



SAFETY NOTICE

This Shop Manual has been prepared primarily for use by professional snowmobile mechanics, who are already familiar with all service procedures relating to Bombardier made snowmobiles, and secondly to assist the mechanically snowmobiler who has limited access to an authorized dealer, or prefers to perform his own servicing.

In either case, special tools must be used, where required, and a good sense of safety is deemed necessary. If in doubt, contact your dealer for assistance.

This manual emphasizes particular information denoted by the wording and symbols;

◆ **WARNING:** Identifies an instruction which, if not followed, could cause personal injury.

▼ **CAUTION:** Denotes an instruction which, if not followed, could severely damage vehicle components.

○ **NOTE:** Indicates supplementary information needed to fully complete an instruction.

Although the mere reading of such information does not eliminate the hazard, your understanding of the information will promote its correct use.

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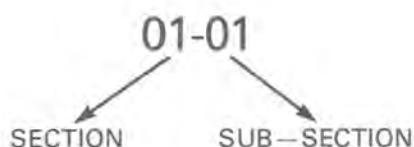
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THE SKI-DOO SNOWMOBILE SHOP MANUAL

DEFINITION OF NUMBERING SYSTEMS

The manual makes use of a 2-part digital numbering system (i.e. 01-01), in which the first digit represents the Section, the second digit the Sub-section.



The numerotation at the bottom of each page assists the user in page location.

ARRANGEMENT OF THE MANUAL

The Manual is divided into nine (9) major sections: (01) Suspension, (02) Transmission, (03) Steering, (04) Engine, (05) Electrical, (06) Chassis, (07) Tools, (08) Technical Data, (09) Warranty.

Each section is comprised of various sub-sections, and yet again, although not indicated in the table of content, each sub-section has one or more divisions. For example, Section 01 — Suspension. Sub-section 02. Slide suspension, contains three divisions, "Ground Leveler", "Torque Reaction", and "High Performance" slide suspensions.

ILLUSTRATIONS & PROCEDURES

An exploded view is conveniently located as close as possible to the written procedures and is meant to assist the user in identifying parts and components. When something special applies (such as adjustment,... etc), the specific parts are circled and referred to in the text.

As many of the procedures in this manual are inter-related, we suggest that before undertaking any task, you read and thoroughly understand the entire section or sub-section in which the procedure is contained.

A number of procedures throughout the book require the use of special tools. Where a special tool is indicated, refer to section 7. Before commencing any procedure, be sure that you have on hand all of the tools required, or approved equivalents.

GENERAL

All of the information, illustrations and component / system descriptions contained in this manual are correct at time of publication. Bombardier Limited, however, maintains a policy of continuous improvement of its products without imposing upon itself any obligation to install them on products previously manufactured.

This manual has been published by the

TECHNICAL INFORMATION CENTRE
SERVICE DEPARTMENT
BOMBARDIER LIMITED
VALCOURT, QUEBEC, CANADA



SLIDE SUSPENSION APPLICATION

SUSPENSION TYPE	APPLICATION
Ground Leveller	Olympique 1973 T'NT F / C (15 inches) 1973 Elan 294 SS 1974 Elan 300 SS 1975
High Performance	T'NT F / A 1973 — 1974
Torque Reaction	T'NT F / C, Everest 1974
Torque Reaction type 1	T'NT F / C 1975-1976 T'NT F / A 1975-1976 Everest 1977 RV 1977
Torque Reaction type 2	Olympique 1975-1976-1977 T'NT 1977
Torque Reaction type 3	T'NT F / A 245 RV 1975



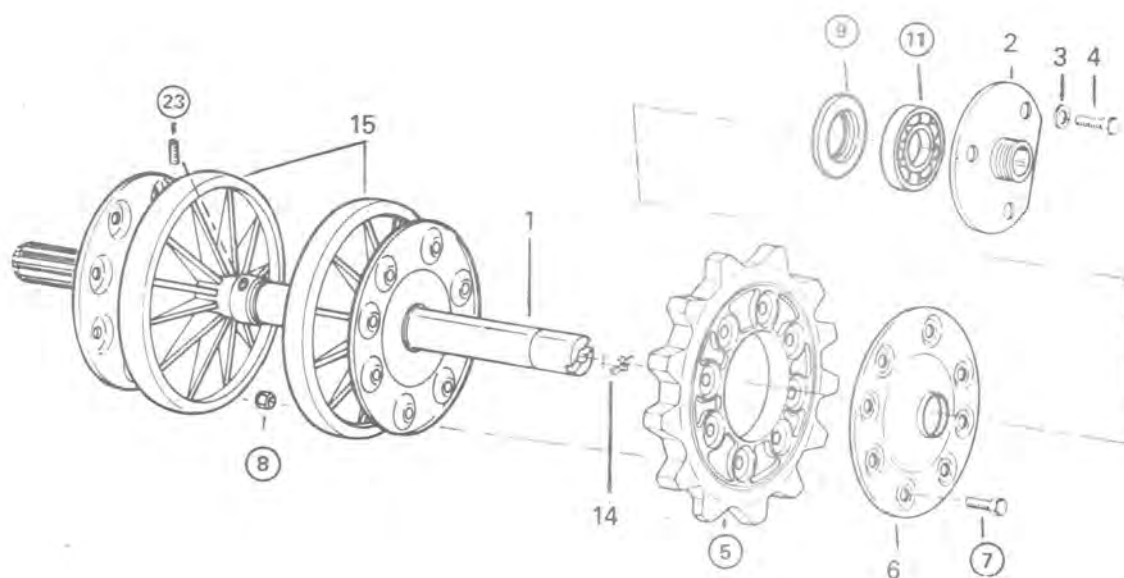
DRIVE AXLE TYPES APPLICATION CHART

DRIVE AXLE WITH CENTER IDLER	Nordic 1974
DRIVE AXLE WITH TWO (2) SIDE IDLERS	Olympique (slide) 1974
DRIVE AXLE WITH TWO (2) INNER IDLERS	T'NT F / A 1974, 1975
DRIVE AXLE WITH TWO (2) INNER IDLERS TYPE 1	T'NT RV 1976
DRIVE AXLE WITH HEXAGONAL SHAFT INTERNAL DRIVE TRACK	RV 250 1975
DRIVE AXLE WITH NARROW SPROCKETS, 9 TOOTH	Elan 1974, 75, 76, 77 Olympique 1974, 75, 76, 77 Alpine 1974, 75, 76, 77 Elite 1974, 75
DRIVE AXLE WITH NARROW SPROCKETS, 11 TOOTH	T'NT 1977 RV 1977
DRIVE AXLE WITH WIDE SPROCKETS, NARROW SPACERS	Olympique (slide) 1975, 76, 77
DRIVE AXLE WITH WIDE SPROCKETS, LARGE SPACER	T'NT F / C & Everest 1974, 75, 76 Everest 1977

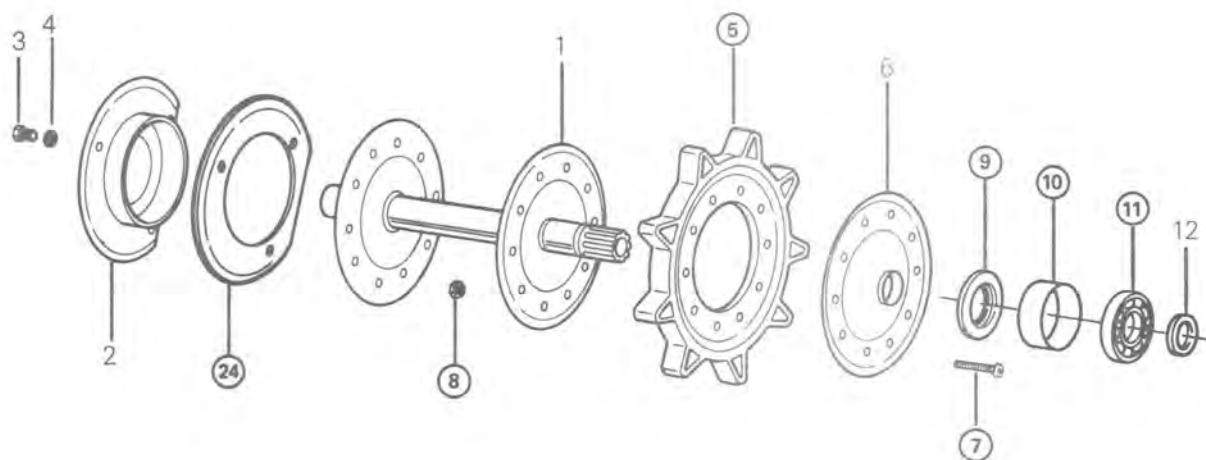




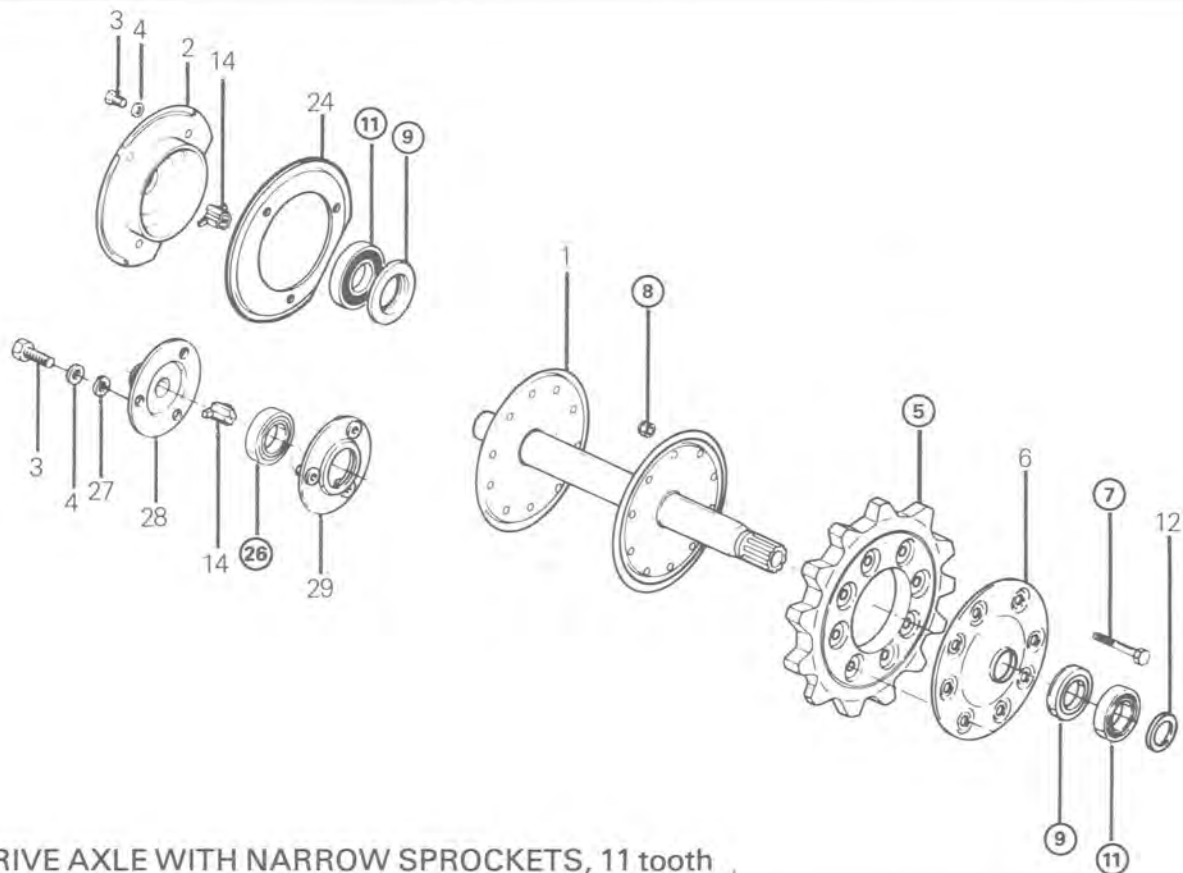
SECTION 01
SUB-SECTION 04 (DRIVE AXLE)



