04 (IGNITION TIMING)

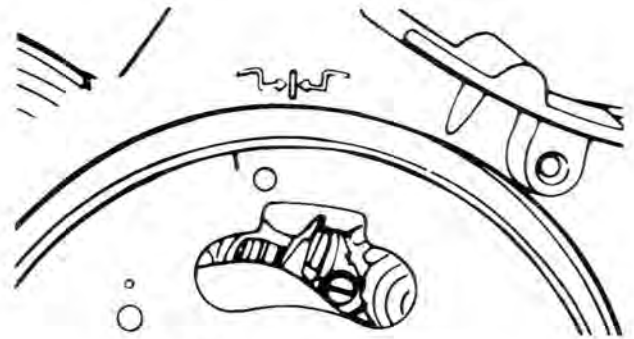
6. Ignition timing can change upon tightening therefore, rotate the magneto counter-clockwise 1/4 of a turn and slowly turn the magneto back in a clockwise direction. As soon as the timing marks align the timing light should fluctuate, or the tone signal level should vary. Readjust if necessary.



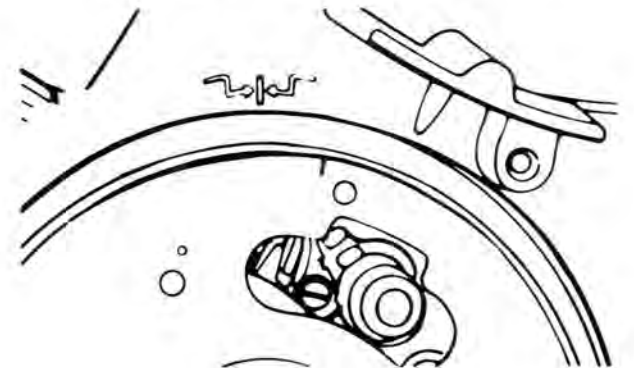
Too early: Turn armature plate clockwise



Too late: Turn armature plate counter-clockwise



Too early: Decrease point gap



Too late: Increase point gap

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 point gap toward lower limit, i.e. 0.35 mm (.014"), then re-check timing.
 - If timing is too late increase breaker point gap toward upper limit, i.e. 0.45 mm (.018"), then re-check timing.

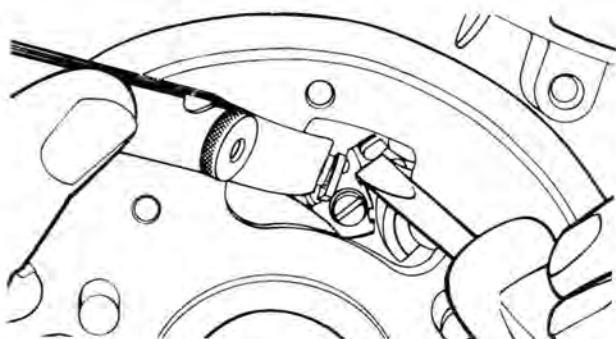
TDC GAUGE PROCEDURE

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 point set controls the timing of the **magneto side** piston and the lower breaker point set controls the **P.T.O. side** piston.

3. Rotate crankshaft until breaker points, visible through magneto ring opening, are fully open. Adjust point setting to $0.40 \text{ mm} \pm 0.05$ (.016" $\pm$.002) using a feeler gauge and screwdriver, as illustrated.

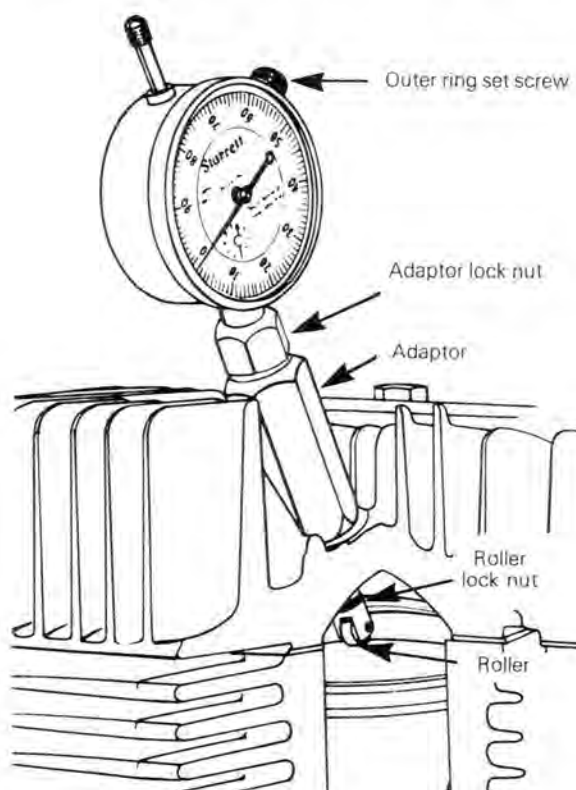
Repeat procedure for other set of points. **Adjust both side equally.**



○ NOTE: Breaker point 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 "0" on dial aligns with pointer.
- Lock outer ring in position.

SECTION 04

SUB-SECTION 04 (IGNITION TIMING)

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.

Engine type	Direct measurement B.T.D.C.	Indirect measurement B.T.D.C.
		
248	Not applicable	2.29 mm $\pm$ 0.25 (.090" $\pm$.010)
294	Not applicable	2.49 mm $\pm$ 0.25 (.098" $\pm$.010)
343, 402	Not applicable	2.46 mm $\pm$ 0.25 (.097" $\pm$.010)
440	Not applicable	3.30 mm $\pm$ 0.25 (.130" $\pm$.010)
444	2.35 mm $\pm$ 0.25 (.092" $\pm$.010)	Not applicable
503	2.07 mm $\pm$ 0.25 (.081" $\pm$.010)	Not applicable
640	Not applicable	4.11 mm $\pm$ 0.25 (.162" $\pm$.010)

Hold advance mechanism centrifugal lever in full advance position (toward magneto rim) 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 point set retaining screw then readjust breaker point gap until timing light fluctuates or tone signal level varies.

- If timing is too early decrease breaker point gap toward lower limit, i.e. 0.35 mm (.014"), then recheck timing.
- If timing is too late increase breaker point gap toward upper limit, i.e. 0.45 mm (.018"), then recheck timing.

 **NOTE:** Breaker point gap can change upon tightening. Always recheck after tightening.

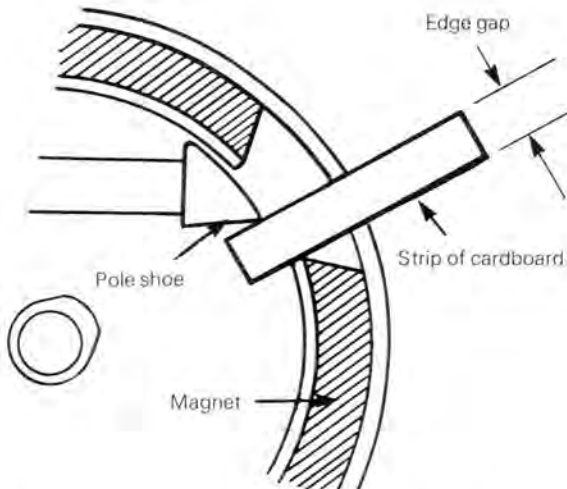
EDGE GAP VERIFICATION

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 1/4 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 the following table.)

Engine type	Edge gap
248, 294	7-11 mm (.275 - .430")
440, 640	5-8 mm (.200 - .315")
343, 402, 444, 503	6-10 mm (.235 - .400")



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 — 354-454 ENGINE TYPES

FOREWORD

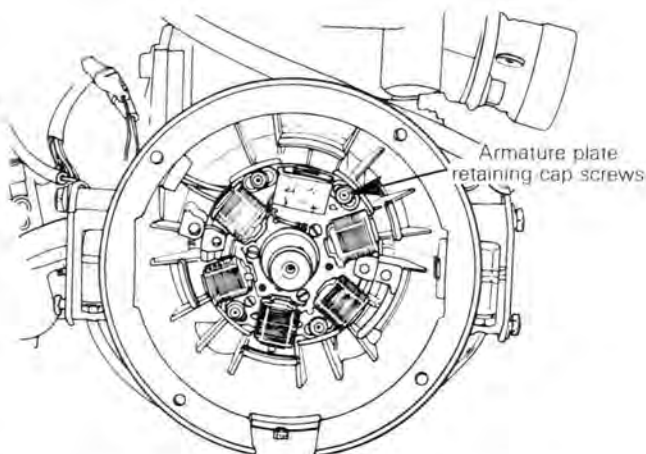
On models equipped with a C.D. ignition system, plug firing is initiated by an electrical pulse. This pulse is released when a metal projection on the flywheel hub rotates near the pick-up coil. Therefore, timing must be performed while the engine is running.

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.

IGNITION TIMING

Timing procedure for this engine type is composed of four main phases, all being equally important:

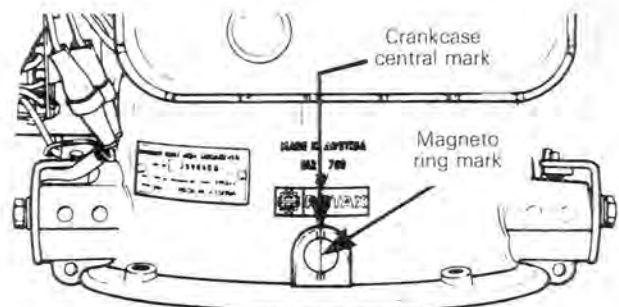
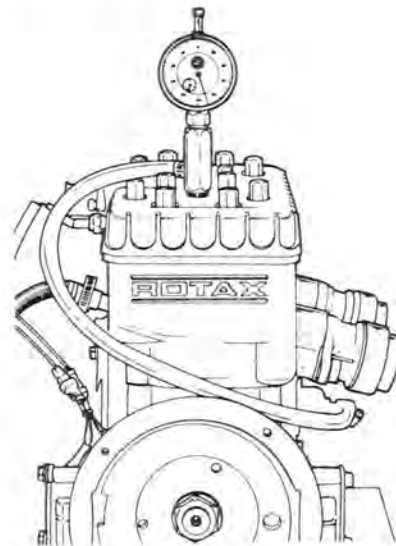
1. Position of the armature plate.
 2. Position of the timing marks on magneto ring.
 3. Air gap between trigger coil and magneto ring.
 4. Timing verification using a stroboscopic timing light.
1. To obtain best generator coil performance, position the armature plate on the crankcase with the retaining cap screws in the middle of the plate slots.



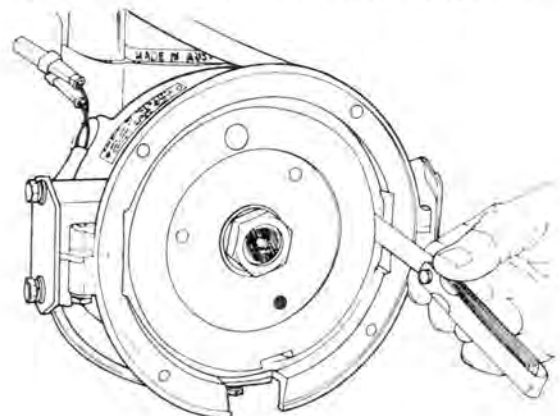
CAUTION: When assembling magneto ring on crankshaft, clean crankshaft extension (cone) and threads. Apply Loctite 242 (no. 413 7025) on cone and threads. Torque bolt to 80 N•m (60 ft-lbs).

2. Check the position of the timing marks (for each cylinder) on magneto ring; repunch if necessary.

With the piston positioned at 1.40 mm (.055") B.T.D.C., magneto ring mark should align with central mark on crankcase (around timing hole).



3. Check air gap between magneto ring and trigger coil. The gap should be 0.8 to 1.2 mm (.031 to .047").



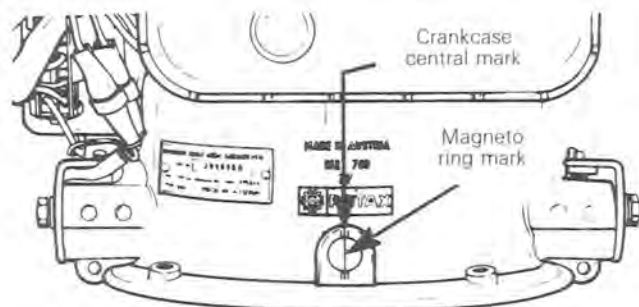
SECTION 04

SUB-SECTION 04 (IGNITION TIMING)

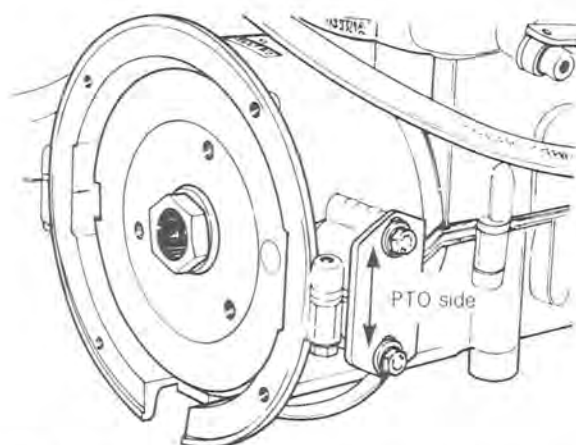
4. Check timing using a stroboscopic timing light (on each cylinder).

◆ **WARNING:** Place ski tips against the wall, raise rear of vehicle so the track is not in contact with the ground and place it on a stand equipped with a protector. Make sure nobody passes behind the vehicle during timing procedure.

Magneto ring mark and crankcase central mark should align at 6500 RPM.

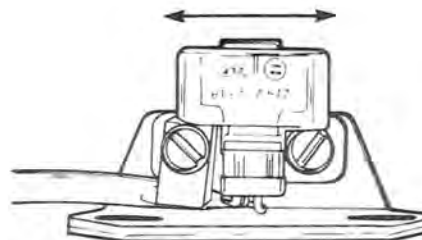


If necessary to adjust: unscrew slightly the two (2) screws holding trigger coil bracket, then move bracket up or down.



○ **NOTE:** Carburetor side trigger coil controls magneto side ignition and exhaust side trigger coil controls P.T.O. side ignition.

If correct timing is impossible with trigger coil bracket travel, stop engine, remove bracket from crankcase and relocate the trigger coil on its bracket.

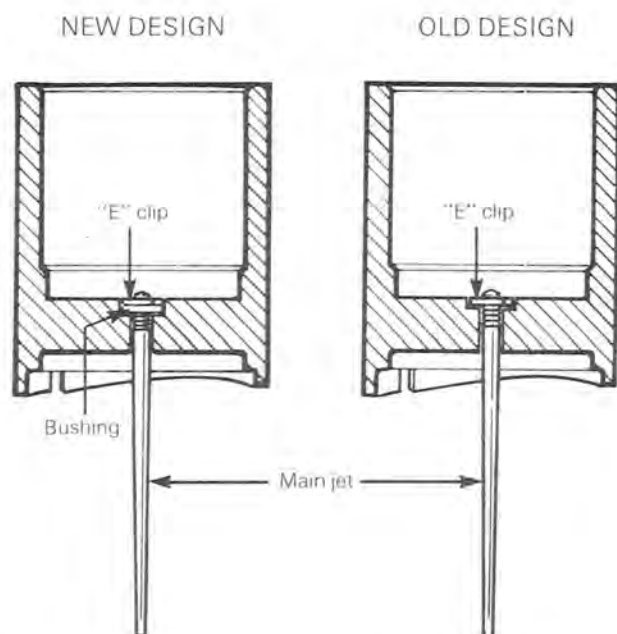


CARBURETOR

Refer to the 1978 Bombardier Shop Manual

○ NOTE: Supplementary information applicable to all Mikuni carburetors.

All new Mikuni carburetors are equipped with a new throttle slide. The new design has a deeper "E" clip seat, to permit the installation of a nylon bushing between the "E" clip and its seat.



Make sure the bushing is installed on all applicable throttle slides.

▼ CAUTION: Serious engine damage can occur if this notice is disregarded.

Models covered in this section:

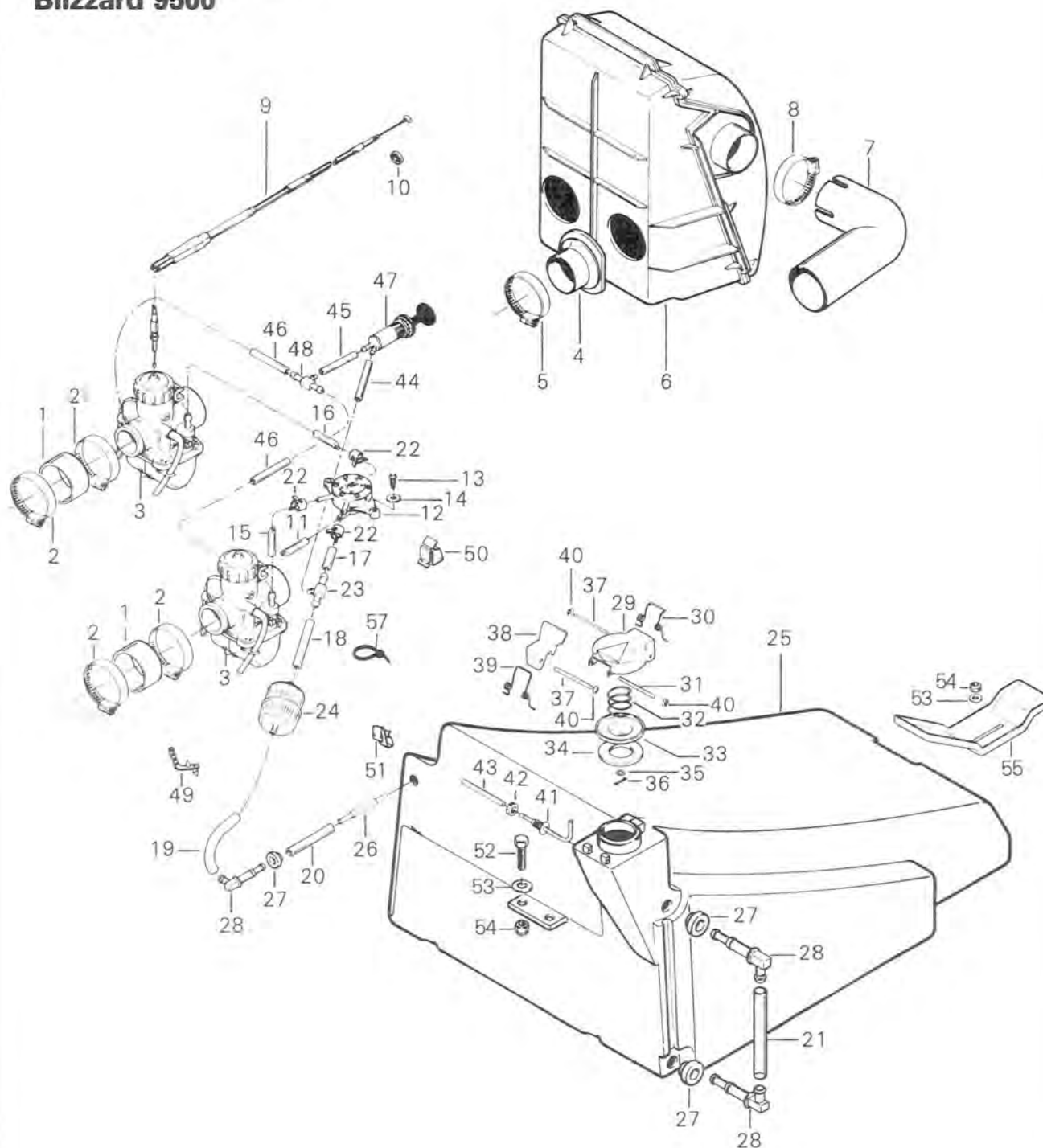
BLIZZARD 5500 1979
GRAND PRIX SPÉCIAL 1979
BLIZZARD 9500 1979

For all other models, refer to the 1978

1979 ELAN	refer to	1978 ELAN
1979 SPIRIT	refer to	1978 SPIRIT
1979 OLYMPIQUE	refer to	1978 OLYMPIQUE
1979 NUVIK	refer to	1978 NUVIK
1979 CITATION	refer to	1978 CITATION
1979 MIRAGE	refer to	1978 CITATION
1979 EVEREST	refer to	1978 EVEREST
1979 FUTURA	refer to	1978 FUTURA
1979 BLIZZARD 7500 / CROSS COUNTRY	refer to	1978 BLIZZARD 6500
1979 SUPER SONIC / CROSS COUNTRY	refer to	1978 BLIZZARD 6500
1979 ALPINE 640 ER	refer to	1978 ALPINE 640 ER
1979 ELITE 450 LC	refer to	1978 ELITE

SECTION 04
SUB-SECTION 06 (AIR INTAKE SILENCER AND FUEL TANK)

Blizzard 5500
Grand Prix Special
Blizzard 9500



SECTION 04

SUB-SECTION 06 (AIR INTAKE SILENCER AND FUEL TANK)

- | | |
|------------------------------------|--------------------------------------|
| 1. Rubber Flange (2) | 29. Fuel Tank Cap |
| 2. Clamp (4) | 30. Spring |
| 3. Carburetor VM 34-203 (2) | 31. Pin |
| 4. Adaptor (2) | 32. Release spring |
| 5. Gear Clamp (2) | 33. Pressure Pad |
| 6. Air Intake | 34. Gasket |
| 7. Elbow | 35. O'Ring |
| 8. Clamp | 36. Roll Pin |
| 9. Throttle Cable & Housing | 37. Pin (2) |
| 10. Circlip | 38. Lock |
| 11. Impulse hose 12" (305 mm) (AR) | 39. Spring |
| 12. Fuel Pump | 40. Push Nut (6) |
| 13. Washer Head Screw (2) | 41. Air Vent Fitting |
| 14. Internal Tooth Lockwasher (2) | 42. Nut |
| 15. Fuel Line 23" (584 mm) (AR) | 43. Air Vent Tube 49" (1235 mm) (AR) |
| 16. Fuel Line 16" (406 mm) (AR) | 44. Primer Tube 12.5" (318 mm) (AR) |
| 17. Fuel Line 12" (305 mm) (AR) | 45. Primer Tube 23" (584 mm) (AR) |
| 18. Fuel Line 4" (102 mm) (AR) | 46. Primer Tube 4.5" (115 mm) (AR) |
| 19. Fuel Line 6" (153 mm) (AR) | 47. Primer Valve |
| 20. Fuel Line 20" (508 mm) (AR) | 48. Tee |
| 21. Fuel Gauge 6.6" (133 mm) (AR) | 49. Cable Clip |
| 22. Spring Clip (AR) | 50. Clip |
| 23. Tee | 51. Clip |
| 24. Fuel Filter | 52. Screw (2) |
| 25. Fuel Tank | 53. Washer (4) |
| 26. Tube | 54. Nut (4) |
| 27. Grommet (3) | 55. Retainer |
| 28. Male Connector (3) | 56. Tie Rap (AR) |

SECTION 04
SUB-SECTION 06 (AIR INTAKE SILENCER AND FUEL TANK)

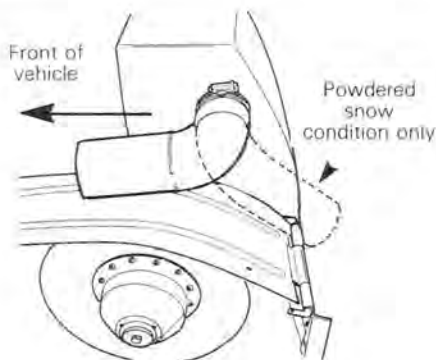
BLIZZARD 5500
GRAND PRIX SPÉCIAL
BLIZZARD 9500

Air silencer

▼ **CAUTION:** Never operate your snowmobile with the air intake silencer disconnected. Serious engine damage will occur if this notice is disregarded.

The air intake silencer elbow must always be turned to the front of the vehicle when operated in cold, warm temperature.

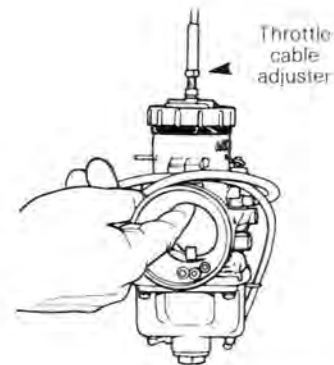
If the vehicle is to be operated in deep powdered snow it is recommended to turn the elbow towards the rear of the vehicle.



Throttle slide adjustment

◆ **WARNING:** Ensure the engine is turned **OFF**, prior to the throttle slide adjustment.

With the throttle cable adjuster jam nut unlocked, press the throttle lever against the handle grip. Unscrew the cable adjuster manually to obtain maximum carburetor slide opening. (With the air silencer removed, check with your finger if the carburetor slide is well seated against the carburetor top portion). Then, screw the cable adjuster in two turns in order to nullify any possible tension on the throttle cable then tighten the cable adjuster jam nut.



◆ **WARNING:** It is important that the throttle side adjustment be performed to ensure proper functioning of throttle mechanism.

SECTION 05
SUB-SECTION 01 (ELECTRICAL CHARTS)

MODEL	HEADLAMP watts	TAILLIGHT watts	CHART NO
ELAN 250 / SPIRIT	60/60	5/21	1
ELAN 250 DELUXE	45/45	5/21	2
CITATION / MIRAGE	45/45	5/21	3
OLYMPIQUE / NUVIK 340	60/60	5/21	4
OLYMPIQUE / NUVIK 340E	60/60	5/21	5
EVEREST 340-440 / FUTURA 400-440	60/60	5/21	6
EVEREST 340E-440E / FUTURA 400E-440E	60/60	5/21	7
EVEREST 444 LC / FUTURA 444 LC	45/45	5/21	8
BLIZZARD 5500 / GRAND PRIX SPECIAL	60/60	5/21	9
BLIZZARD 7500 PLUS / SUPER SONIC / CROSS COUNTRY	60/60	5/21	10
BLIZZARD 9500 PLUS	60/60	5/21	11
ALPINE 640 ER	60/60	5/21	12
ELITE 450 LC	60/60	5/21	13

COLOR CODE	
BK — BLACK	GN — GREEN
WH — WHITE	GY — GREY
RD — RED	VI — VIOLET
BL — BLUE	OR — ORANGE
YL — YELLOW	BR — BROWN

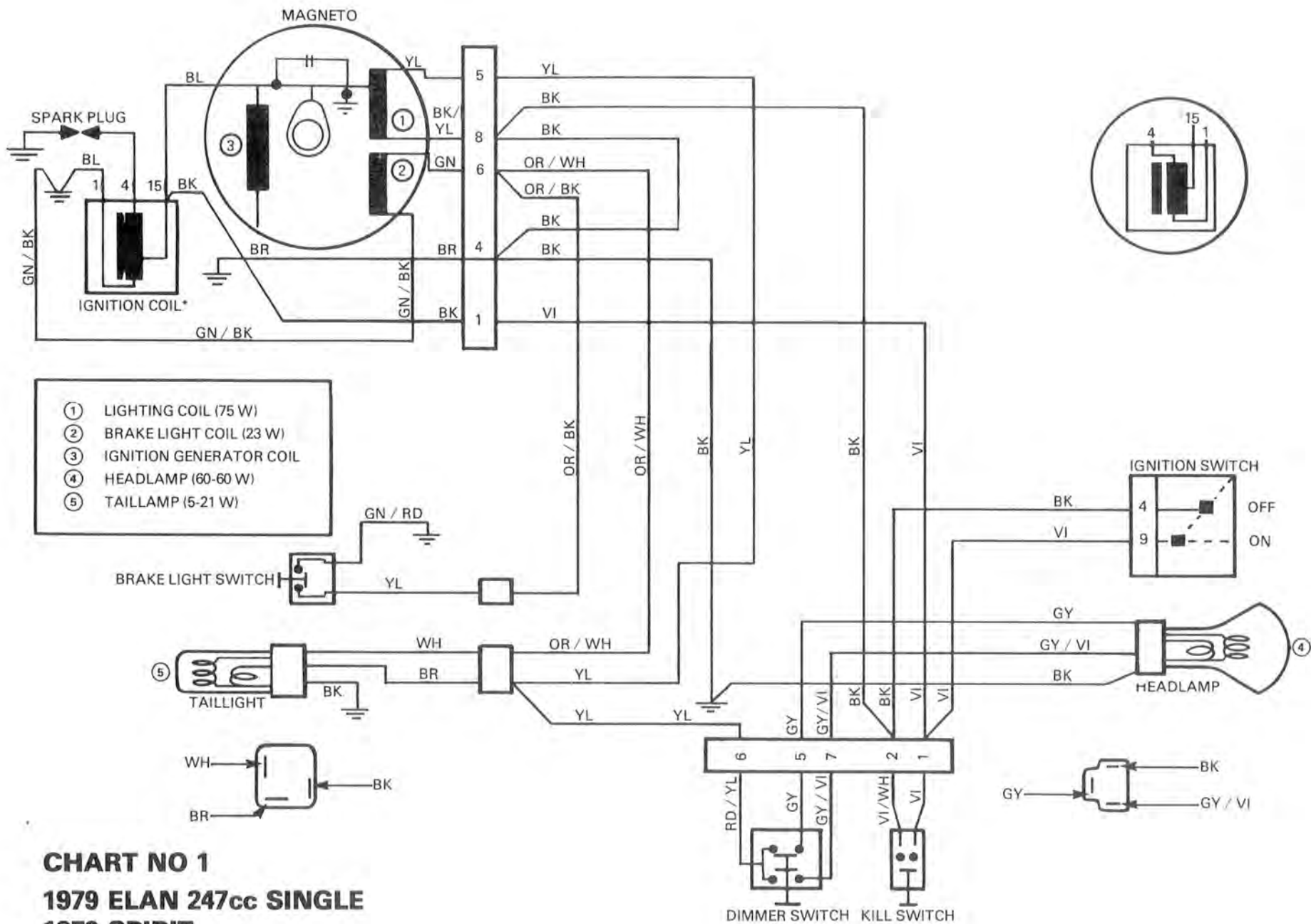
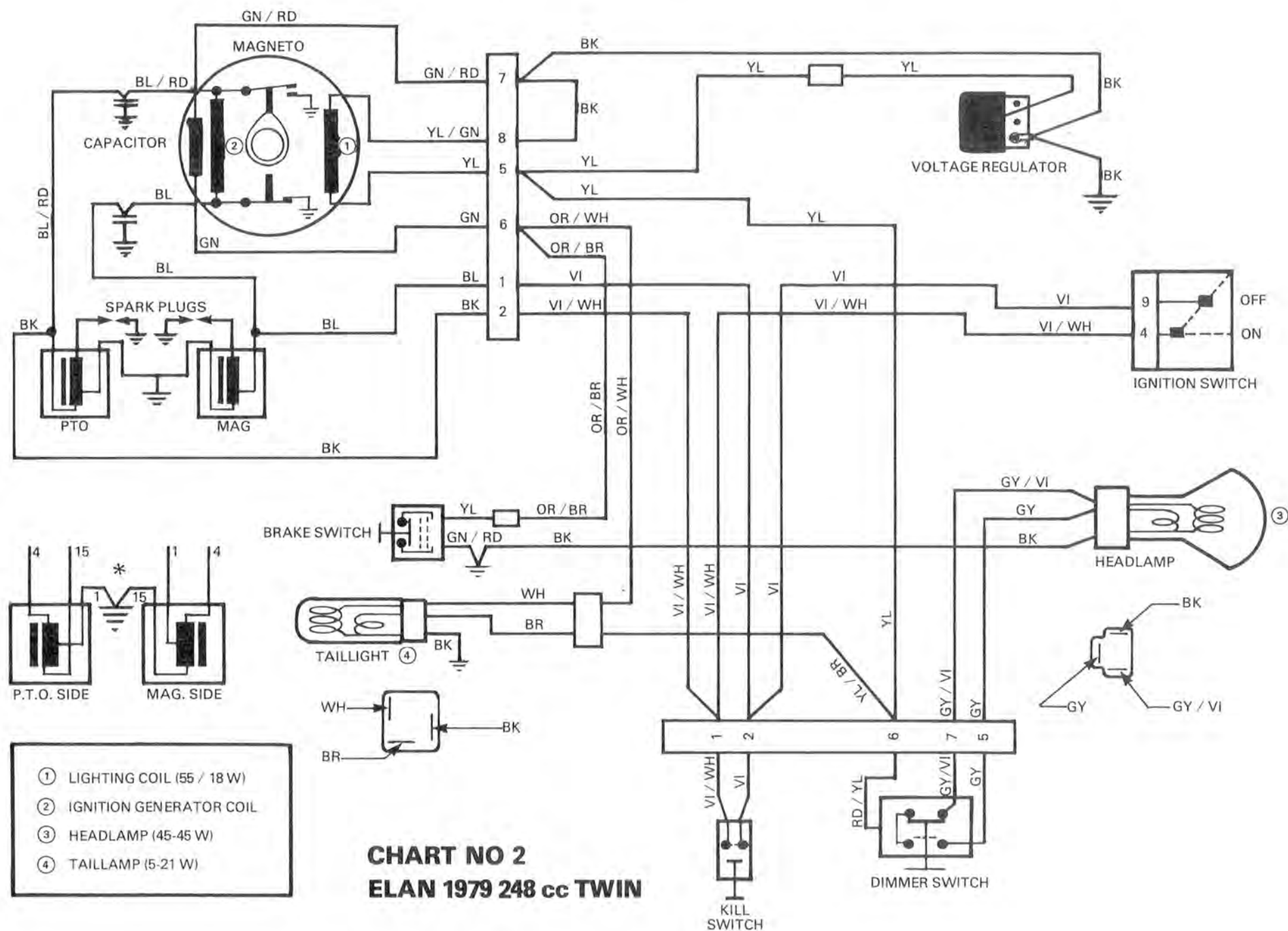