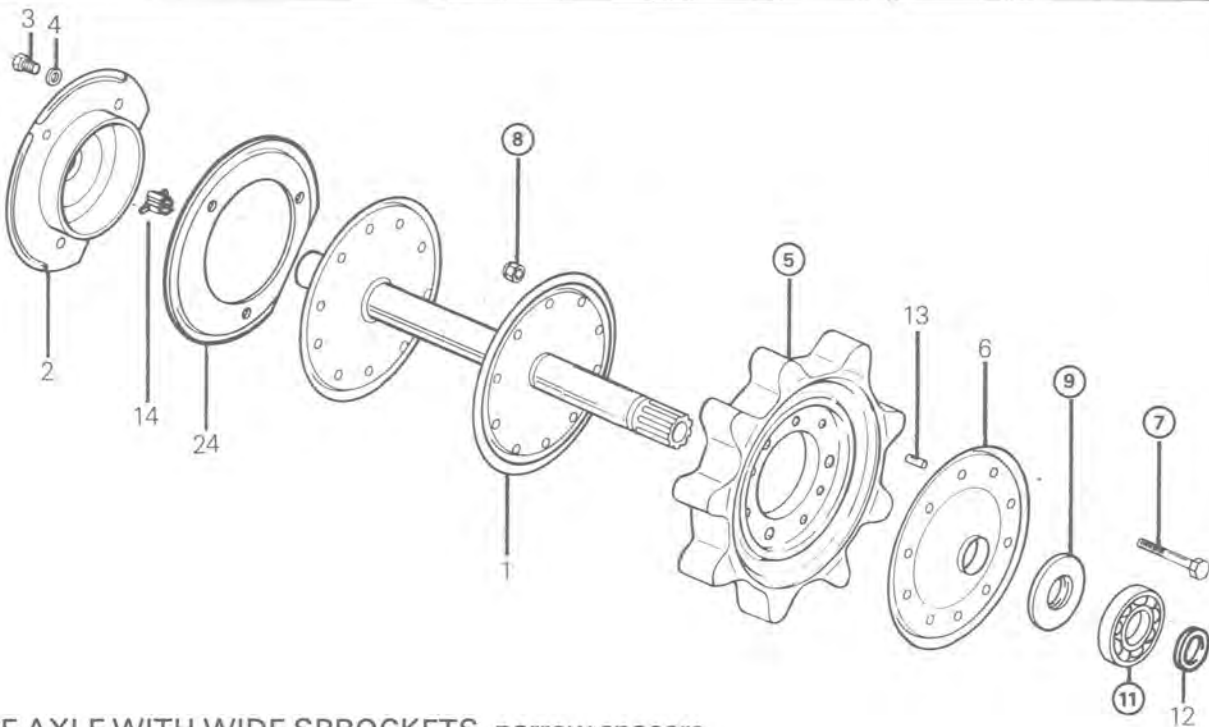
DRIVE AXLE WITH TWO INNER IDLERS



DRIVE AXLE WITH NARROW SPROCKETS, 9 tooth

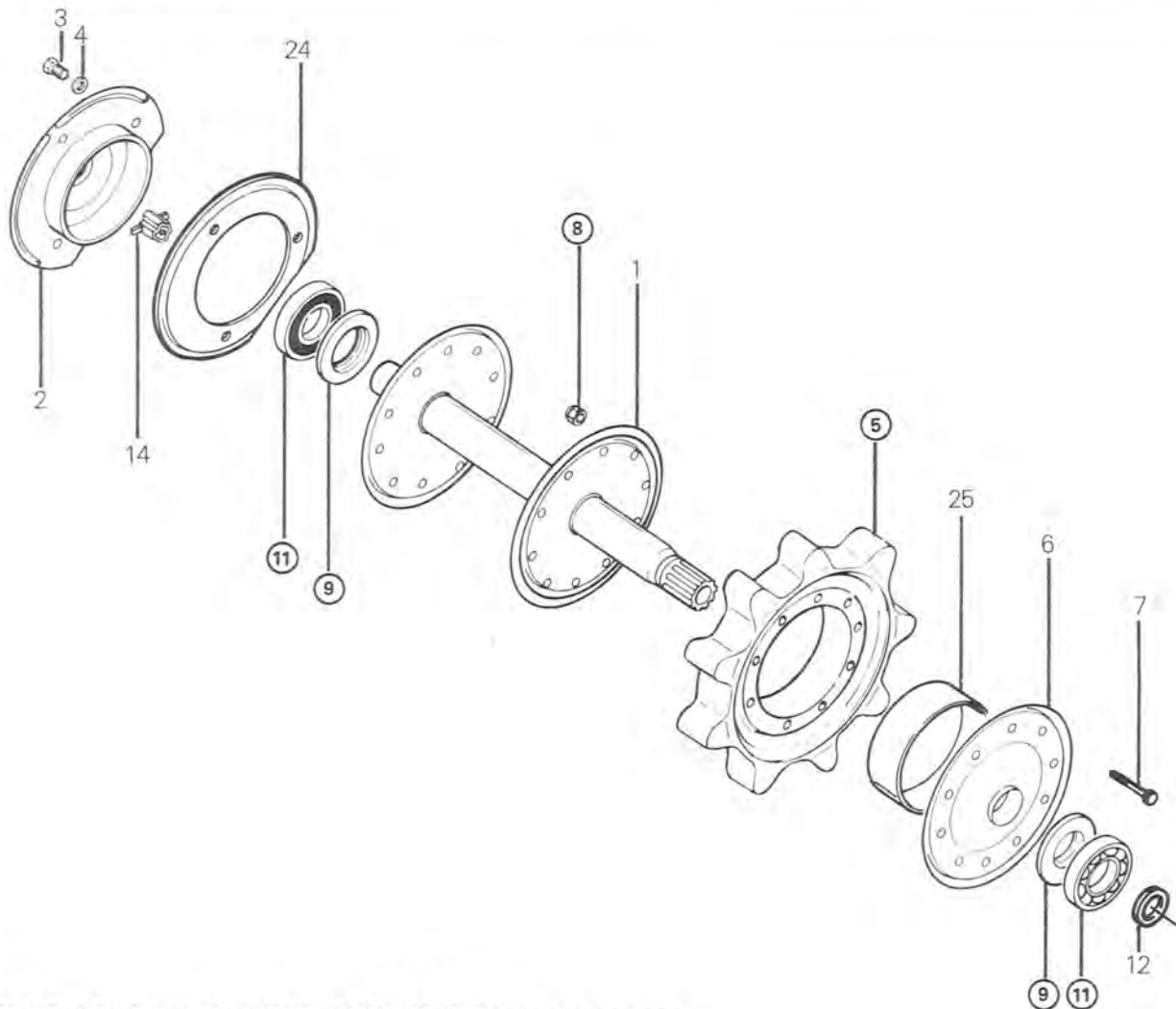


DRIVE AXLE WITH NARROW SPROCKETS, 11 tooth



DRIVE AXLE WITH WIDE SPROCKETS, narrow spacers

SECTION 01
SUB-SECTION 04 (DRIVE AXLE)



DRIVE AXLE WITH WIDE SPROCKETS, large spacer

- 1. Drive axle
- 2. End bearing housing
- 3. Screw
- 4. Lock washer
- 5. Sprocket
- 6. Flange (sprocket)
- 7. Bolt
- 8. Nut
- 9. Oil seal
- 10. Spacer
- 11. Bearing
- 12. Shim
- 13. Spacer
- 14. Speedo drive insert
- 15. Idler

- 16. Flange (idler)
- 17. Idler wheel
- 18. Bearing
- 19. Screw
- 20. Nut
- 21. "O" ring
- 22. Collar
- 23. Allen screw
- 24. Retainer ring
- 25. Spacer
- 26. Bearing
- 27. Flat washer
- 28. End bearing housing half (outer)
- 29. End bearing housing half (inner)

REMOVAL

Drain oil from chaincase or gear box.

Release drive chain tension (if applicable).

On models equipped with a spacer between chaincase and frame; remove the chaincase.

Raise and block rear of vehicle off ground.

Remove suspension.

Pry oil seals from chaincase and end bearing housing.

Remove end bearing housing.

NOTE: If applicable, remove battery and its seat. If vehicle is equipped with a speedometer, remove angle drive unit and coupling cable.

Remove the cotter pin and shim from chaincase side.

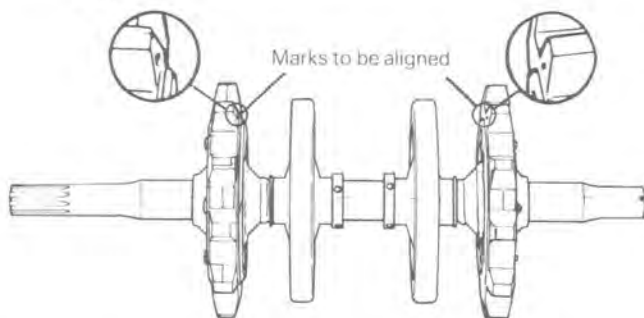
Release drive sprocket teeth from track notches, at the same time, pulling the drive axle towards the end bearing housing side of frame. (This action will disengage the axle splines from the lower chaincase sprocket).

Remove drive axle from vehicle. If applicable, pull out shim located between bearing and lower chaincase sprocket.

DISASSEMBLY & ASSEMBLY

⑤ Before securing sprockets and flanges, place axle assembly on a even surface and check alignment of sprocket teeth.

NOTE: On some models sprocket teeth must be synchronized, make sure that aligning dots are in line.



⑦⑧ Tightening torques for sprockets are: 0.3-0.4 kg-m (2.3 ft-lbs) for narrow sprockets, and 0.6-0.7 kg-m (4.5 ft-lbs) for wide sprockets.

⑨ When assembling drive axle, always position a new oil seal on each end of axle. The seal lip must face sprocket.

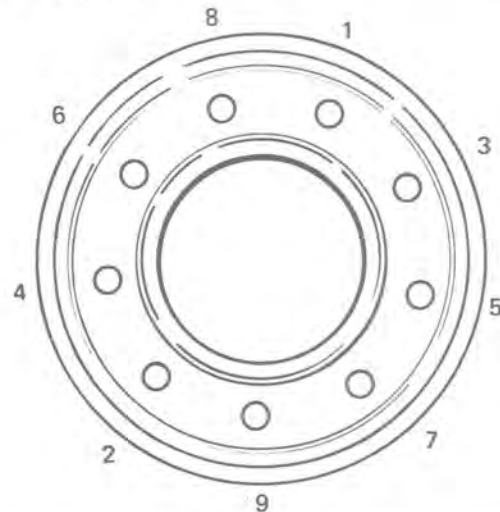
⑩ Applicable on twin cylinder, fan cooled engines with aluminum chaincase.

⑪ Always pull or push bearing by inner race.

The bearing on the splined side of axle must be pushed until it is seated on bearing stop. The end housing bearing must be flush with end of drive axle. Each bearing must have it's shield facing the sprocket.

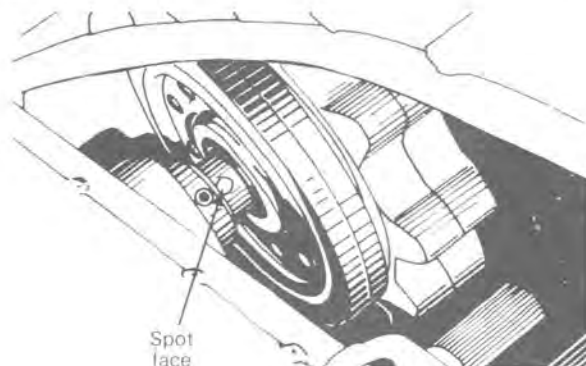
⑭ If the drive axle to be installed is a new component, and the vehicle is equipped with a speedometer, a correct size speedometer drive insert must be installed into the axle end. Ensure that insert is flush with end of axle.

⑮⑰ Idler wheels are factory riveted. When separation is necessary, remove rivets securing idler by using a 1/4" dia. bit. Secure idler wheel and flanges using bolts and nuts tightened in the following sequence to 0.3-0.4 kg-m (2-3 ft-lbs).



To remove center idler wheel tire, apply liquid soap or petroleum jelly on idler bead and flange then with two screwdrivers (round bars), pass the idler wheel tire over flange. Reverse change-over procedure to install idler wheel tire.

⑳㉑ The locking collar Allen screw must sit into the spot face of the axle. On spare parts, if the spot face is absent, use a 15/64" dia. bit and drill to a depth of 2 mm (5/64"). Spot face location is 8 mm (5/16") from bearing idler.



㉒ This end bearing housing bearing has a shield on each side.

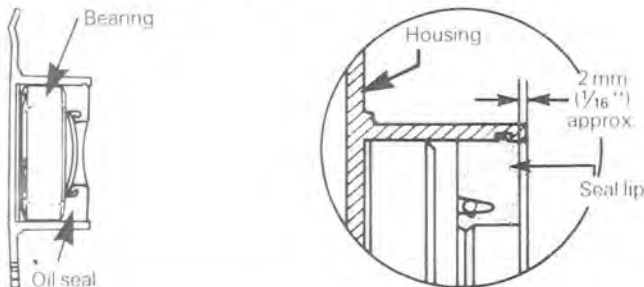
SECTION 01
SUB-SECTION 04 (DRIVE AXLE)

INSTALLATION

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

Position drive axle assembly into location. Install shim between bearing and lower chaincase sprocket. Install end bearing housing.

Install chaincase and position oil seals, making sure that a gap of approximately 2 mm ($\frac{1}{16}$ ") exists between end of bearing housing and each oil seal.



Replenish chaincase with oil, and check chain tension and pulley alignment.

Install suspension.

Apply track tension and carry out track alignment procedure.

TRACK

TRACK TYPES APPLICATION

Refer to "Technical Data" section 08, 01-05.

REMOVAL

Raise and block rear of vehicle off the ground.

Remove suspension system.

Remove rear axle.

Remove drive axle and withdraw the track from beneath the vehicle.

INSPECTION

Visually inspect track for cuts and abnormal wear.

Inspect track for broken rods. If excessive damage is evident and rods are broken, replace track.

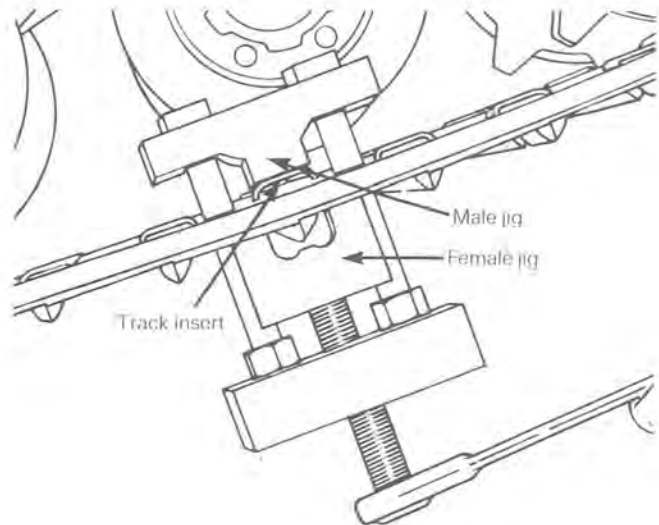
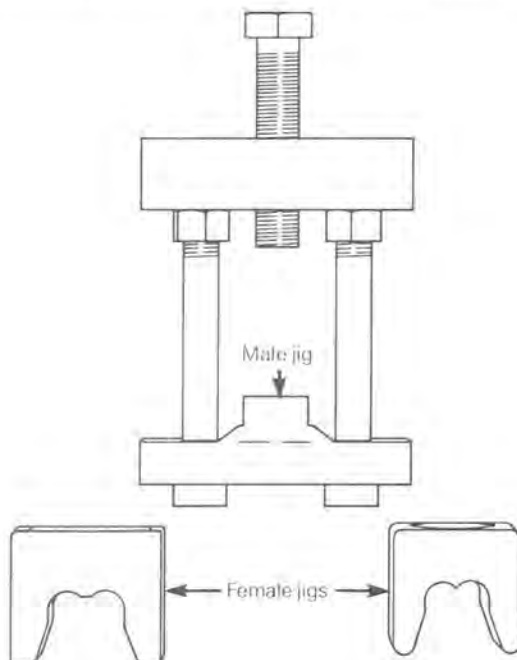
Inspect track for damaged or missing inserts. Replace damaged insert(s).

TRACK INSERT INSTALLATION

Tilt vehicle on its side to expose the track notches then place insert into position.

Place the track insert installer (See Tool Section) into track notches and position male jig on top of track insert.

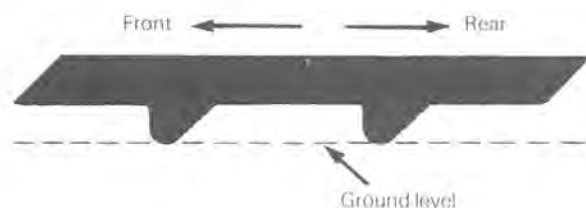
Tighten installer bolt until track insert is locked in place.



INSTALLATION

Raise and block rear of vehicle off the ground. Position track beneath the vehicle frame tunnel.

NOTE: When installing the track, ensure the right angle of bearing surface of the track rib is facing the front of vehicle.



Install drive axle.

If applicable, install rear axle. Install suspension system.

Carry out track tension and alignment procedure.

TRACK TENSION & ALIGNMENT

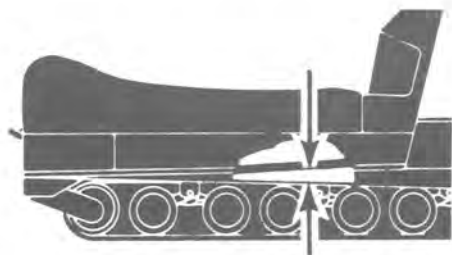
Track tension and alignment are inter-related. Do not adjust one without checking the other. Track tension procedure must be carried out prior to track alignment.

TENSION (Bogie wheel), all except Alpine

With rear of vehicle blocked off the ground, check the track tension at middle set of bogie wheels as indicated in the Technical Data (Section 08, 01-05).

SECTION 01

SUB-SECTION 05 (TRACK)



If applicable, ensure link plate springs are in the middle position of the 3 position slotted anchors.

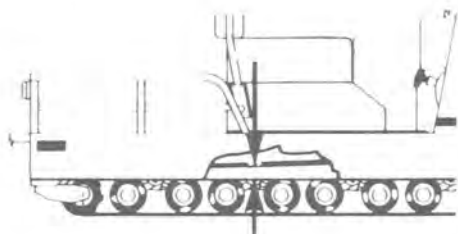
To correct track tension, loosen link plate spring lock nuts on inner side of link plate springs. Turn adjuster bolts clockwise to tighten track or counter-clockwise to slacken.

Tighten link plate spring lock nuts.

TENSION (Bogie wheel), Alpine

With rear of vehicle blocked off the ground, check the tension of each track as indicated in Technical Data (Section 08, 01 05).

Deflection should be measured between top inside edge of track and center of bogie wheel set retaining bolt.

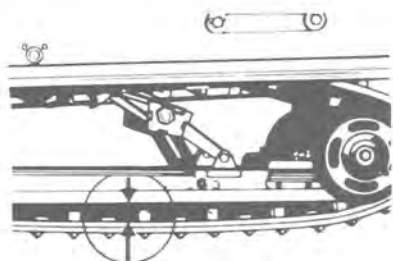


To correct track tension, loosen link plate spring lock nuts on inner side of link plate springs. Turn adjuster bolts clockwise to tighten track or counter-clockwise to slacken.

Tighten link plate spring lock nuts.

TENSION (Slide Suspension)

With rear of vehicle blocked off the ground, check track tension as indicated in Technical Data (section 08, 01 02). Deflection should be measured between slider shoe and bottom inside of track.



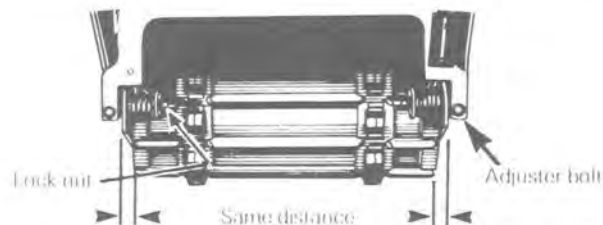
To adjust, loosen or tighten adjuster bolts located on inner side of rear idler wheels.

ALIGNMENT (Bogie Wheel)

With rear of vehicle supported off the ground, start engine and allow the track to rotate slowly.

Check if track is well centered and turns evenly on rear sprockets. Distance between edge of track and link plate must be equal on both sides. (If applicable, ensure link plate springs are in the middle position of the 3 position slotted anchors).

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.



Rotate track slowly and recheck alignment and tension.

To correct alignment, loosen link plate spring lock nut on side where track is closest to the link plate.

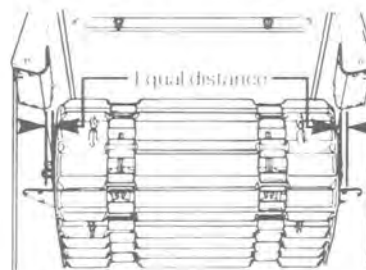
Turn track adjuster bolt on same side, clockwise until track re-aligns.

Tighten link plate spring lock nut.

ALIGNMENT (Slide Suspension)

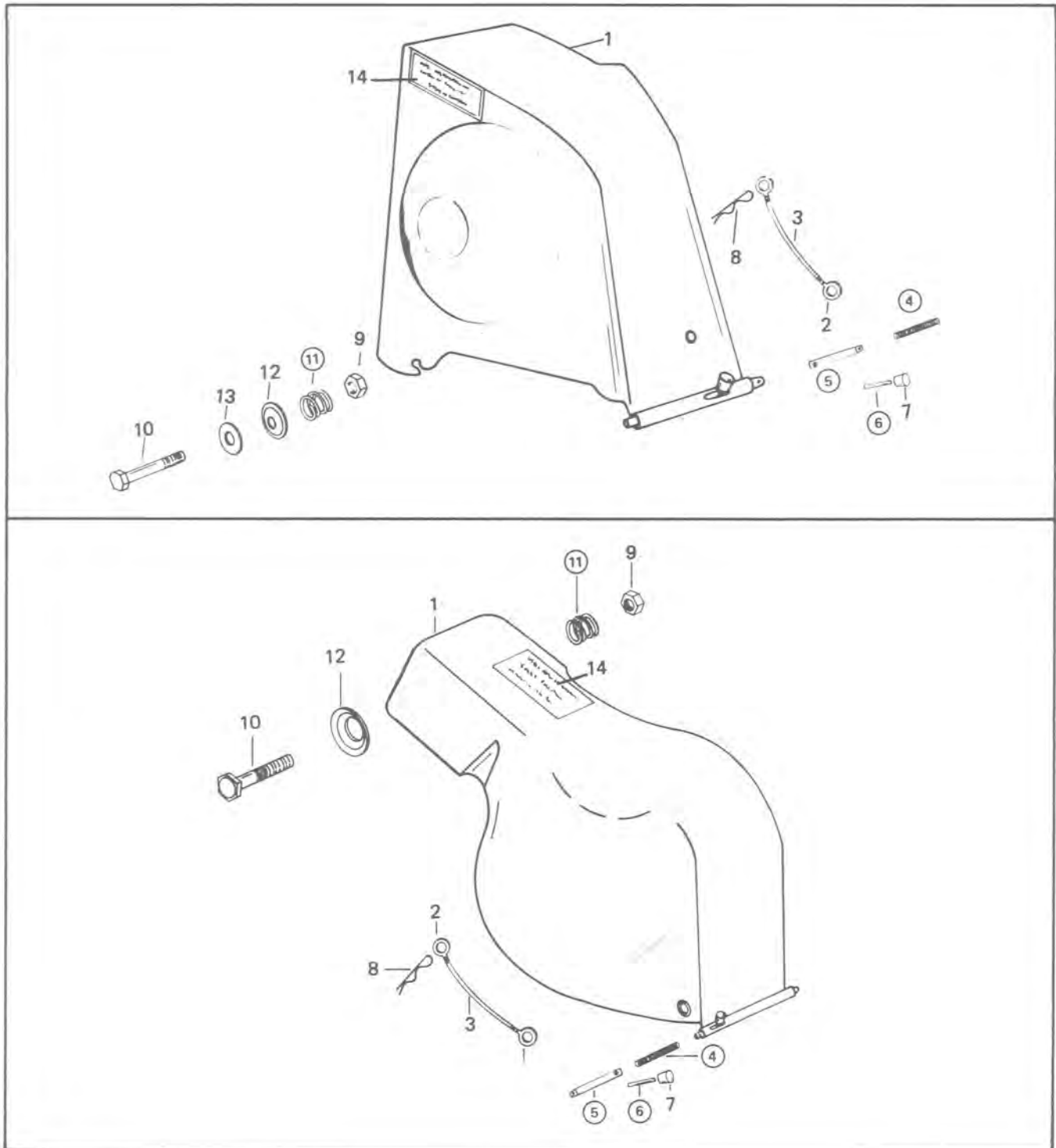
With rear of vehicle supported off the ground, start engine and allow the track to rotate slowly.

Check that track is well centered and turns evenly. To correct, stop engine then loosen the lock nuts and tighten the adjuster bolt on side where track is closest to the frame. Tighten lock nuts and recheck alignment.



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, tools, feet and clothing clear of track.

PULLEY GUARD



1. Pulley guard
2. Open barrel
3. Wire
4. Spring (pin)

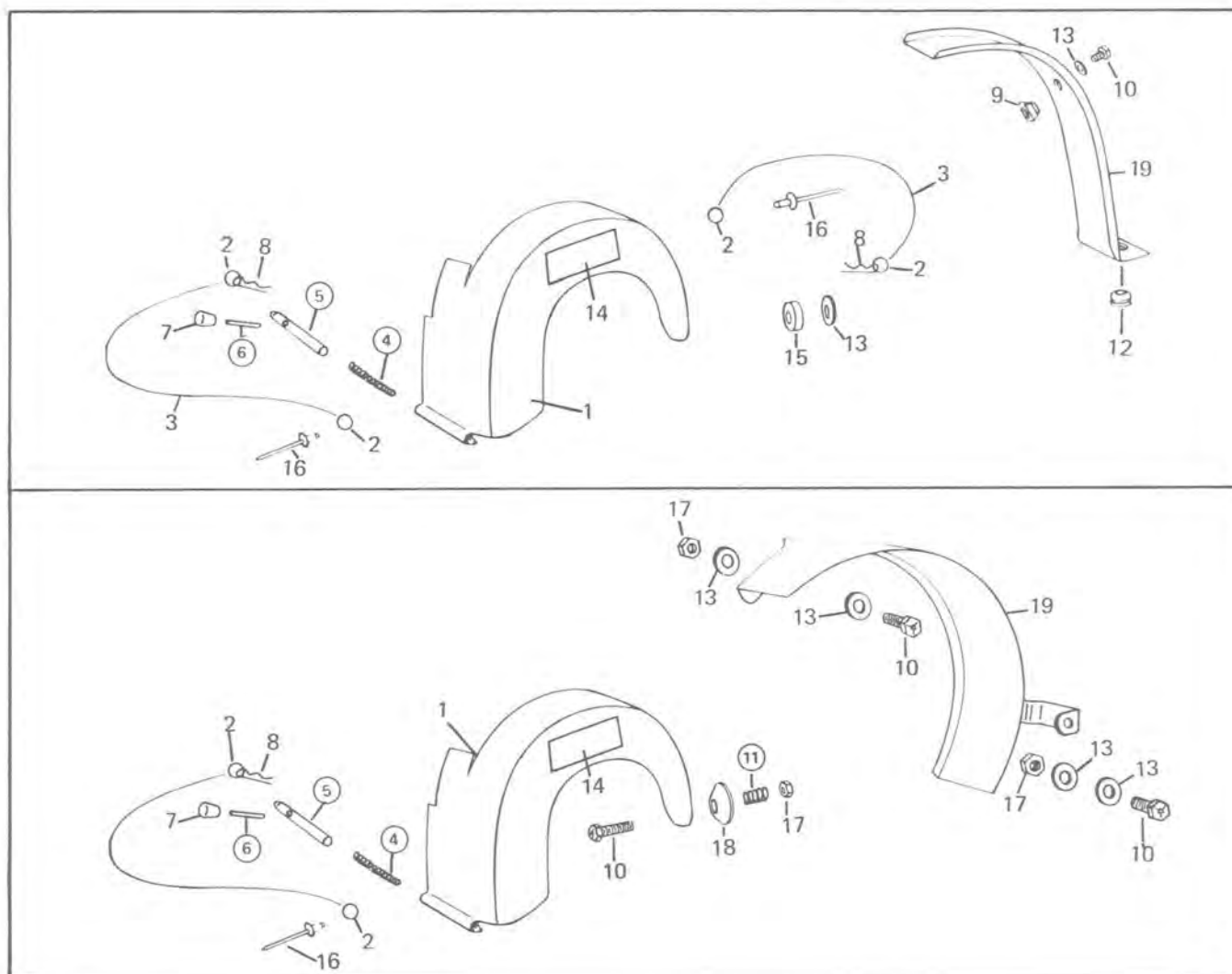
5. Pin
6. Spirol pin
7. Cap
8. Hair pin cotter

9. Nut
10. Bolt
11. Spring
12. Retainer washer

13. Flat washer
14. Pulley guard label

SECTION 02

SUB-SECTION 01 (PULLEY GUARD)



- | | | | |
|-----------------|--------------------|------------------------|-------------------------|
| 1. Pulley guard | 6. Spirol pin | 11. Spring | 16. Rivet |
| 2. Open barrel | 7. Cap | 12. Grommet | 17. Nut |
| 3. Wire | 8. Hair pin cotter | 13. Flat washer | 18. Retainer washer |
| 4. Spring (pin) | 9. Clip nut | 14. Pulley guard label | 19. Driven pulley guard |
| 5. pin | 10. Bolt | 15. Rubber washer | |

REMOVAL

Pull out hair pin cotter and pull on spring to disengage pin from frame bracket. Disengage guard from front bracket.

○ **NOTE:** If necessary to remove driven pulley guard, remove bolts and nuts securing it to frame.

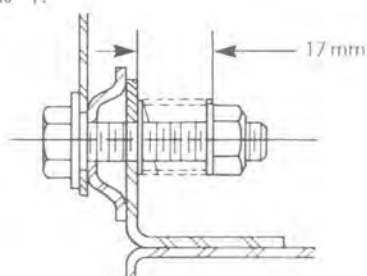
◆ **WARNING:** Never start engine until pulley guard is well installed.

INSPECTION

⑤⑥ Check condition of coil pin. If damaged, replace.

④ The length of uncompressed pin spring should not be less than 47 mm (1 7/8").

⑪ An uncompressed front guard spring should not be less than 20 mm (13/16"). When assembling, adjust length to 17 mm (11/16").



INSTALLATION

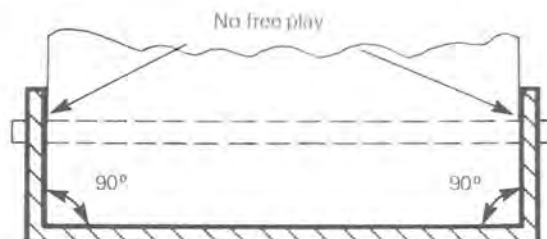
Prior to installation, ensure that pulley guard and frame bracket are 90° with frame.

WARNING: No lateral free-play should exist between pulley guard and frame bracket.

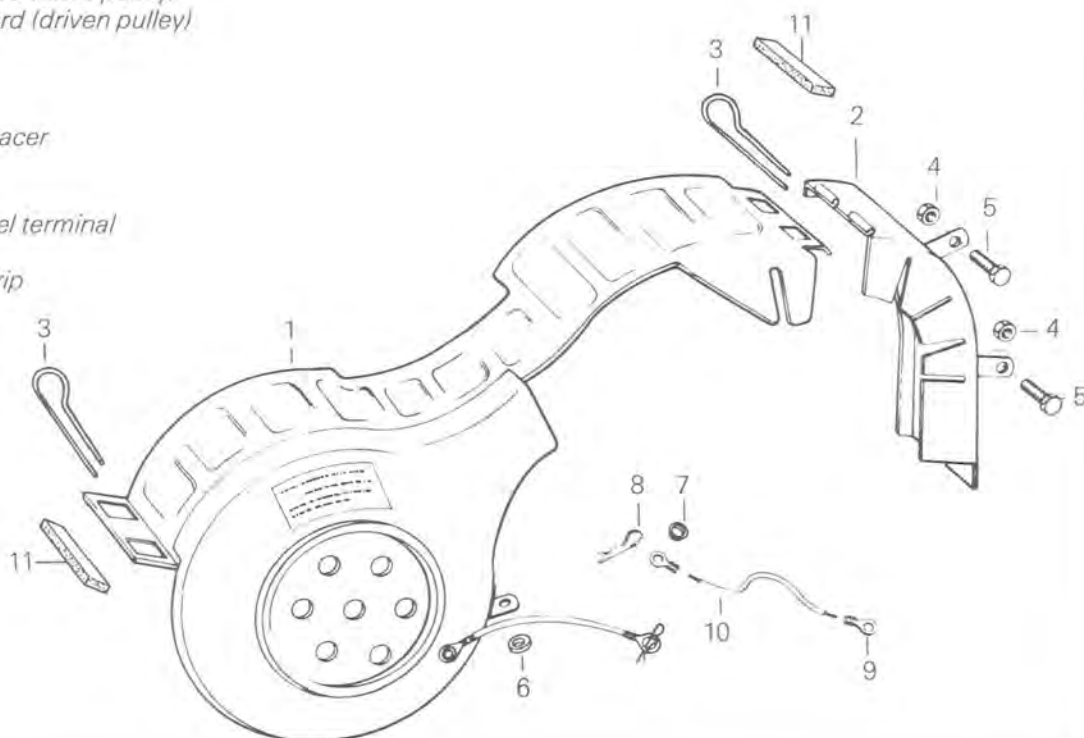
Slide pulley guard into bracket.