CHART NO 1
1979 ELAN 247cc SINGLE
1979 SPIRIT



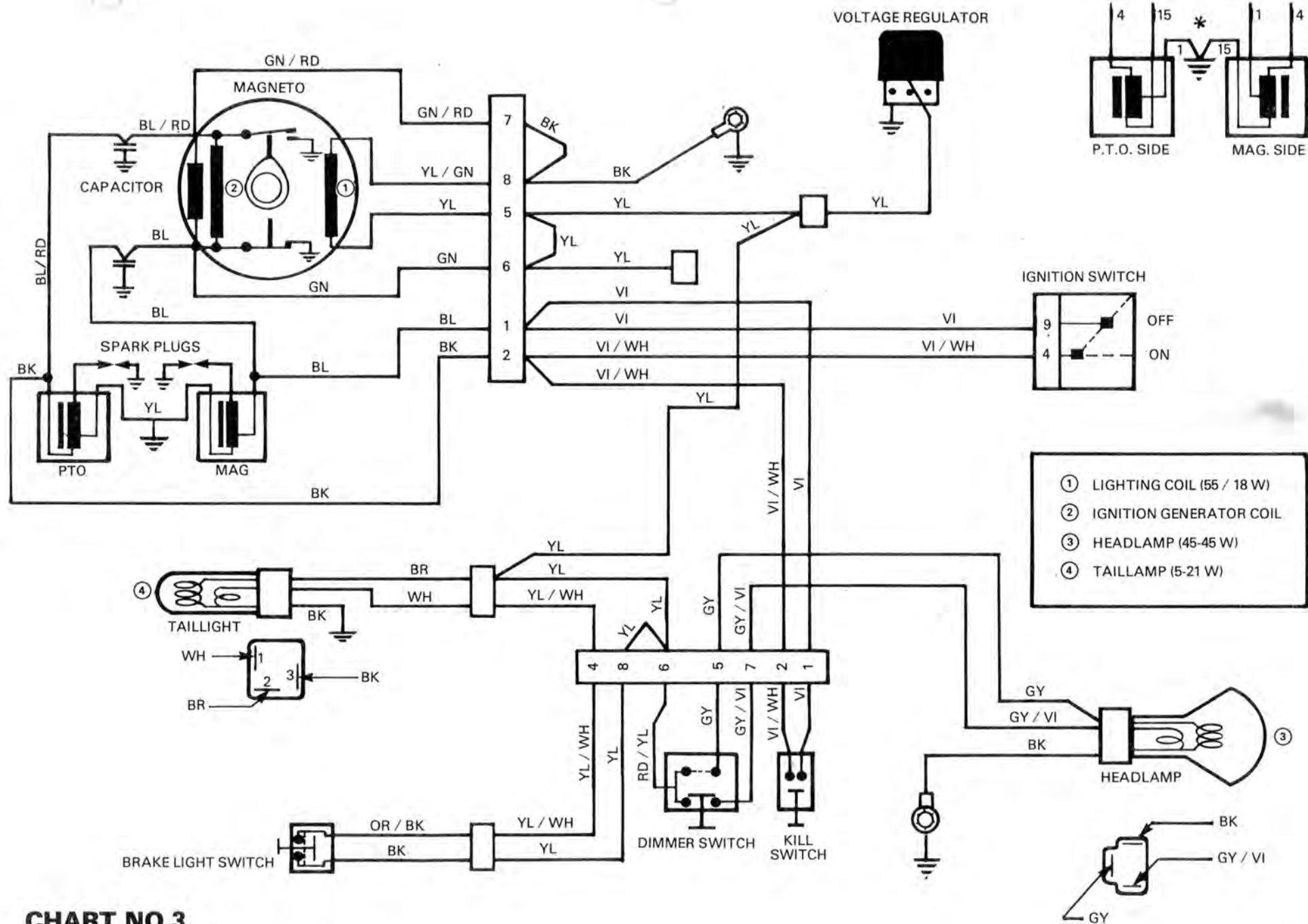


CHART NO 3

1979 CITATION 294cc TWIN

1979 MIRAGE

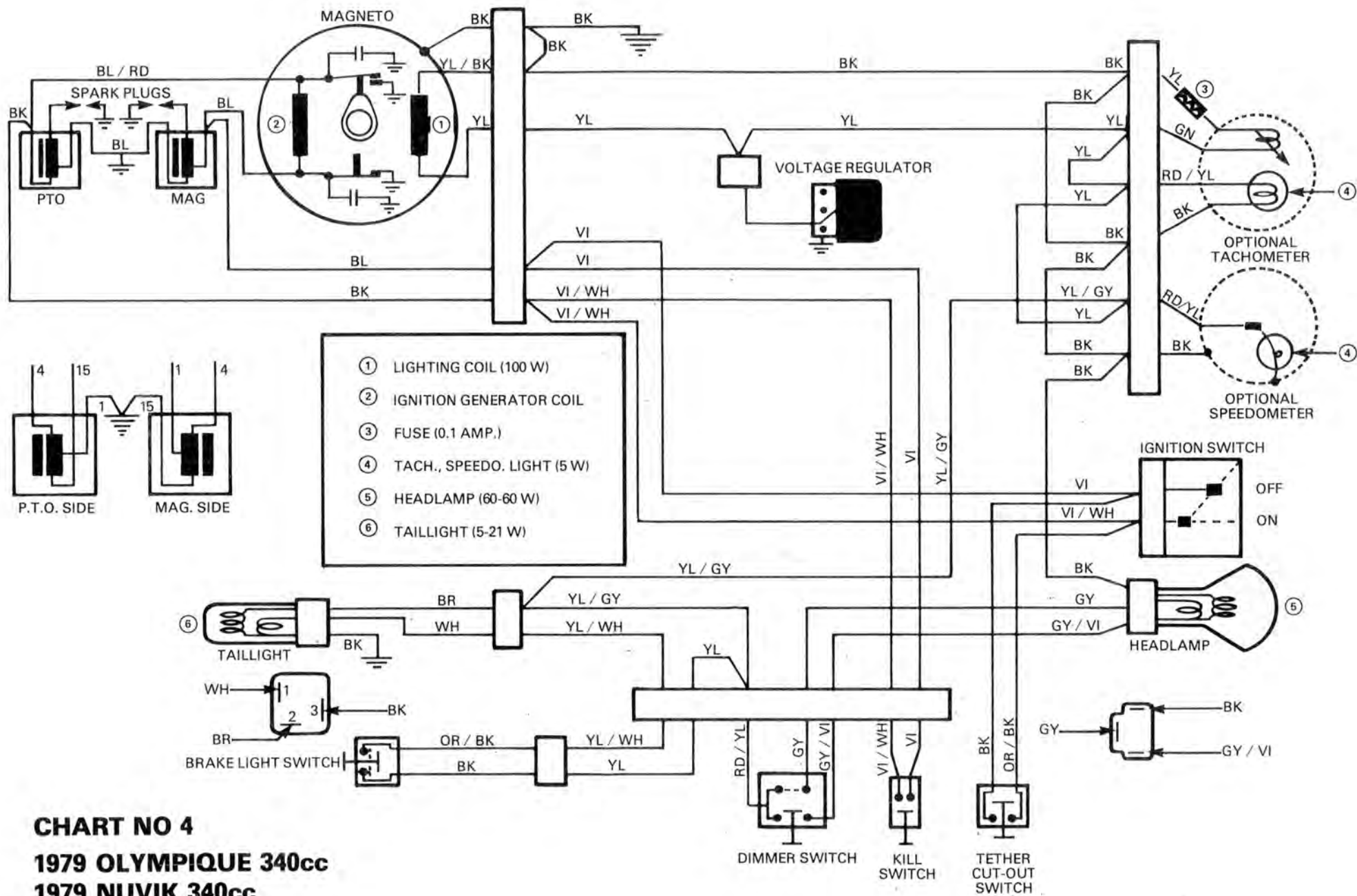
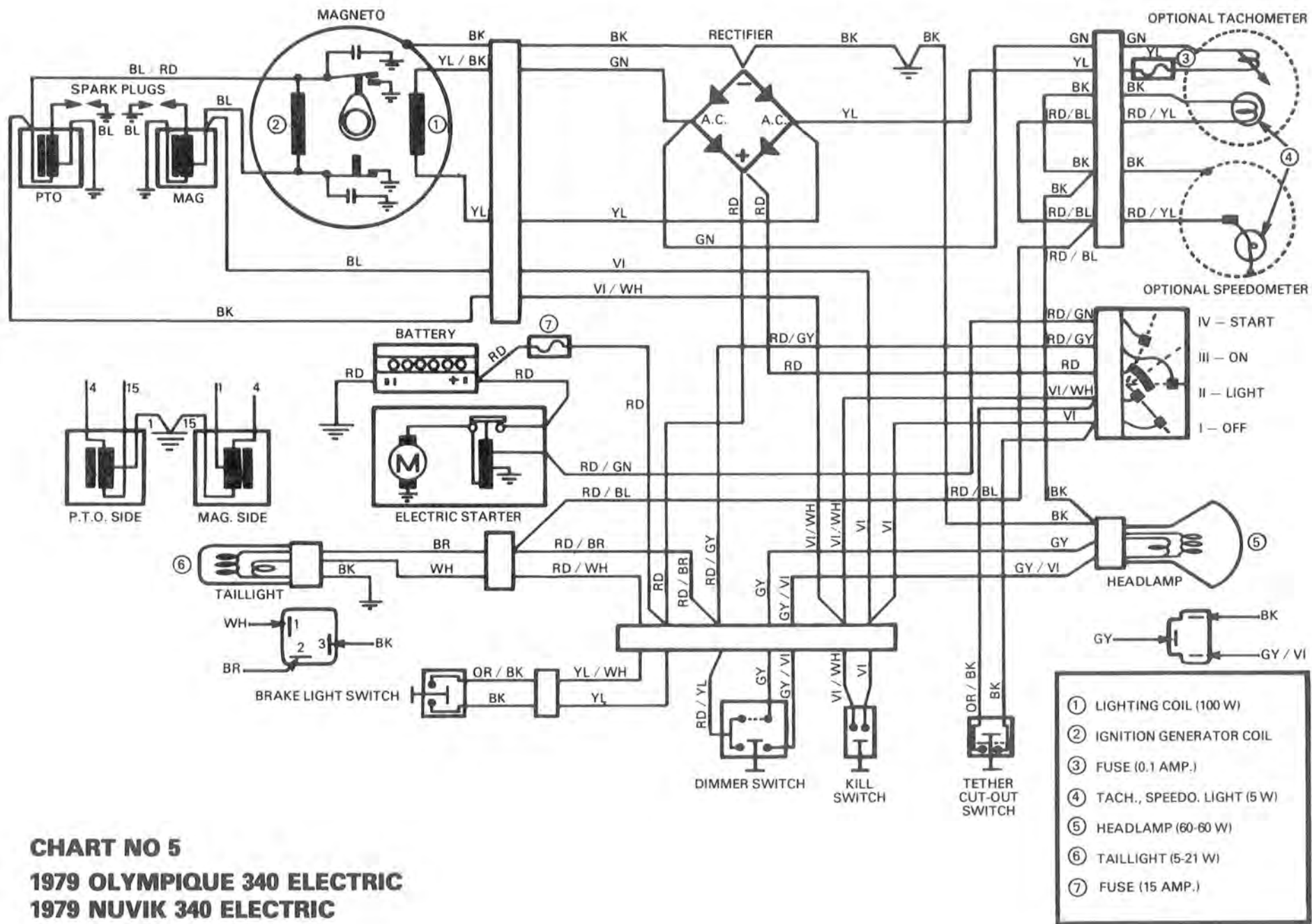


CHART NO 4

1979 OLYMPIQUE 340cc

1979 NUVIK 340cc



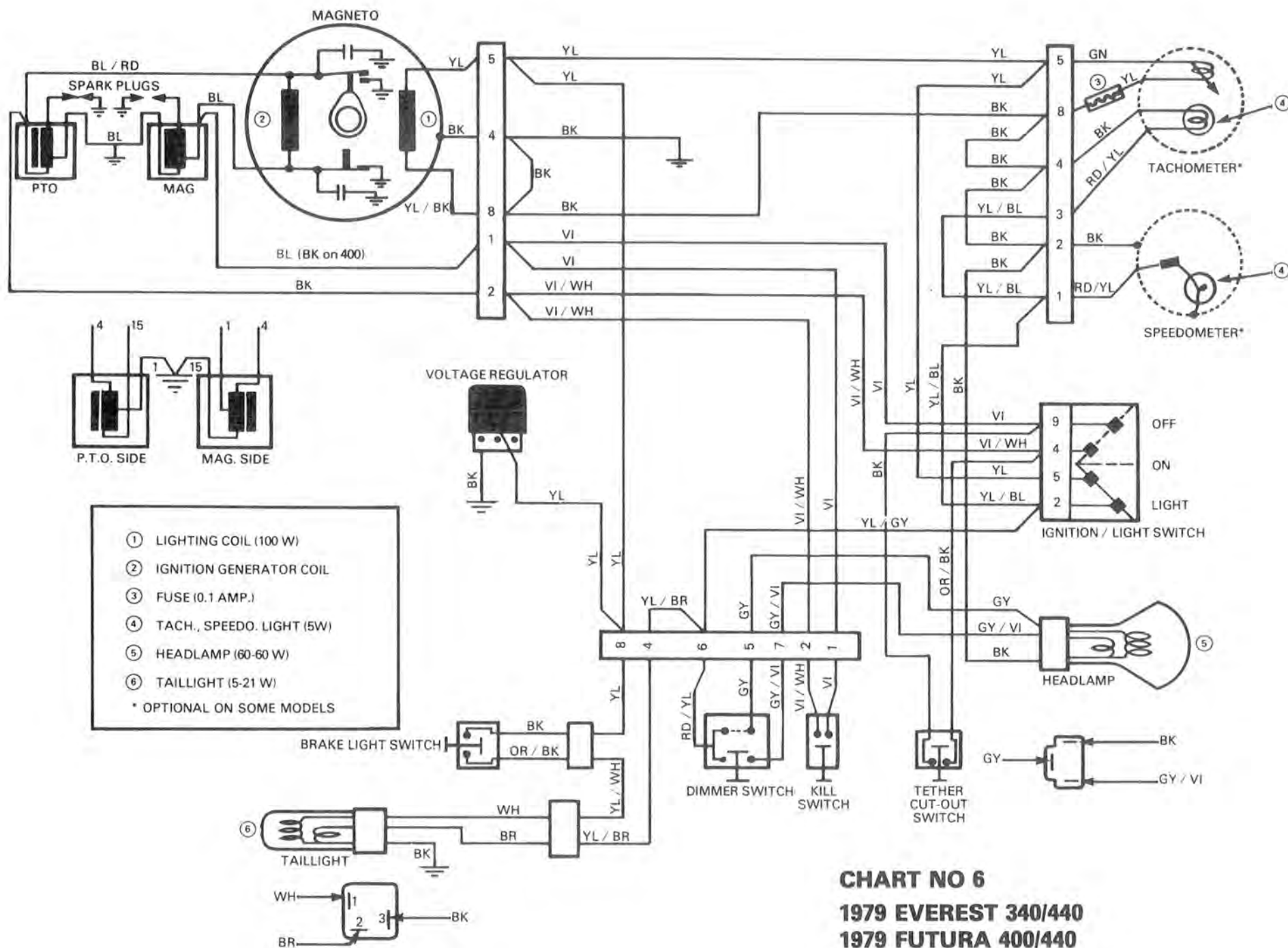


CHART NO 6
1979 EVEREST 340/440
1979 FUTURA 400/440

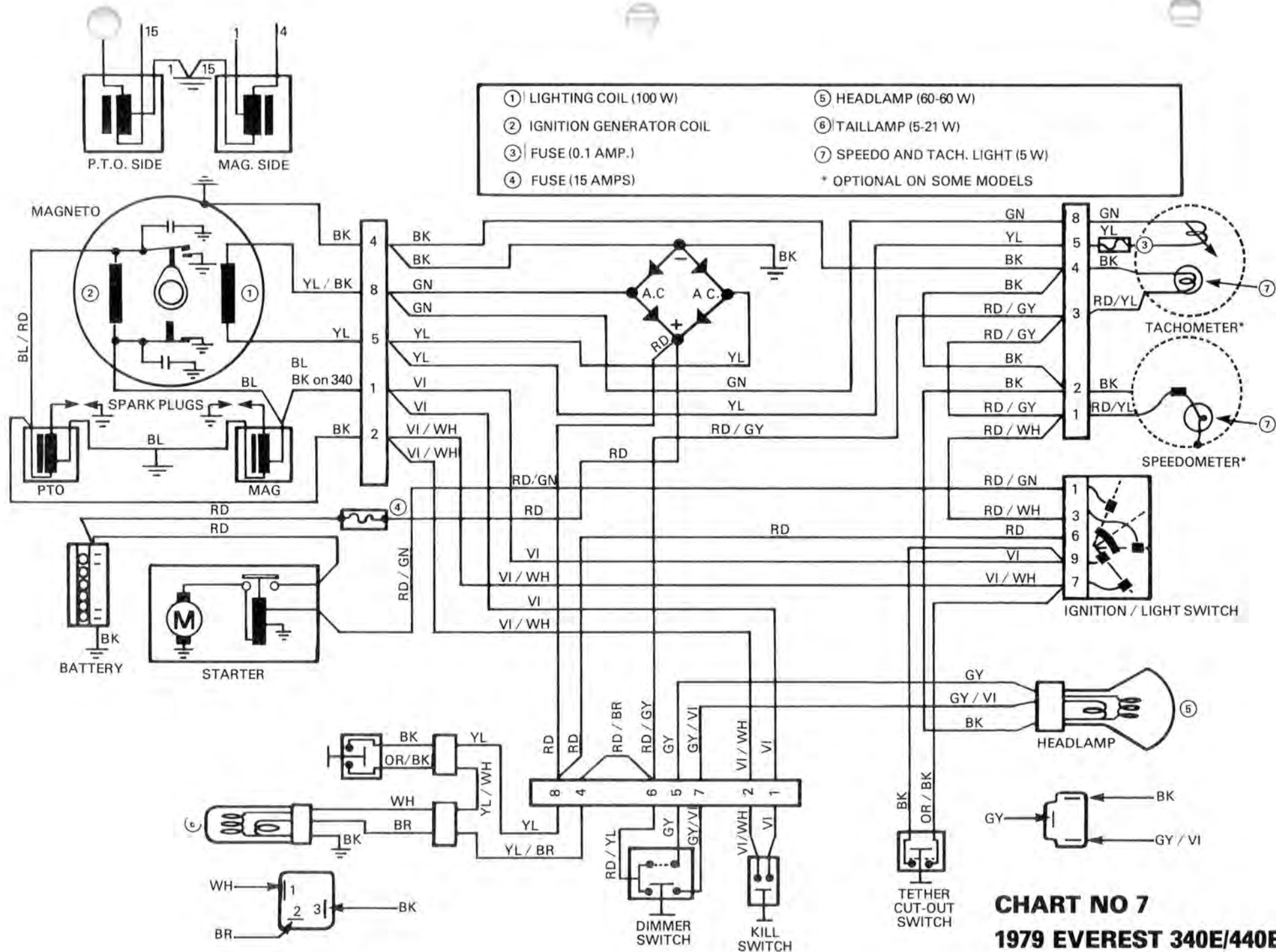


CHART NO 7
1979 EVEREST 340E/440E
1979 FUTURA 400E/440E

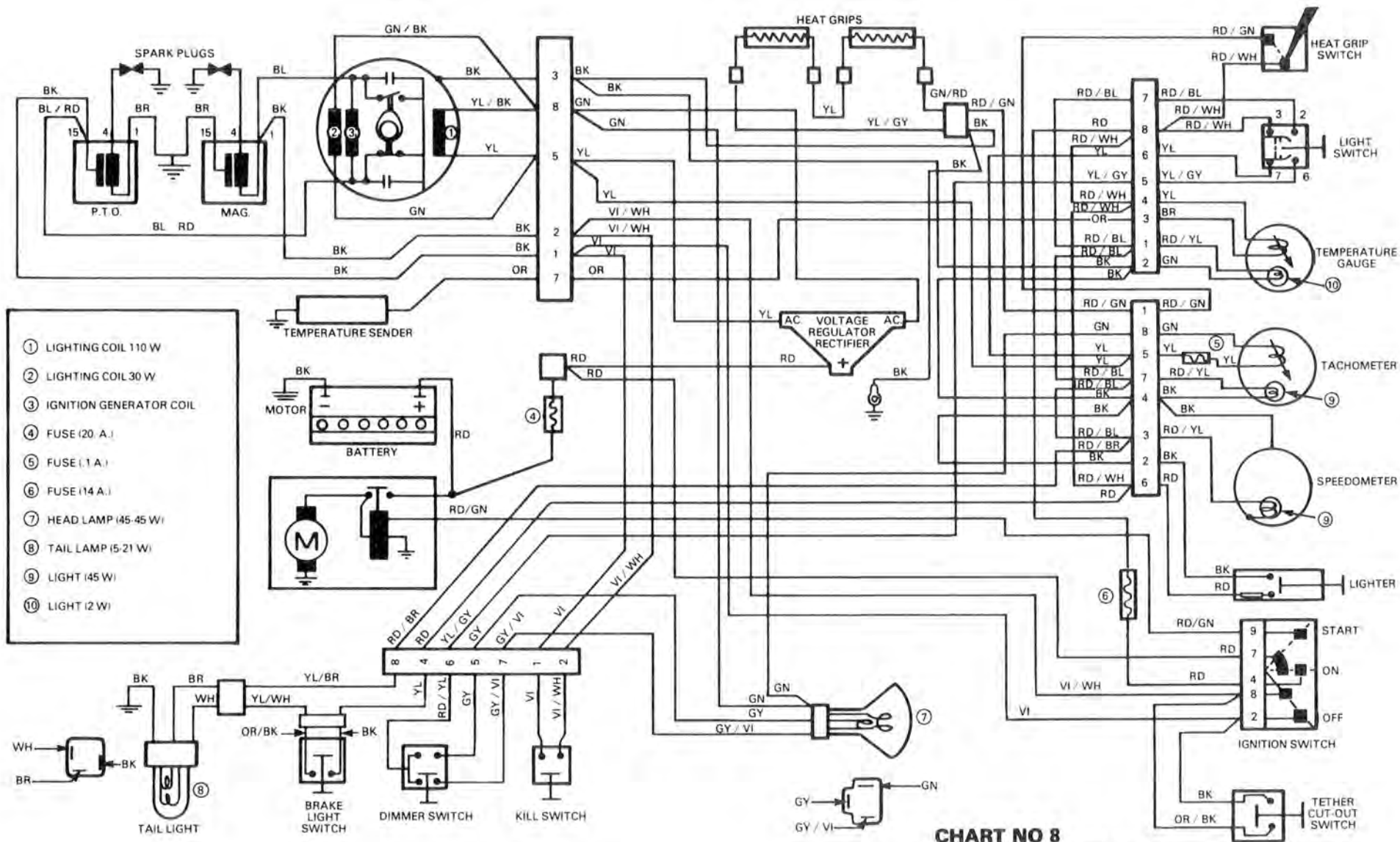
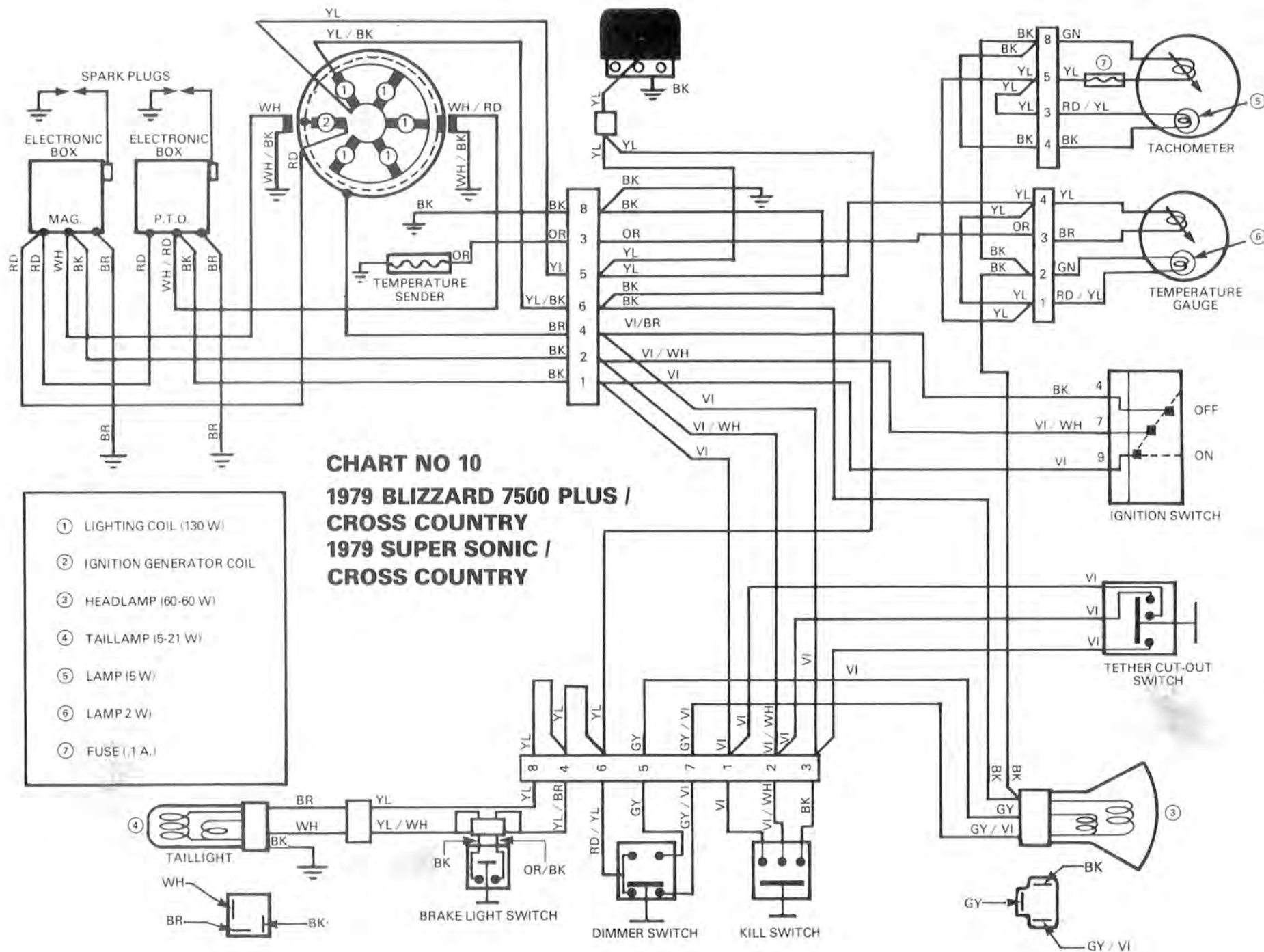


CHART NO 8
1979 EVEREST 444 L/C
1979 FUTURA 444 L/C



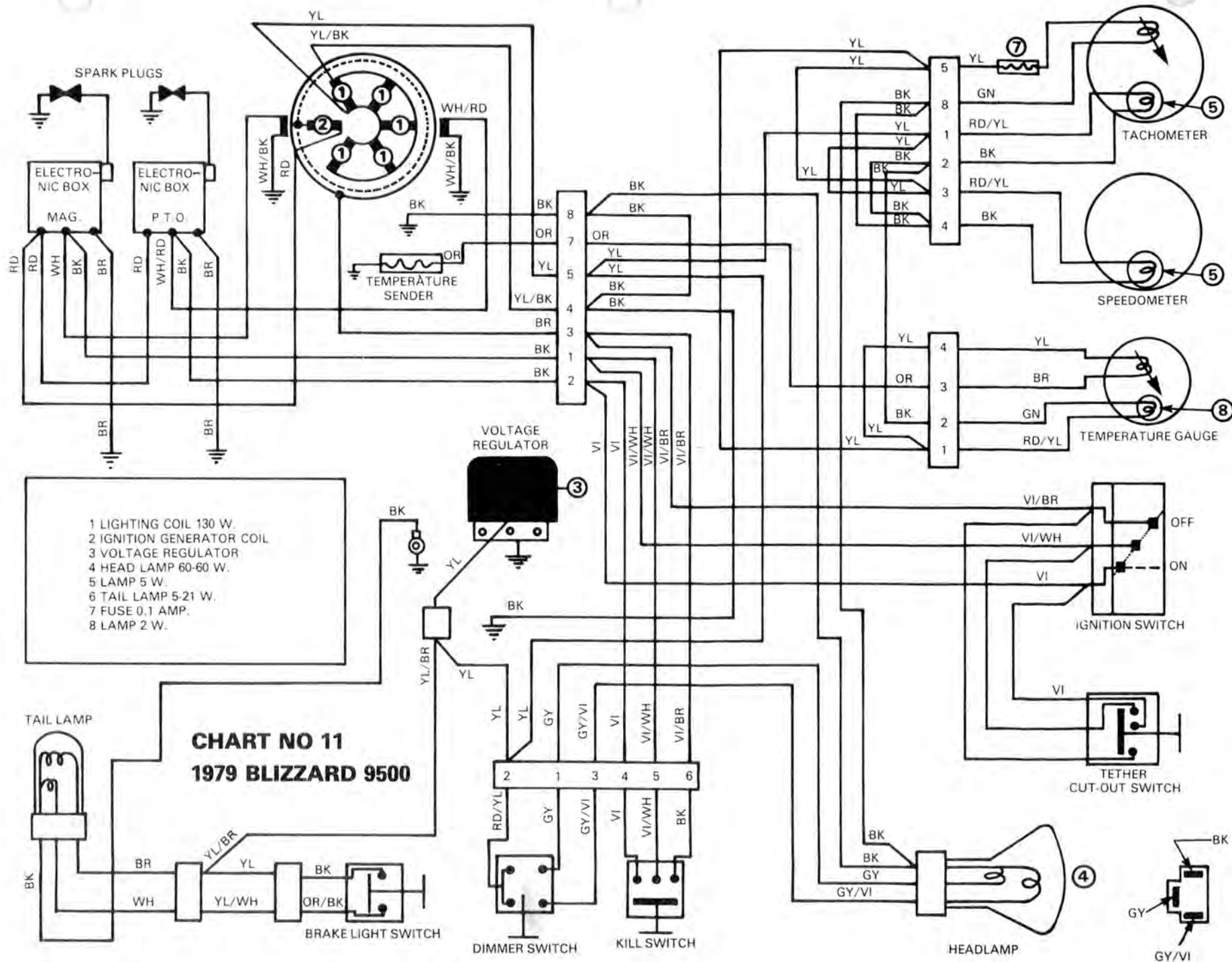
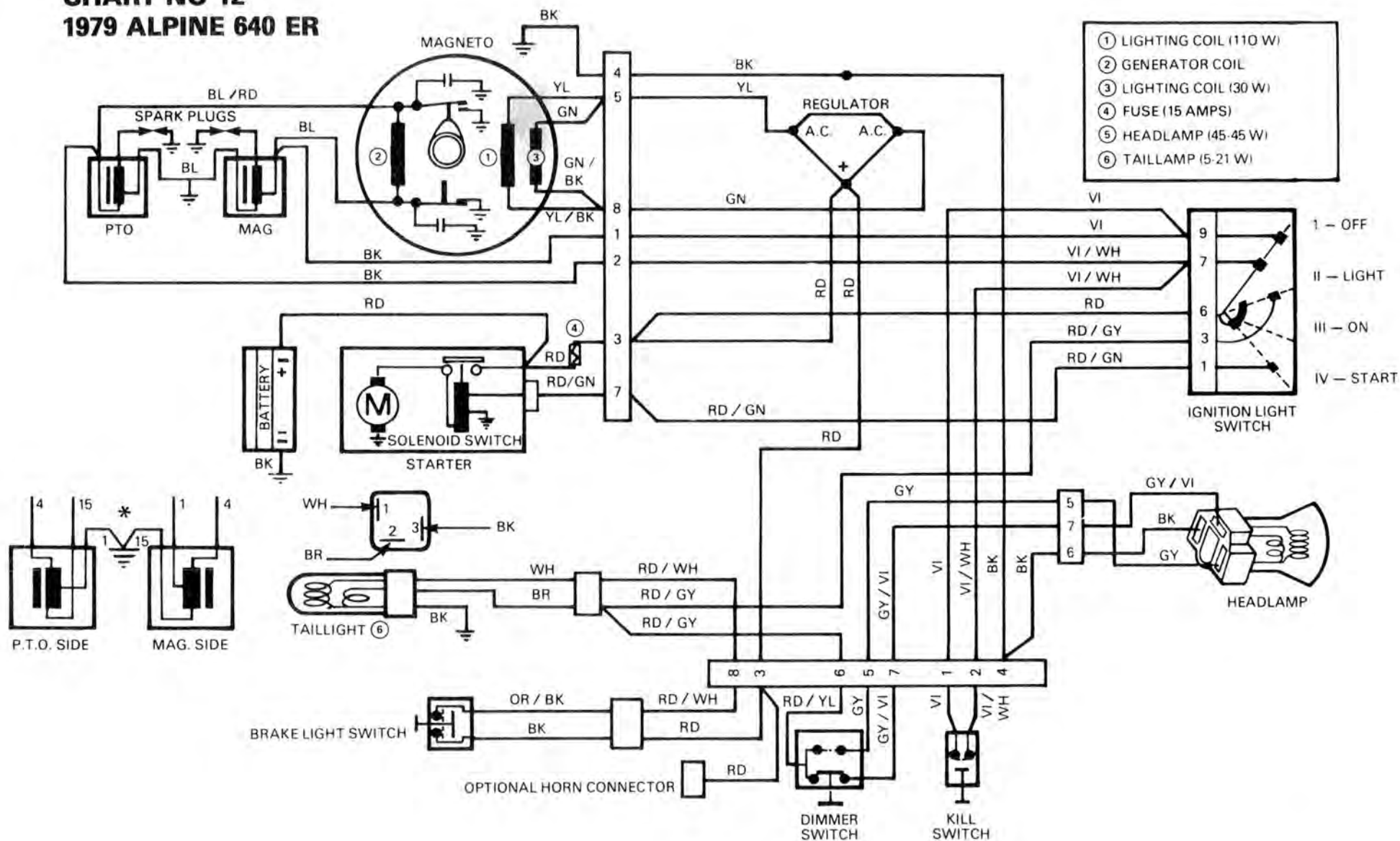
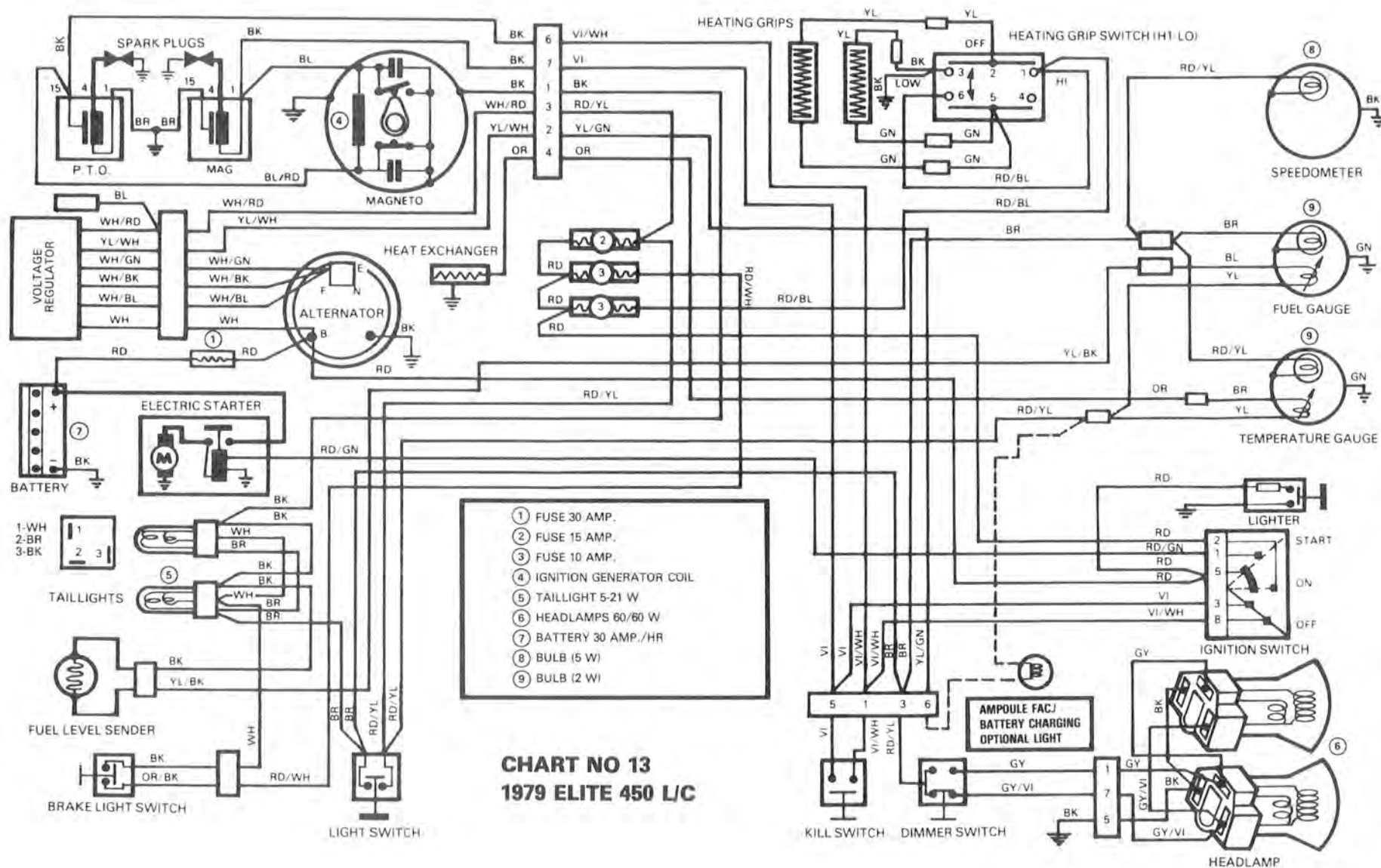


CHART NO 12 **1979 ALPINE 640 ER**





SPARK PLUGS

SPARK PLUG NUMBERING SYSTEM

Bosch has introduced a new numbering code for its complete line of spark plugs. The new code is shorter, therefore easier to use. The following charts will assist you in making the change-over easily and effectively.