Pull on lower spring bolt, engage pin into frame bracket and install hair pin cotter.

NOTE: If driven pulley guard has been removed, secure it to frame using bolts and nuts.



1. Pulley guard (drive pulley)
2. Pulley guard (driven pulley)
3. Hair pin
4. Nut
5. Bolt
6. Rubber spacer
7. Eyelet
8. Hair pin
9. Open barrel terminal
10. Wire
11. Rubber strip



REMOVAL

Remove the three (3) hair pins then remove drive pulley guard.

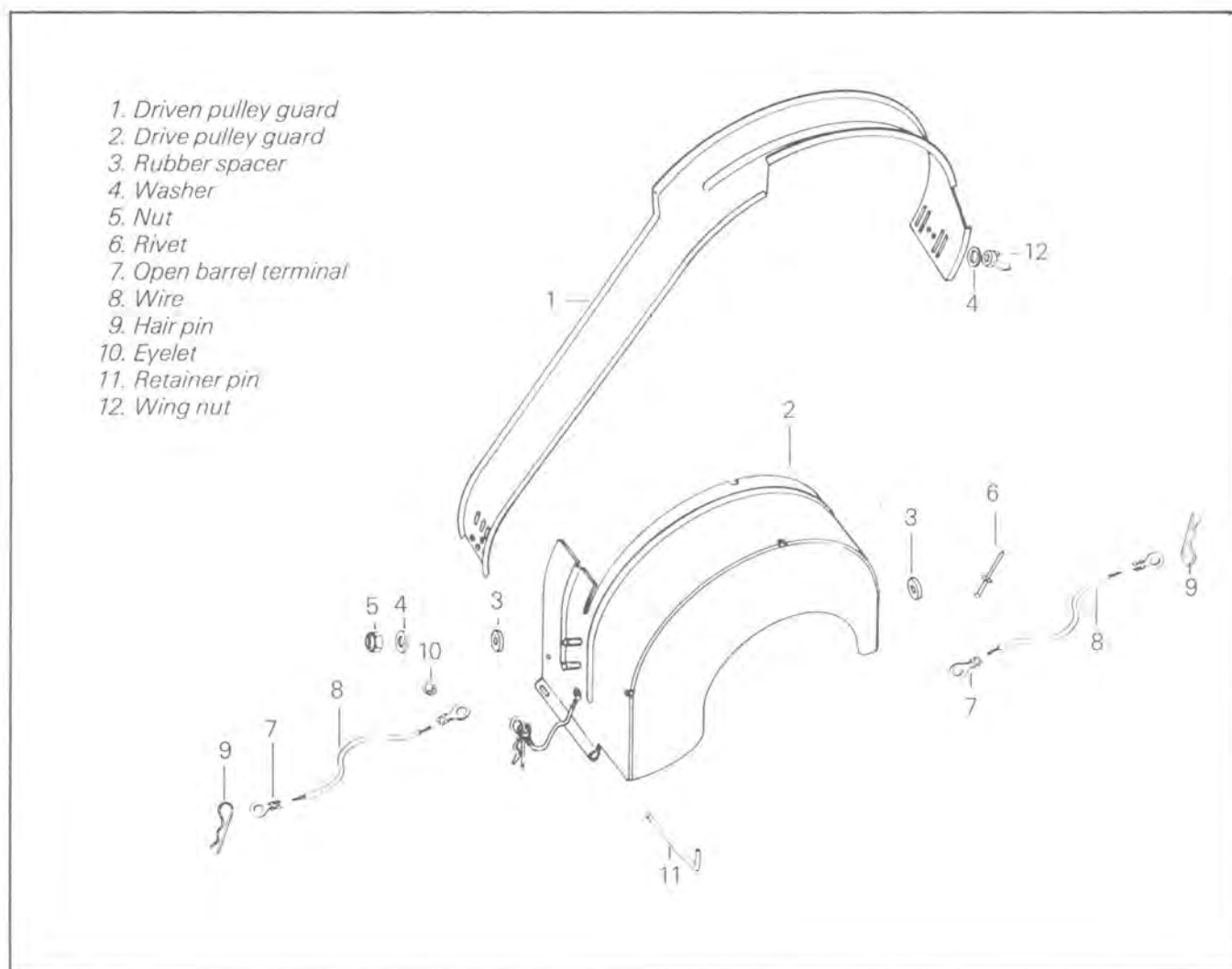
NOTE: If necessary to remove driven pulley guard, remove bolts and nuts securing it to frame.

WARNING: Never start engine until pulley guard is well installed, and cab is closed.

INSPECTION

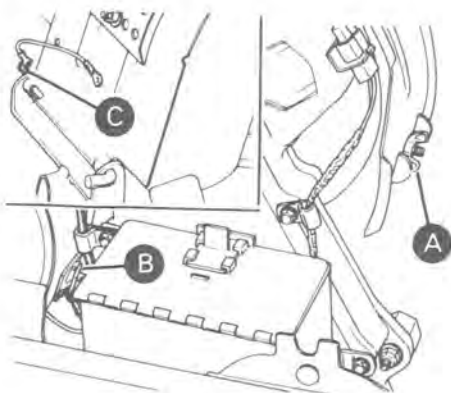
Check general condition of parts. If damaged, replace.

SECTION 02
SUB-SECTION 01 (PULLEY GUARD)



REMOVAL

Unscrew wing nut (A) and pull out hair pins (B & C).



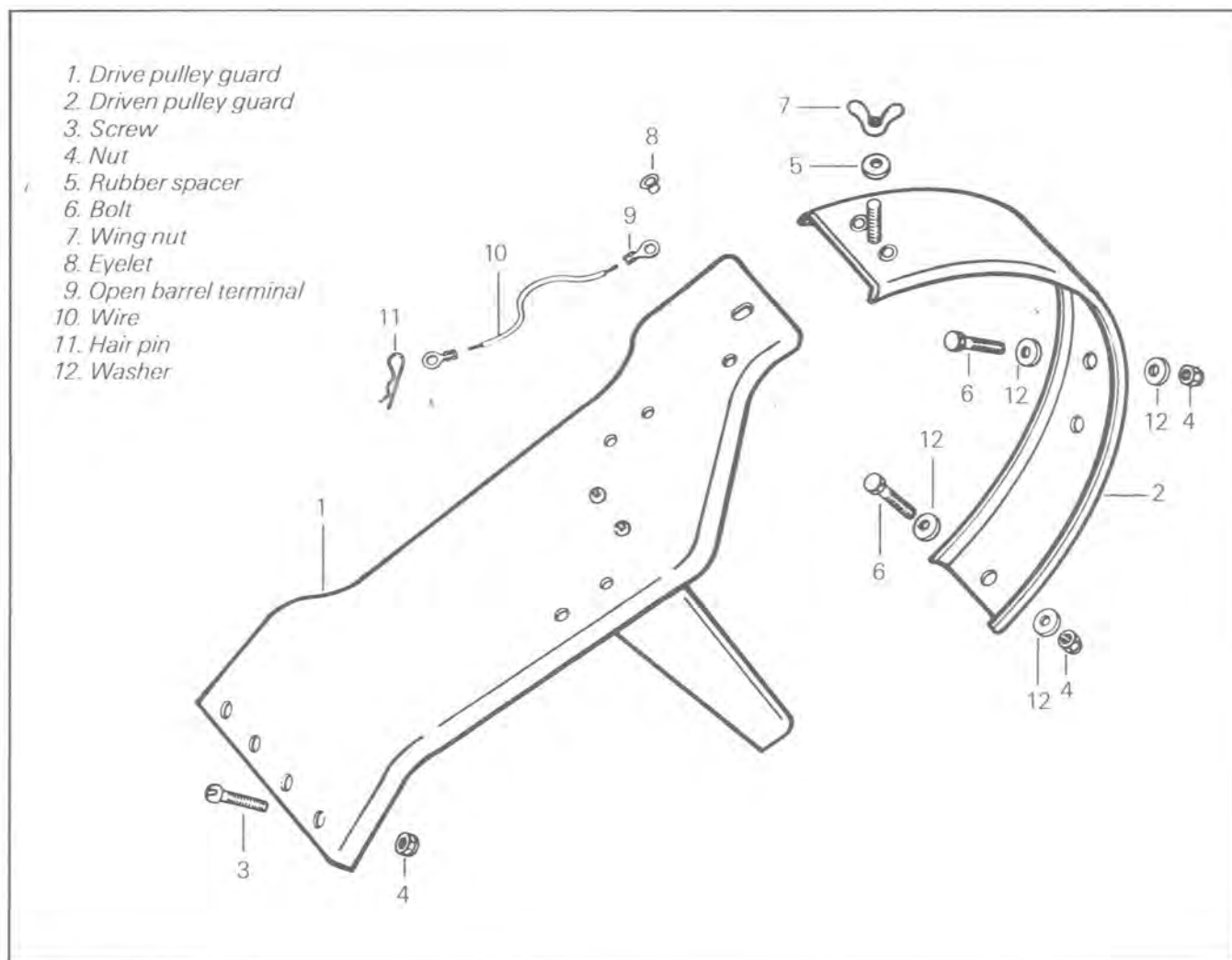
Disengage guard from rear and middle brackets then disengage retainer pin from front bracket.

Remove complete assembly from vehicle.

WARNING: Never start engine until pulley guard is well installed, and cab is closed.

INSPECTION

Check general condition of parts. If damaged, replace.



REMOVAL

To tilt drive pulley guard, remove hair pin then wing nut.

NOTE: If necessary to remove drive or driven pulley guard, remove bolts and nuts securing it to frame.

WARNING: Never start engine until pulley guard is well installed, and cab is closed.

INSPECTION

Check general condition of parts. If damaged, replace.

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DRIVE BELT

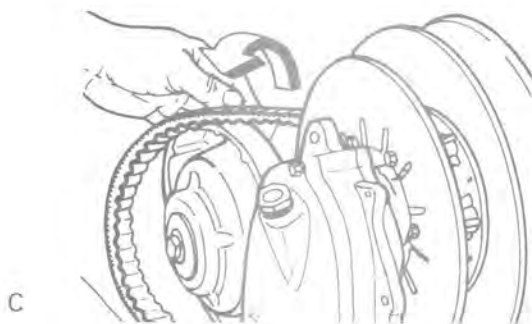
REMOVAL & INSTALLATION

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

Drive Belt Removal

Tilt cab and remove pulley guard. Open drive pulley by twisting and pushing the sliding half. Hold in open position then slip slackened belt over top edge of pulley. Slip belt from drive pulley.

◆ **WARNING:** Never start or run engine without drive belt installed.



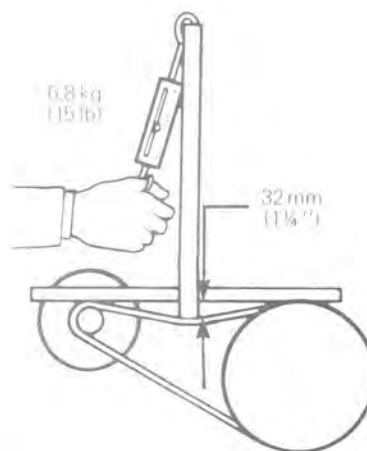
TENSION ADJUSTMENT

For proper drive belt use, see Technical Data.


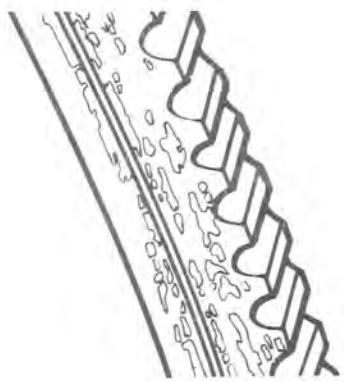
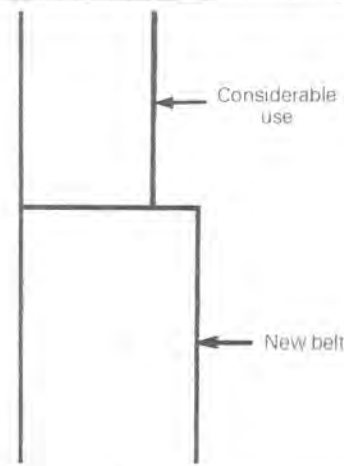
If a drive belt does not have the minimum recommended width, performance will be affected.

Adjust belt tension as follows:

Position a reference rule on drive belt. Using a wooden stick and fish scale, apply a 6.8 kg (15 pounds) pressure on drive belt. Deflection must be 32 mm (1 1/4"). To correct, decrease or increase distance between pulleys.



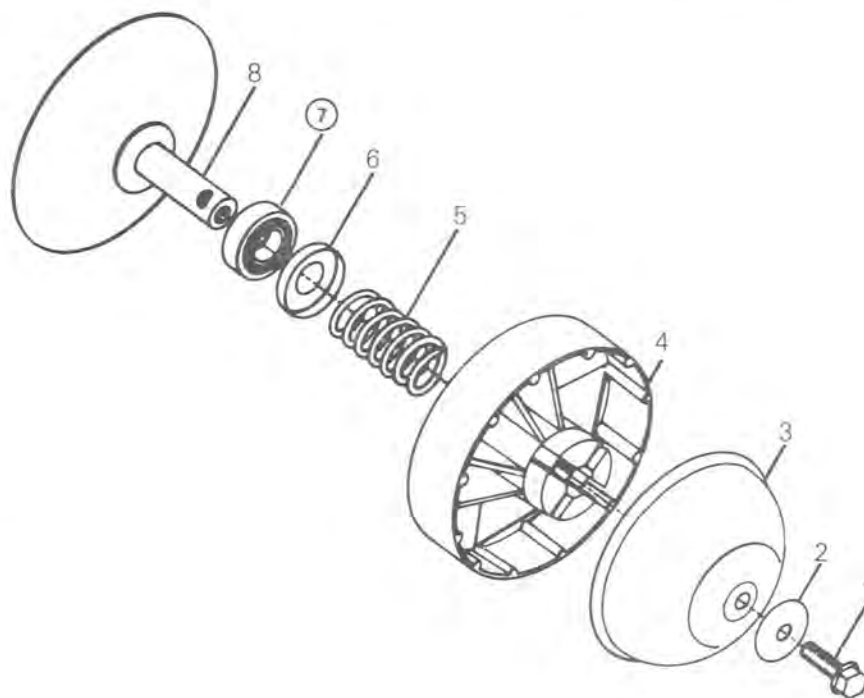
TROUBLE SHOOTING

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 has 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 and lubricate with low temperature grease. 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 $\frac{1}{8}$ " less than recommended width (see Technical Data).

DRIVE PULLEY APPLICATION CHART

PRESSURE LEVER TYPE	Olympique 1974 Alpine 1974 Olympique 300 mono 1976
ROLLER ROUND SHAFT	Elan 250 1974-75-76-77 Olympique 300 mono 1977
HIGH PERFORMANCE	T'NT F / A 1974-75
ROLLER SQUARE SHAFT	Elan 294 SS 1974, 250 Deluxe & 300 SS Olympique 1975, Olympique Plus 1976 Nordic 1974 Elite 1974-75 T'NT F / C & Everest 1974-75 Alpine 1975
ROLLER SQUARE SHAFT WITH HUB PLUG	T'NT R / V 1975
ROLLER SQUARE SHAFT WITH DURALON BUSHING	Olympique twin 1976-77 T'NT F / C & Everest 1976 T'NT R / V 1976 Everest, T'NT, R / V, 1977
ROLLER SQUARE SHAFT BEARING TYPE	Alpine 1976
ROLLER SQUARE SHAFT BEARING TYPE WITH DURALON BUSHING	Alpine 1977

PRESSURE LEVER TYPE



- 1. Retaining bolt
- 2. Washer
- 3. Governor
- 4. Sliding half
- 5. Spring
- 6. Spring seat
- 7. Bearing
- 8. Fixed half

WARNING: Drive pulley repairs that include any disassembly or assembly procedures must be performed by an authorized Ski-Doo dealer, or other such qualified person. Sub-component installation and assembly tolerances require strict adherence to procedures detailed.

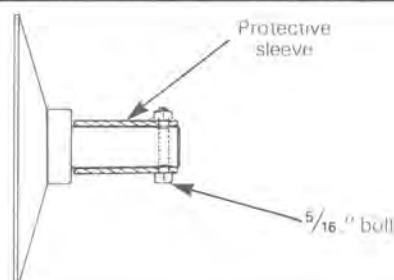
REMOVAL

With engine cold, remove spark plugs then bring P.T.O. (power Take Off) piston at T.D.C. (Top Dead Center) position. Rotate drive pulley 45° **clockwise** then insert enough starter rope into cylinder to fill it completely.

WARNING: Spring pressure can force assembly apart therefore, it is imperative that the governor cup be held firmly during retaining bolt removal.

Remove governor retaining bolt, governor, sliding half, spring and spring seat from fixed half.

To remove fixed pulley half, slide a length of steel pipe over shaft. Attach using a 5/16" nut and bolt, as illustrated. The fixed half can then be removed with a pipe wrench.



DISASSEMBLY & ASSEMBLY

⑦ Bearing is replaceable. Removal and installation is carried out using a standard puller and pusher.

CLEANING & INSPECTION

Clean fixed pulley half shaft and pulley inner faces with fine steel wool and a clean cloth.

Check contact surfaces of sliding half hub and pressure levers for excessive wear. Replace as necessary.

Check pressure lever attachment into governor cup. If excessive play is evident, the governor cup assembly must be replaced.

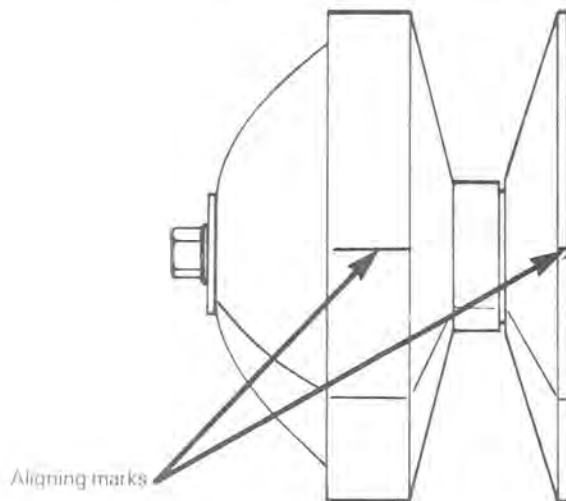
INSTALLATION

Lock crankshaft in position as explained in removal procedure. Make sure crankshaft is rotated 45° **counter-clockwise** from T.D.C. position and that cylinder is completely filled with a starter rope.

Lubricate crankshaft threads and install fixed pulley half.

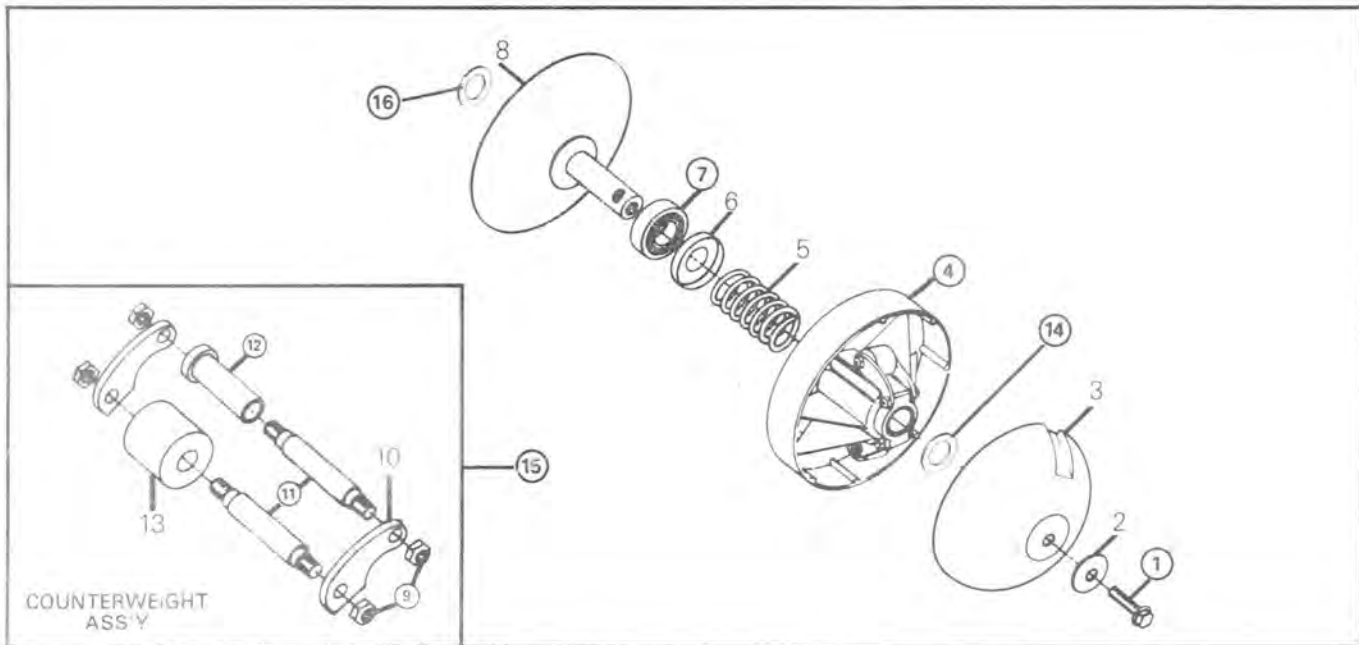
Install spring seat, spring and sliding half on shaft. Make sure that pulley halves marks are aligned.

Pack inside of pulley shaft with "High Performance Clutch Lubricant". Apply a light coat of same lubricant to pressure levers.



Lubricate threads of retaining bolt with light machine oil. Install governor cup, washer and retaining bolt. Torque retaining bolt to 5.1-7.5 kg-m (37-54 ft-lbs).

ROLLER ROUND SHAFT TYPE



- | | |
|-----------------------|-------------------------|
| 1. Retaining bolt | 9. Nut |
| 2. Washer | 10. Counterweight |
| 3. Governor cup | 11. Shouldered pin |
| 4. Sliding half ass'y | 12. Bushing |
| 5. Spring | 13. Roller |
| 6. Spring seat | 14. Shim |
| 7. Bearing | 15. Counterweight ass'y |
| 8. Fixed half | 16. Shim |

WARNING: Drive pulley repairs that include any disassembly or assembly procedures must be performed by an authorized Ski-Doo dealer, or other such qualified person. Sub-component installation and assembly tolerances require strict adherence to procedures detailed.

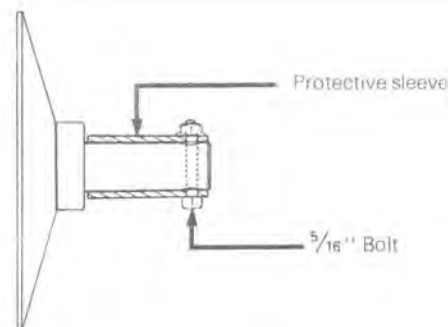
REMOVAL

With engine cold, remove spark plug(s) then bring P.T.O. (Power Take Off) piston at T.D.C. (Top Dead Center) position.

Rotate drive pulley 45° clockwise then insert enough starter rope into cylinder to fill it completely.

WARNING: Spring pressure can force assembly apart therefore, it is imperative that the governor cup be held firmly during governor retaining bolt removal.

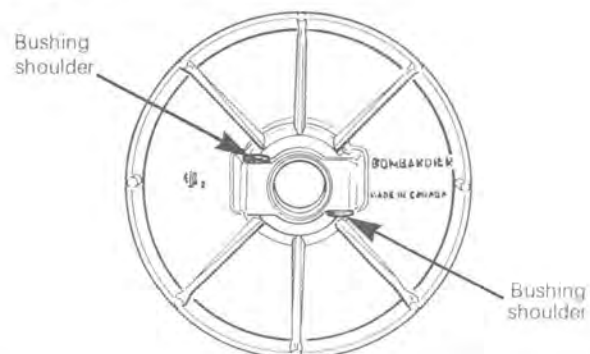
If necessary to remove fixed half, slide a length of steel pipe over shaft. Attach a 5/16" nut and bolt, as illustrated. The fixed half can then be removed with a pipe wrench.



DISASSEMBLY & ASSEMBLY

② At assembly, lube torque bolt to 5.1-7.5 kg-m (37-54 ft-lbs).

④ ⑫ Shouldered pin bushings must be installed in sliding half as per illustration.



SECTION 02

SUB-SECTION 03 (DRIVE PULLEY)

⑦ Bearing is replaceable and can be removed and installed with a standard puller and pusher.

⑨ ⑪ Apply Loctite Lock'n Seal or equivalent on threads then torque nuts to 1.2-1.5 kg-m (9-11 ft-lbs).

⑮ These components are available only in a matched replacement kit. If part replacement becomes necessary, all components within kit must be used.

CAUTION: Do not disassemble counterweight unless replacement is necessary.

⑭ As required, maximum of two (2) Used to obtain a neutral function of the drive pulley when engine is idling: refer to INSTALLATION.

⑯ Used to obtain correct pulley alignment, refer to section 02-05.

CLEANING

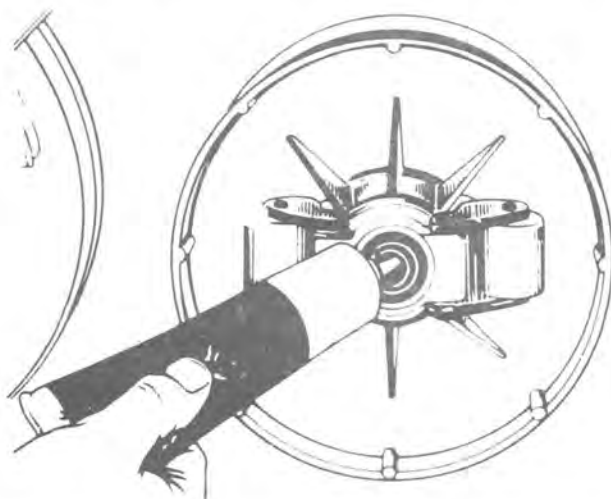
Clean pulley faces and shaft with fine steel wool and dry cloth. Clean sliding half bushing with clean dry cloth.

INSTALLATION

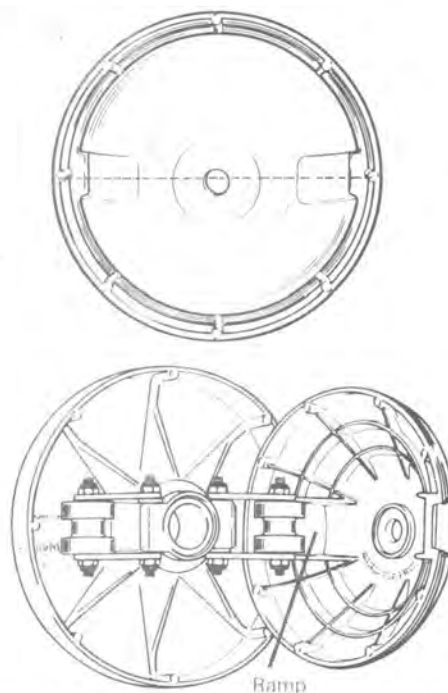
Lock crankshaft in position as explained in removal procedure. Make sure crankshaft is rotated 45° **counter-clockwise** from T.D.C. position and that cylinder is completely filled with a starter rope.

Clean crankshaft extension threads and apply Loctite 242 Lock'n Seal or equivalent then install fixed half on extension. Position spring seat, spring and sliding half on fixed half shaft.

Pack inside of pulley shaft with High Performance Drive Pulley Lubricant.



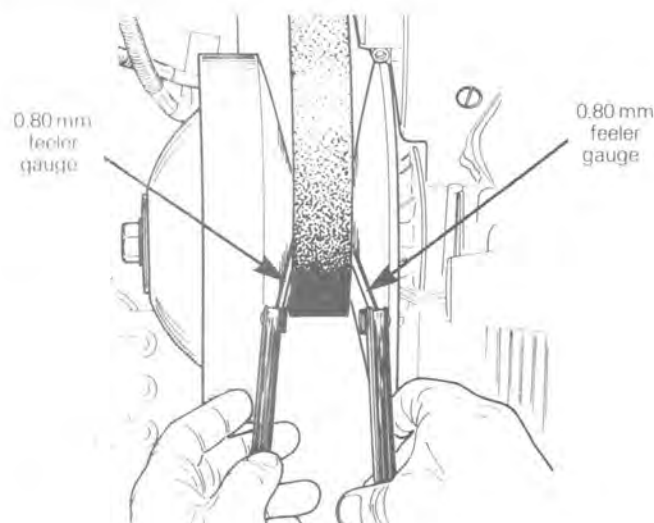
Install governor cup correctly as per illustration making sure that the rollers are sliding on their ramp.



Position retaining bolt then lubetorque to 5.1-7.5 kg-m (37-54 ft-lbs).