IMPORTANT: The new code has a different heat range identification system.

High number _____ → hot plug

Low number _____ → cold plug

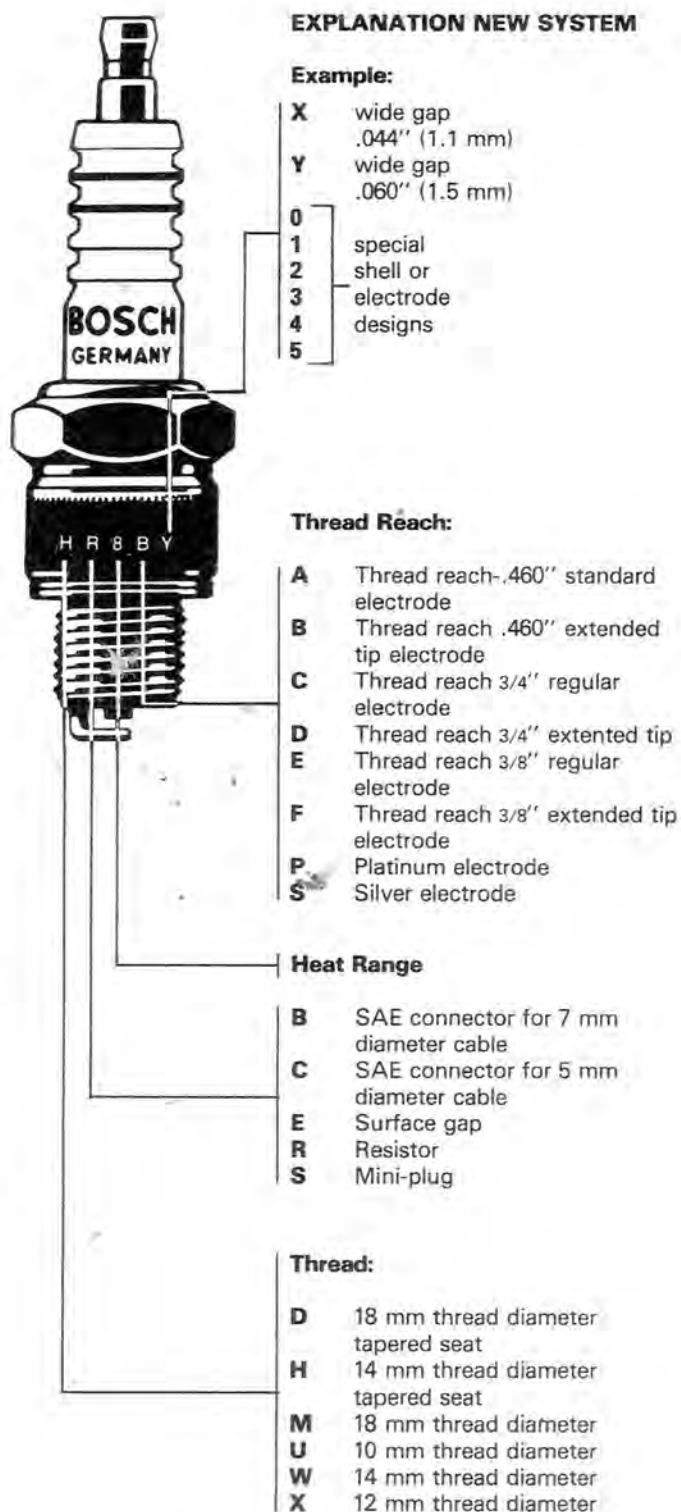
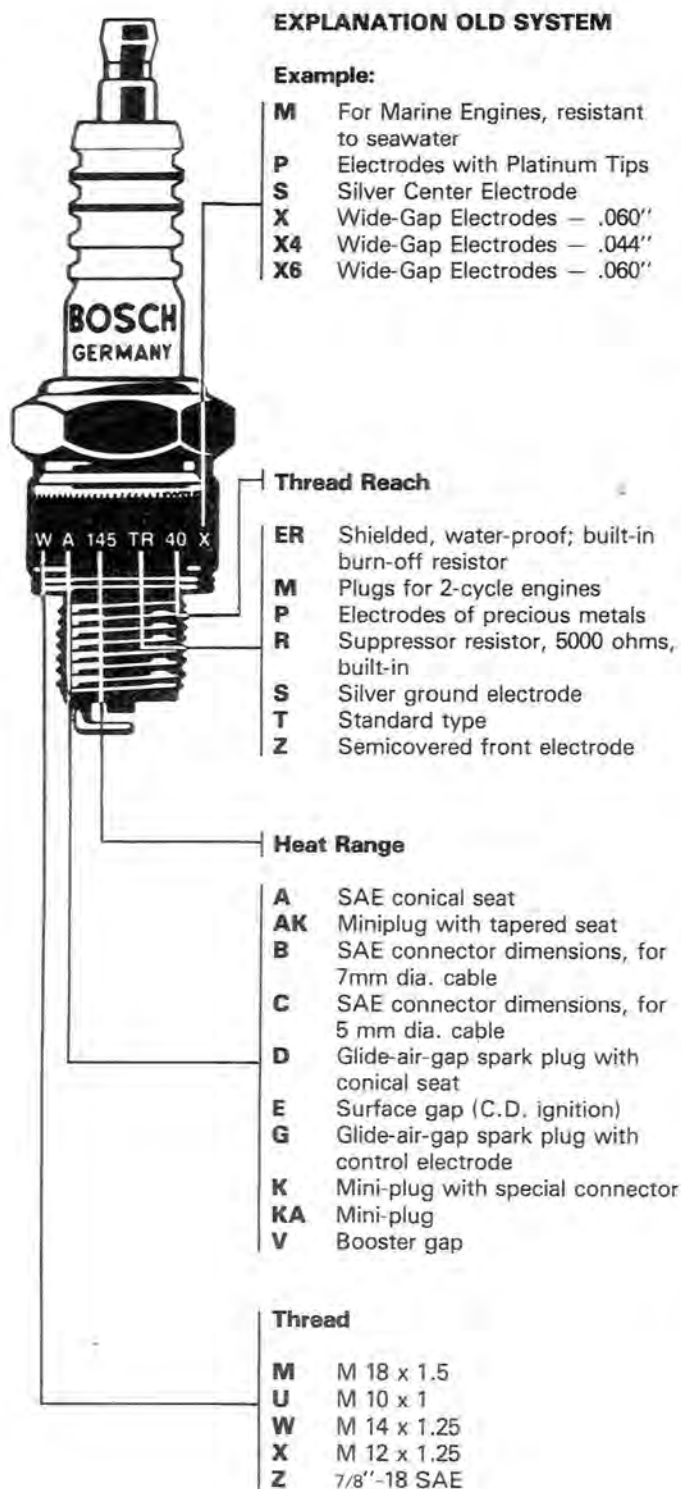
CROSS REFERENCE CHART

List of Bosch* spark plugs used on Bombardier snow-mobiles:

NEW NUMBER	OLD NUMBER
M4A1	M260T1
M4A2	M240T1
M5A	M225T1
M7A	M175T1
W08CS	W340S2S
W3A0	W280MZ1
W3C0	W280MZ2
W4A2	W240T1
W4A5	W260MZ1
W4A6	W240MZ1
W4C3	W260MZ2

* The bosch M280T1 spark plug is replaced by the NGKA8 plug.

SECTION 05
SUB-SECTION 02 (SPARK PLUGS)



SPARK PLUG

HEAT RANGE

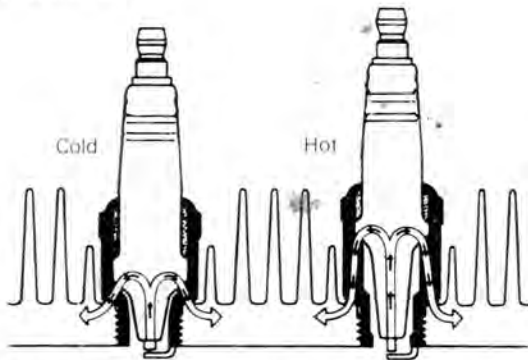
The proper operating temperature or heat range of the spark plug is determined by the spark plug's ability to dissipate the heat generated by combustion.

The longer the heat path between the electrode tip to the plug shell, the hotter the spark plug operating temperature will be — and inversely, the shorter the heat path, the colder the operating temperature will be.

A "cold" type plug has a relatively short insulator nose and transfers heat very rapidly into the cylinder head.

Such a plug is used in heavy duty or continuous high speed operation to avoid overheating.

The "hot" type plug has a longer insulator nose and transfers heat more slowly away from its firing end. It runs hotter and burns off combustion deposits which might tend to foul the plug during prolonged idle or low speed operation.



CAUTION: Severe engine damage can occur if a wrong heat range plug is used:

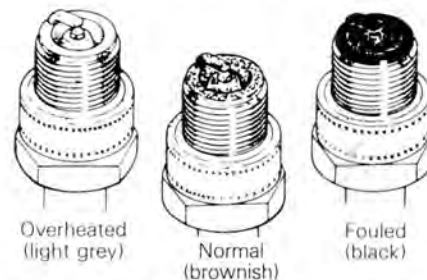
A too "hot" plug will result in overheating and pre-ignition, etc.

A too "cold" plug will result in fouling (shorting the spark plug) or may create carbon build up which can heat up red-hot and cause pre-ignition or detonation.

FOULING

Fouling of the spark plug is indicated by irregular running of the engine, decreasing engine speed due to misfiring, reduced performance, and increased fuel consumption. This is due to a loss of compression. Other possible causes are: prolonged idling, running the engine with the choke on, or running on a too rich a mixture due to a faulty carburetor adjustment or incorrect fuel and/or fuel mixing. The plug face of a fouled spark plug has either a dry coating of soot or an oily, glossy coating given by an excess either of oil or of oil with soot. Such coatings form a conductive connection between the center electrode and ground.

SPARK PLUG ANALYSIS



The plug face (and piston dome) reveals the condition of the engine, operating condition, method of driving and fuel mixture. For this reason it is advisable to inspect the spark plug at regular intervals, examining the plug face (i.e. the part of the plug projecting into the combustion chamber) and the piston dome.

SPARK PLUG INSTALLATION

Prior to installation make sure that contact surfaces of the cylinder head and spark plug are free of grime.

1. Using a wire feeler gauge, set electrode gap.
2. Apply A light coat of graphite grease over the spark plug threads to prevent possible seizure.
3. Hand screw spark plug into cylinder head and tighten with a torque wrench:
M (18 mm) 40 N•m (30 ft-lbs)
W (14 mm) 27 N•m (20 ft-lbs)

SECTION 05
SUB-SECTION 02 (SPARK PLUGS)

1979 SPARK PLUG CHART

Bombardier Limited prescribes two spark plug types for specific uses on many of its snowmobile models.

Full load: frequent use of maximum engine RPM.

Partial load: use of medium engine RPM.

		ENGINE TYPE	FULL LOAD	PART LOAD
ELAN & SPIRIT	250	247	M175 T1	M175 T1
ELAN	250 Deluxe	248	W240 MZ1	W240 MZ1
CITATION & MIRAGE	300	294	W260 MZ1	W260 MZ1
OLYMPIQUE & NUVIK	340	343	W280 MZ1	W280 MZ1
EVEREST	340	343	W280 MZ1	W280 MZ1
FUTURA	400	402	W280 MZ1	W280 MZ1
EVEREST & FUTURA	440	440	M280 T1 (NGK A-8)	M260 T1
EVEREST & FUTURA	444 LC	444	W280 MZ2	W260 MZ2
BLIZZARD 5500/ GP Special	503	503	W275 T2	W275 T2
BLIZZARD 7500/SUPER SONIC	354	354	W340 S2S	W340 S2S
CROSS COUNTRY	354	354	W275 T2	W275 T2
BLIZZARD	9500	454	W340 S2S	W340 S2S
ALPINE	640 ER	640	M240 T1	M240 T1
ELITE	450 LC	444	W280 MZ2	W260 MZ2

TESTS PERFORMED WITH MERC-O-TRONIC ANALYSER

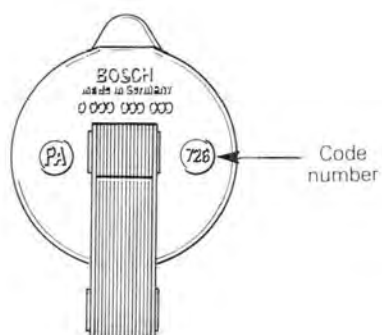
*This sub-section applies to 1979 models
as for no. 3 test (Ignition coil resistance
«secondary»).*

*For all other tests, refer to 1978
Bombardier Shop Manual.*

SECTION 05
SUB-SECTION 03 (MERC-O-TRONIC TEST)

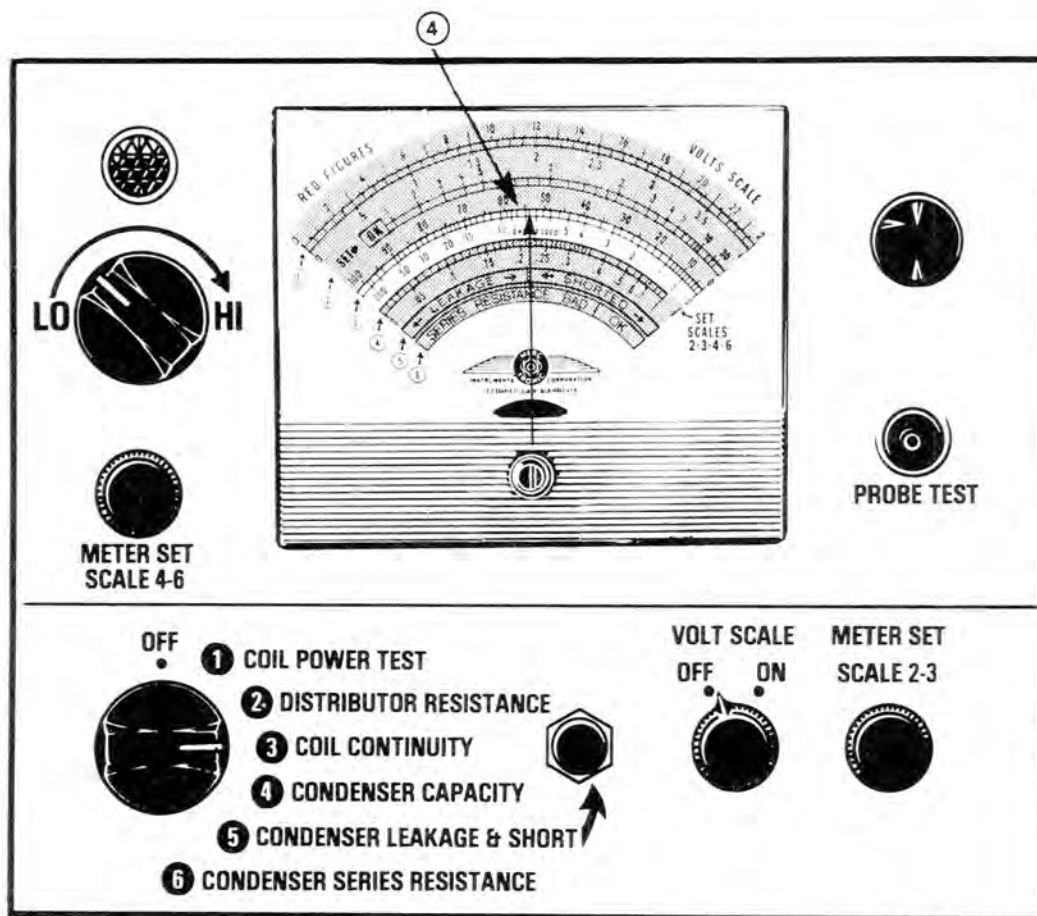
TEST NO. 3 IGNITION COIL
RESISTANCE (SECONDARY)

1. Turn selector switch to position no. 3 — COIL CONTINUITY.
2. Connect the back test lead to terminal no. 15 of the external coil.
3. Connect the red test lead to the spark plug terminal of the coil.
4. Read the RED figures of Scale no. 3. Meter reading must be between specification limits. The values on red scale no. 3 are in OHM and must be multiplied by 1,000. If coil is not within specifications, replace the defective coil.

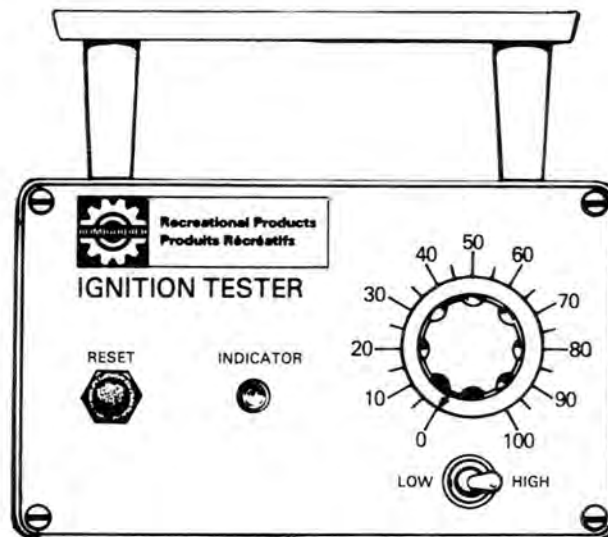


CODE NUMBER	RESISTANCE
	MINIMUM — MAXIMUM
Up to 724	6300 — 8500 ohms
From 725 and up	4850 — 5850 ohms

TEST NO. 3 IGNITION COIL RESISTANCE (SECONDARY)



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.

Vigorous cranking against compression causes the fly-wheel to snap over, raising the output higher than by cranking without compression, therefore, do not remove spark plug.

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 lower setting

This indicates that the output is less than that designed to operate in a satisfactory manner. However, before coming to the conclusion of a faulty condition 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 faulty parts. If after a component has been replaced, the problem still persists, carefully repeat the complete test procedure to find the other faulty 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.

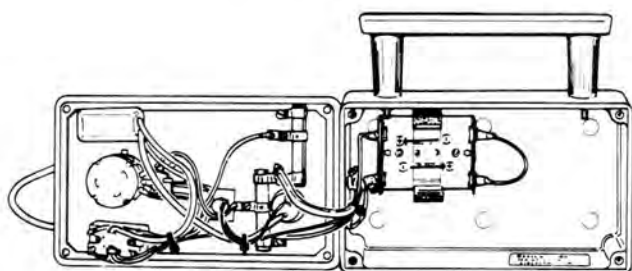
Low scale test

- 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. Carefully install cover on case 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 glow 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. Re-check 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

ROTAX ONE CYLINDER BREAKER POINTS ENGINE

1. Generator coil output.
2. Lighting coil output.
3. Brake light coil output.

ROTAX TWO CYLINDER BREAKER POINTS ENGINE

4. Generator coil output.
5. Lighting coil output.
6. Brake light coil output.

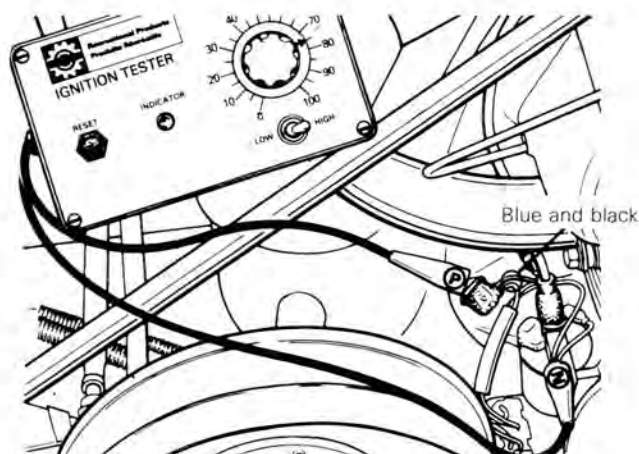
ROTAX TWO CYLINDER ELECTRONIC IGNITION ENGINE

7. Generator coil output.
8. Trigger coil output.
9. Lighting coil output.

ONE CYLINDER ENGINE

1. 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.



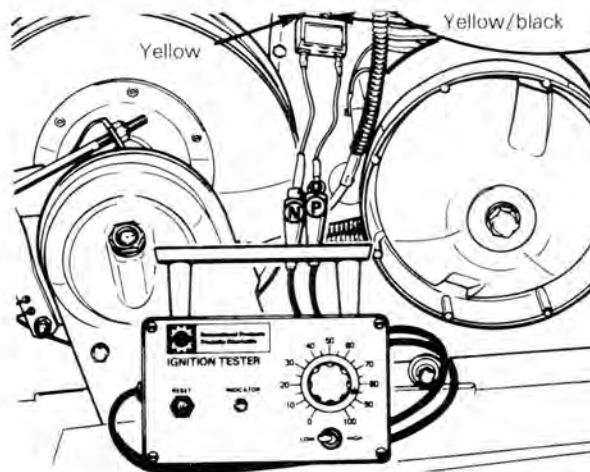
3. Set tester dial and switch as follows:

Engine type	Switch position	Dial
247	HIGH	75

4. Turn ignition key to ON position, disable emergency cut-out 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.

2. 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:

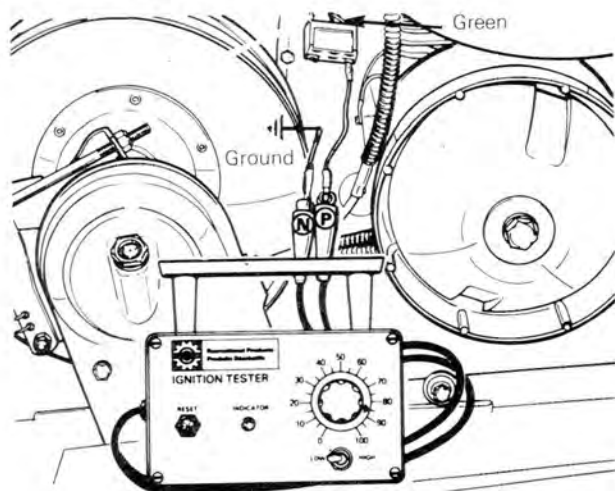
Engine type	Switch position	Dial
247	LOW	85

4. 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:** Lighting coil is faulty.

SECTION 05
SUB-SECTION 03 (ELECTRICAL TESTS)

3. 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	LOW	85

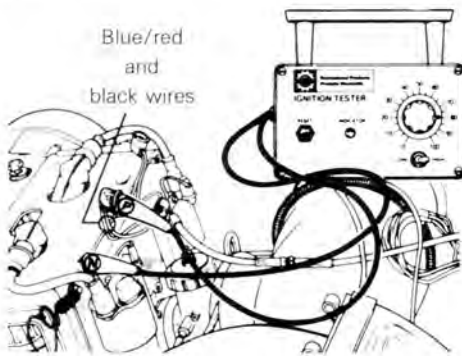
4. Crank engine.

- A. Indicator lamp lights:** Brake light coil output is up to specifications. Repeat test at least three (3) times to verify reading and check for consistency.
- B. Indicator lamp does not light:** Brake light coil output is faulty.

TWO CYLINDER BREAKER POINTS ENGINE

4. GENERATOR COIL OUTPUT

1. Disconnect **blue/red and black** wires from terminal (15) of P.T.O. side ignition coil. Disconnect the **two (2) blue wires** from terminal (1) of magneto side ignition coil. Make sure that neither connector touches 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:

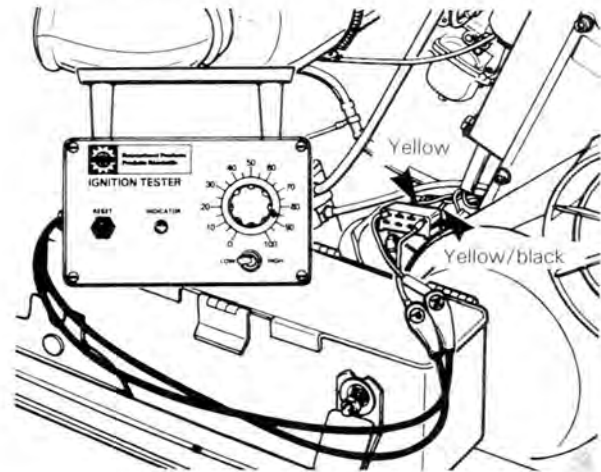
Engine type	Switch position	Dial
248, 294	HIGH	75
343, 402, 440, 444, 503, 640	HIGH	80

4. Turn ignition key to ON position, disable cut-out button circuit then crank engine.
 - Indicator lamp lights:** Generator coil output is up to specifications. Repeat test at least three (3) times to verify reading and consistency.
 - 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.

5. LIGHTING COIL OUTPUT

- NOTE: On 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 appears to be negative, each component must be checked separately.

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:

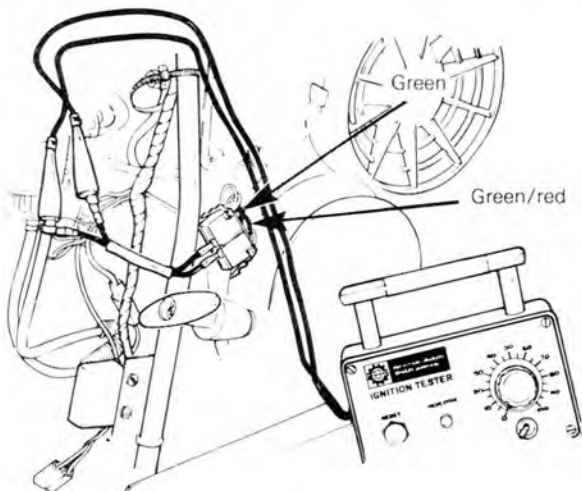
Engine type	Switch position	Dial
248, 294	LOW	80
343, 402, 440, 444, 503, 640	LOW	85

4. Crank engine.
 - Indicator lamp lights:** Lighting coil output is up to specifications. Repeat test at least three (3) times to verify reading and consistency.
 - Indicator lamp does not light:** Lighting coil is faulty.

SECTION 05
SUB-SECTION 03 (ELECTRICAL TESTS)

6. 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:

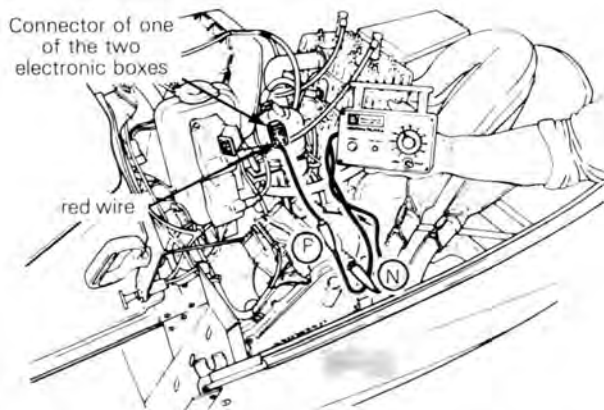
Engine type	Switch position	Dial
248, 294	LOW	80

4. 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 output is defective.

TWO CYLINDER ELECTRONIC IGNITION ENGINE

7. GENERATOR COIL OUTPUT

1. Disconnect wire connectors from C.D.I. electronic boxes.
2. Using one (1) harness adaptor, connect tester P test lead to **red** wire of one of the two connectors removed from C.D.I. electronic boxes. 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
354, 454	HIGH	40

4. Turn ignition key to **ON** position, disable cut-out button circuit then crank engine.

◆ **WARNING:** To prevent powerful electric shocks with engine running, do not touch any component related to electronic ignition system (ignition coil, high tension wire, wire harness, etc...)

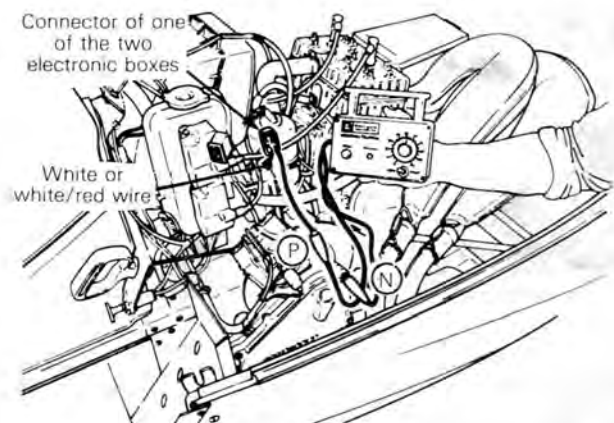
A. **Indicator lamp lights:** Generator coil output is up to specifications. Repeat test at least three (3) times to verify reading and consistency.

B. **Indicator lamp does not light:** If trigger coil (no. 8) is positive, the problem is a faulty 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.

8. TRIGGER COIL OUTPUT

1. Disconnect electronic box connectors.
Magneto side: Connect tester P lead to **white** wire.
P.T.O. side: Connect tester P lead to **white/red** wire.
Connect tester N lead to a good engine ground.
2. Set tester switch and dial as follows:



Engine type	Switch position	Dial
354, 454	LOW	50

3. Turn ignition key to **ON** position, disable cut-out button circuit then crank engine.

◆ **WARNING:** To prevent powerful electric shocks with engine running, do not touch any component related to electronic ignition system (ignition coil, high tension wire, wire harness, etc...)

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.

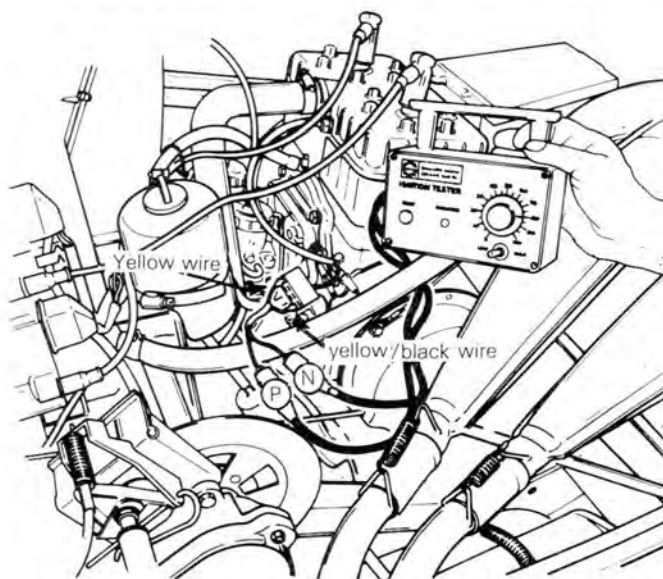
B. **Indicator lamp does not light:** The problem is a faulty trigger coil.