WARNING: Shim(s) ⑭ is(are) used to obtain a neutral function of the drive pulley when engine is idling. Proceed as follows when retaining bolt is torqued:

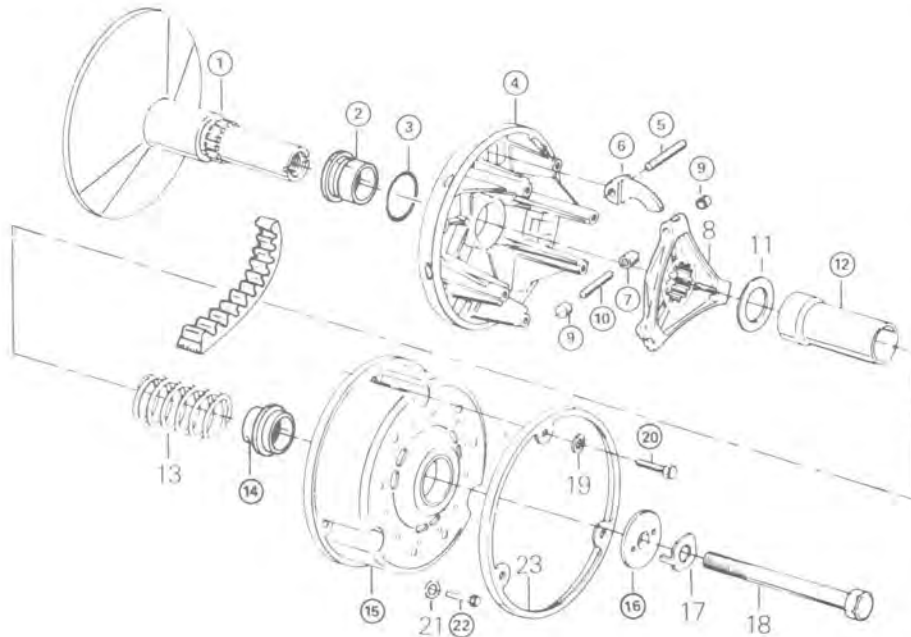
With a **new** drive belt installed, you should be able to insert a minimum of 0.80 mm (.030") thick feeler gauge on each side of the drive belt simultaneously when pushing drive belt to sit on bearing.



Shim ⑭ located between governor cup and drive pulley shaft will help you to obtain correct adjustment, use not more than two (2) shims.

HIGH PERFORMANCE TYPE

1. Fixed half
2. Sliding half bushing
3. Retaining ring
4. Sliding half
5. Counterweight axle
6. Counterweight
7. Roller
8. Governor
9. Glider
10. Roller axle
11. Washer
12. Sleeve
13. Spring
14. Governor guard bushing
15. Governor guard
16. Washer
17. Tab washer
18. Retaining bolt
19. Star washer
20. Retaining screw (lower)
21. Star washer
22. Retaining screw (upper)
23. Safety ring



WARNING: Drive pulley repairs that include any disassembly or assembly procedures must be performed by an authorized Ski-Doo dealer, or other such qualified person. Sub-component installation and assembly tolerances require strict adherence to procedures detailed.

REMOVAL

To remove drive pulley it is first necessary to raise engine from frame. Support engine by inserting a wooden block between engine mount and cross support of frame.

With engine cold, remove spark plugs then bring P.T.O. (Power Take Off) piston at T.D.C. (Top Dead Center) position.

Rotate drive pulley 45° **clockwise** then insert enough starter rope into cylinder to fill it completely. Remove drive pulley retaining bolt.

Remove sliding half assembly with governor cup. To remove fixed pulley half, use drive pulley puller (See Tools Section).

NOTE: Remove starter rope blocking piston, then reblock piston after having turned 45° **counter-clockwise** from T.D.C. position.

While applying pressure, tap the puller head to release drive pulley from crankshaft.

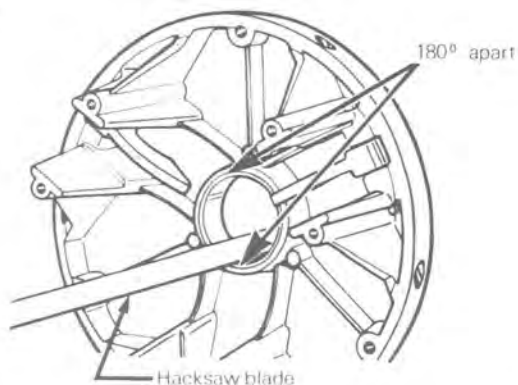
DISASSEMBLY & ASSEMBLY

20 22

WARNING: Spring pressure can force assembly apart, therefore, it is imperative that the governor cup be held firmly during screw removal.

2 3 4 To remove worn bushing, use a hacksaw blade. Make two (2) cuts (180° apart). Remove bushing and discard retaining ring.

CAUTION: Cut through bushing material only.



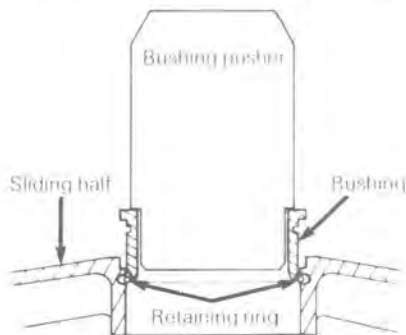
SECTION 02

SUB-SECTION 03 (DRIVE PULLEY)

Prior to installation, inspect bushing seat for burrs. Repair only damaged area, otherwise bushing pressfit characteristic will be altered.

Install new retaining ring into sliding half groove. Position new bushing and bushing pusher over sliding half hub. (See Special Tools).

Drive bushing into hub while at same time, holding retaining ring inside pulley groove using a suitable pointed tool. After properly locating spring into its groove, continue insertion until bushing sits squarely on its seat.



NOTE: Sliding half bushing and governor guard bushings are available as a matched set. Never replace one without replacing the other.

⑤⑥ Use a drive punch to push axles from or into counterweights.

During assembly, apply a coat of "High Performance Drive Pulley Lubricant" over contact face of counterweights.



WARNING: If counterweight replacement is necessary, all three counterweights must be replaced. Failure to do so will affect performance and safe operation.

⑦⑨⑩ Rollers can be removed by first removing gliders with a pair of pliers then using a drive punch to remove axle. Worn gliders should be replaced when axle end is visible. At assembly, apply a light coat of "High Performance Drive Pulley Lubricant" over rollers.



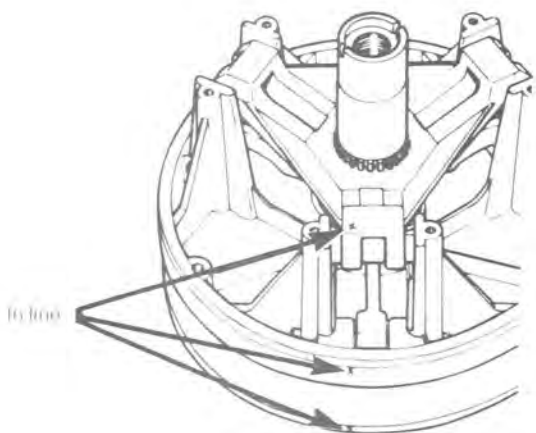
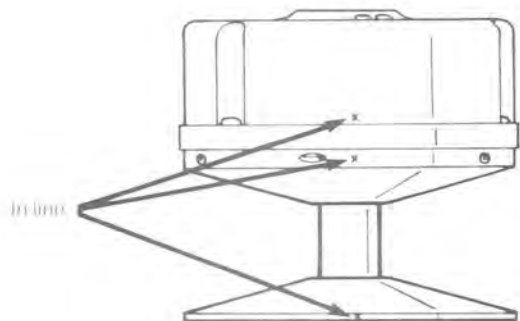
WARNING: If roller replacement is indicated, always replace all three rollers.

⑫ At assembly, apply a light coat of "High Performance Drive Pulley Lubricant" over sleeve surface.

⑮ To remove or install governor guard bushing use a suitable pusher and hammer.

⑯ At assembly, make sure the two retaining washer holes align with the slot of fixed half end.

①④⑧⑮ Balance marks are stamped on fixed half, sliding half, governor and governor guard. At assembly, these components must be installed with the marks in line.



②② At assembly, apply a light coat of "Loctite Lock'n Seal" over threads of nine (9) retaining screws.

Torque the three (3) lower screws to 0.6-0.7 kg-m (4-5 ft-lbs). Torque the six (6) upper screws to 0.3-0.4 kg-m (2-3 ft-lbs).

▼ CAUTION: Use only specified sealing, "Loctite Lock'n Seal" (TL-242), its adhesive properties conform to our requirements as well as allow future removal of screws. It should also be noted that to correctly remove a Loctite sealed screw, it is necessary to slightly tap on head of screwdriver to break "Loctite" seal. The screw can then be removed. This procedure will eliminate the possibility of screw breakage.

CLEANING

②⑭ To clean bushings use fine steel wool and a clean dry cloth.

▼ CAUTION: Bushing material is oil impregnated therefore, avoid soaking in solvent.

INSTALLATION

Prior to installation clean crankshaft taper with fine steel wool soaked in acetone. Dry using a clean, dry cloth.

Lock crankshaft in position as explained in removal procedure. Make sure crankshaft is rotated 45° **counter-clockwise** from T.D.C. position and that cylinder is completely filled with a starter rope.

Install drive pulley ass'y on crankshaft.

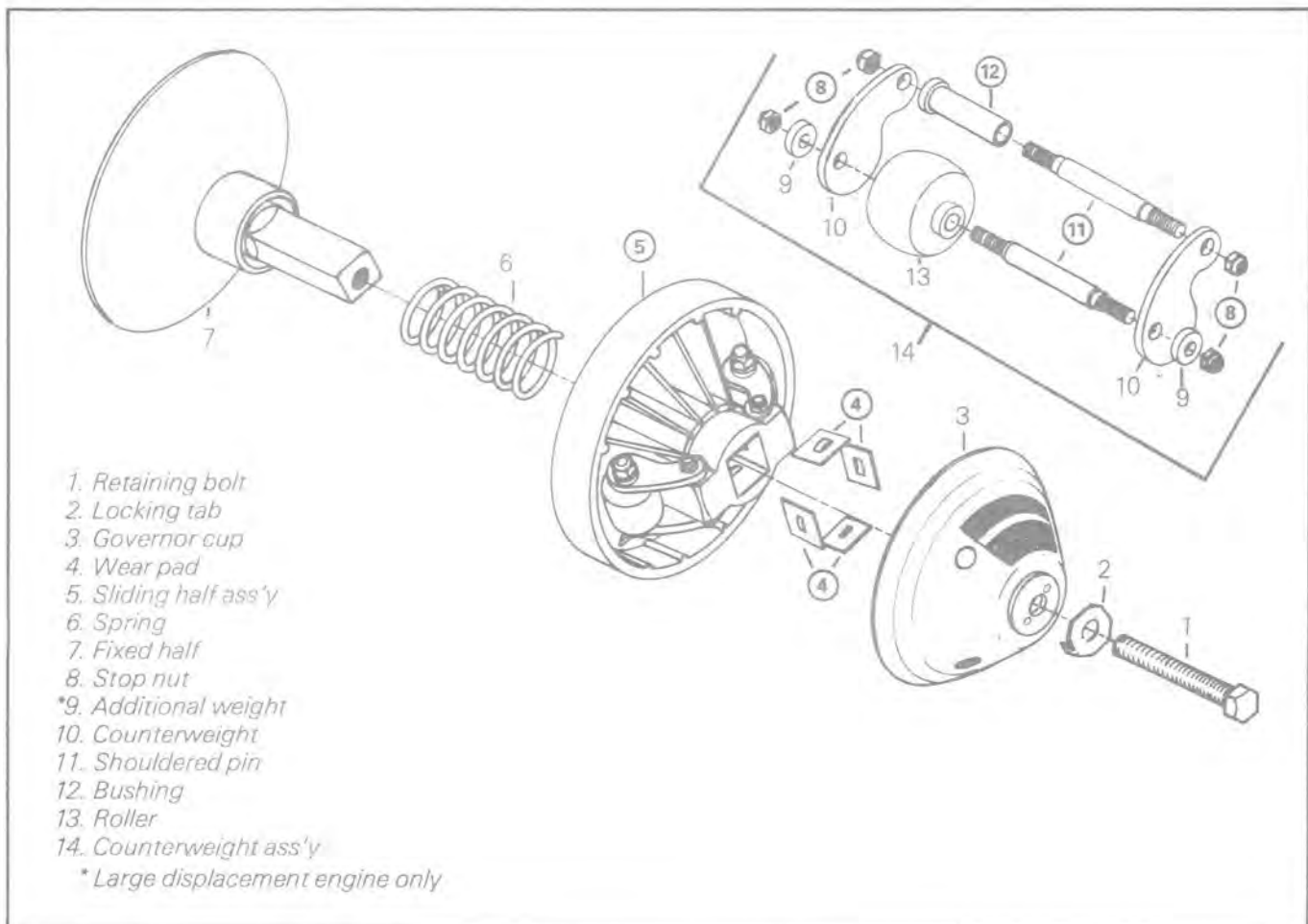
Position a **new** tab lock with retaining bolt then torque to 8-9.4 kg-m (58-68 ft-lbs).

Remove rope from cylinder and reinstall spark plugs.

Raise and block rear of vehicle off the ground. Position pulley guard and close cab. Start engine and repeatedly apply throttle **and** brake.

Stop engine and re-torque governor bolt. Bend one side of locking tab over bolt head.

ROLLER SQUARE SHAFT



◆ **WARNING:** Drive pulley repairs that include any disassembly or assembly procedures must be performed by an authorized Ski-Doo dealer, or other such qualified person. Sub-component installation and assembly tolerances require strict adherence to procedures detailed.



REMOVAL

With engine cold, remove spark plugs then bring P.T.O. (Power Take off) piston at T.D.C. (Top Dead Center) position.

Rotate drive pulley 45° **clockwise** then insert enough starter rope into cylinder to fill it completely.

Install "U" clamp (See Tools Section) over pulley halves. Open locking tab and remove retaining bolt.

Remove governor cup.

Push and turn drive pulley to disengage "U" clamp then carefully remove sliding half.

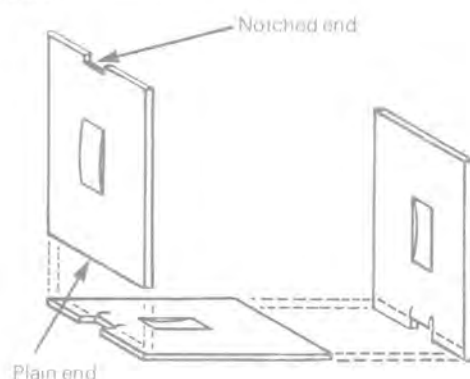
◆ **WARNING:** Spring pressure can force assembly apart therefore, it is imperative that the sliding half be held firmly during removal.

If it is necessary to remove fixed half, use a 1 1/8" open end wrench on the square section, closely held against hub.

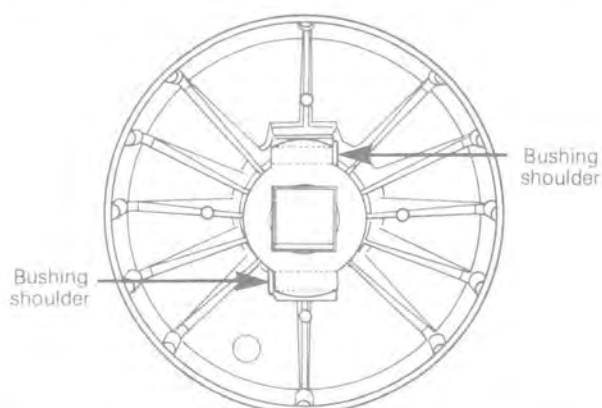
DISASSEMBLY & ASSEMBLY

④ Visually inspect wear pads. If steel backing shows through gray, Teflon lining and bronze, pad must be replaced. (See Technical Data).

To remove worn pads, pry using a screwdriver blade. At assembly, position new pads into hub so that plain end of pad sits over adjoining pad notched end, as illustrated.



⑤ ⑫ Install shouldered pin bushings in sliding half as per illustration.



⑭ These components are available only as a matched replacement kit. If part replacement is necessary, all components within kit must be used.

⑧ ⑪ Apply Loctite Lock'n Seal or equivalent on threads then torque to 1.2-1.5 kg-m (9-11 ft-lbs).

⚠ **CAUTION:** Do not disassemble counterweight unless replacement is necessary. Shouldered pin retaining nuts qualities will alter if tightened more than once.

CLEANING & INSPECTION

An easy way to check the wear pad condition without disassembling the pulley is to check the free-play of the

sliding half pulley. This is achieved by restraining the inner half and checking if the sliding half rotates more than 3 mm ($\frac{1}{8}$ ") sideways. If so, replace pads. To install the correct wear pads, refer to Technical Data, 08, 02-03.

Clean wear pad using only a clean cloth.

Clean pulley faces and shaft with fine steel wool and a clean cloth.

INSTALLATION

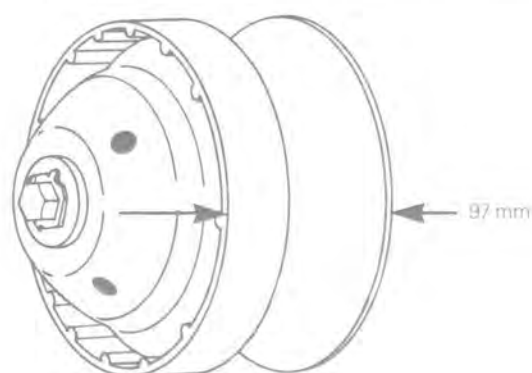
Lock crankshaft in position as explained in removal procedure. Make sure crankshaft is rotated 45° counter-clockwise from T.D.C. position and that cylinder is completely filled with starter rope.

Install fixed half on crankshaft extension then position spring and sliding pulley half on fixed half shaft. Install "U" clamp to hold sliding half in position.

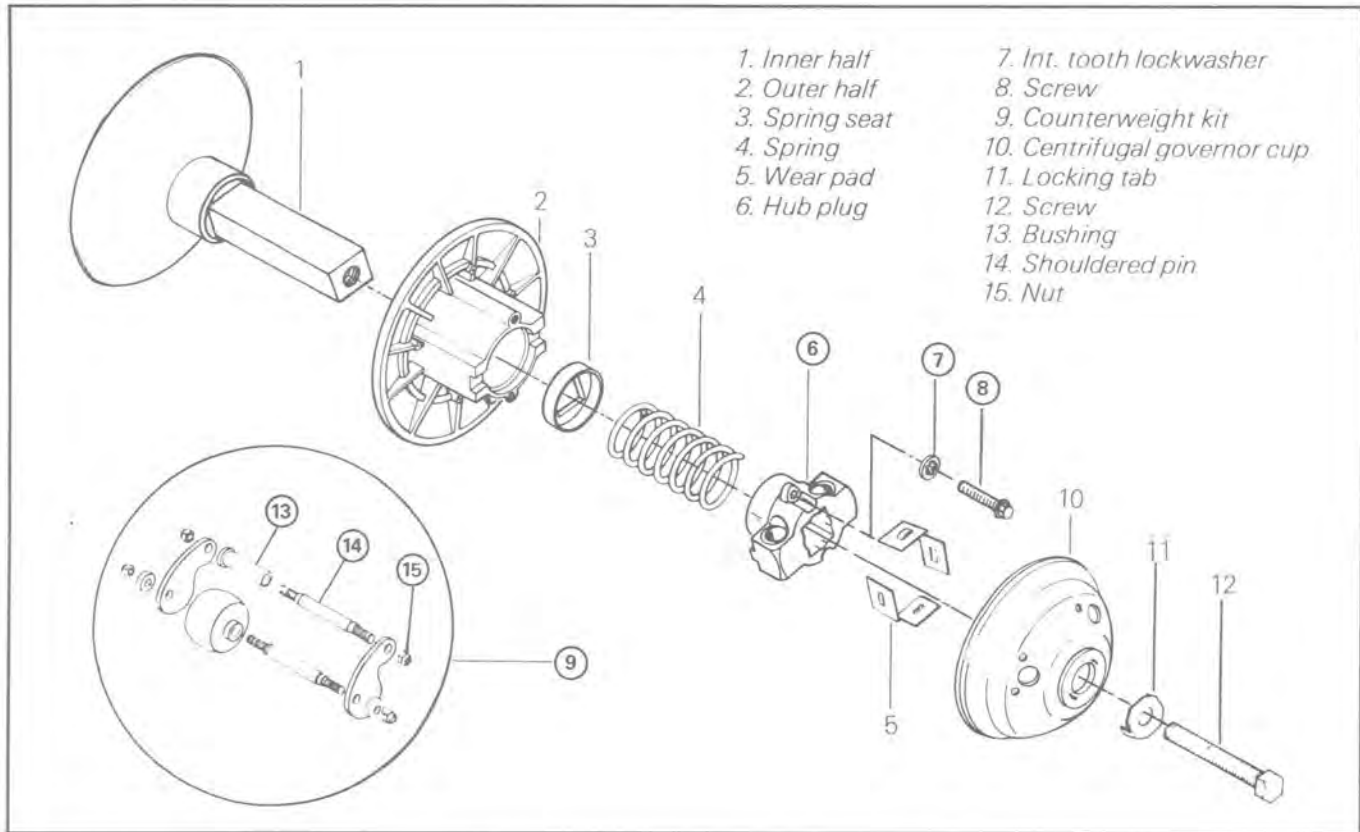
Install governor cup making sure that the shaft end rests in governor cup seating. Install a new locking tab.

Lubricate threads of retaining bolt with light machine oil. Install and torque bolt to 11.5-12.7 kg-m (83-92 ft-lbs). Loosen retaining bolt then retorque to specification, bend one side of locking tab over bolt head.

⚠ **CAUTION:** Incorrect seating of shaft end in governor cup can cause crankshaft bending. When pulley is completely assembled always measure distance of both pulley halves to make sure that the pulley is properly installed. Distance must be 97 mm (3 $\frac{13}{16}$ ").



ROLLER SQUARE SHAFT WITH HUB PLUG



WARNING: Drive pulley repairs that include any disassembly or assembly procedures must be performed by an authorized Ski-Doo dealer, or other such qualified person. Sub-component installation and assembly tolerances require strict adherence to procedures detailed.

DISASSEMBLY / ASSEMBLY

⑥ Visually inspect wear pads. (Wear pads are made with: from the exterior, Teflon, bronze, steel). If steel backing shows through the gray Teflon and the bronze, pads must be replaced.

REMOVAL

With engine cold, remove spark plugs then bring P.T.O. (Power Take Off) piston at T.D.C. (Top Dead Center) position.

Rotate drive pulley 45° **clockwise** then insert enough starter rope into cylinder to fill it completely.

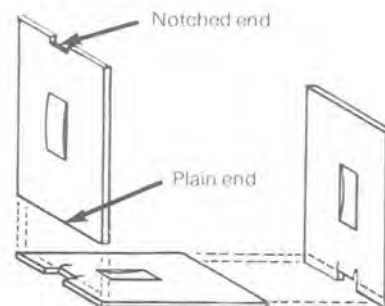
Open tab lock and remove retaining bolt.

Remove sliding half assembly with governor cup.

To remove fixed pulley half, use drive pulley puller. (See Tools Section).

NOTE: Remove starter rope blocking piston, then reblock piston after having turned 45° **counter-clockwise** from T.D.C. position.

While applying pressure, tap the puller head to release drive pulley from crankshaft.

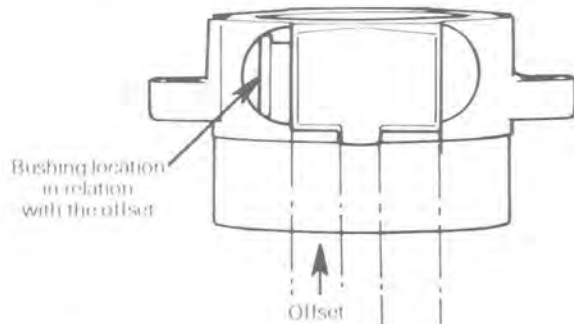


To remove worn pads, pry using a screwdriver blade. At assembly, position new pads into hub so that plain end of pad sits adjoining pad notched end, as illustrated.

SECTION 02

SUB-SECTION 03 (DRIVE PULLEY)

- ⑥ ⑦ ⑧ To remove hub plug from the sliding half, hold the hub with one hand and remove the two (2) screws and lock washers. Then, remove spring and seat. When reassembling torque screws to 0.8-1 kg-m (6-8 ft-lb). Apply "Loctite Lock'n Seal" or equivalent on threads.
- ⑥ ⑬ Shouldered pin bushings must be installed in hub plug as per illustration.



- ⑨ Counterweight is available only as a complete unit (rollers, counterweight, nuts, etc.). If part replacement is necessary, all components within kit must be used (matched components).

- ⑭ ⑮ Apply Loctite Lock'n Seal or equivalent on threads then torque nuts to 1.2-1.5 kg-m (9-11 ft-lbs).

CAUTION: Do not disassembly counterweight unless replacement is necessary. Shouldered pin and nut retaining qualities will alter if tightened more than once.

CLEANING

Clean pulley faces with fine steel wool and a clean cloth. Clean wear pads and square shaft using only a clean cloth.

INSTALLATION

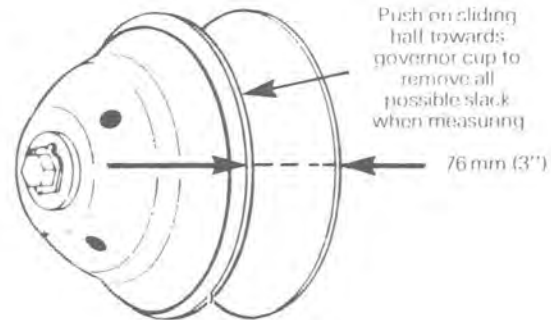
Lock crankshaft in position as explained in removal procedure. Make sure crankshaft is rotated 45° **counter-clockwise** from T.D.C. position and that cylinder is completely filled with a starter rope.

Clean crankshaft extension with fine steel wool and a clean cloth.

Install fixed half on crankshaft extension then position sliding half assembly on fixed half shaft.

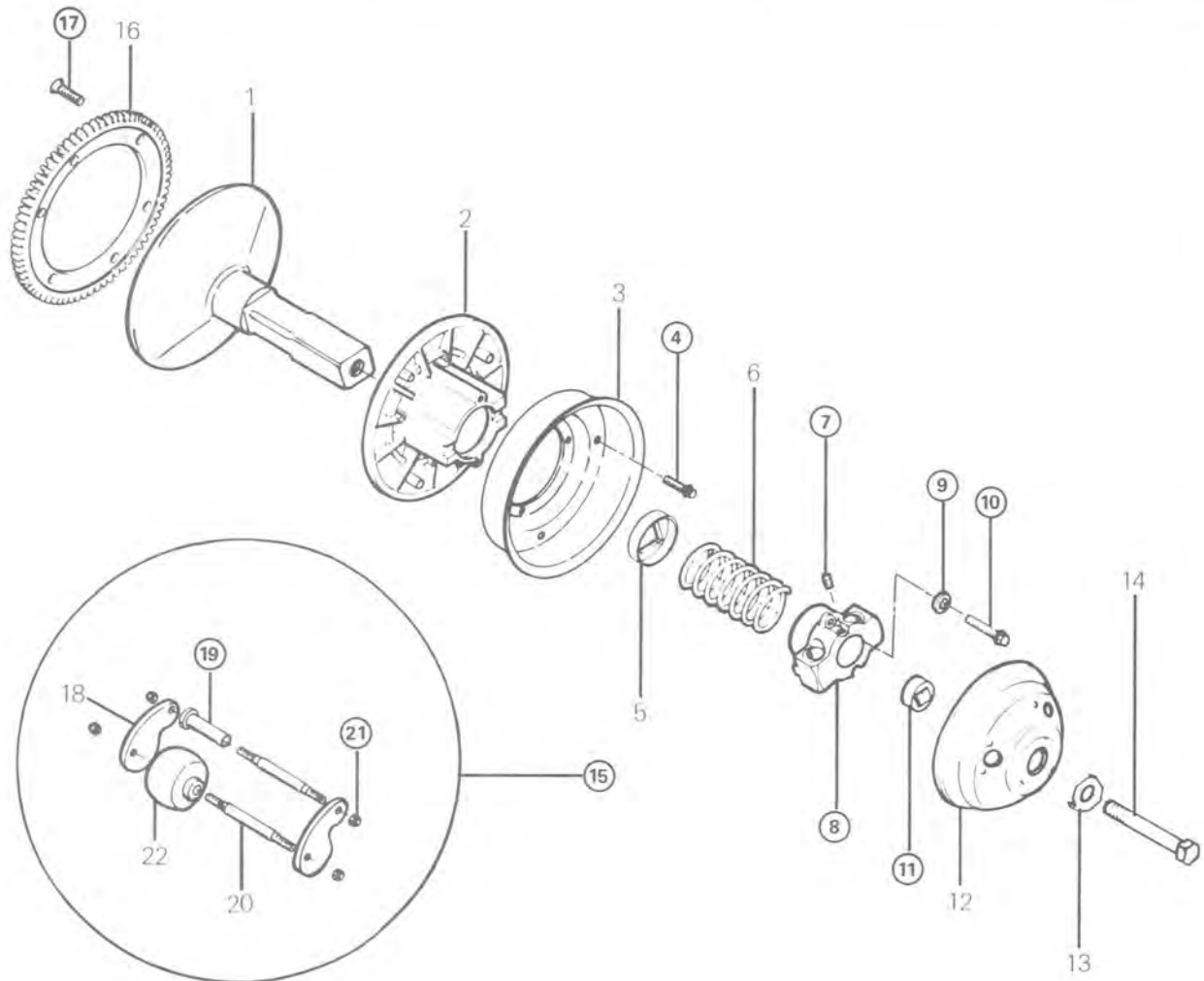
Install governor cup making sure that the shaft end rests in governor cup seating.

CAUTION: Incorrect seating of shaft end in governor cup can cause crankshaft bending. When pulley is completely assembled always measure distance of both pulley halves to make sure that the pulley is properly installed. Distance must be 76 mm (3").



Install a **new** locking tab with retaining bolt torqued to 8-9.4 kg-m (58-68 ft-lbs). Loosen retaining bolt then re-torque. Bend one side of locking tab over retaining bolt head.