○ **NOTE:** If no 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.

SECTION 05
SUB-SECTION 03 (ELECTRICAL TESTS)

9. 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
354, 454	LOW	80

4. 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 faulty.

ELECTRIC STARTER

Refer to the 1978 Bombardier Shop Manual.

BATTERY

Refer to the 1978 Bombardier Shop Manual.

ALTERNATOR

Refer to the 1978 Bombardier Shop Manual.

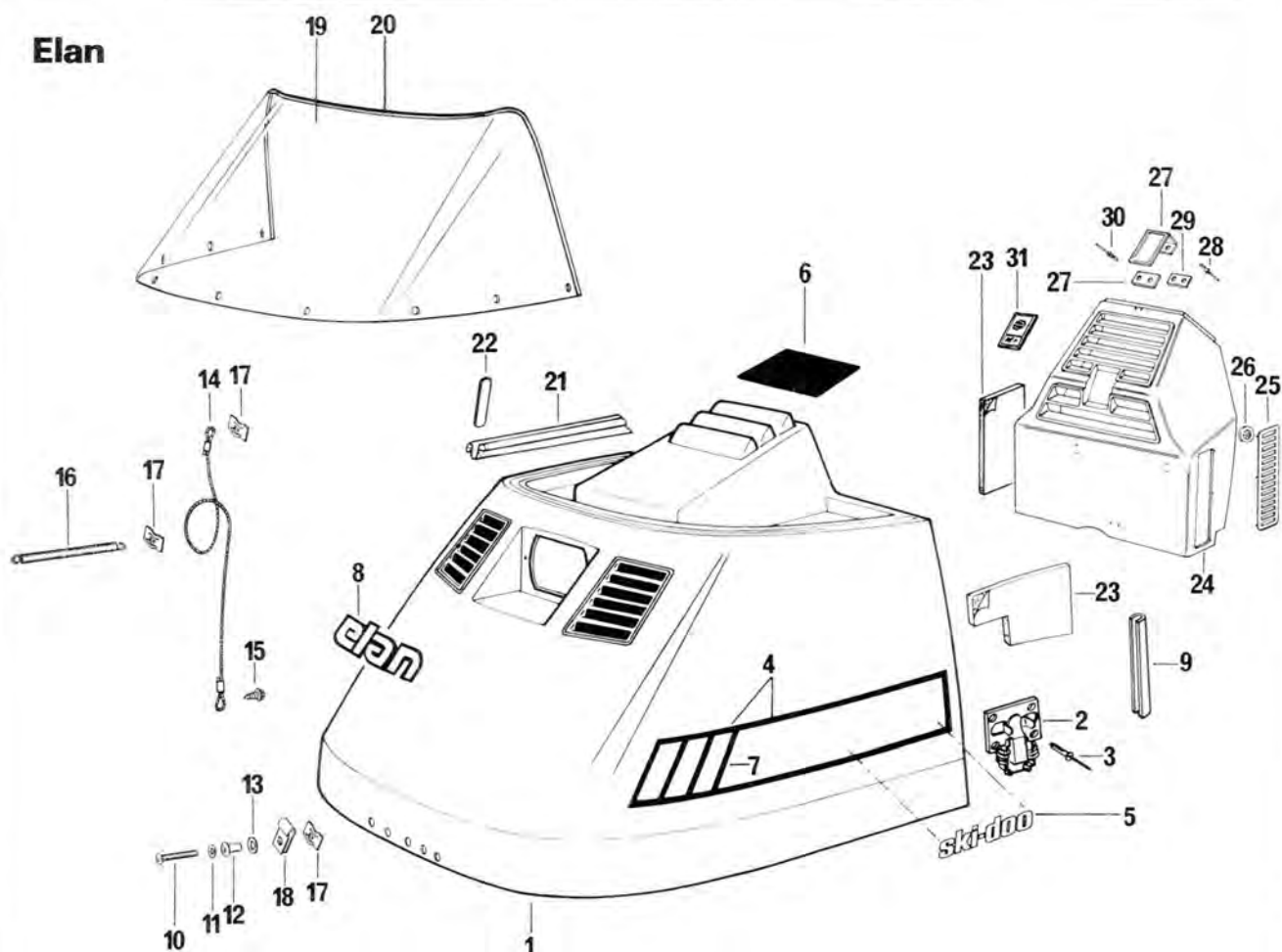
CAB

Models covered in this section:

1979: Elan
Spirit
Citation
Mirage
Olympique
Nuvik
Everest / Futura
Blizzard 7500 / Cross Country
Super Sonic / Cross Country
Blizzard 5500 / Grand Prix Special
Blizzard 9500
Alpine 640 ER
Elite 450 LC (winshield installation only, cab and
frame, refer to section 06-02 Frame).

SECTION 06
SUB-SECTION 01 (CAB)

Elan



250 250 DL

250 250 DL

1. Cab
2. Cabin Latch
3. Rivet
4. Stripe 193" (4902 mm)
5. Ski-Doo Label
6. Decal, Black
7. Side Decal Set
8. Identification Label
9. Cab Trim 17.5" (445 mm)
10. Machine Screw
11. Washer
12. Well Nut
13. Washer
14. Retainer Cable
15. Hexagonal Washer Head Metal Screw
16. Spring

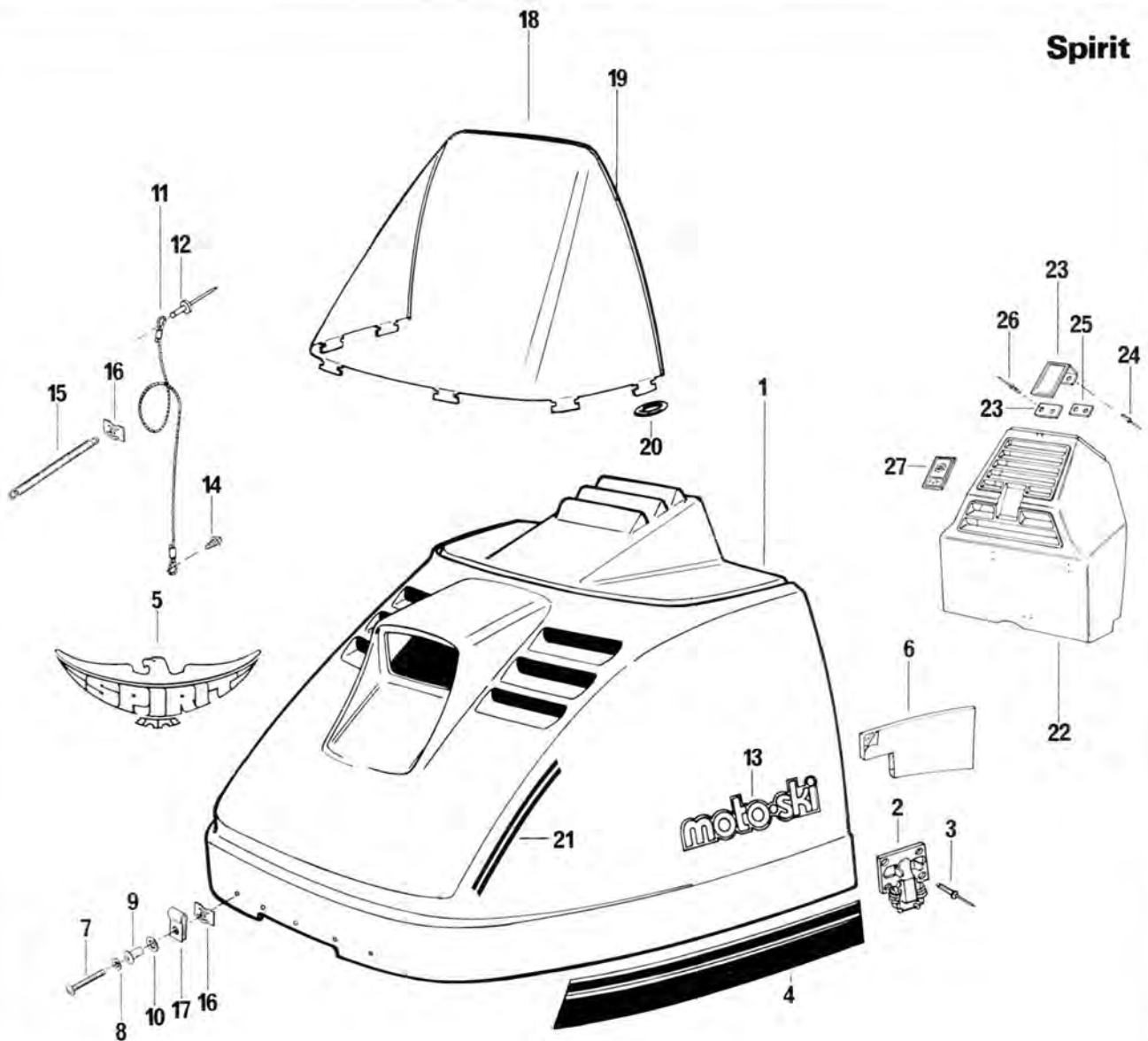
1	1
2	2
8	8
AR	AR
2	2
1	1
1	1
1	1
AR	AR
5	5
5	5
5	5
5	5
1	1
1	1
1	1

17. Speed Nut
18. Clip
19. Windshield
20. Windshield Trim
21. Windshield Anchor Strip
22. Anchor Tab
23. Aphonics Foam (As required)
24. Console
25. Louvre
26. Push Nut
27. Latch
28. Rivet
29. Plate
30. Rivet
31. Bombardier Crest

3	4
2	2
1	1
AR	AR
1	1
7	7
AR	AR
1	1
	1
	2
	12
1	1
2	2
1	1
2	2
1	1

AR: as required

Spirit



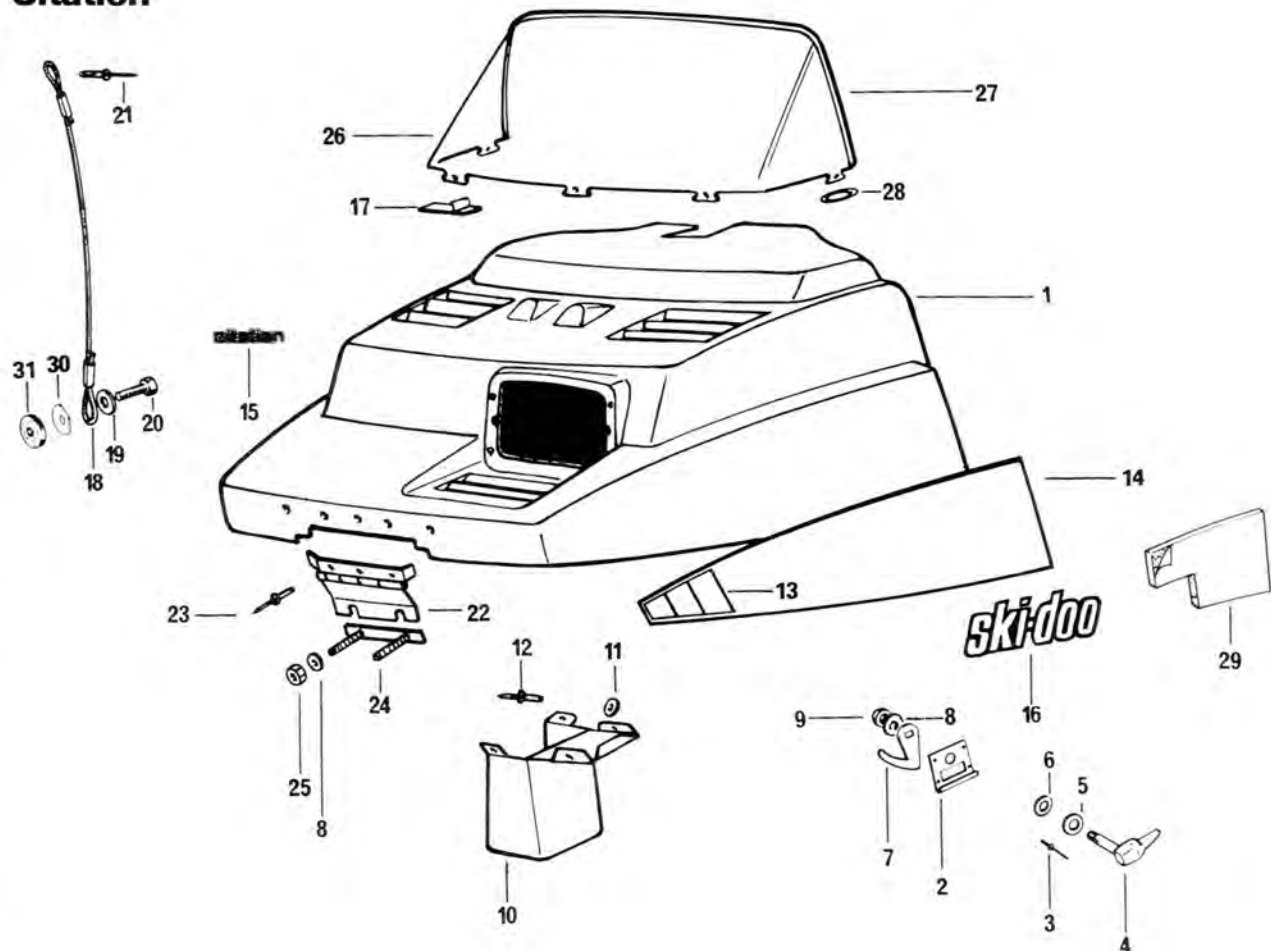
1. Cab
2. Cabin Latch (2)
3. Rivet (8)
4. Stripe 83" (2108 mm) (AB)
5. Identification Label (Spirit)
6. Aphonic Foam (AR)
7. Machine Screw (5)
8. Washer (5)
9. Well nut (5)
10. Washer (5)
11. Retainer Cable
12. Rivet
13. Moto-Ski Label (2)
14. Hexagonal Washer Head, Metal Screw

15. Spring
16. Speed Nut (3)
17. Clip (2)
18. Windshield
19. Windshield Trim (AR)
20. O'Ring (6)
21. Stripe 135" (3429 mm)
22. Console
23. Latch
24. Rivet (2)
25. Plate
26. Rivet (2)
27. Bombardier Crest

AR: as required

SECTION 06
SUB-SECTION 01 (CAB)

Citation

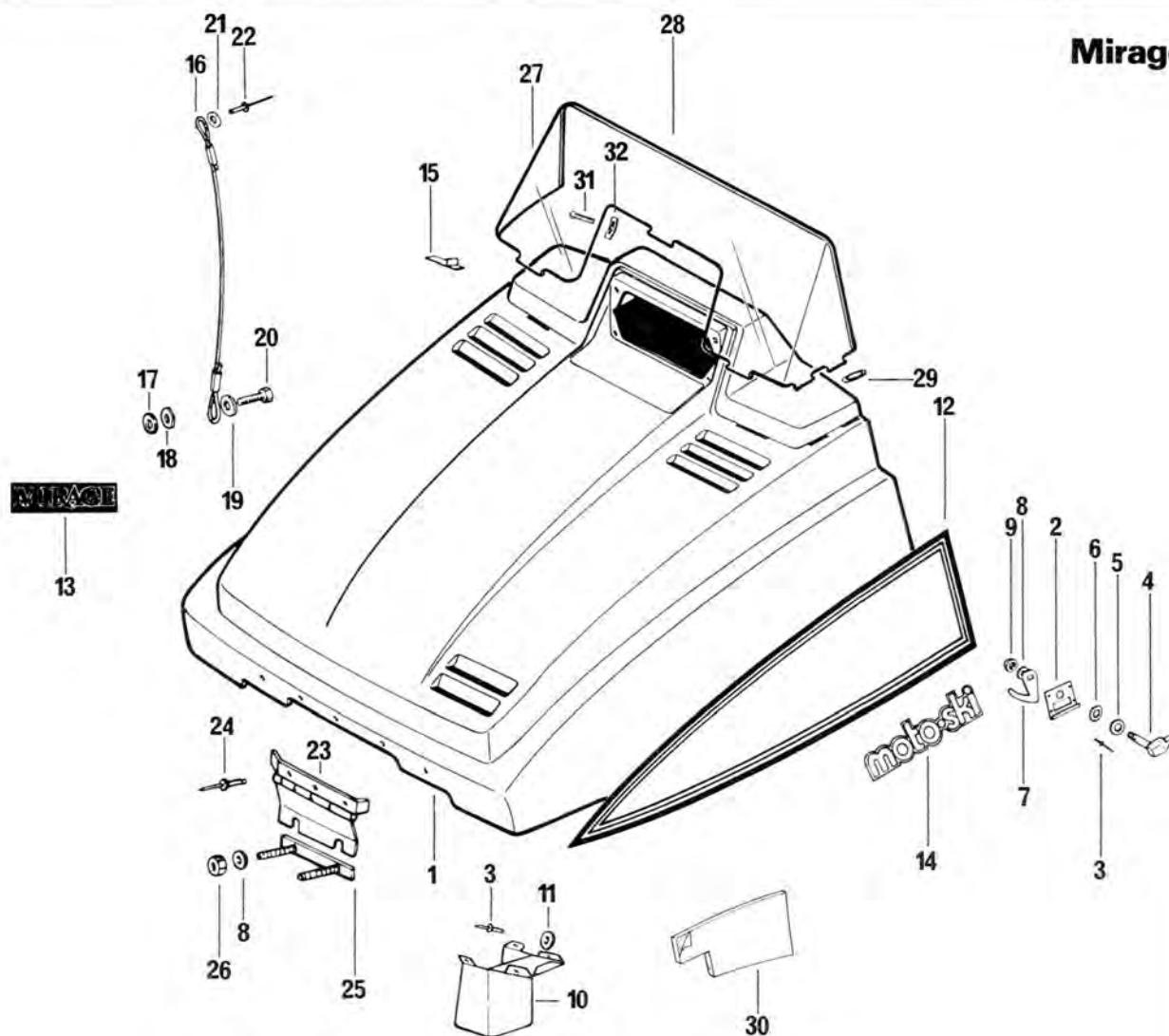


1. Cab
2. Cabin Latch Bracket (2)
3. Rivet (8)
4. Hand lever (2)
5. Washer (2)
6. Spring Washer (2)
7. Hook (2)
8. Washer (4)
9. Nut (2)
10. Air Intake Duct
11. Washer (4)
12. Rivet (4)
13. Side Decal Set
14. Stripe 206" (5233 mm) (AR)
15. Identification Label
16. Ski-Doo Label (2)

17. Felt Strip 5.5" (140 mm) (AR)
18. Retainer Cable
19. Washer (2)
20. Screw
21. Rivet
22. Hinge
23. Rivet (5)
24. Retainer Plate
25. Nut (2)
26. Windshield
27. Windshield Trim (AR)
28. O'Ring (7)
29. Acoustic Foam (AR)
30. Washer
31. Rubber Washer

AR: as required

Mirage



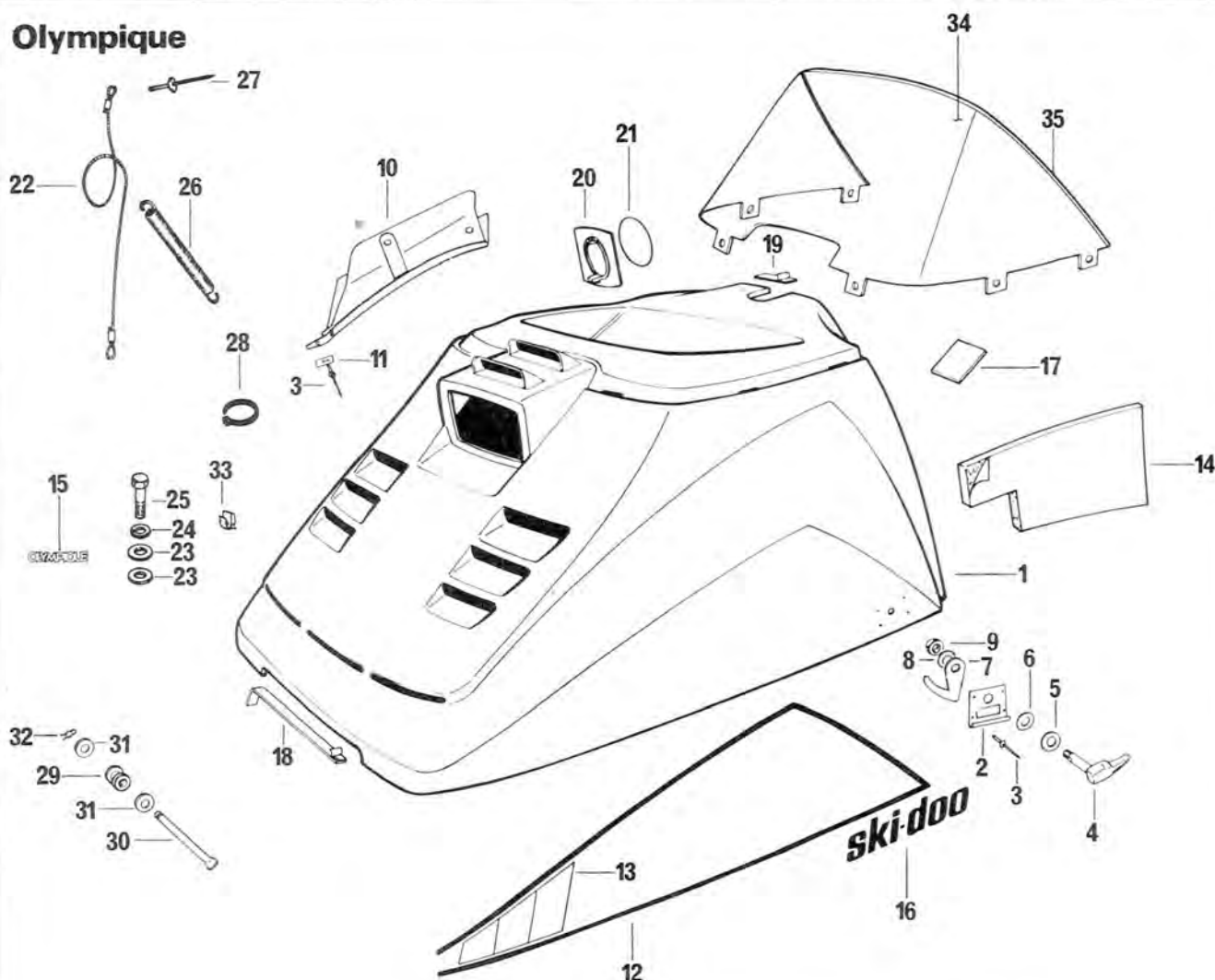
1. Cab
2. Cabin Latch Bracket (2)
3. Rivet (12)
4. Hand lever (2)
5. Washer (2)
6. Spring Washer (2)
7. Hook (2)
8. Washer (4)
9. Nut (2)
10. Air Intake Duct
11. Washer (4)
12. Stripe (AR)
13. Identification Label
14. Label (2)
15. Felt Strip 5.5" (140 mm) (AR)
16. Retainer Cable

17. Rubber Washer
18. Washer
19. Washer
20. Screw
21. Washer
22. Rivet
23. Hinge
24. Rivet (5)
25. Retainer Plate
26. Nut (2)
27. Windshield
28. Windshield Trim (AR)
29. O'Ring (6)
30. Acoustic Foam (AR)
31. Screw (2)
32. Speed Nut (2)

AR: as required

SECTION 06
SUB-SECTION 01 (CAB)

Olympique

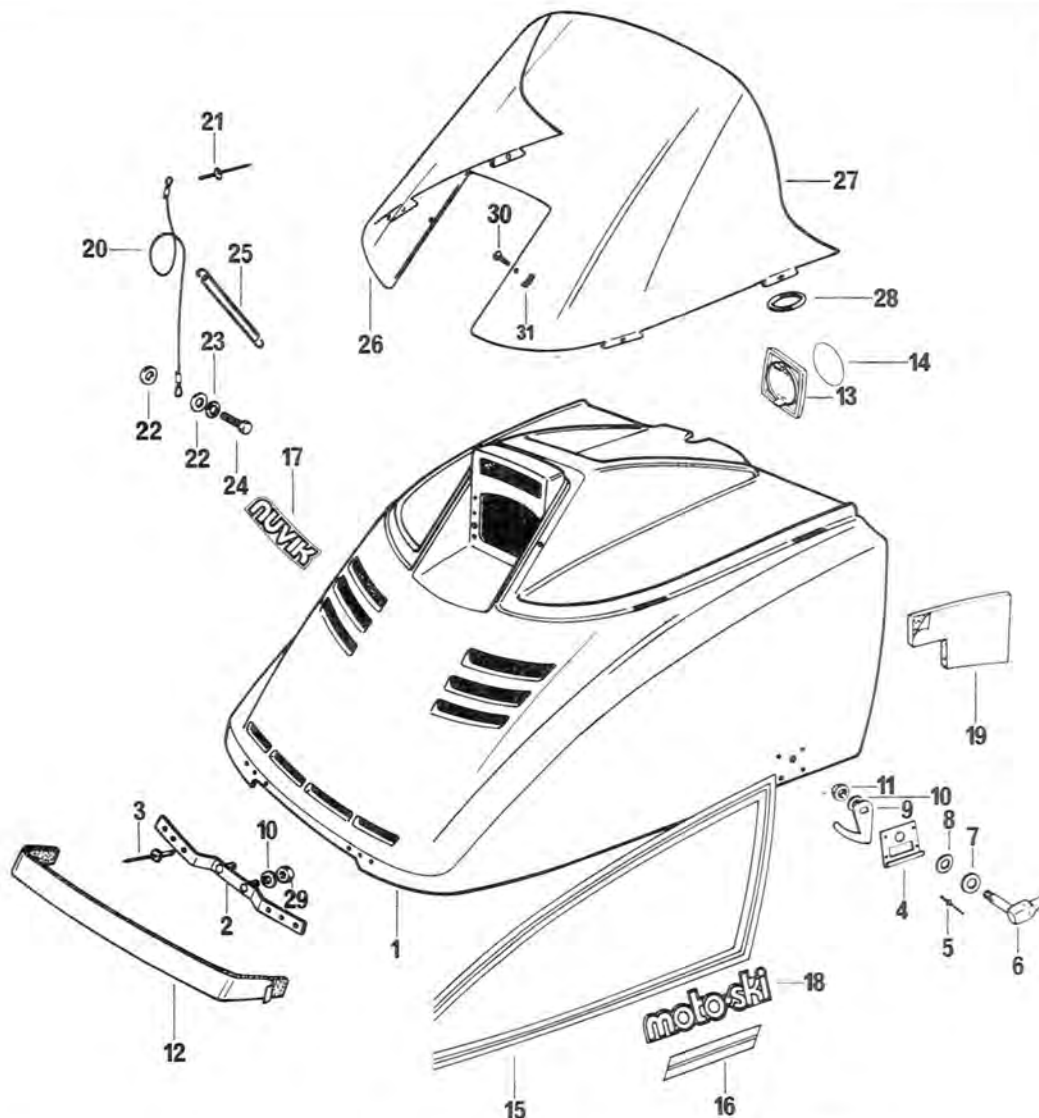


1. Cab
2. Cabin Latch Bracket (2)
3. Rivet (12)
4. Hand Lever (2)
5. Washer (2)
6. Spring Washer (2)
7. Hook (2)
8. Washer (2)
9. Nut (2)
10. Air Deflector
11. Square Washer (4)
12. Stripe 164'' (4166 mm) (AR)
13. Side Decal Set
14. Acoustic Foam (AR)
15. Identification Label
16. Ski-Doo Label (2)
17. Decal Patch
18. Foam Heat Shield

19. Felt Strip 5.5'' (140 mm) (AR)
20. Meter Plug (2)
21. Decal (Meter Plug) (2)
22. Retainer Cable
23. Washer (2)
24. Lock Washer
25. Screw
26. Spring
27. Rivet
28. Tie Rap (AR)
29. Grommet (4)
30. Hinge Pin (2)
31. Washer (4)
32. Retainer Clip (2)
33. Clip
34. Windshield
35. Windshield Trim (AR)

AR: as required

Nuvik



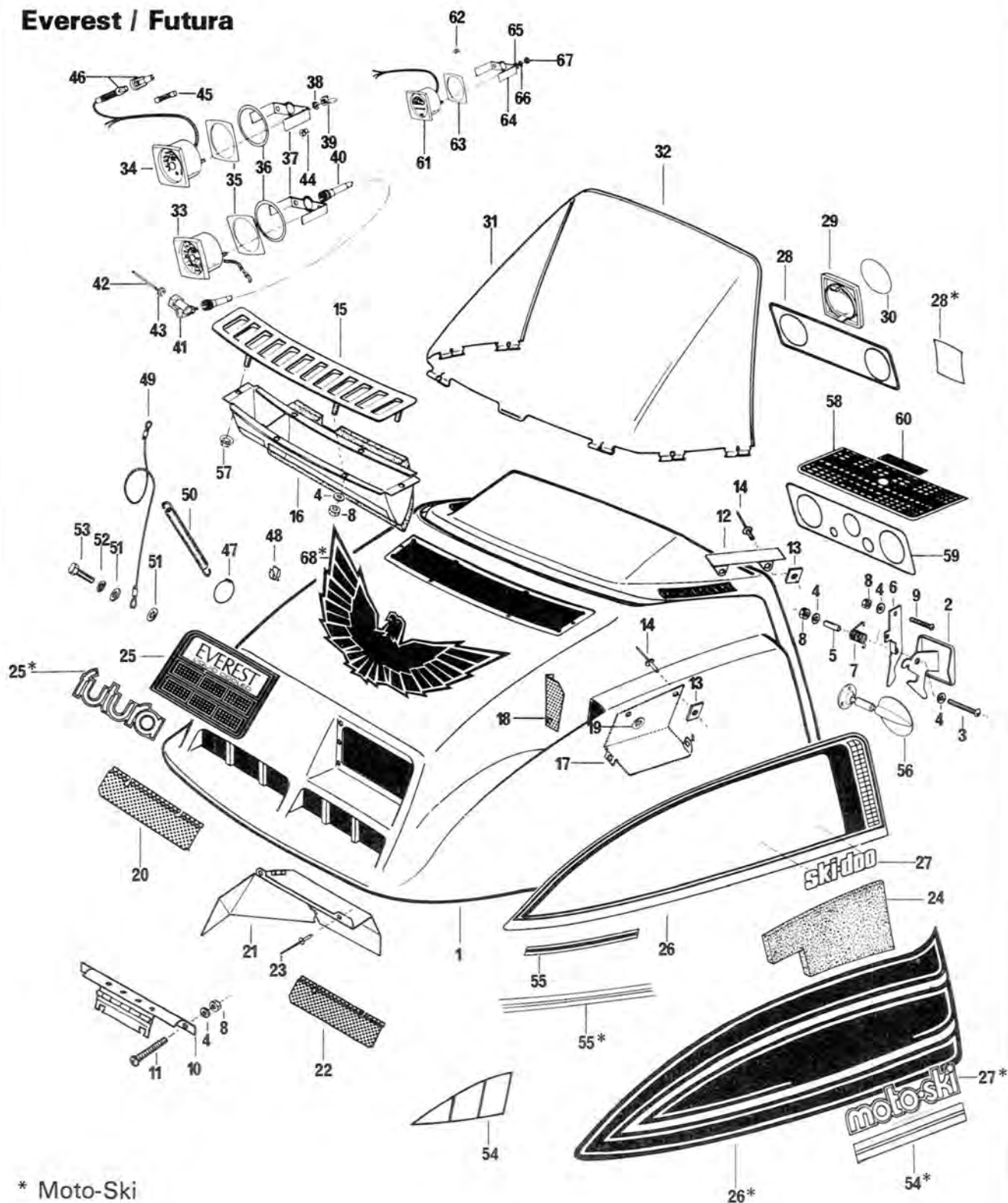
1. Cab
2. Reinforcement
3. Rivet (6)
4. Cabin Latch Bracket (2)
5. Rivet (8)
6. Hand Lever (2)
7. Washer (2)
8. Spring Washer (2)
9. Hook (2)
10. Washer (4)
11. Nut (2)
12. Acoustic Foam (Heat Shield)
13. Plug (Dash Board) (2)
14. Decal (Meter Plug) (2)
15. Stripe 160" (4064 mm) (AR)
16. Stripe (2)

17. Identification Label
18. Moto-Ski Label
19. Acoustic Foam (AR)
20. Retainer Cable
21. Rivet
22. Washer
23. Lockwasher
24. Screw
25. Spring
26. Windshield
27. Windshield Trim (AR)
28. O'Ring (4)
29. Nut (Cabin Hinge) (2)
30. Machine Screw (2)
31. Speed Nut (2)

AR: as required

SECTION 06
SUB-SECTION 01 (CAB)

Everest / Futura



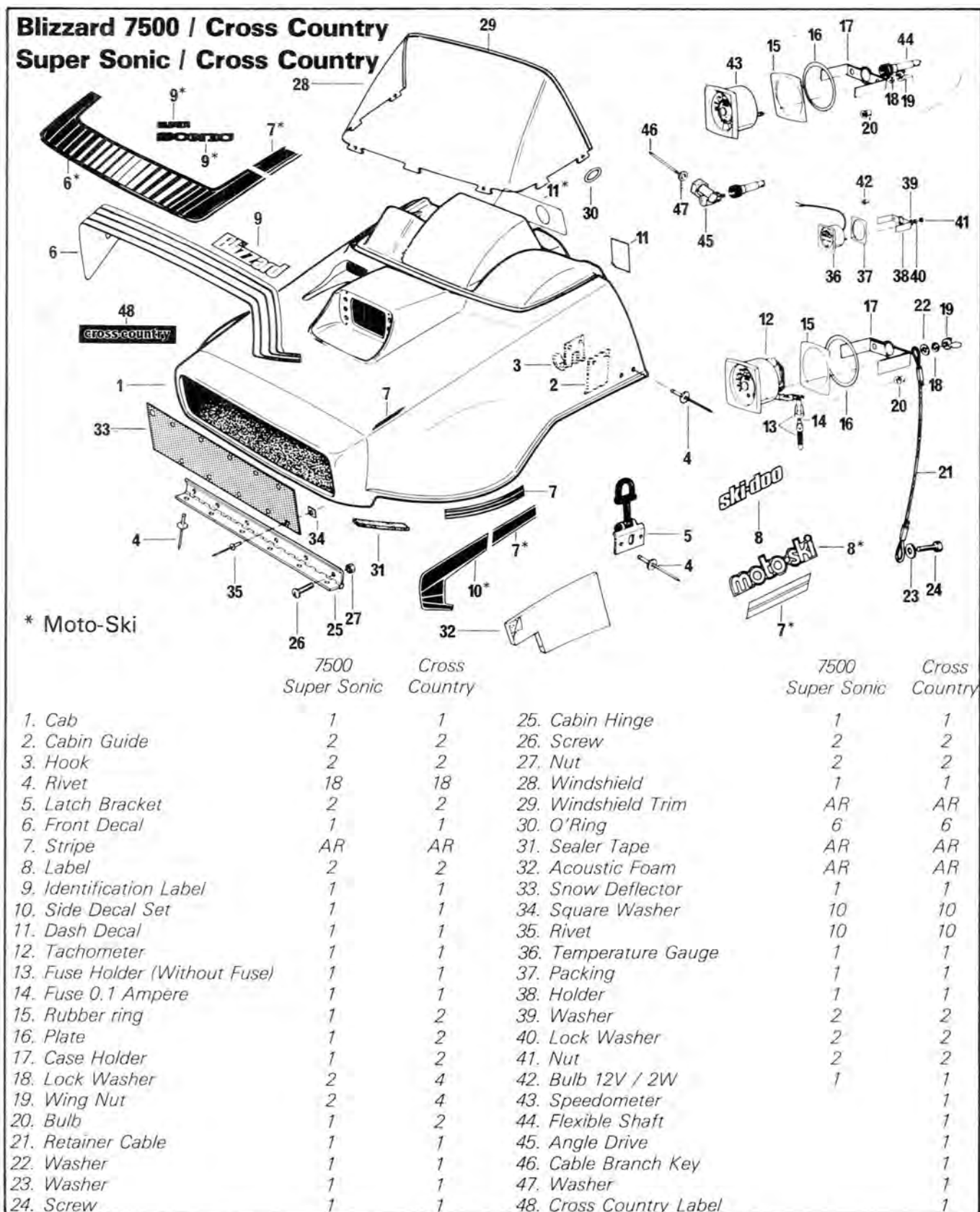
SECTION 06
SUB-SECTION 01 (CAB)

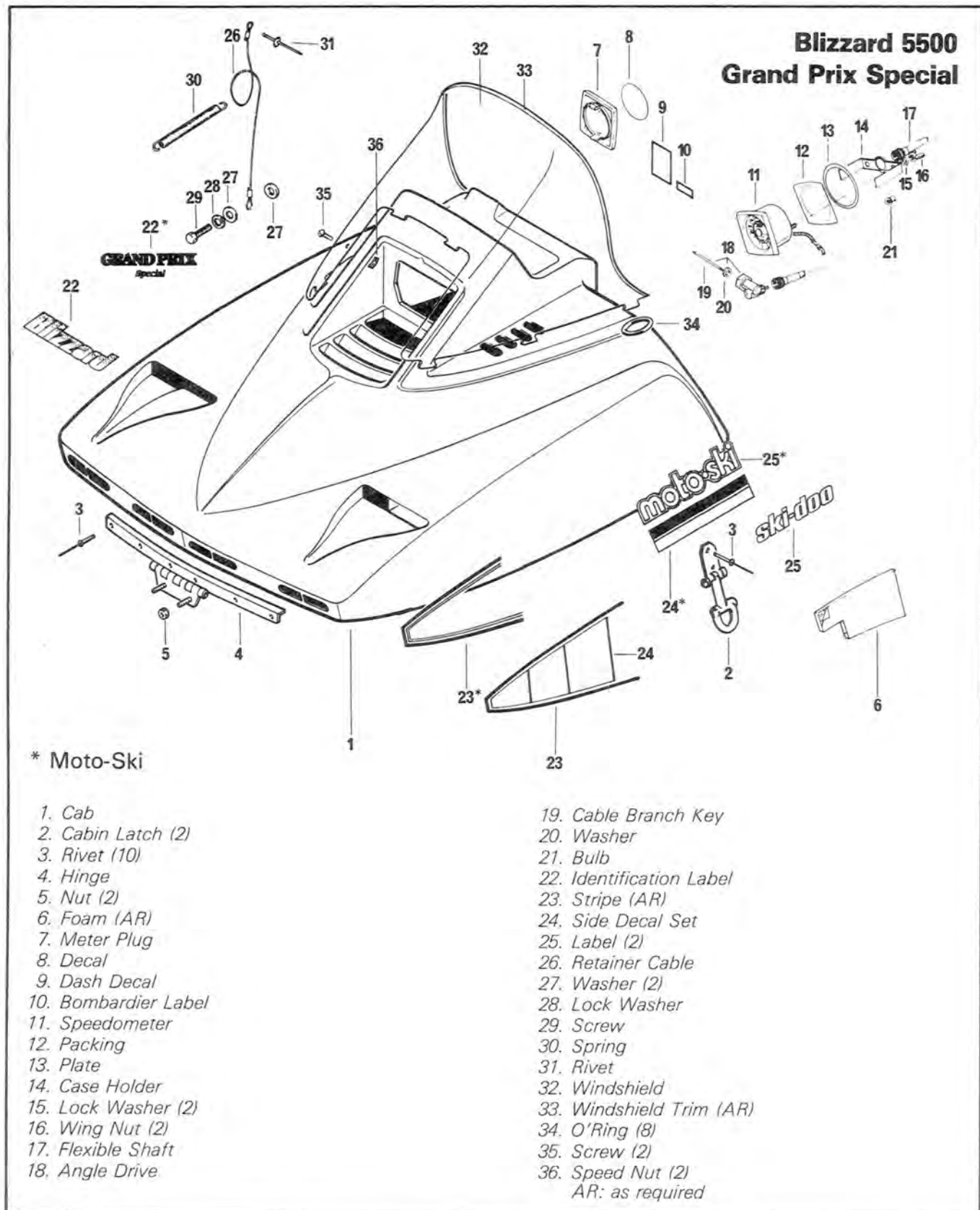
Everest / Futura

	340	400	440	444		340	400	440	444
1. Cab	1	1	1	1	34. Tachometer with Fuse				
2. Cabin Latch	2	2	2	2	0.1 Ampere			1	1
3. Machine Screw	2	2	2	2	35. Packing			2	2
4. Washer	16	16	16	10	36. Plate			2	2
5. Bushing	2	2	2	2	37. Case Holder			2	2
6. R.H. Stopper	1	1	1	1	38. Lock Washer			4	4
L.H. Stopper	1	1	1	1	39. Wing Nut			4	4
7. R.H. Spring	1	1	1	1	40. Flexible Shaft			1	1
L.H. Spring	1	1	1	1	41. Angle Drive			1	1
8. Nut	14	14	14	8	42. Cable Branch Key			1	1
9. Machine Screw	2	2	2	2	43. Washer			1	1
10. Hinge Assembly	1	1	1	1	44. Bulb			2	2
11. Machine Screw	4	4	4	4	45. Fuse 0.1 Ampere			1	1
12. Side Louvre			2		46. Fuse Holder Without				
Plate				2	Fuse			1	1
13. Square Washer	2	2	5	5	47. Tie Rap	AR	AR	AR	AR
14. Rivet	8	8	14	14	48. Clip	4	4	7	7
15. Grill	1	1	1	1	49. Retainer Cable	1	1	1	1
16. Duct Assembly	1	1	1		50. Spring	1	1	1	1
17. R.H. Side Duct	1	1	1	1	51. Washer	1	1	2	2
L.H. Side Duct	1	1	1	1	52. Lock Washer	1	1		1
18. Intake Grill R.H.	1	1	1	1	53. Screw	1	1	1	1
Intake Grill L.H.	1	1	1	1	54. Side Decal	1	1	1	
19. Washer	2	2	2	2	55. Stripe 150" (3810 mm)	AR	AR	AR	
20. R.H. Grill	1	1	1	1	56. Mirror				1
21. L.H. Front Baffle	1	1	1		57. Palnut				6
22. L.H. Grill	1	1	1	1	58. Upper Dash Decal				1
23. Rivet	2	2	2		59. Lower Dash Decal				1
24. Acoustic Foam	AR	AR	AR	AR	60. Label				1
25. Identification Label	1	1	1	1	61. Temperature gauge				1
26. Side Decal Set				1	62. Bulb				1
27. Label	2	2	2	2	63. Packing				1
28. Dash Panel Decal	1	1	1		64. Holder				1
29. Meter Plug	2	2			65. Washer				2
30. Decal	2	2			66. Lock Washer				2
31. Windshield	1	1	1	1	67. Nut				2
32. Windshield Trim	AR	AR	AR	AR	68. Decal "Eagle"			1	1
33. Speedometer			1	1					

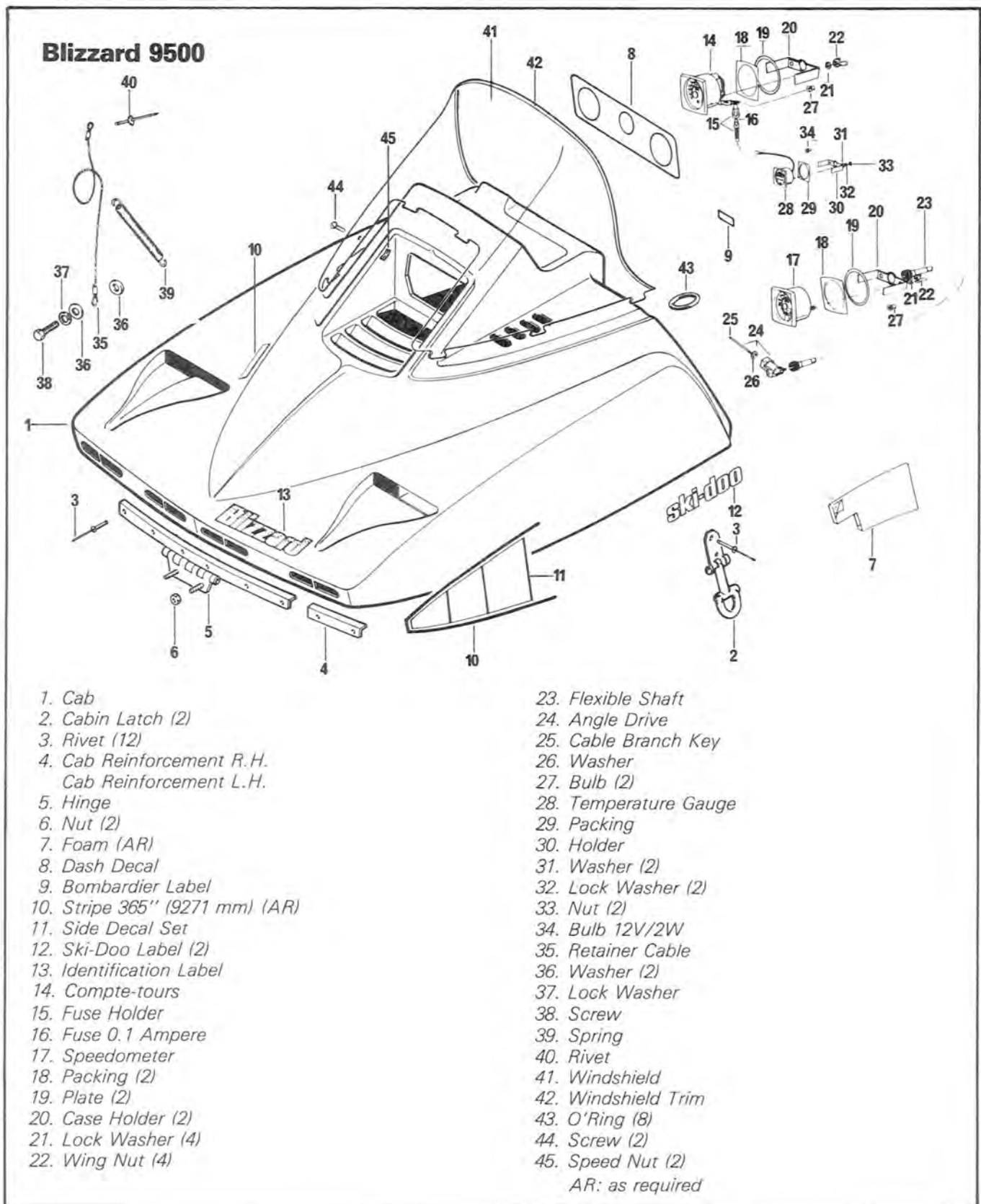
AR: as required

SECTION 06
SUB-SECTION 01 (CAB)

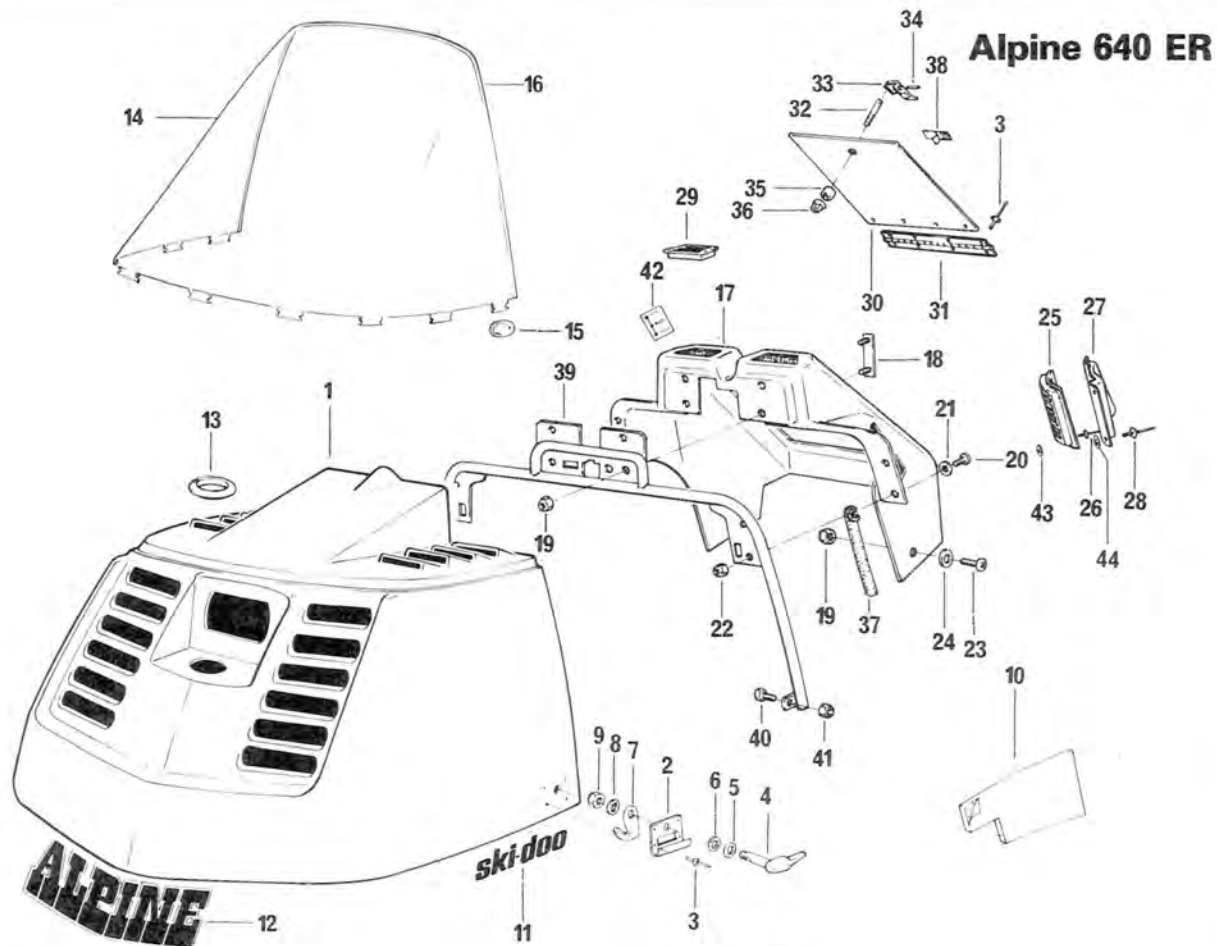




SECTION 06
SUB-SECTION 01 (CAB)



SECTION 06
SUB-SECTION 01 (CAB)



Alpine 640 ER

- | | |
|----------------------------|----------------------------------|
| 1. Cab | 24. Washer (2) |
| 2. Cabin Latch Bracket (2) | 25. Louvre |
| 3. Rivet (16) | 26. Rivet (5) |
| 4. Hand Lever (2) | 27. Air Deflector |
| 5. Washer (2) | 28. Rivet (5) |
| 6. Spring Washer (2) | 29. Louvre R.H. |
| 7. Hook (2) | Louvre L.H. |
| 8. Washer (2) | 30. Door |
| 9. Nut (2) | 31. Hinge |
| 10. Aphonc Foam (AR) | 32. Threaded Screw |
| 11. Ski-Doo Label (2) | 33. Latch |
| 12. Identification Label | 34. Pin |
| 13. Filler Pipe Grommet | 35. Rubber Spacer |
| 14. Windshield | 36. Plastic Nut |
| 15. O'Ring (11) | 37. Cab Trim (29" - 736 mm) (AR) |
| 16. Windshield Trim (AR) | 38. Bombardier Label |
| 17. Console | 39. Upper Column |
| 18. Stud Plate (2) | 40. Screw (2) |
| 19. Nut (6) | 41. Nut |
| 20. Machine Screw (4) | 42. Shifting Label |
| 21. Washer (4) | 43. Washer (5) |
| 22. Nut (4) | 44. Washer (3) |
| 23. Machine Screw (2) | |

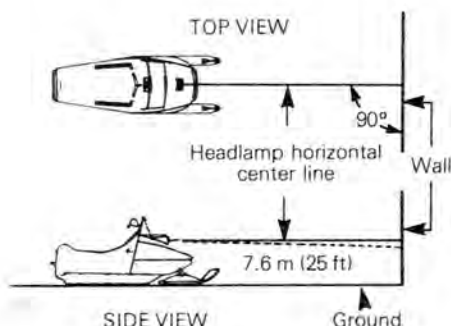
AR: as required

SECTION 06

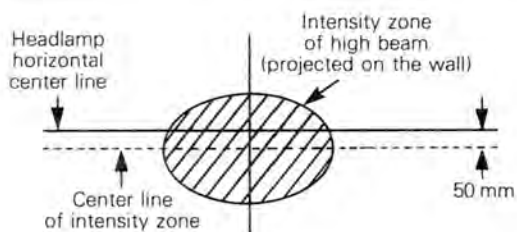
SUB-SECTION 01 (CAB)

HEADLAMP BEAM AIMING

Place the vehicle on a flat surface 7.6 m (25') from a wall or screen.



With the suspension correctly adjusted, the rider seated on the vehicle and the high beam ON (engine must be running on manual start models), check that the center of the high intensity zone of the high beam is 50 mm (2") below the horizontal line of the headlamp height.



To adjust, on vehicles so equipped, remove the headlamp chrome ring, turn the upper or lower adjusting screws to obtain the desired beam position.

BULB REPLACEMENT

If headlamp is burnt, tilt cab, unplug the connector from the headlamp. Remove the rubber boot and unfasten the bulb retainer clips. Detach the bulb and replace. If the taillight bulb is burnt, expose the bulb by removing red plastic lens. To remove, unscrew the two (2) Phillips head screws. Verify all lights after replacement.

CAB MAINTENANCE

Clean the vehicle thoroughly, removing all dirt and grease accumulation.

CAUTION: Plastic alloy components such as fuel tank, windshield, cab, etc., can be cleaned using mild detergents or isopropyl alcohol. Do not use strong soaps, degreasing solvents, abrasive cleaners, paint thinners, etc.

Inspect cab and repair damage. Repair kits are available at your authorized dealer.

NOTE: Apply wax on glossy finish of cab only. Protect the vehicle with a cover to prevent dust accumulation during storage.

CAUTION: If for some reason the snowmobile has to be stored outside it is necessary to cover it with an opaque tarpaulin. This caution will prevent the sun rays affecting the plastic components and the vehicle finish.

DECAL

To remove a decal, pull it off.

Clean the surface.

Apply liquid soap on the new decal. Position the decal and pass a sponge over it to remove air bubbles and water. Allow to air dry.

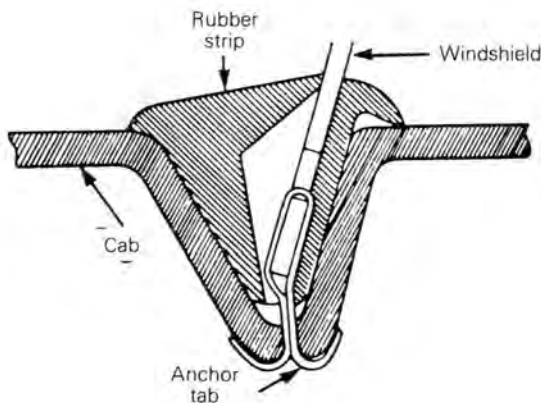
SHEET MOLDED COMPOUND

To repair cabs made of sheet molded compound, use appropriate resin compound.

WINDSHIELD INSTALLATION

Elan

- Peel off protective film from the new windshield and install windshield trim. Insert anchor tabs into holes of windshield. Install tabs in every retaining holes at the exception of the front center hole.
- Bend each tab in the middle until ends meet. Lubricate rubber strip with liquid soap. Install strip into cab channel. Position windshield in cab channel then from within the cab, pull and fully open anchor tabs. Work from center, outward.



Olympique, Everest, Futura

- Peel off protective film from the new windshield.
- Position windshield on cab then push down until tabs are locked in their holes.
- Install windshield trim on outer edge.

Elite

- Rebore the windshield retaining holes to 17/64".
- Align the windshield in position (in order to have the windshield deflector pleat on each side in line with the body side).
- Mark the body, and drill 17/64" holes. Secure the windshield in place.
- Install windshield trim on outer edge.
- Install the hood stopper in place by drilling a 1/8" hole in the center of the windshield at exactly 23 mm (9") from bottom edge of windshield and push the hood stopper in place.

Citation, Spirit, Blizzard 7500/Cross Country, Super Sonic/Cross Country

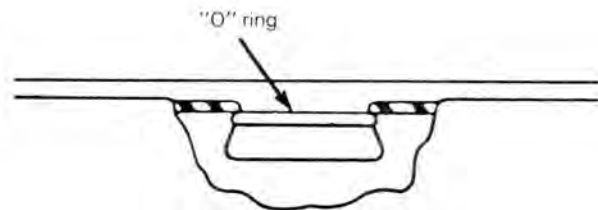
- Peel off protective film from the new windshield and install windshield trim.
- Position windshield on cab then push tabs in their slots. Lock in place using the "O" rings supplied in kit.

Nuvik, Blizzard 5500, Grand Prix Special, Blizzard 9500, Mirage

- Peel off protective film from the new windshield.
- Position windshield on cab then push until tabs are fully inserted into cab slots. Lock windshield tabs in position using the "O" rings supplied in kit.
- Using the windshield holes as a guide, drill 7/32" dia. holes through cab. Install the two (2) retaining bolts and the two (2) push nuts.
- Install windshield trim on outer edge.

Alpine

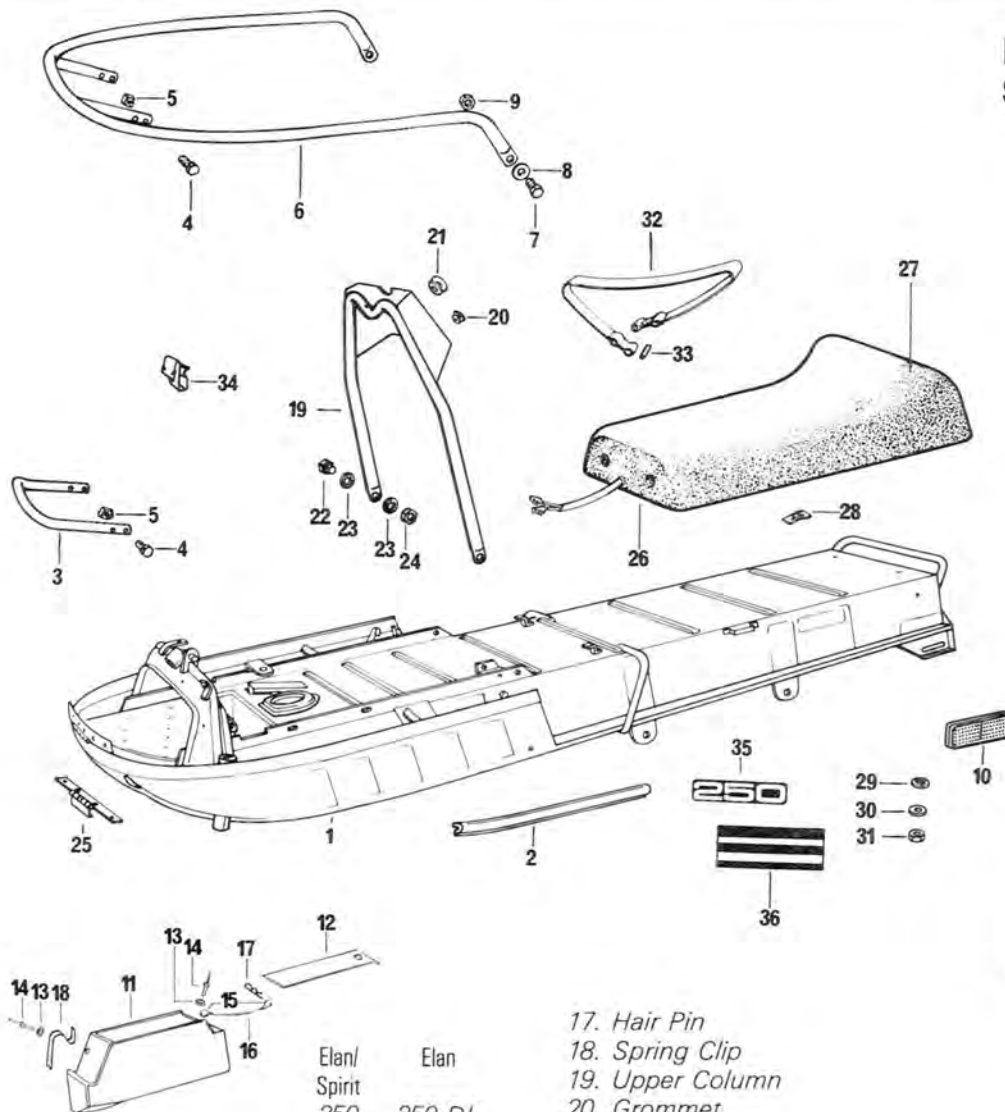
- Peel off protective film from the new windshield.
- Position windshield on cab then push until tabs are fully inserted into cab slots. Lock windshield tabs in position using the eleven (11) "O" rings supplied in kit (install two (2) "O" rings on outer tabs.)





SECTION 06
SUB-SECTION 02 (FRAME)

**Elan
Spirit**

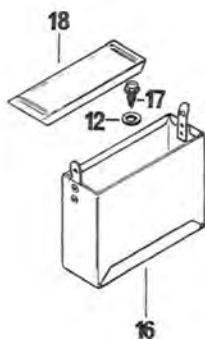
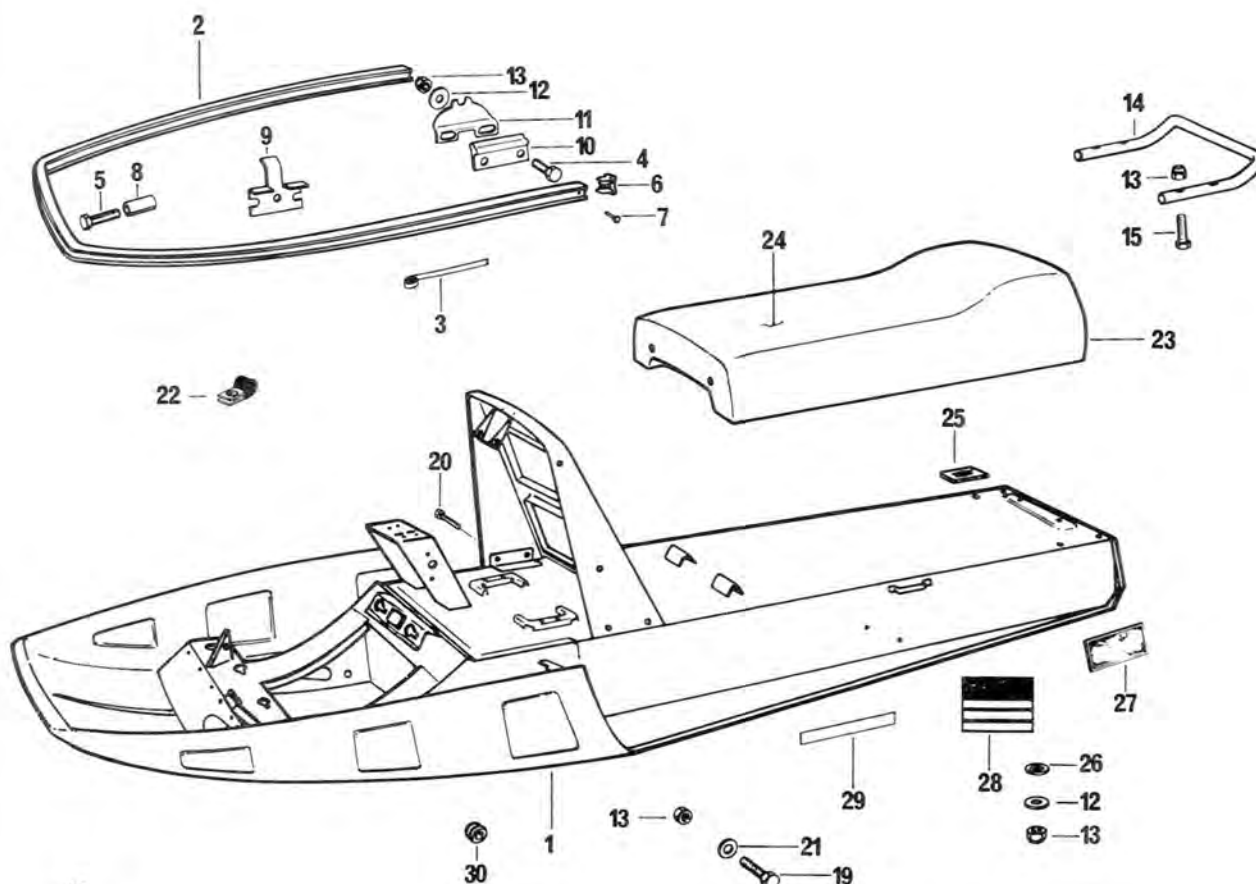


	Elan/ Spirit 250	Elan 250 DL		Elan/ Spirit 250	Elan 250 DL
1. Frame	1	1	17. Hair Pin	1	1
2. Body Moulding	1	1	18. Spring Clip	1	1
3. Front Handle	1	1	19. Upper Column	1	1
4. Screw	4	4	20. Grommet	2	2
5. Clip Nut	4	4	21. Grommet	1	1
6. Front Bumper		1	22. Screw	2	2
7. Screw		2	23. Internal Tooth Lockwasher		2
8. Washer		2	24. Nut	2	2
9. Nut		2	25. Hinge Assembly	1	1
10. Reflector	2	2	26. Seat	1	1
11. Tool Box Assembly (Include Items 11 to 17)	1	1	27. Leatherette	1	1
12. Cover	1	1	28. Speed Nut	2	2
13. Washer	2	2	29. Internal Tooth Lockwasher	1	1
14. Rivet	2	2	30. Washer	2	2
15. Open Barrel	2	2	31. Nut	2	2
16. Wire 4" (102 mm)	AR	AR	32. Seat Belt	1	1
			33. Pin	2	2
			34. Clip (To Hold Harness on Frame)	6	4
			35. Decal (250)	2	2
			36. Decal (De Luxe)		2

AR: as required

SECTION 06
SUB-SECTION 02 (FRAME)

**Mirage
Citation**



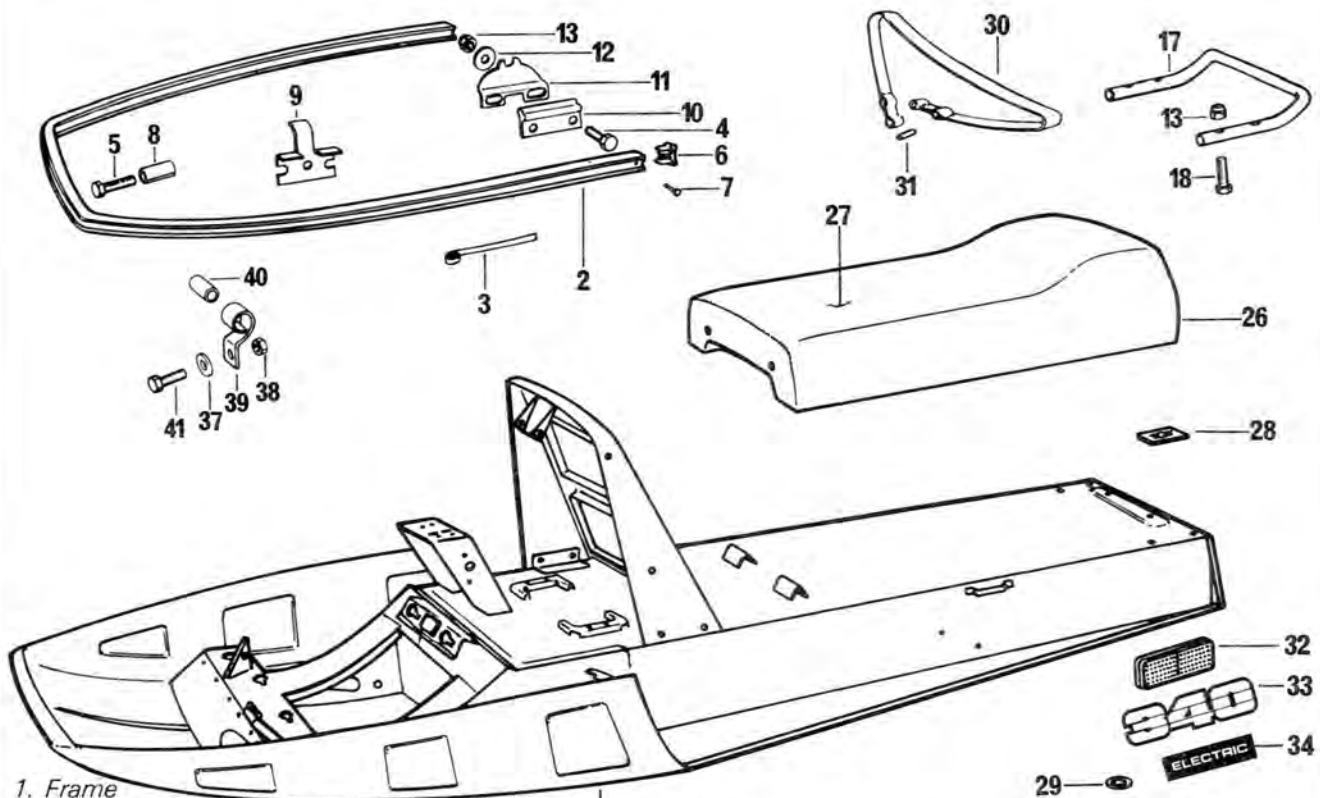
1. Frame
2. Bumper
3. Stripe 91" (2311 mm) (AR)
4. Screw (8)
5. Screw (2)
6. End cap (2)
7. Drive Screw (2)
8. Bushing (2)
9. Cabin Guide (4)
10. Cushion (2)
11. Latch Bracket (2)
12. Washer (10)
13. Nut (20)
14. Rear Bumper
15. Screw (4)
16. Tool Box

17. Hexagonal Washer Head Taping Screw (3)
18. Tool Box Cover
19. Screw (3)
20. Screw
21. Washer (4)
22. Clip (4)
23. Seat
24. Leatherette
25. Speed Nut
26. Internal Tooth Lockwasher
27. Reflector (2)
28. Decal 300 (2)
29. Stripe 81" (2058 mm) (Citation Only) (AR)
30. Grommet (Brake Cable)

AR: as required

SECTION 06
SUB-SECTION 02 (FRAME)

**Olympique
Nuvik**

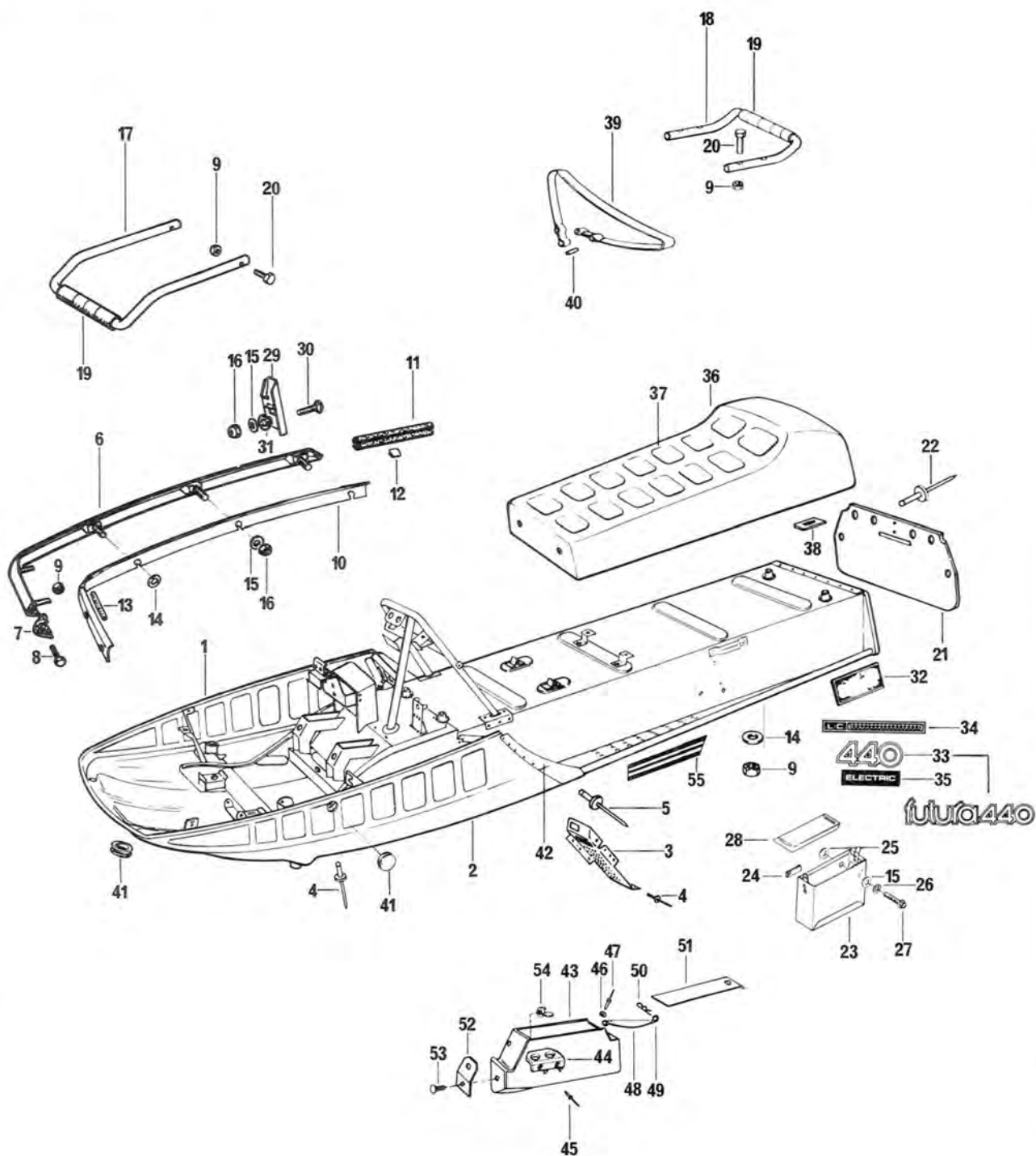


- | | |
|--|------------------------------------|
| 1. Frame | 27. Leatherette |
| 2. Bumper | 28. Speed Nut (2) |
| 3. Stripe 91" (2311 mm) (AR) | 29. Internal Tooth Lockwasher |
| 4. Screw (8) | 30. Seat Belt |
| 5. Screw (2) | 31. Pin (2) |
| 6. End Cap (2) | 32. Reflector (2) |
| 7. Drive Screw (2) | 33. Decal 340 2) |
| 8. Bushing (2) | 34. Label (2) |
| 9. Cabin Guide (4) | 35. Grommet (Brake Cable) |
| 10. Cushion (2) | 36. Noise Shield R.H. |
| 11. Latch Bracket (2) | 37. Washer (Olympique Only) (15) |
| 12. Washer (15) | 38. Nut (Olympique Only) (26) |
| 13. Nut (26) | 39. Cab Hinge (Olympique Only) (2) |
| 14. Cabin Hinge | 40. Bushing (Olympique Only) (2) |
| 15. Cotter Pin | 41. Screw (Olympique Only) (10) |
| 16. Screw (10) | |
| 17. Rear Bumper | |
| 18. Screw (4) | |
| 19.20.21. Tool Box | |
| 22. Hexagonal Washer Head Taping Screw (3) | |
| 23. Tool Box Cover | |
| 24. Washer (8) | |
| 25. Clip (2) | |
| 26. Seat | |

AR: as required

SECTION 06
SUB-SECTION 02 (FRAME)

Everest / Futura

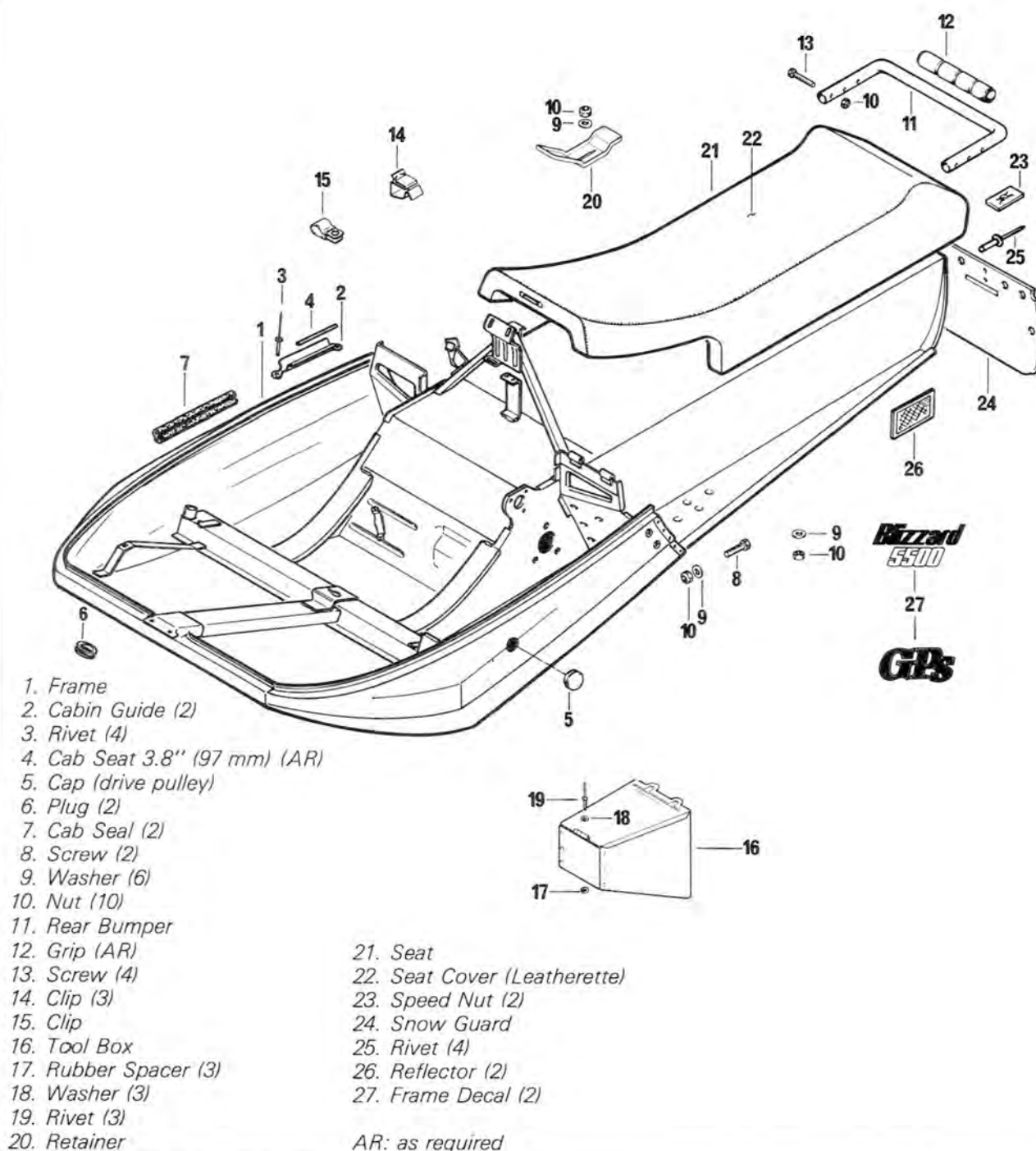


SECTION 06
SUB-SECTION 02 (FRAME)

	340	400	440	444		340	400	440	444
1.2.3. Frame	1	1	1		49. Open Barrel				2
Frame (With Radiators)				1	50. Hair Pin				1
2. Bottom Plate	1	1	1	1	51. Cover				1
3. Footrest R.H.	1	1	1	1	52. Heat Shield				1
Footrest L.H.	1	1	1	1	53. Carriage Bolt				2
4. Steel Pop Rivet	55	55	55	55	54. Wing Nut				2
5. Steel Pop Rivet	8	8	8	8	55. Stripe 72" (1828 mm)	AR	AR	AR	1
6. Bumper R.H.	1	1	1	1	AR: as required				
Bumper L.H.	1	1	1	1					
7. Rubber Bumper	1	1	1	1					
8. Screw	1	1	1	1					
9. Nut	9	9	9	9					
10. Cab Protector R.H.	1	1	1	1					
Cab Protector L.H.	1	1	1	1					
11. Cab Sealer	2	2	2	2					
12. Clip (Cab Sealer)	12	12	12	12					
13. Trim 4" (102 mm) R.H.	AR	AR	AR	AR					
14. Washer	6	6	6	6					
15. Washer	12	12	12	10					
16. Nut	14	14	14	14					
17.19. Front Handle	1	1	1	1					
18.19. Rear Bumper	1	1	1	1					
19. Grip	2	2	2	2					
20. Screw	6	6	6	6					
21. Snow Guard	1	1	1	1					
22. Pop Rivet	4	4	4	4					
23. Tool Box	1	1	1						
24. Felt Strip 1.5" (38 mm)	AR	AR	AR						
25. Cup	2	2	2						
26. Lockwasher	2	2	2						
27. Screw	2	2	2						
28. Cover	1	1	1						
29. Latch Bracket R.H.	1	1	1	1					
Latch Bracket L.H.	1	1	1	1					
30. Carriage Bolt	4	4	4	4					
31. External Tooth									
Lockwasher	4	4	4	4					
32. Reflector	2	2	2	2					
33. Decal	2	2	2	2					
34. Decal				2					
35. Label	2	2	2						
36. Seat	1	1	1	1					
37. Leatherette	1	1	1	1					
38. Speed Nut	2	2	2	2					
39. Seat Belt	1	1	1	1					
40. Pin	2	2	2	2					
41. Cap	1	1	1	3					
42. Protector R.H.	1	1	1	1					
Protector L.H.	1	1	1	1					
43. Tool Box				1					
44. Bracket (Spark Plug)				1					
45. Rivet				2					
46. Washer				2					
47. Rivet				2					
48. Wire 4" (102 mm)				AR					

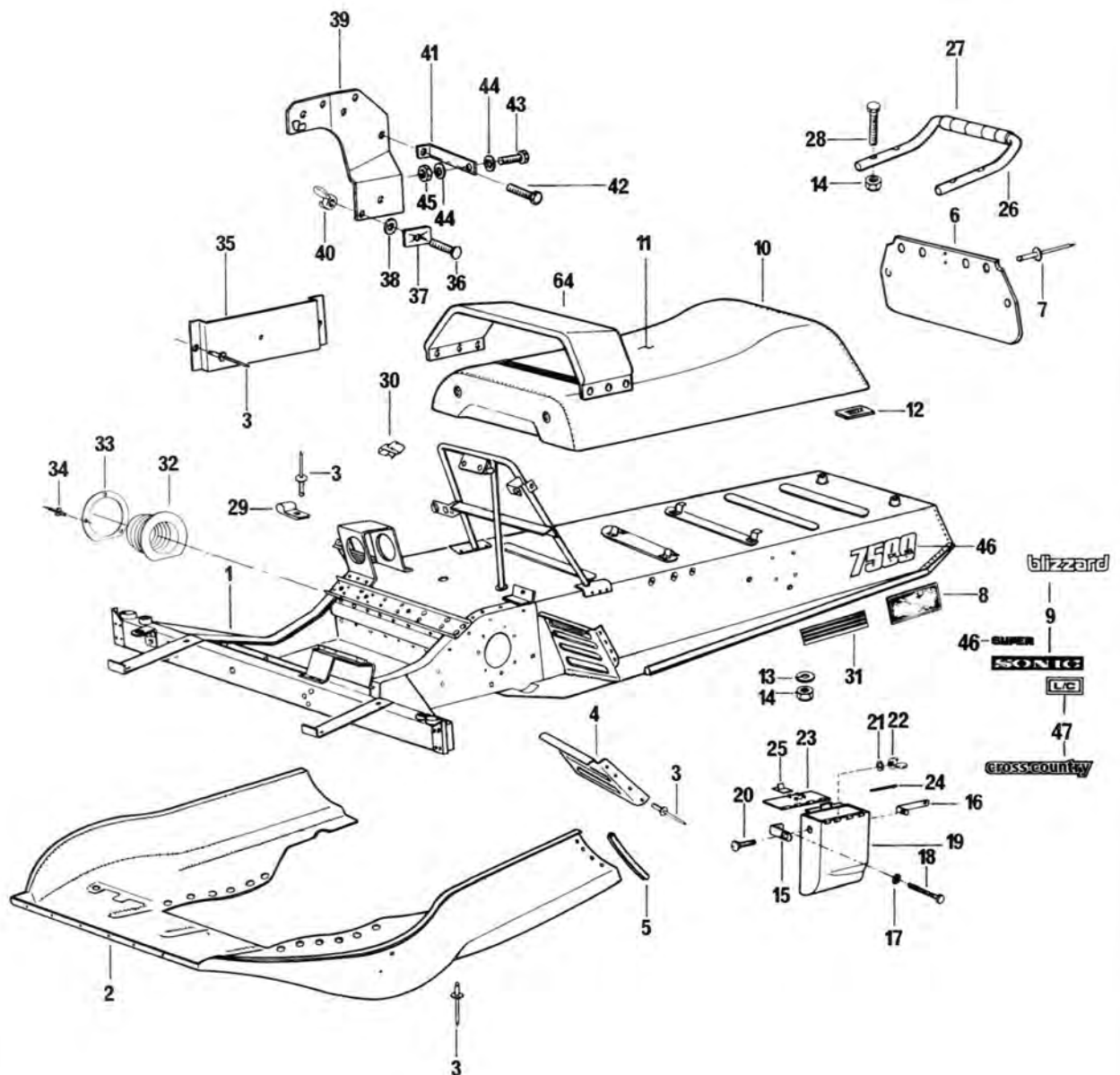
SECTION 06
SUB-SECTION 02 (FRAME)

Blizzard 5500
Grand Prix Spécial



SECTION 06
SUB-SECTION 02 (FRAME)

**Blizzard 7500 / Cross Country
Super Sonic / Cross Country**



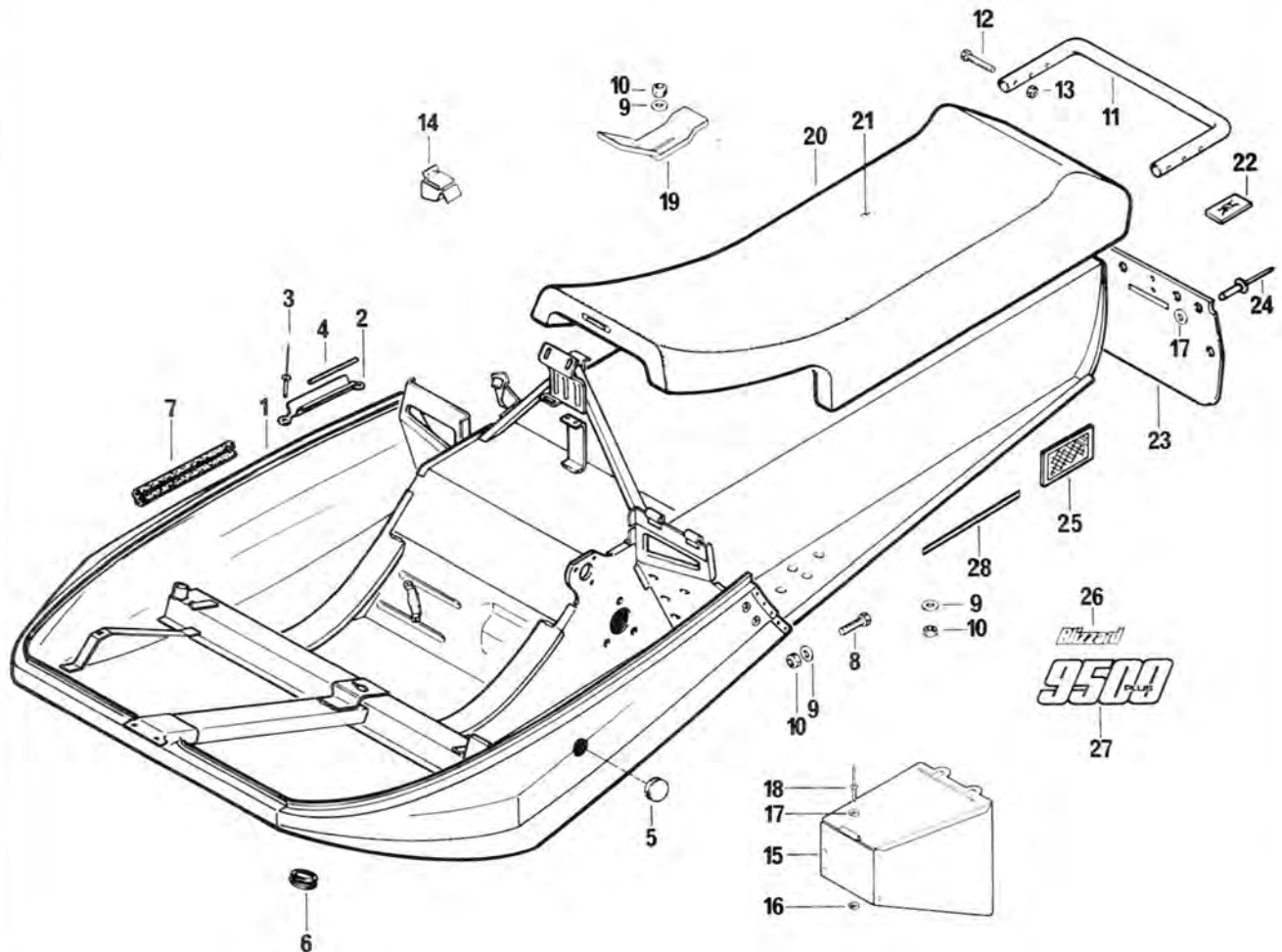
SECTION 06
SUB-SECTION 02 (FRAME)

	<i>Blizzard 7500 Super Sonic</i>	<i>Cross Country</i>
1. Frame (With Radiators)	1	1
2. Bottom Plate	1	1
3. Rivet	44	44
4. R.H. Footrest	1	
L.H. Footrest	1	1
5. Trim 22" (559 mm)	AR	AR
6. Snow Guard	1	1
7. Rivet	4	4
8. Reflector	2	2
9. Frame Decal	2	2
10. Seat	1	1
11. Leatherette	1	1
12. Speed Nut	2	2
13. Washer	2	2
14. Nut	6	6
15. Tool Box Bracket	1	1
16. Tool Box Bracket	1	1
17. Internal Tooth Lockwasher	2	2
18. Screw	2	2
19. Tool Box	1	1
20. Carriage Bolt	2	2
21. Washer	2	2
22. Wing Nut	2	2
23. Cover	1	1
24. Hinge Pin	2	2
25. Lock	1	1
26.27. Rear Bumper	1	1
27. Grip	1	1
28. Screw	4	4
29. Clip	3	3
30. Clip	2	2
31. Stripe 96" (2439 mm)	AR	AR
32. Exhaust Grommet	1	1
33. Exhaust Ring	1	1
34. Rivet	3	3
35. Heat Insulator	1	1
36. Carriage Bolt	2	2
37. Speed Nut	3	3
38. Rubber Spacer	3	3
39. Heat Shield	1	1
40. Wing Nut	3	3
41. "L" Bracket	1	1
42. Screw	1	1
43. Screw	1	1
44. Washer	2	1
45. Nut	1	1
46. Frame Decal	2	2
47. Frame Decal Cross Country		2
48. Protector Band		1

AR: as required

SECTION 06
SUB-SECTION 02 (FRAME)

Blizzard 9500



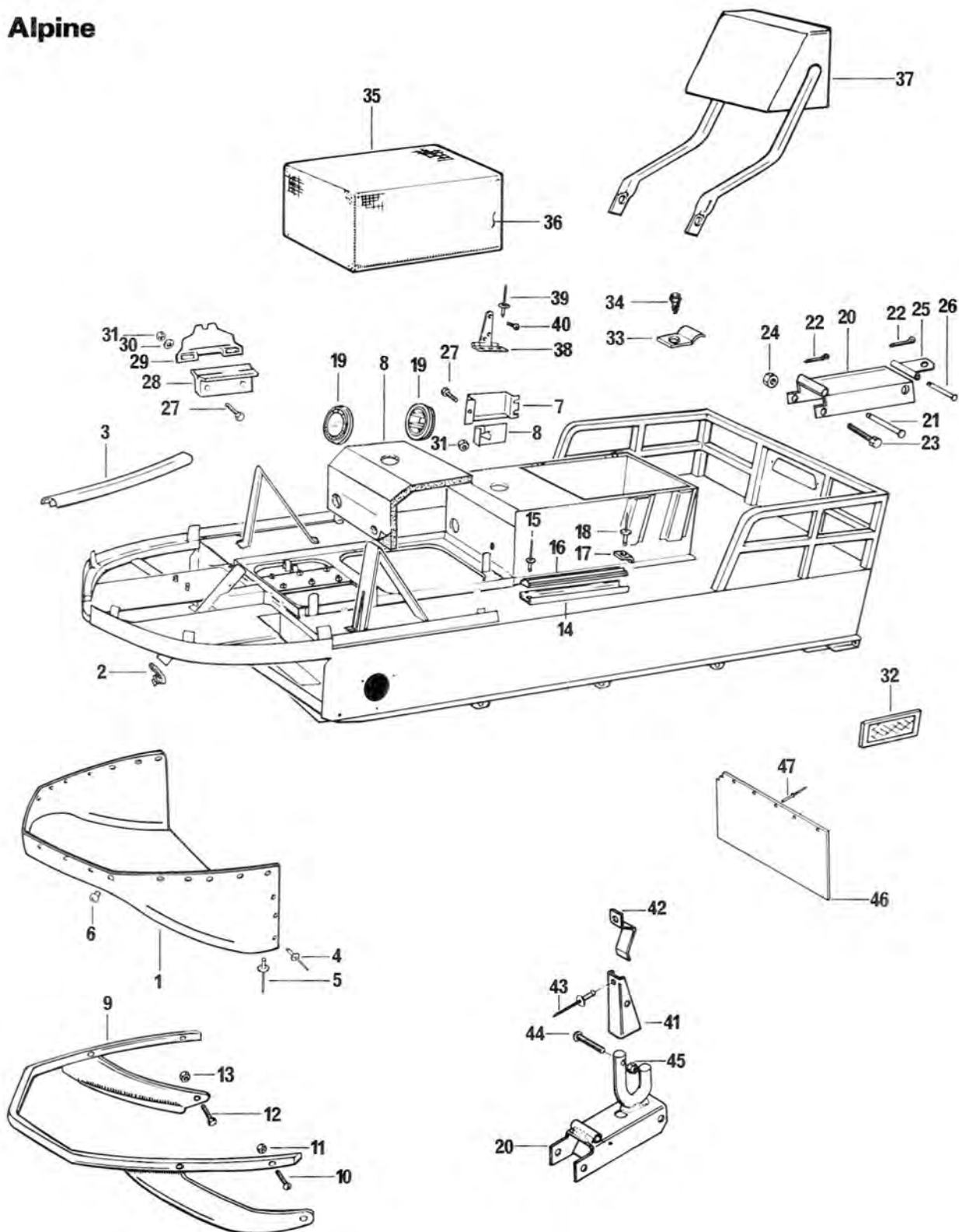
1. Frame
2. Cabin Guide (2)
3. Rivet (4)
4. Cab Seat 3.8 (97 mm) (AR)
5. Cap (Drive Pulley)
6. Plug (2)
7. Cab Seal (2)
8. Screw (2)
9. Washer (6)
10. Nut (6)
11. Rear Bumper
12. Screw (4)
13. Nut (4)
14. Clip (2)

15. Tool Box
16. Rubber Spacer (3)
17. Washer (7)
18. Rivet (3)
19. Retainer
20. Seat
21. Seat Cover (Leatherette)
22. Speed Nut (2)
23. Snow Guard
24. Rivet (4)
25. Reflector (2)
26. Frame Decal Blizzard (2)
27. Frame Decal 9500 Plus (2)
28. Stripe 89" (2260 mm) (AR)

AR: as required

SECTION 06
SUB-SECTION 02 (FRAME)

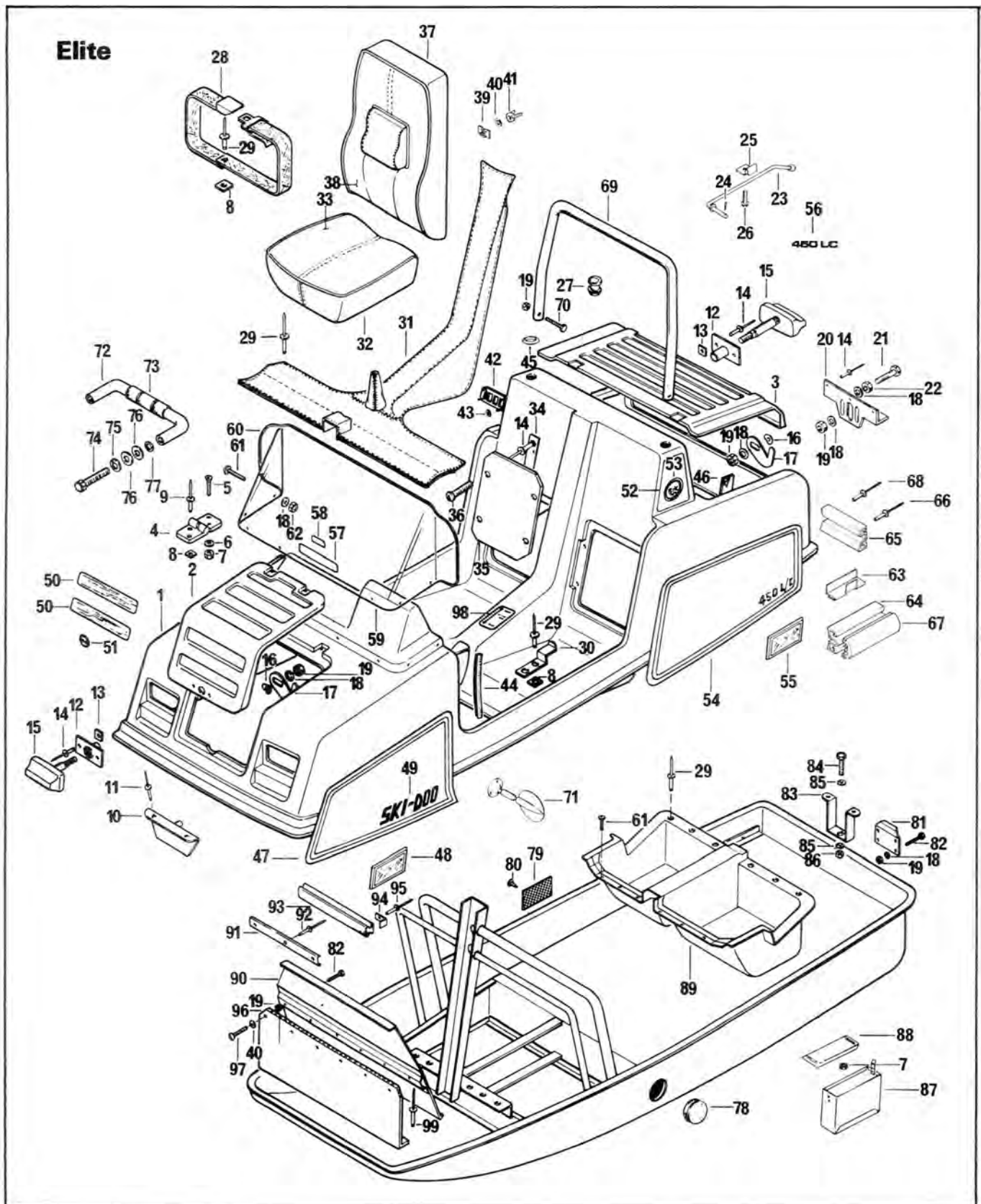
Alpine



1. Bottom Plate
2. Plastic Sealer 7" (178 mm) (AR)
3. Body Moulding
4. Rivet (4)
5. Rivet (10)
6. Tubular Rivet (14)
7. Deflector
8. Acoustic Foam (AR)
9. Front Bumper
10. Machine Screw (4)
11. Nut (4)
12. Screw (2)
13. Nut (2)
14. Side Guard (20 1/2" Long) (521 mm) (2)
Side Guard (27 3/16" Long) (691 mm) (4)
15. Rivet (16)
16. Rubber Rib 160" (4064 mm) (AR)
17. Foot Rib Stop (12)
18. Rivet (12)
19. Grille
Grille (Close)
20. Attach Bracket
21. Retainer Pin
22. Cotter Pin (2)
23. Screw
24. Nut
25. Hitch Plate
26. Pin
27. Machine Screw (5)
28. Cushion (2)
29. Latch Bracket (2)
30. Washer (4)
31. Nut (5)
32. Reflector (2)
33. Clip
34. Washer Head Screw
35. Seat
36. Leatherette
37. Padded Backrest
38. Hinge (2)
39. Rivet (6)
40. Machine Screw (6)

AR: as required

SECTION 06
SUB-SECTION 02 (FRAME)



SECTION 06
SUB-SECTION 02 (FRAME)

1. Upper Body
2. Trunk Door
3. Hood
4. Hinge (4)
5. Machine Screw (8)
6. Washer (8)
7. Nut (12)
8. Square Washer (8)
9. Rivet (8)
10. Front Latch Bracket
11. Rivet (2)
12. Plate (2)
13. Square Washer (4)
14. Rivet (21)
15. Knob (2)
16. Spring Washer (2)
17. Hook (2)
18. Washer (17)
19. Nut (13)
20. Rear Latch Bracket
21. Screw
22. Nut
23. Stand Rod
24. Cotter Pin
25. Stand Rod Retainer
26. Metal Screw
27. Grommet (6)
28. Seat Belt
29. Rivet (33)
30. Seat Backet (4)
31. Console Cover
32. Seat (2)
33. Leatherette Seat
34. Plate (4)
35. Access Plate (2)
36. Machine Screw (8)
37. Backrest (2)
38. Leatherette (Backrest)
39. Speed Nut (4)
40. Washer (10)
41. Wing Nut (4)
42. Louvre (2)
43. Push Nut (12)
44. Trim (AR)
45. Grommet (2)
46. Foam (AR)
47. Side Decal Set (Front)
48. Front Reflector (2)
49. Ski-Doo Label (2)
50. Decal Trunk Door (2)
51. Elite Label
52. Decal (2)
53. Elite Label (2)
54. Side Decal Set (Rear)
55. Rear Deflector (2)
56. Label 450 L/C
57. Dash Decal
58. Bombardier Label
59. Windshield
60. Trim (AR)
61. Machine Screw (14)
62. Nut (8)
63. Body Retainer (22)
64. Side Bumper (2)
65. Rear Bumper
66. Rivet (55)
67. Vinyl Trim
68. Rivet (2)
69. Roll Bar
70. Screw (2)
71. Mirror
72. 73. Front Handle
73. Grip
74. Screw (2)
75. Lock Washer (2)
76. Washer (4)
77. Washer (2)
78. Cover (Drive Axle Access) (2)
79. Grill
80. Machine Screw (4)
81. Hitch Plate
82. Screw (8)
83. Fuel Pump Bracket
84. Screw
85. Washer (2)
86. Nut
87. Tool Box
88. Cover
89. Floor
90. Footrest
91. Footrest Guard (2)
92. Rivet (2)
93. Rubber Rib 31.5" (801 mm) (AR)
94. Foot Rib Stop (4)
95. Rivet (4)
96. Trunk Shield
97. Machine Screw (6)
98. Shifting Label
99. Rivet (8)

AR: as required

FRAME

FRAME WELDING

Steel frame:

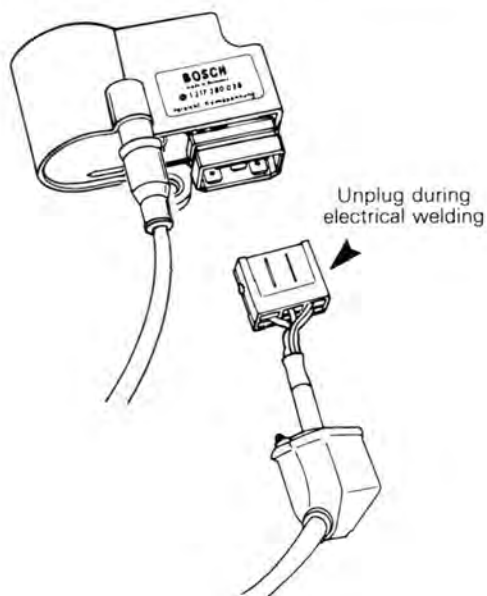
- Electric Welding
- Amperage: 70-110 Amp.
- Voltage: 20-24 volts
- Rod: E-7014 (3/32")

Aluminium frame: (refer to specialized welding shop)

- Argon-oxygen/acetylen welding
- Rod: ER-4043 (3/32")

▼ **CAUTION:** When electrical welding is to be performed anywhere on the vehicle, unplug the multiple connector at the electronic box prior to connecting the welding wire to the vehicle. This will protect the electronic box against damage caused by flowing current when welding.

○ **NOTE:** This procedure applies to all electronic ignition systems.



FRAME CLEANING

Clean frame. For aluminum frame use only "Aluminum cleaner" and follow instructions on container. (Dursol cleaner or equivalent).

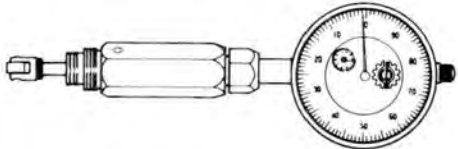
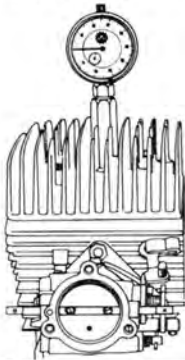
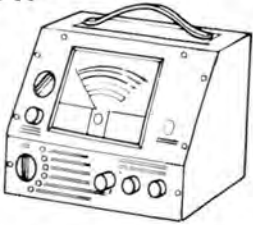
Touch up all metal spots where paint has been scratched off. Spray all bare metal parts of vehicle with metal protector.

SEATS

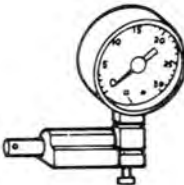
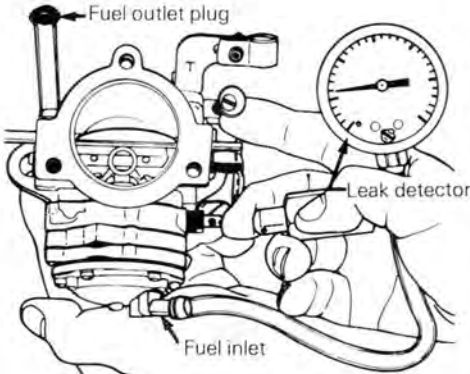
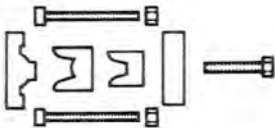
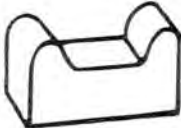
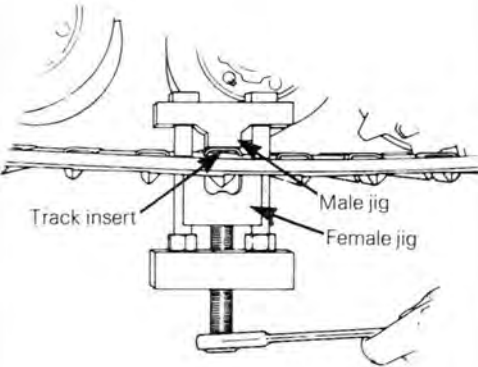
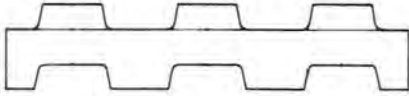
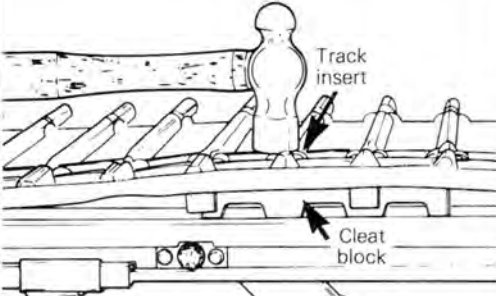
Elite model

To remove the backrest, unscrew the two (2) wing nuts located in the engine compartment.

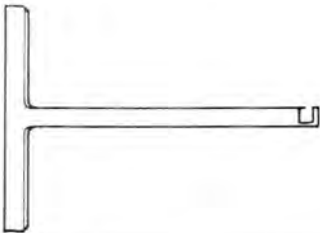
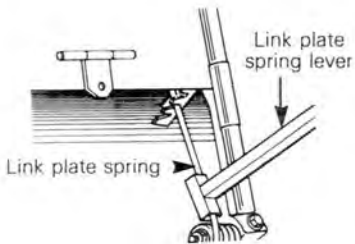
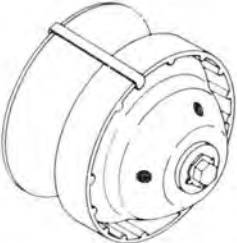
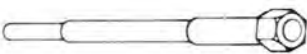
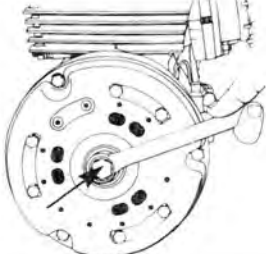
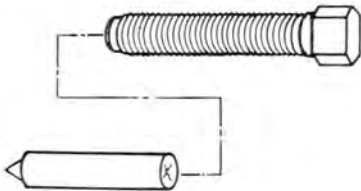
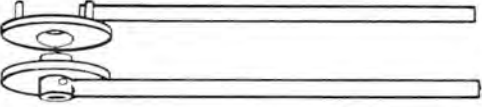
TOOLS

ITEM	USE	APPLICABLE TO
Dial indicator (T.D.C. gauge). 414 1047 00 	Engine timing, to determine T.D.C. 	All engine types.
Tone timer. 414 0990 00 	Engine timing (static).	All engine types.
Circuit tester (continuity light). 414 0122 00 	Engine timing (static). Continuity tests.	All engine types.
Magneto ignition analyser (Merc-O-Tronic). 414 0192 00 	Engine electrical components tests.	All engine types.

SECTION 07 (TOOLS)

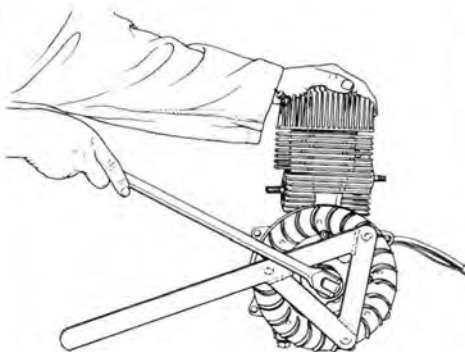
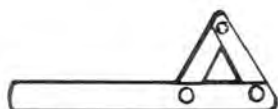
Bombardier ignition tester. 419 0033 00 	Engine electrical components tests.	All engine types.
Carburetor leak detector. 404 0163 00 	 Fuel outlet plug Fuel inlet Leak detector	All Tillotson carburetors.
Track insert installer Heavy duty 419 0027 00  Insert block 529 0003 00 	 Track insert Male jig Female jig	All types of track.
Cleat block 529 0026 00 	 Track insert Cleat block	All types of track.

SECTION 07
(TOOLS)

Link plate spring lever. 529 0006 00 		All models with link plate springs.
Drive pulley retainer. 529 0017 00 	For indexation of governor cup. 	Square shaft drive pulley.
Drive pulley puller. 529 0021 00 	To remove drive pulley from crankshaft. 	Taper shaft engines. Except Super Stock models.
Clutch puller tool. P/N 414 3813 00 	To remove the drive pulley from the crankshaft.	1979 Super Stock models.
Spider grunt tool. P/N 414 3814 00 	To remove the spider ass'y from the fixed half of the drive pulley.	1979 Super Stock models.

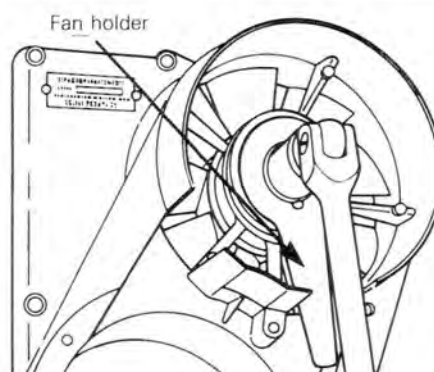
SECTION 07 (TOOLS)

Magneto housing holder.
420 976 550



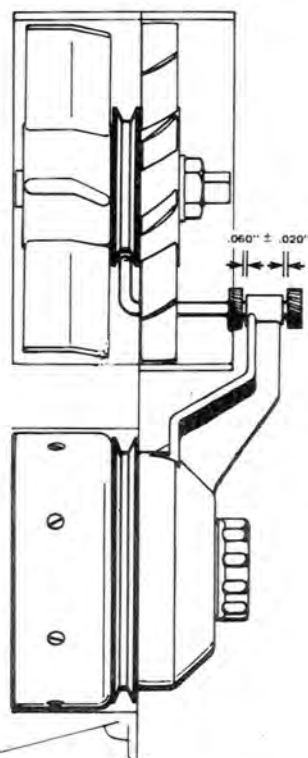
Single cylinder engine types.

Fan holder
420 977 880



Twin cylinders.

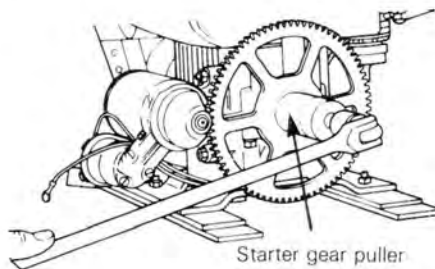
Fan pulley aligning tool.
420 876 440



248, 249, 294 engine types.

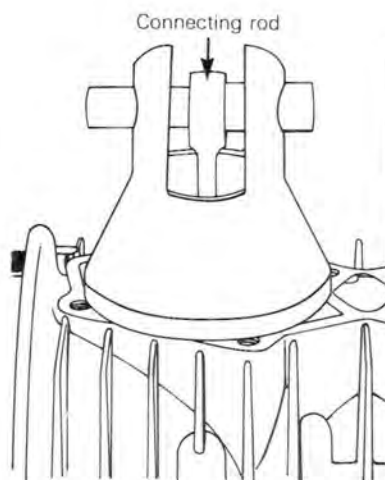
SECTION 07
(TOOLS)

Starter gear puller.
420 876 145



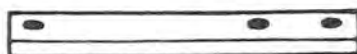
Twin cylinder electric
start engines.

Connecting rod holder.
420 977 900

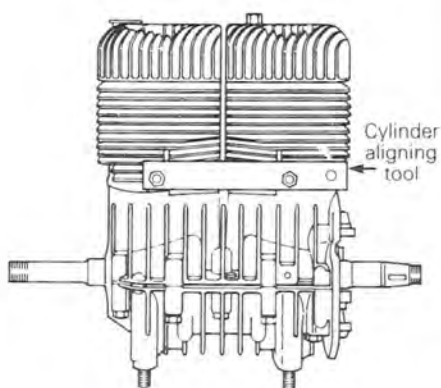


All single cylinder models.

Cylinder aligning tool.
420 876 170

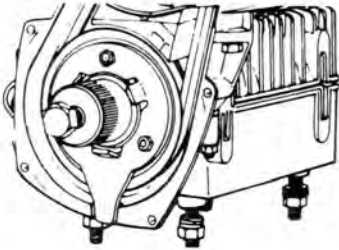
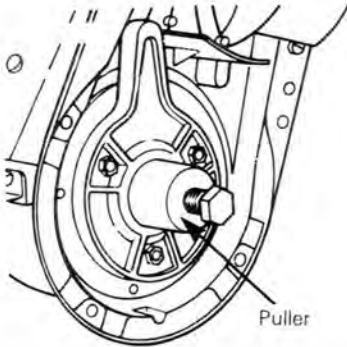


420 842 160



Twin cylinder engine
types.

SECTION 07
(TOOLS)

Magneto housing holder. 420 876 350 		Twin cylinder engine types.
Magneto housing holder. All twin cylinders F.C. Except 248, 294 420 876 080  345 engine 420 876 085		Twin cylinder engine types.
Bearing puller. 247 engine 420 976 350  All twin cylinders 420 876 065	To remove magneto ring from engine	All engines.
Bearing simulator. 305, 343, 402, 440 engine 420 876 155 640 engine 420 876 160 248, 294 420 876 380 	When adjusting crankshaft play.	All engine types.

Puller assembly.
420 876 296
With 145 mm screw.



Screw

420 940 755
M16 x 1.5 x 145



420 841 200
M8 x 70

420 840 680
M8 x 40



Ring for puller ball bearing.
420 977 480
All models since 1971
Except 292, 337, 640, 641, 775

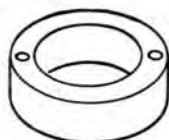
420 977 490
Since 1971
292, 337, 640, 641, 775



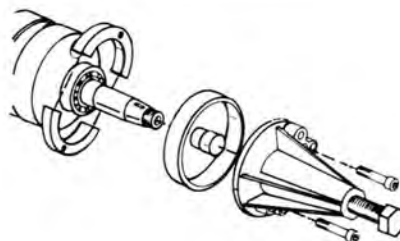
Ring for roller bearing
420 276 020
Since 1971
All models except:
248, 249, 292, 294, 337, 640,
641, 775

420 977 470
Since 1971
292, 337, 640, 641, 775

420 876 330
Since 1971
248, 249, 294

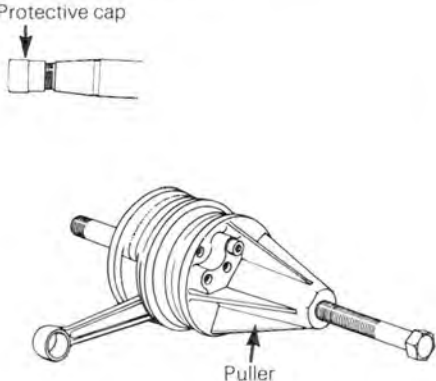
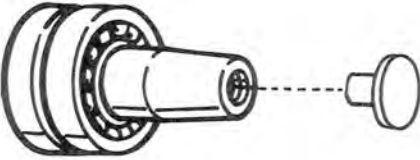
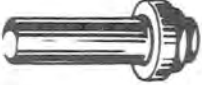
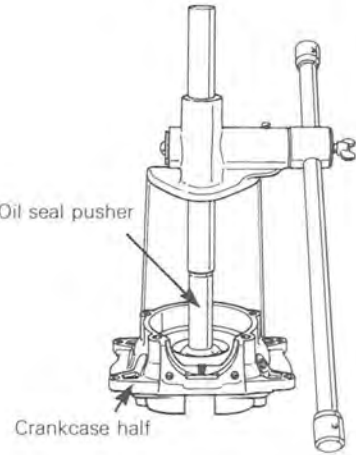


Distance ring for puller 420 876 560

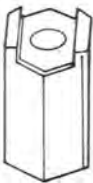
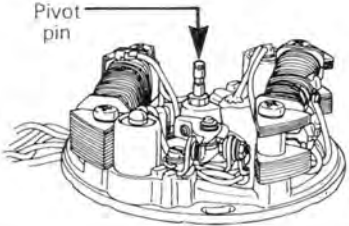
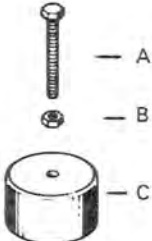
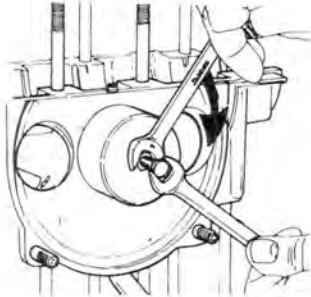
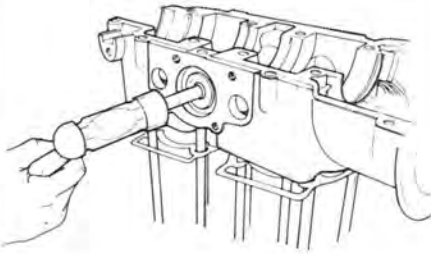


All engine types.

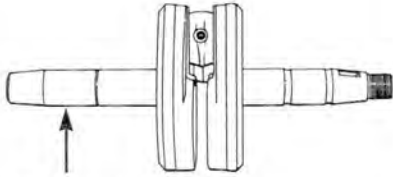
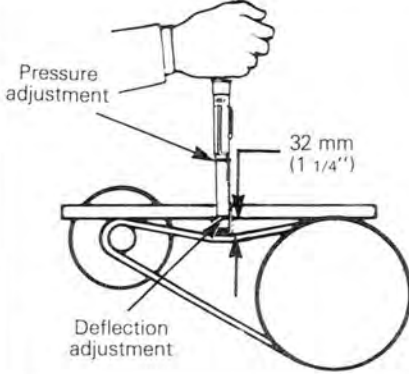
SECTION 07 (TOOLS)

Protection cap.  12 mm 420 676 120 14 mm 420 976 880 18 mm 420 976 890 22 mm 420 876 402 248, 294 420 876 390	Protect crankshaft end, when using bearing puller. Protective cap 	All engine types.
Protection end cap. 420 876 550 	To protect crankshaft end, when using bearing puller. 	All taper shaft engine type.
Oil seal pusher. 247 engine 420 977 920 		All single cylinder engine type.

SECTION 07 (TOOLS)

Armature plate contact set pivot pin remover (socket). 420 876 530 	To remove contact set pivot pin from armature plate. 	All engine types using breaker point type ignition.
Rotary valve shaft puller. 420 876 485 	To remove rotary valve shaft assembly from crankcase. 	RV engines up to serial no. 3095 551
Rotary valve shaft pusher. 420 876 610 		RV engines serial no. 3095 552 on up.
Insertion jig for oil seal. 420 876 505 	To install oil seal.	RV engines up to serial no. 3095 551
Insertion jig for oil seal. 420 876 600 	To install oil seal	RV engines serial no. 3095 552 and up.

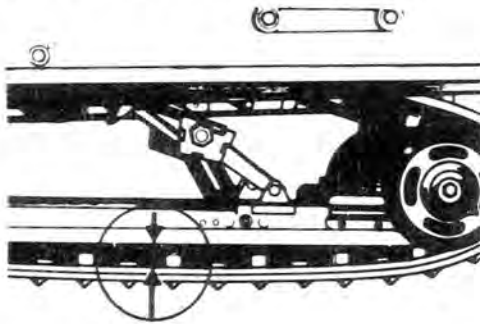
SECTION 07 (TOOLS)

Ball bearing pusher. 420 876 500 	To install water pump ball bearing.	354, 444, 454 engine types.
Oil seal pusher. 420 876 510 	To install water pump oil seal.	354, 444, 454 engine types.
Oil seal sleeve. 247 engine: mag. side 420 276 900 PTO side 420 977 910  444 LC engine water pump 420 876 490 rotary valve 420 876 495 	To avoid oil seal damage during crankshaft installation.  Oil seal sleeve (on crankshaft)	All single cylinder engine types.
Belt tension tester. 414 3482 00 		All models.

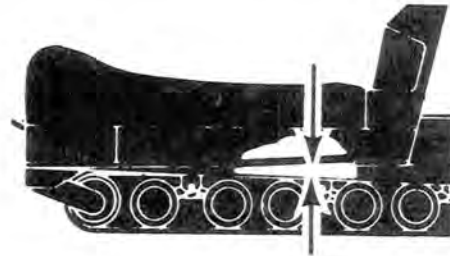
TECHNICAL DATA LIST

TRACK TENSION SPECIFICATIONS (SLIDE SUSPENSION)
TRACK TENSION SPECIFICATIONS (BOGIE WHEEL SUSPENSION)
TRACK SPECIFICATIONS
VEHICLE MODEL/DRIVE BELT NUMBER
DRIVE PULLEY SPECIFICATIONS
DRIVEN PULLEY SPRING TENSION
PULLEY ALIGNMENT SPECIFICATIONS
SPROCKET AND CHAIN SPECIFICATIONS
STEERING SYSTEM TORQUE SPECIFICATIONS
SKI SYSTEM TORQUE SPECIFICATIONS
TOLERANCE AND WEAR LIMIT — ENGINES
IGNITION TIMING SPECIFICATIONS
CARBURETOR SPECIFICATIONS
BOSCH SPARK PLUG CHART
IGNITION GENERATING COIL, TRIGGER COIL AND LIGHTING
COIL RESISTANCE CHART
BOMBARDIER IGNITION TESTER DIAL POSITIONS
METRIC INFORMATION CHART

TRACK TENSION SPECIFICATIONS (SLIDE SUSPENSION)

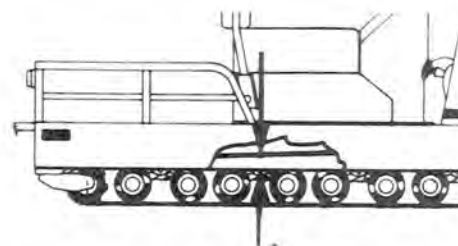


TRACK TENSION SPECIFICATIONS (BOGIE WHEEL SUSPENSION)



		1979
CITATION	300	13 mm (1/2")
MIRAGE	300	
OLYMPIQUE	340	
NUVIK	340	
EVEREST	340, 400	13 mm (1/2")
FUTURA	440, 444 LC	
BLIZZARD 5500		13 mm (1/2")
GRAND PRIX SPECIAL		
BLIZZARD 7500/CROSS COUNTRY		13 mm (1/2")
SUPER SONIC/CROSS COUNTRY		
BLIZZARD	9500	13 mm (1/2")
ELITE	450 LC	13 mm (1/2")

		1979
ELAN and SPIRIT	250	35 mm (1 3/8")
ALPINE	640 ER	*57 mm (2 1/4")

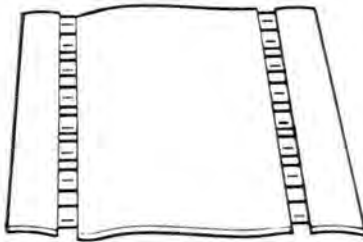


*Between top inside edge of track and center of second bogie wheel set retaining bolt (from rear).

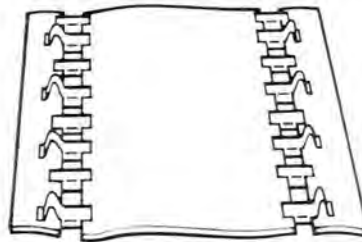


1979 TRACK SPECIFICATIONS

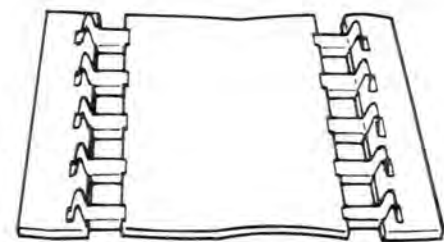
CLEAT AND GUIDE ARRANGEMENT



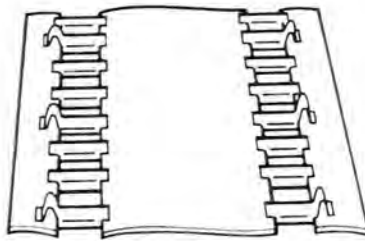
TYPE 1: Narrow insert.



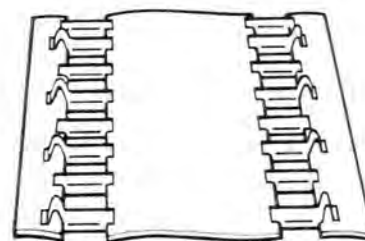
TYPE 2: Narrow insert with shoulder



TYPE 3: Narrow guide with shoulder.



TYPE 4: Wide guide (large track hole).



TYPE 5: Wide guide (large track hole).

	TYPE	TRACK PART NUMBER	WIDTH	LENGTH (interior)
ELAN	1	570 0006 00	38.1 cm (15")	289.6 cm (114")
SPIRIT	1	570 0085 00	38.1 cm (15")	289.6 cm (114")
CITATION	2	570 0069 00	38.1 cm (15")	289.6 cm (114")
MIRAGE	2	570 0068 00	38.1 cm (15")	289.6 cm (114")
NUVIK	4	570 0056 00	38.1 cm (15")	304.8 cm (120")
OLYMPIQUE	5	570 0071 00	38.1 cm (15")	304.8 cm (120")
EVEREST	4	570 0045 00	41.9 cm (16 1/2")	314.9 cm (124")
FUTURA	4	570 0060 00	41.9 cm (16 1/2")	314.9 cm (124")
BLIZZARD 5500	2	570 0086 00	38.1 cm (15")	289.6 cm (114")
GRAND PRIX SPECIAL	2	570 0068 00	38.1 cm (15")	289.6 cm (114")
BLIZZARD 7500/CROSS COUNTRY	2	570 0079 00	41.9 cm (16 1/2")	289.6 cm (114")
SUPER SONIC/CROSS COUNTRY	2	570 0080 00	38.1 cm (15")	289.6 cm (114")
BLIZZARD 9500	2	570 0088 00	38.1 cm (15")	289.6 cm (114")
ALPINE 640 ER	1	570 0014 00	38.1 cm (15")	353 cm (139")
ELITE 450 LC	4	570 0056 00	38.1 cm (15")	304.8 cm (120")



VEHICLE MODEL/DRIVE BELT NUMBER

	1979	WIDTH
ELAN and SPIRIT	570 0411	30 mm (1 3/16")
OLYMPIQUE NUVIK CITATION MIRAGE	414 2327	33 mm (1 5/16")
EVEREST 340	414 2327	33 mm (1 5/16")
EVEREST 400, 440 FUTURA	414 2417	33 mm (1 5/16")
EVEREST 444 LC FUTURA	414 2277	33 mm (1 5/16")
BLIZZARD 5500 GRAND PRIX SPECIAL	414 2277	33 mm (1 5/16")
BLIZZARD 7500/CROSS COUNTRY SUPER SONIC/CROSS COUNTRY	414 2277	33 mm (1 5/16")
BLIZZARD 9500	414 3758	33 mm (1 5/16")
ALPINE 640 ER	414 2277	33 mm (1 5/16")
ELITE 450 LC	414 2277	33 mm (1 5/16")

 **NOTE:** For longer belt life, always reinstall the drive belt in the same direction of rotation.



1979 DRIVE PULLEY SPECIFICATIONS

	TYPE	CUP NUMBER	COUNTERWEIGHT IDENTIFICATION	ROLLER IDENTIFICATION	SPRING AND COLOR PART NUMBER	LENGTH ±1.5 mm (.060")	CLUTCH ENGAGEMENT R.P.M.	RETAINING BOLT TORQUE N•m (ft-lbs)
ELAN and SPIRIT ELAN 250 250 Deluxe	R.R.S.	504 2186	E4	Nylon 31.75 (1 1/4)	414 2580 Bronze	76.7 (3.020)	2000-2200	61 (45)
	R.R.S.	504 2186	D2	Nylon 31.75 (1 1/4)	414 2581 Blue	77.7 (3.060)	3300-3500	61 (45)
CITATION and MIRAGE OLYMPIQUE and NUVIK	R.S.S.	504 2289	A3S	Fiber 34.04 (1.340)	414 1967 Light blue	119.1 (4.688)	3800-4300	85 (63)
	R.S.S.	504 2289	C3L	Fiber 34.04 (1.340)	414 1967 Light blue	119.1 (4.688)	3800-4100	85 (63)
EVEREST FUTURA EVEREST and FUTURA EVEREST and FUTURA 340 400 440 444 LC	R.S.S.	504 2289	C3L	Fiber 34.04 (1.340)	414 1967 Light blue	119.1 (4.688)	3800-4100	85 (63)
	R.S.S.	504 2289	C4L	Fiber 34.04 (1.340)	414 1966 Pink	122.3 (4.813)	2900-3200	85 (63)
	R.S.S.	504 2289	C7L	Fiber 34.04 (1.340)	414 1995 Yellow	100 (3.938)	3400-3700	85 (63)
	R.S.S.	504 2289	C8M-H	Fiber 34.04 (1.340)	414 1967 Light blue	119.1 (4.688)	3200-3500	85 (63)
BLIZZARD 5500/GRAND PRIX SPECIAL BLIZZARD 7500/SUPER SONIC BLIZZARD CROSS COUNTRY/ SUPER SONIC CROSS COUNTRY BLIZZARD 9500	R.S.S.R. ①	504 2398	A3S	Steel 15.87 (.625)	414 3412 Brown	76.9 (3.030)	4200-4500	85 (63)
	R.S.S.R. ②	504 2419	A6S	Aluminum 15.49 (.610)	414 1967 Light blue	119.1 (4.688)	3800-4000	85 (63)
	R.S.S.R. ②	504 2419	A3S	Aluminum 15.87 (.625)	414 2610 Violet	73.66 (2.90)	3800-4100	85 (63)
	R.S.S.	504 2374	C8	Fiber 34.04 (1.340)	414 1967 Light blue	119.1 (4.688)	3200-3500	85 (63)
ELITE ALPINE 450 LC	R.S.S.B.	504 2302	C8 Double	Fiber 34.04 (1.340)	414 1966 Pink	122.2 (4.812)	2250-2400	118 (87)

R.S.S.: Roller square shaft
R.R.S.: Roller round shaft
R.S.S.B.: Roller square shaft with bearing
R.S.S.R.: Roller square shaft 3 ramps

- ① Ramps no. 2406
② Ramps no. 2422

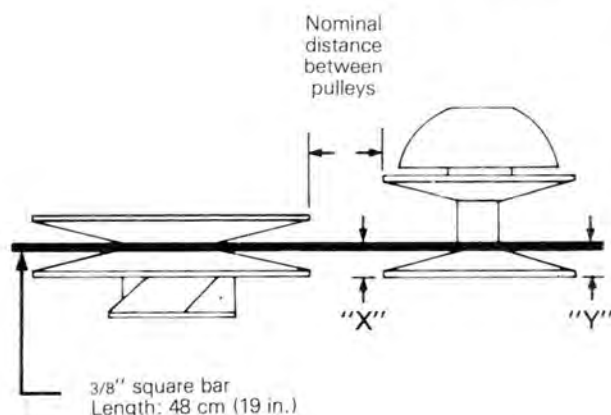


DRIVEN PULLEY SPRING TENSION

1979	kg $\pm$ 1 (lbs $\pm$ 2)
ELAN/SPIRIT	3.6 (8)
CITATION/MIRAGE	3.6 (8)
OLYMPIQUE/NUVIK	3.6 (8)
EVEREST/FUTURA	3.6 (8)
BLIZZARD 5500/GRAND PRIX SPECIAL	5.9 (13)
BLIZZARD 7500/SUPER SONIC	5.9 (13)
CROSS COUNTRY	5.9 (13)
BLIZZARD 9500	5.9 (13)
ELITE 450 LC	5.9 (13)
ALPINE 640 ER	5.9 (13)



1979 PULLEY ALIGNMENT



- Dimension "X" must never exceed dimension "Y".
- Dimension "Y" can exceed dimension "X" by 1.6 mm (1/16").

	DIMENSIONS X and Y (offset)	NOMINAL DISTANCE (between pulleys)
ELAN and SPIRIT	33-35 mm (1 5/16" - 1 3/8")	44 mm (1 3/4")
OLYMPIQUE and NUVIK CITATION and MIRAGE EVEREST and FUTURA	33-35 mm (1 5/16" - 1 3/8")	36 mm (1 7/16")
BLIZZARD 5500 and GRAND PRIX SPECIAL	① 33-35 mm (1 5/16" - 1 3/8")	35 mm (1 3/8")
BLIZZARD 7500 and SUPER SONIC	33-35 mm (1 5/16" - 1 3/8")	36 mm (1 7/16")
CROSS COUNTRY	33-35 mm (1 5/16" - 1 3/8")	36 mm (1 7/16")
BLIZZARD 9500	① 33-35 mm (1 5/16" - 1 3/8")	36 mm (1 7/16")
ALPINE	33-35 mm (1 5/16" - 1 3/8")	44 mm (1 3/4")
ELITE 450 LC	33-35 mm (1 5/16" - 1 3/8")	41 mm (1 5/8")

① With a 1/16" shim between driven pulley and bearing flange. Refer to section 02.



1979 SPROCKET AND CHAIN SPECIFICATIONS

		SPROCKET UPPER/LOWER	CHAIN PITCH AND NUMBER OF LINKS
ELAN and SPIRIT	250	10/25	1/2" single, 62
ELAN	250 DELUXE	14/35	3/8" double, 84
CITATION/MIRAGE		17/33	3/8" double, 88
OLYMPIQUE/NUVIK	340	17/33	3/8" double, 88
EVEREST	340	16/34	3/8" double, 88
FUTURA	400	18/34	3/8" double, 90
EVEREST/FUTURA	440	21/38	3/8" triple, 94
EVEREST/FUTURA	444 LC	20/34	3/8" triple, 90
BLIZZARD 5500/GRAND PRIX SPECIAL		21/38	3/8" triple, 68
BLIZZARD 7500/SUPER SONIC		19/38	3/8" triple, 92
CROSS COUNTRY		21/38	3/8" triple, 94
BLIZZARD	9500	19/40	3/8" triple, 68
ALPINE	640 ER	17/38	3/8" triple, 90
ELITE	450 LC	17/38	3/8" triple, 188

1979 STEERING SYSTEM TORQUE SPECIFICATIONS

	STEERING SYSTEM TYPE	HANDLEBAR RETAINING BOLT N•m (ft-lbs)	STEERING ARM TO SKI LEG N•m (ft-lbs)	TIE ROD END TO STEERING ARM N•m (ft-lbs)
ELAN and SPIRIT	1 (1978)	— — —	27 (20)	27 (20)
CITATION and MIRAGE	2 (1978)	— — —	42 (31)	27 (20)
OLYMPIQUE and NUVIK EVEREST and FUTURA	3 (1978)	— — —	42 (31)	27 (20)
BLIZZARD 5500 GRAND PRIX SPECIAL BLIZZARD 9500*	8 (1978)	— — —	42 (31)	27 (20)
BLIZZARD 7500 SUPER SONIC CROSS COUNTRY	5 (1978)	— — —	42 (31)	27 (20)
ALPINE	6 (1978)	42 (31)	42 (31)	*61 (45)
ELITE	7 (1978)	42 (31)	42 (31)	27 (20)

*Ball bushing nut torque value.

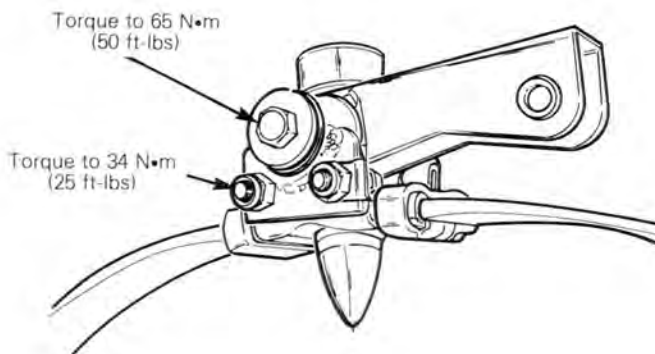


1979 SKI SYSTEM TORQUE SPECIFICATIONS

	SKI SYSTEM TYPE	SPRING LEAF/ LEAF COUPLER RETAINING BOLT N•m (ft-lbs)	RUNNER SHOE NUT N•m (ft-lbs)	LEAF COUPLER TO SKI LEG
ELAN & SPIRIT ELAN DELUXE	1 2	50 (37)	7 (5)	Tighten bolt, move ski by hand to check that it pivots easily on ski leg. Then tight- en locking nut to 61 N•m (45 ft-lbs).
CITATION & MIRAGE	3	50 (37)	14 (10)	
OLYMPIQUE & NUVIK EVEREST 340, FUTURA 400	4	50 (37)	14 (10)	
EVEREST & FUTURA 440 & 444 LC	5	— — — —	14 (10)	
BLIZZARD 7500/CROSS COUNTRY SUPER SONIC/CROSS COUNTRY	6	— — — —	14 (10)	
ALPINE	7	50 (37)	14 (10)	
ELITE	8	50 (37)	14 (10)	
BLIZZARD 9500	9	small bolts 34 (25) main bolt 68 (50)	14 (10)	•

* Assemble the ski to the ski leg, using water or liquid soap.

○ **NOTE:** Install the two machined bolts from inside the coupler; install and tighten the large bolt to 68 N•m (50 ft-lbs).



Install the new lock tabs and elastic stop nuts and torque to 34 N•m (25 ft-lbs).

Bend the lock tabs.

Secure the shock absorber to the ski leg using the retainer pin and cotter pin.

Repeat the procedure for the other ski.



TOLERANCES AND WEAR LIMIT — 1979 ENGINES

ENGINE TYPE	CYL. BORE (MIN. NOMINAL) STANDARD OVERSIZE		PISTON TO WALL CLEARANCE MINIMUM — MAXIMUM	MAXIMUM RING END GAP	MAXIMUM CRANKSHAFT END PLAY
247	69.5 mm (2.7362")		0.065 — 0.170 mm (.0025 — .0067")	0.20-0.40 mm (.008-.016")	0.1 mm (.004")
248	54.0 mm (2.159")	54.5 mm (2.1456")	0.050 — 0.140 mm (.0020 — .0055")	0.15-0.35 mm (.006-.014")	0.1 mm (.004")
294	57.0 mm (2.2441")	57.5 mm (2.2638")	0.050 — 0.140 mm (.0020 — .0055")	0.15-0.35 mm (.006-.014")	0.1 mm (.004")
343	59.5 mm (2.3425")	60.0 mm (2.3622")	0.080 — 0.200 mm (.0031 — .0079")	0.15-0.35 mm (.006-.014")	0.1 mm (.004")
354	59.5 mm (2.3425")	59.75 mm (2.3524")	0.080 — 0.200 mm (.0031 — .0079")	0.15-0.35 mm (.006-.014")	N.A.
402	64.5 mm (2.5394")	65.0 mm (2.5590")	0.070 — 0.180 mm (.0028 — .0071")	0.20-0.40 mm (.008-.016")	0.1 mm (.004")
440	67.5 mm (2.6574")	68.0 mm (2.6771")	0.070 — 0.180 mm (.0028 — .0071")	0.20-0.40 mm (.008-.016")	0.1 mm (.004")
444	69.5 mm (2.7362")	69.75 mm (2.7461")	0.070 — 0.180 mm (.0028 — .0071")	0.20-0.40 mm (.008-.016")	N.A.
454	67.5 mm (2.6575")	67.75 mm (2.6673")	0.090 — 0.220 mm (.0035 — .0087")	0.20-0.40 mm (.008-.016")	N.A.
503	72.0 mm (2.8346")	72.25 mm (2.8445")	0.060 — 0.160 mm (.0024 — .0063")	0.20-0.40 mm (.008-.016")	N.A.
640	76.0 mm (2.9921")	76.5 mm (3.0118")	0.070 — 0.180 mm (.0028 — .0071")	0.25-0.45 mm (.010-.018")	0.1 mm (.004")

N.A.: not applicable



1979 IGNITION TIMING SPECIFICATIONS

ENGINE TYPE	IGNITION TYPE	DIRECT MEASUREMENT B.T.D.C. 	INDIRECT MEASUREMENT B.T.D.C. 	EDGE CAP 
247	Breakers	3.98 mm $\pm$ 0.25 (.157" $\pm$.010)	N.A.	6.6 mm $\pm$ 1.5 (.260" $\pm$.060)
248	Breakers	N.A.	2.29 mm $\pm$ 0.25 (.090" $\pm$.010)	9.0 mm $\pm$ 2.0 (.354" $\pm$.080)
294	Breakers	N.A.	2.49 mm $\pm$ 0.25 (.098" $\pm$.012)	9.0 mm $\pm$ 2.0 (.354" $\pm$.080)
343	Breakers	N.A.	2.46 mm $\pm$ 0.25 (.097" $\pm$.010)	8.0 mm $\pm$ 2.0 (.315" $\pm$.080)
354	CD *	1.39 mm $\pm$ 0.25 (.055" $\pm$.010)	N.A.	N.A.
402	Breakers	N.A.	2.46 $\pm$ 0.25 (.097" $\pm$.010)	8.0 mm $\pm$ 2.0 (.315" $\pm$.080)
440	Breakers	N.A.	3.30 mm $\pm$ 0.25 (.130" $\pm$.010)	6.6 mm $\pm$ 1.5 (.260" $\pm$.060)
444	Breakers	2.35 mm $\pm$ 0.25 (.092" $\pm$.010)	N.A.	8.0 mm $\pm$ 2.0 (.315" $\pm$.080)
454	CD *	1.39 mm $\pm$ 0.25 (.055" $\pm$.010)	N.A.	N.A.
503	Breakers	2.07 mm $\pm$ 0.25 (.081" $\pm$.010)	N.A.	8.0 mm $\pm$ 2.0 (.315" $\pm$.080)
640	Breakers	N.A.	4.11 mm $\pm$ 0.25 (.162" $\pm$.010)	6.6 mm $\pm$ 1.5 (.260" $\pm$.060)

N.A. not applicable

* Stroboscopic timing at 6000 R.P.M.



CARBURETOR SPECIFICATIONS

MODEL		ENGINE TYPE	CARBURETOR TYPE	LOW SPEED ADJ. $\pm 1/8$	IDLE SPEED R.P.M.
ELAN & SPIRIT ELAN	250 250 DL	247 248	Tillotson HR 173A Tillotson HR 172A	1 turn 1 turn $+1/4 - 0$	1800-2000 1800-2200
OLYMPIQUE & NUVIK CITATION & MIRAGE	340 300	343 294	Mikuni VM 30-91 Mikuni VM 30-104	1 1/2 turn 1 1/2 turn	1500-1800 1800-2000
EVEREST FUTURA EVEREST FUTURA EVEREST FUTURA	340 400 440 444 LC	343 402 440 444	Mikuni VM 30-98 Mikuni VM 30-92 Mikuni VM 34-165 Mikuni VM 34-150	1 1/2 turn 1 1/2 turn 2 turns 1 1/2 turn	1500-1800 1500-1800 1500-1800 1500-1800
BLIZZARD 5500 GRAND PRIX SPECIAL		503	Mikuni VM 34-203	1 1/2 turn	1500-2000
BLIZZARD 7500/SUPER SONIC		354	Mikuni VM 34-184	1 1/2 turn	2800-3200
CROSS COUNTRY		354	Mikuni VM 34-199m	1 1/2 turn	1800-2000
BLIZZARD 9500		454	Mikuni VM 36-78	1 turn	1800-2000
ALPINE 640 ER		640	Tillotson HRM-7A	*1 1/8 + 1/4 - 0	1500-1800
ELITE 450 LC		444	Mikuni VM 34-201	1 turn	1500-1800

* High Speed = 1 1/4 turn + 1/4 - 0

MIKUNI CARBURETOR SPECIFICATIONS

YEAR	CARBURETOR	MAIN JET	NEEDLE	NEEDLE JET	CUTAWAY	PILOT JET	AIR SCREW ② ± 1/4
1979	VM 30-91	260	6DH2-3	159 Q-0	2.0	25	1 1/2 turn
1979	VM 30-92	220	6DH7-4	159 Q-0	3.5	45	1 1/2 turn
1979	VM 30-94	220	6DH4-3	159 P-2	2.0	30	1 1/2 turn
1979	VM 30-98	250	6F9-3	159 Q-2	3.5	35	1 1/2 turn
1979	VM 30-104	220	6DH4-3	159 P-2	2.0	30	1 1/2 turn
1979	VM 34-150	450	6EJ1-4	159 P-4	3.0	45	1 1/2 turn
1979	VM 34-165	320	6F9-3	159 P-6	3.0	35	2 turns
1979	VM 34-199	240	6F9-2	159 P-4	3.5	50	1 1/2 turn
1979	VM 34-199M	250	6F9-2	159 P-4	3.5	50	1 1/2 turn
1979	VM 34-201	370	6EJ1-3	159 P-2	2.5	30	1 turn
1979	VM 34-203	220	6DH2-3	159 P-4	3.0	35	1 1/2 turn
1979	VM 36-78	MAG PTO 300 280	6DH4-4	159 P-2	3.5	40	1 turn

① Jet needle last digit indicates "E" clip position from top.

Ex.: 6HD2-3: 3rd slot from top.

② Turning clockwise will enrich the mixture and counterclockwise will lean it.

1979 MAIN JET APPLICATION CHARTS

1979 CITATION – MIRAGE VM 30-104								
TEMPERATURE 0°C (0°F)	-45°C (-50)	-35°C (-30)	-25°C (-10)	-15°C (10)	0°C (30)	10°C (50)	20°C (70)	30°C (90)
Altitude Meters (feet)								
0 Sea level	250	240	230	220	220	210	200	190
600 m (2,000)	240	230	220	210	210	195	185	180
1,200 m (4,000)	230	220	210	200	190	185	175	165
1,800 m (6,000)	210	210	195	190	180	170	165	155
2,400 m (8,000)	200	195	185	175	170	160	150	145
3,000 (10,000)	190	180	175	165	155	150	140	130

CAUTION: These adjustments are guideline only, specific adjustments vary with temperature, altitude, atmospheric pressure and humidity. Always observe spark plug condition for proper jetting.

SECTION 08
SUB-SECTION 04-05

1979 OLYMPIQUE & NUVIK 340 VM 30-91								
TEMPERATURE 0°C (0°F)	-45°C (-50)	-35°C (-30)	-25°C (-10)	-15°C (10)	0°C (30)	10°C (50)	20°C (70)	30°C (90)
Altitude Meters (feet)								
0 Sea level	290	280	270	260	260	250	240	230
600 m (2,000)	280	270	260	250	240	230	220	210
1,200 m (4,000)	270	260	250	240	230	220	210	195
1,800 m (6,000)	250	240	230	220	210	200	195	185
2,400 m (8,000)	240	230	220	210	200	190	180	170
3,000 (10,000)	230	220	210	195	185	175	165	155

 CAUTION: These adjustments are guideline only, specific adjustments vary with temperature, altitude, atmospheric pressure and humidity. Always observe spark plug condition for proper jetting.

1979 EVEREST 340 VM 30-98									
TEMPERATURE 0°C (0°F) Altitude Meters (feet)	-45°C (-50)	-35°C (-30)	-25°C (-10)	-15°C (10)	0°C (30)	10°C (50)	20°C (70)	30°C (90)	Needle & E clip position
0 Sea level	280	270	260	250	240	230	220	210	6F9-3
600 m (2,000)	270	260	250	240	230	220	210	200	
1,200 m (4,000)	250	240	230	230	220	210	200	190	
1,800 m (6,000)	240	230	220	210	200	195	185	175	6F9-2
2,400 m (8,000)	230	220	210	200	190	180	170	160	
3,000 (10,000)	210	200	195	185	175	165	160	150	

CAUTION: These adjustments are guideline only, specific adjustments vary with temperature, altitude, atmospheric pressure and humidity. Always observe spark plug condition for proper jetting.

SECTION 08
SUB-SECTION 04-05

1979 FUTURA 400 VM 30-92								
TEMPERATURE 0°C (0°F) Altitude Meters (feet)	-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	250	240	230	220	220	210	200	190
600 m (2,000)	240	230	220	210	210	195	185	180
1,200 m (4,000)	230	220	210	200	190	185	175	165
1,800 m (6,000)	210	210	195	190	180	170	165	155
2,400 m (8,000)	200	200	185	175	170	160	150	145
3,000 m (10,000)	190	180	175	165	155	150	140	130

 CAUTION: These adjustments are guideline only, specific adjustments vary with temperature, altitude, atmospheric pressure and humidity. Always observe spark plug condition for proper jetting.

1979 EVEREST — FUTURA — 440 — 440E 1979 VM 34-165										
TEMPERATURE 0°C (0°F)	-45°C (-50)	-35°C (-30)	-25°C (-10)	-15°C (10)	0°C (30)	10°C (50)	20°C (70)	30°C (90)	Needle & E clip position	Pilot Jet
Altitude Meters (feet)										
0 Sea level	360	350	330	320	310	300	290	280	6F9-3	35
600 m (2,000)	340	330	320	300	290	280	270	260		
1,200 m (4,000)	320	310	300	290	280	270	250	240	6F9-2	30
1,800 m (6,000)	310	300	280	270	260	250	240	230		
2,400 m (8,000)	290	280	270	260	240	230	220	210	6F9-1	25
3,000 (10,000)	270	260	250	240	230	220	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.

SECTION 08
SUB-SECTION 04-05

1979 EVEREST & FUTURA 444 L/C VM 34-150									
TEMPERATURE 0°C (0°F) Altitude Meters (feet)	-45°C (-50)	-35°C (-30)	-25°C (-10)	-15°C (10)	0°C (30)	10°C (50)	20°C (70)	30°C (90)	Needle & E clip position
0 Sea level	460	440	430	410	400	380	370	350	6EJ1-3
600 m (2,000)	440	420	410	390	380	360	350	330	
1,200 m (4,000)	420	400	390	370	360	340	320	310	
1,800 m (6,000)	390	380	360	350	330	320	300	290	6EJ1-2
2,400 m (8,000)	370	360	340	330	310	300	280	270	
3,000 (10,000)	350	340	320	300	290	270	260	240	

 CAUTION: These adjustments are guideline only, specific adjustments vary with temperature, altitude, atmospheric pressure and humidity. Always observe spark plug condition for proper jetting.

1978 BLIZZARD 6500 VM 34-184 1979 BLIZZARD 7500 & SUPER SONIC 340 L/C VM 34-199								
TEMPERATURE 0°C (0°F)	-45°C (-50)	-35°C (-30)	-25°C (-10)	-15°C (10)	0°C (30)	10°C (50)	20°C (70)	30°C (90)
Altitude Meters (feet)								
0 Sea level	270	260	250	240	230	220	210	200
600 m (2,000)	260	250	240	230	220	210	200	195
1,200 m (4,000)	240	230	230	220	210	200	190	180
1,800 m (6,000)	230	220	210	200	195	185	180	170
2,400 m (8,000)	220	210	200	190	180	175	165	155
3,000 (10,000)	210	195	190	180	170	160	150	140


CAUTION: These adjustments are guideline only, specific adjustments vary with temperature, altitude, atmospheric pressure and humidity. Always observe spark plug condition for proper jetting.

SECTION 08
SUB-SECTION 04-05

1979 BLIZZARD 5500 / GRAND PRIX SPECIAL VM 34-203								
TEMPERATURE 0°C (0°F) Altitude Meters (feet)	-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 Niveau de la mer	250	240	230	220	210	200	195	190
600 m (2,000)	240	230	220	210	200	195	185	175
1,200 m (4,000)	220	210	210	200	190	180	175	165
1,800 m (6,000)	210	200	195	185	180	170	160	155
2,400 m (8,000)	200	190	180	175	165	160	150	140
3,000 (10,000)	190	180	170	165	155	145	140	130

 CAUTION: These adjustments are guideline only, specific adjustments vary with temperature, altitude, atmospheric pressure and humidity. Always observe spark plug condition for proper jetting.

1979 BLIZZARD 9500 VM 36-78								
TEMPERATURE ° C (° F)	-45° C (-50)	-35° C (-30)	-25° C (-10)	-15° C (10)	0° C (30)	10° C (50)	20° C (70)	30° C (90)
ALTITUDE Meters (feet)	PTO MAG	PTO MAG	PTO MAG	PTO MAG	PTO MAG	PTO MAG	PTO MAG	PTO MAG
0 Sea level	310 330	300 320	290 310	280 300	270 290	260 280	250 270	240 260
600 m (2,000)	300 320	290 310	280 300	270 290	260 280	250 270	240 260	230 250
1,200 m (4,000)	290 310	280 300	270 290	260 280	250 270	240 260	230 250	220 240
1,800 m (6,000)	270 290	260 280	250 270	240 260	230 250	220 240	200 230	190 220
2,400 m (8,000)	260 290	250 270	240 260	230 250	220 240	210 230	200 220	190 210
3,000 m (10,000)	250 270	240 260	230 250	220 240	210 230	200 220	190 210	180 200

▼ CAUTION: These adjustments are guideline only, specific adjustments vary with temperature, altitude, atmospheric pressure and humidity. Always observe spark plug condition for proper jetting.

1979 BOSCH SPARK PLUG CHART

		ENGINE TYPE	FULL LOAD	PARTIAL LOAD
ELAN & SPIRIT	250	247	M175 T1	M175 T1
ELAN	250 DL	248	W240 MZ1	W240 MZ1
CITATION & MIRAGE	300	294	W260 MZ1	W260 MZ1
OLYMPIQUE & NUVIK	340	343	W280 MZ1	W280 MZ1
EVEREST	340	343	W280 MZ1	W280 MZ1
FUTURA	400	402	W280 MZ1	W280 MZ1
EVEREST & FUTURA	440	440	NGK A-8	M260 T1
EVEREST & FUTURA	444 LC	444	W280 MZ2	W260 MZ2
BLIZZARD 5500/ GP Special	503	503	W275 T2	W275 T2
BLIZZARD 7500/SUPER SONIC	354	354	W340 S2S	W340 S2S
CROSS COUNTRY	354	354	W275 T2	W275 T2
BLIZZARD	9500	454	W340 S2S	W340 S2S
ALPINE	640 ER	640	M240 T1	M240 T1
ELITE	450 LC	444	W280 MZ2	W260 MZ2



IGNITION GENERATING COIL, TRIGGER COIL AND LIGHTING COIL RESISTANCE CHART 1979

1979 MODELS	ENGINE	IGNITION GENERATING COIL	TRIGGER COIL	LIGHTING COIL	BRAKE LIGHT COIL
ELAN ET SPIRIT 250 ELAN 250 Deluxe	247 248	3.4 1.15	— — — — — —	0.45 0.45	1.85 1.90
CITATION & MIRAGE 300 OLYMPIQUE & NUVIK 340	294 343	1.15 3.3	— — — — — —	0.45 0.23	1.90 — — —
EVEREST 340 FUTURA 400 EVEREST & FUTURA 440 EVEREST & FUTURA 444 LC	343 402 440 444	3.3 3.3 3.3 3.3	— — — — — — — — — — — —	0.23 0.23 0.23 0.23	— — — — — — — — — 2.15 ①
BLIZZARD 5500 & GRAND PRIX SPECIAL	503	3.3	— — —	0.23	2.15 ①
BLIZZARD 7500 PLUS SUPER SONIC L/C CROSS COUNTRY	354	445-490	49-59	0.20	— — —
BLIZZARD 9500 PLUS	454	445-490	49-59	0.20	— — —
ALPINE 640 ER	640	3.3	— — —	0.23	2.15 ①
ELITE 450 LC	444	3.3	— — —	— — —	— — —

All values are given in ohms, with a tolerance of $\pm 20\%$, except otherwise specified at a temperature of 20°C (70°F).

① Additional lighting coil 30 W.

BOMBARDIER IGNITION TESTER ADJUSTMENTS FOR 1979 COMPONENTS

1979 MODELS	ENGINE	GENERATING COIL	TRIGGER COIL	LIGHTING COIL	BRAKE LIGHT COIL
ELAN ET SPIRIT 250 ELAN 250 Deluxe	247 248	HIGH 75 HIGH 75	— — — — — —	LOW 85 LOW 80	LOW 85 LOW 80
CITATION & MIRAGE 300 OLYMPIQUE & NUVIK 340	294 343	HIGH 75 HIGH 80	— — — — — —	LOW 80 LOW 85	LOW 80 — — —
EVEREST 340 FUTURA 400 EVEREST & FUTURA 440 EVEREST & FUTURA 444 LC	343 402 440 444	HIGH 80 HIGH 80 HIGH 80 HIGH 80	— — — — — — — — — — — —	LOW 85 LOW 85 LOW 85 LOW 85	— — — — — — — — — LOW 85 ①
BLIZZARD 5500 & GRAND PRIX SPECIAL	503	HIGH 80	— — —	LOW 85	LOW 85 ①
BLIZZARD 7500 PLUS SUPER SONIC L/C CROSS COUNTRY	354	HIGH 40	LOW 50	LOW 80	— — —
BLIZZARD 9500 PLUS	454	HIGH 40	LOW 50	LOW 80	— — —
ALPINE 640 ER	640	HIGH 80	— — —	LOW 85	LOW 85 ①
ELITE 450 LC	444	HIGH 80	— — —	— — —	— — —

① Additional lighting coil 30 W.

S.I.* METRIC INFORMATION CHART

BASE UNITS		
DESCRIPTION	UNIT	SYMBOL
length	meter	m
mass	kilogram	kg
liquid	liter	L
temperature	celsius	°C
pressure	kilopascal	kPa
torque	Newton meter	N•m
speed	kilometer per hour	km/h

PREFIXES			
PREFIX	SYMBOL	MEANING	VALUE
kilo	k	one thousand	1,000
centi	c	one hundredth of a	0.01
milli	m	one thousandth of a	0.001

*THE INTERNATIONAL SYSTEM OF UNITS
(SYSTEME INTERNATIONAL) ABBREVIATES "SI" IN
ALL LANGUAGES.



WARRANTY

LIMITED WARRANTY SKI-DOO® SNOWMOBILES

BOMBARDIER Limited as manufacturer, warrants FROM THE DATE OF FIRST CONSUMER SALE, every 1979 Ski-Doo® snowmobile, sold as NEW AND UNUSED, by an authorized SKI-DOO dealer, subject to the following limitations and conditions, for a period of:

- **two (2) seasons maximum** for models: Elan®, Olympique®, Citation®, Everest®, Elite®.
- Warranty **STARTS** on the date of sale to the first consumer and **ENDS** the **SECOND APRIL 30TH** following the date warranty coverage started.
- **Ninety (90) consecutive** days for the following models: Blizzard® 5500-7500-9500 and Alpine® subject to the following:
 1. When a sale is made after **MARCH 31ST** of a given year but before **THE 1ST DAY OF DECEMBER** of the same year, the warranty will start on **DECEMBER 1ST** following the date of sale.
 2. When a sale is made on / or after **JANUARY 2ND** of a given year, the unused portion of the 90 days warranty as of **MARCH 31ST**, of that year will be carried over to the next season, beginning the **1ST DAY OF DECEMBER**.

Any 1979 model not listed above is not warranted.

WHAT BOMBARDIER WILL DO

BOMBARDIER will repair and / or replace, at its option, components defective in **material and / or workmanship (under normal use and service,)** with a genuine BOMBARDIER component without charge for parts or labour at any authorized SKI-DOO dealer during said warranty period.

EXCLUSIONS

Items and components

Any of the following expendable items and / or components that are damaged or worn due to normal use: variable speed drive belt, windshield, filters, ignition breaker points, condensers, spark plugs, light bulbs, protective lenses, brake linings, ski runner shoes, slider shoes on suspension and variable speed pulleys, labels, soft trim, appearance items, lubricants and paints and all tune-ups and adjustments required, seized, melted or holed piston.

Also excluded are:

- Damage resulting from installation of parts other than genuine BOMBARDIER parts.
- Damage caused by failure to provide **proper maintenance** as detailed in the **Operator Manual** supplied with each SKI-DOO snowmobile. The labour, parts and lubricants cost of all maintenance services, including tune-ups and adjustments will be charged to the owner.
- Damage resulting from improper servicing or adjustment of the drive pulley assembly. **The drive pulley assembly is factory sealed, and can only be serviced by an authorized SKI-DOO dealer.**
- Vehicles used for racing purposes.
- Vehicles used for rental or other business purposes.
- All optional accessories installed on the vehicle. **(The normal warranty policy for parts and accessories if any, applies).**
- Damage resulting from operation of the snowmobile on surfaces other than snow.
- Damage resulting from accident, fire or other casualty, misuse, abuse or neglect.
- Damage resulting from modification to the snowmobile not approved in writing by BOMBARDIER.
- Losses incurred by the snowmobile owner other than parts and labour, such as, but not limited to, transportation, towing, telephone calls, taxis, or any other incidental or consequential damages.

Some states or provinces do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply.

CONDITION TO HAVE WARRANTY WORK PERFORMED

Present, to the servicing dealer, the hard copy of the SKI-DOO Customer Registration card given by the selling dealer at time of purchase.

SECTION 09 (WARRANTY)

EXPRESSED OR IMPLIED WARRANTIES

This warranty gives you specific rights, and you may also have other legal rights which may vary from **state to state, or province to province**.

Where applicable this warranty is expressly in lieu of all other expressed or implied warranties of BOMBARDIER, its distributors and the selling dealer, including any warranty of merchantability of fitness for any particular purpose; otherwise the implied warranty is limited to the duration of this warranty. However, some states or provinces do not allow limitations on how long an implied warranty lasts, so the above limitation may not apply.

Neither the distributor, the selling dealer, nor any other person has been authorized to make any affirmation, representation or warranty other than those contained in this warranty, and if made, such affirmation, representation or warranty shall not be enforceable against BOMBARDIER or any other person.

CONSUMER ASSISTANCE

If a servicing problem or other difficulty occurs, we suggest the following:

1. Try to resolve the problem at the dealership with the Service Manager or Owner.
2. If this fails, contact your area distributor listed in the operator manual.
3. Then if your grievance still remains unsolved, you may write to us:
Bombardier Limited
Customer Relations Dept.
Recreational Product Group
Valcourt, Quebec, Canada, J0E 2L0

Bombardier Limited reserves the right to modify its warranty policy at any time, being understood that such modification will not alter the warranty conditions applicable to vehicles sold while the above warranty is in effect.

JANUARY 1978
BOMBARDIER LIMITED
Valcourt, Quebec, Canada, J0E 2L0

*Trademark of Bombardier Limited
® Registered Trademark of Bombardier Limited

WARRANTY

LIMITED WARRANTY MOTO-SKI® SNOWMOBILES

BOMBARDIER Limited as manufacturer, warrants FROM THE DATE OF FIRST CONSUMER SALE, every 1979 Moto-Ski® snowmobile, sold as NEW AND UNUSED, by an authorized MOTO-SKI dealer, subject to the following limitations and conditions, for a period of:

- two (2) seasons maximum for models: SPIRIT®, NUVIK®, MIRAGE®, FUTURA®
- Warranty STARTS on the date of sale to the first consumer and ENDS the SECOND APRIL 30TH following the date warranty coverage started.
- Ninety (90) consecutive days for the following models: SUPER SONIC®, GRAND PRIX® SPECIAL subject to the following:
 1. When a sale is made after MARCH 31ST of a given year but before THE 1ST DAY OF DECEMBER of the same year, the warranty will start on DECEMBER 1ST following the date of sale.
 2. When a sale is made on / or after JANUARY 2ND of a given year, the unused portion of the 90 days warranty as of MARCH 31ST, of that year will be carried over to the next season, beginning the 1ST DAY OF DECEMBER.

Any 1979 model not listed above is not warranted.

WHAT BOMBARDIER WILL DO

BOMBARDIER will repair and / or replace, at its option, components defective in **material and / or workmanship (under normal use and service,)** with a genuine BOMBARDIER component without charge for parts or labour at any authorized MOTO-SKI dealer during said warranty period.

EXCLUSIONS

Items and components

Any of the following expendable items and / or components that are damaged or worn due to normal use: variable speed drive belt, windshield, filters, ignition breaker points, condensers, spark plugs, light bulbs, protective lenses, brake linings, ski runner shoes, slider shoes on suspension and variable speed pulleys, labels, soft trim, appearance items, lubricants and paints and all tune-ups and adjustments required, seized, melted or holed piston.

Also excluded are:

- Damage resulting from installation of parts other than genuine BOMBARDIER parts.
- Damage caused by failure to provide **proper maintenance** as detailed in the **Operator Manual** supplied with each MOTO-SKI snowmobile. The labour, parts and lubricants cost of all maintenance services, including tune-ups and adjustments will be charged to the owner.
- Damage resulting from improper servicing or adjustment of the drive pulley assembly. **The drive pulley assembly is factory sealed, and can only be serviced by an authorized MOTO-SKI dealer.**
- Vehicles used for racing purposes.
- Vehicles used for rental or other business purposes.
- All optional accessories installed on the vehicle. **(The normal warranty policy for parts and accessories if any, applies).**
- Damage resulting from operation of the snowmobile on surfaces other than snow.
- Damage resulting from accident, fire or other casualty, misuse, abuse or neglect.
- Damage resulting from modification to the snowmobile not approved in writing by BOMBARDIER.
- Losses incurred by the snowmobile owner other than parts and labour, such as, but not limited to, transportation, towing, telephone calls, taxis, or any other incidental or consequential damages.

Some states or provinces do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply.

CONDITION TO HAVE WARRANTY WORK PERFORMED

Present, to the servicing dealer, the hard copy of the MOTO-SKI Customer Registration card given by the selling dealer at time of purchase.

SECTION 09 (WARRANTY)

EXPRESSED OR IMPLIED WARRANTIES

This warranty gives you specific rights, and you may also have other legal rights which may vary from **state to state, or province to province**.

Where applicable this warranty is expressly in lieu of all other expressed or implied warranties of BOMBARDIER, its distributors and the selling dealer, including any warranty of merchantability of fitness for any particular purpose; otherwise the implied warranty is limited to the duration of this warranty. However, some states or provinces do not allow limitations on how long an implied warranty lasts, so the above limitation may not apply.

Neither the distributor, the selling dealer, nor any other person has been authorized to make any affirmation, representation or warranty other than those contained in this warranty, and if made, such affirmation, representation or warranty shall not be enforceable against BOMBARDIER or any other person.

CONSUMER ASSISTANCE

If a servicing problem or other difficulty occurs, we suggest the following:

1. Try to resolve the problem at the dealership with the Service Manager or Owner.
2. If this fails, contact your area distributor listed in the operator manual.
3. Then if your grievance still remains unsolved, you may write to us:
Bombardier Limited
Customer Relations Dept.
Recreational Product Group
Valcourt, Quebec, Canada, J0E 2L0

Bombardier Limited reserves the right to modify its warranty policy at any time, being understood that such modification will not alter the warranty conditions applicable to vehicles sold while the above warranty is in effect.

JANUARY 1978
BOMBARDIER LIMITED
Valcourt, Quebec, Canada, J0E 2L0

*Trademark of Bombardier Limited
® Registered Trademark of Bombardier Limited