ROLLER SQUARE SHAFT WITH DURALON BUSHING



- | | |
|------------------------------|---------------------------------|
| 1. Fixed half | 12. Governor cup |
| 2. Sliding half | 13. Locking tab |
| 3. Guard | 14. Retaining bolt |
| 4. Bolt | 15. Counterweight ass'y |
| 5. Spring seat | 16. Ring gear (electric models) |
| 6. Spring | 17. Screw |
| 7. Allen screw | 18. Counterweight |
| 8. Hub plug | 19. Bushing |
| 9. Internal tooth lockwasher | 20. Shouldered pin |
| 10. Bolt | 21. Nut |
| 11. "Duralon" bushing | 22. Roller |

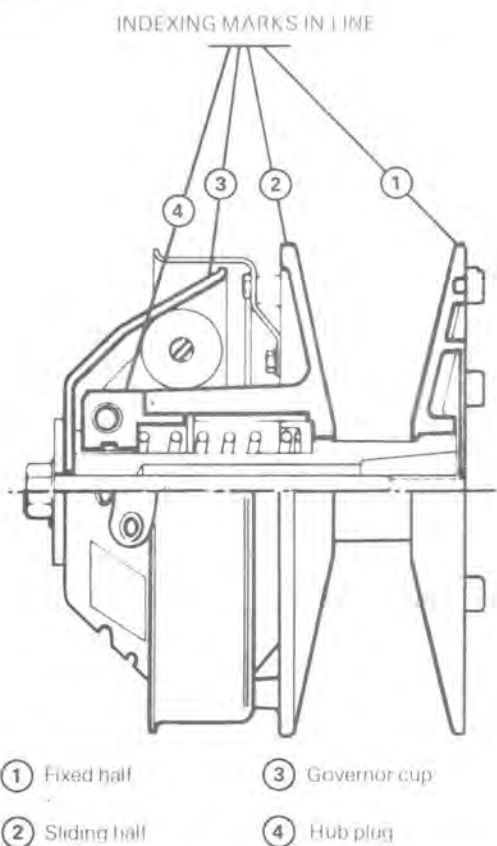
SECTION 02

SUB-SECTION 03 (DRIVE PULLEY)

WARNING: Drive pulley repairs that include any disassembly or assembly procedures must be performed by an authorized Ski-Doo dealer, or other such qualified person. Sub-component installation and assembly tolerances require strict adherence to procedures detailed.

REMOVAL

Some pulley components are marked to insure proper assembly. If components lack such marks, marking should be done manually before disassembly, as per illustration.



With engine cold, remove spark plugs then bring P.T.O. (Power Take Off) piston at T.D.C. (Top Dead Center) position. Rotate drive pulley 45° clockwise then insert enough starter rope into cylinder to fill it completely.

Open tab lock and remove retaining bolt. Remove sliding half assembly and governor cup.

If it is necessary to remove fixed half, use drive pulley puller (See Tool Section).

NOTE: Remove starter rope blocking piston, then reblock piston after having turned 45° counter-clockwise from T.D.C. position.

Install puller in pulley shaft then tighten, at the same time knock slightly on puller head to disengage pulley from engine crankshaft.

DISASSEMBLY / ASSEMBLY

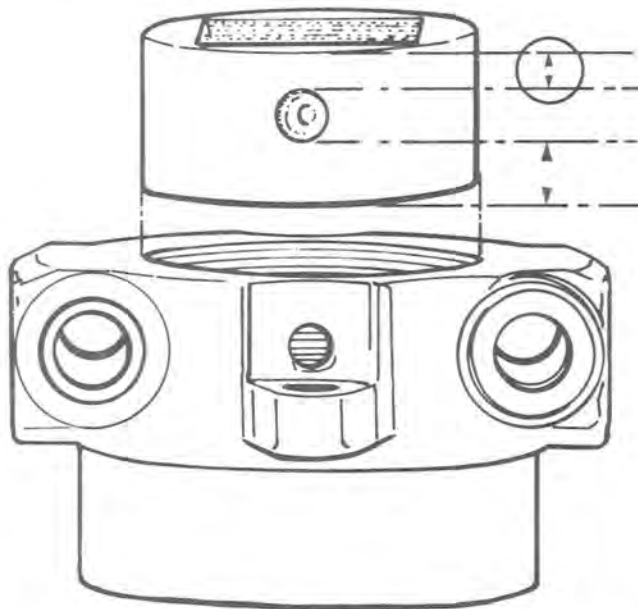
Some bolts of the drive pulley have "Loctite" on their threads, it is advisable to use a tool such as an impact to break the "Loctite" seal before attempting to unscrew.

④ Torque bolts to 0.5-0.7 kg-m (4-5 ft-lbs).

⑦ Apply "Loctite Lock'n Seal" on threads then screw in until head is **flush** with hub plug. Do not allow head to bite into hub plug.

⑧ ⑨ ⑩ At disassembly, hold hub plug firmly against sliding half until the two (2) bolts are completely removed. This will prevent damage of the sliding half threads. At assembly, apply "Loctite Lock'n Seal" on threads of bolts then torque to 1.4-2 kg-m (10-14 ft-lbs).

⑪ To install or remove "Duralon" bushing from hub plug use a suitable pusher and hammer or press. Install bushing as per illustration.



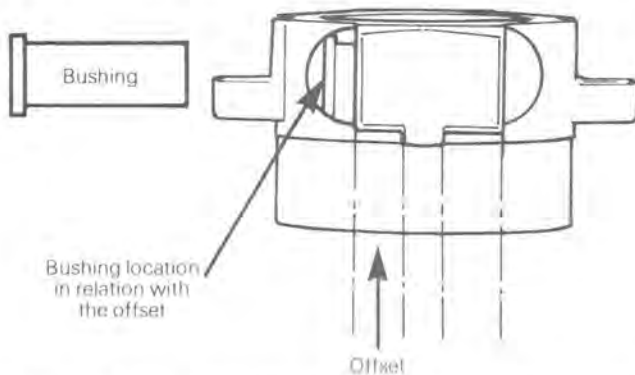
CAUTION: Be careful when installing sliding half assembly on square shaft of drive pulley to avoid scratches on "Duralon" bushing caused by square shaft edge.

⑪ Apply "Loctite Lock'n Seal or equivalent on threads.

⑮ Counterweights are available only as a complete unit (rollers, counterweight, screw, etc...). If part replacement is necessary, all components within kit must be used (matched components). Torque shouldered pin lock nut to 1.2-1.5 kg-m (9-11 ft-lbs) with Loctite Lock'n Seal on threads.

CAUTION: Do not disassemble counterweights unless replacement is necessary. The shouldered pin lock nuts retaining qualities will alter if tightened more than once.

⑩ ⑧ Earlier drive pulleys have an offset in the hub plug. Shouldered pin bushings with shoulder must be installed in these hub plugs.

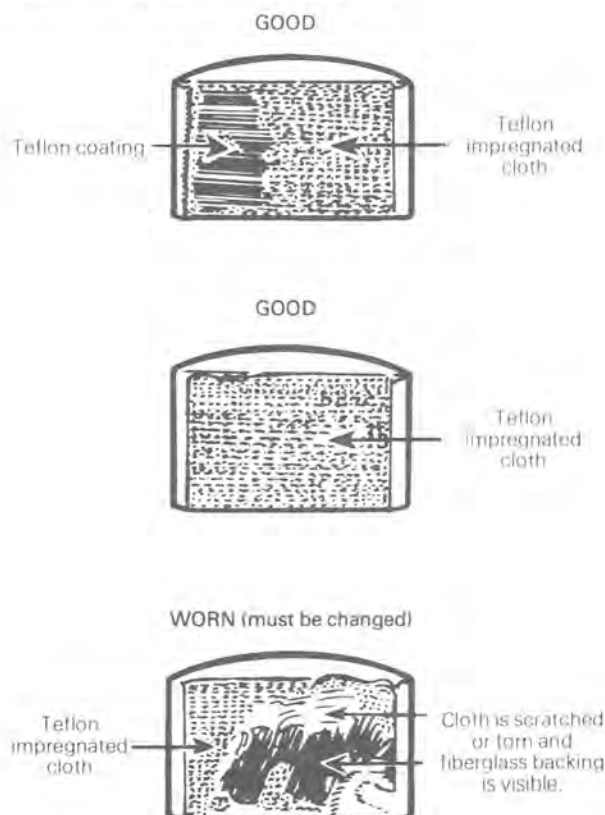


New drive pulleys do not have an offset in the hub plug and are equipped with shouldered pin bushings without shoulder.

INSPECTION / CLEANING

Drive pulley should be inspected annually.

Check general condition of pulley and inspect "Duralon" bushing faces, as per illustrations.



Inside of sliding half should be cleaned with a clean cloth. The square shaft can be cleaned with fine steel wool and a clean cloth.

(1977 Supplement)

INSTALLATION

Clean crankshaft extension using fine steel wool and a clean cloth.

CAUTION: When installing drive pulley on engine, reference mark on fixed half, sliding half and governor cup must be in line.

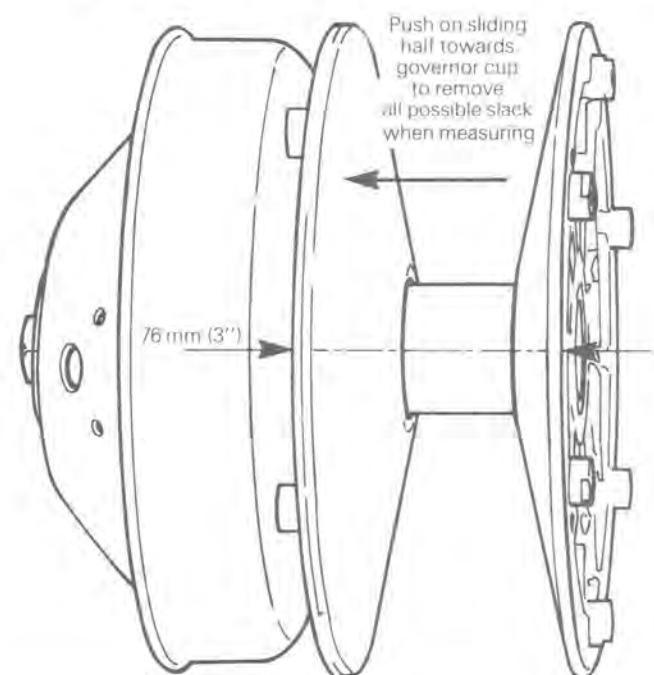
Lock crankshaft in position as explained in removal procedure. Make sure crankshaft is rotated 45° counter-clockwise from T.D.C. position and that cylinder is completely filled with a starter rope.

Install fixed half on crankshaft extension then position sliding half assembly on fixed half square shaft.

CAUTION: Be careful when installing sliding half assembly on square shaft of drive pulley to avoid scratches on "Duralon" bushing caused by square shaft edge.

Install governor cup making sure that the shaft end rests in governor cup seating. Position retaining bolt with a new locking tab then torque to 8-9.4 kg-m (58-68 ft-lbs).

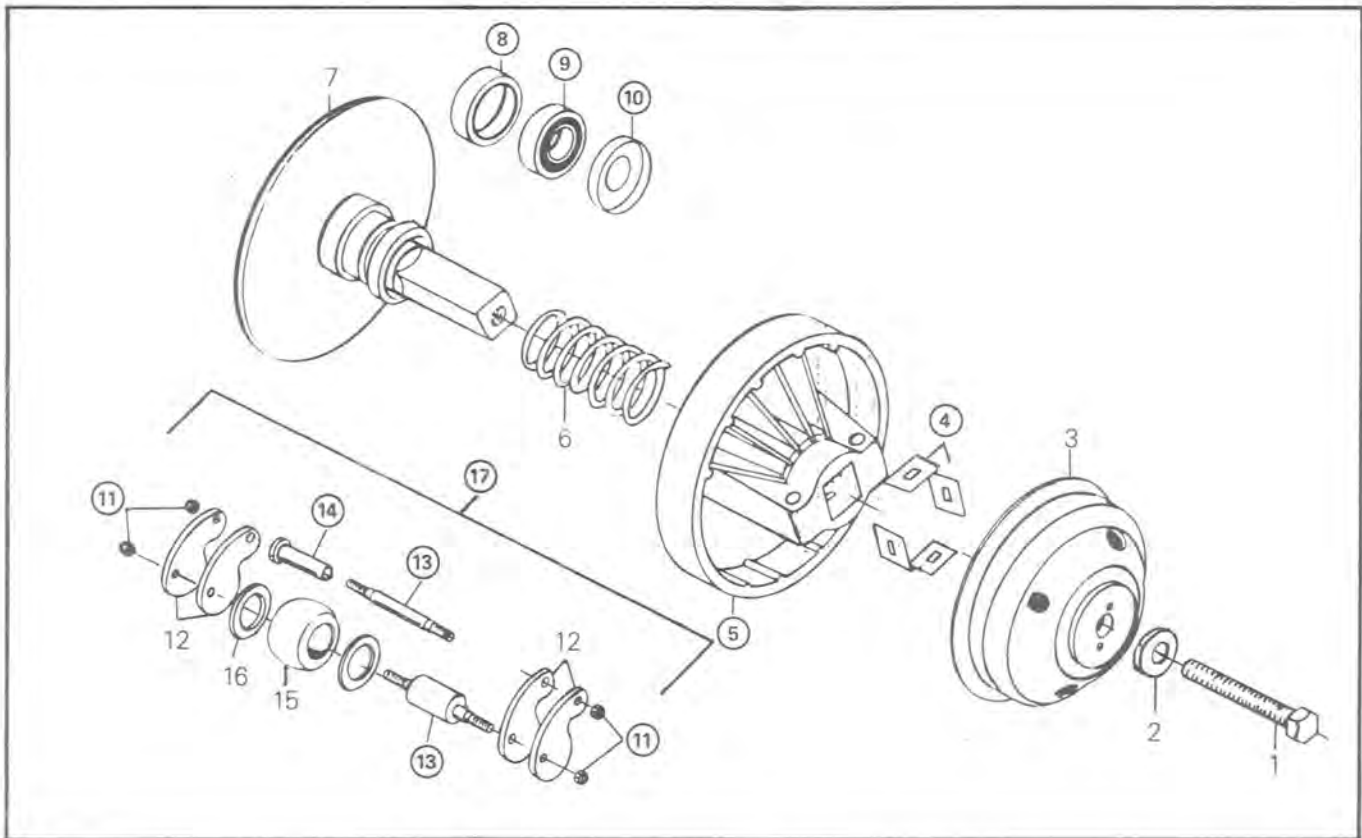
CAUTION: Incorrect seating of shaft end in governor cup can cause crankshaft bending. When pulley is completely assembled always measure distance of both pulley halves to make sure that the pulley is properly installed. Distance must be 76 mm (3").



Lift rear of vehicle off the ground. Install drive belt and pulley guard then start engine and apply throttle and brake, 2-3 times. Stop engine and **retorque** retaining bolt. Bend one side of locking tab over governor bolt.

(ROLLER SQUARE SHAFT WITH DURALON BUSHING), PAGE 3

ROLLER SQUARE SHAFT BEARING TYPE



- | | |
|-----------------------|-------------------------|
| 1. Retaining bolt | 10. Spring seat |
| 2. Tab washer | 11. Stop nut |
| 3. Governor cup | 12. Counterweight |
| 4. Wear pad | 13. Shouldered pin |
| 5. Sliding half ass'y | 14. Bushing |
| 6. Spring | 15. Roller |
| 7. Fixed half | 16. Spacer |
| 8. Ring | 17. Counterweight ass'y |
| 9. Bearing | |

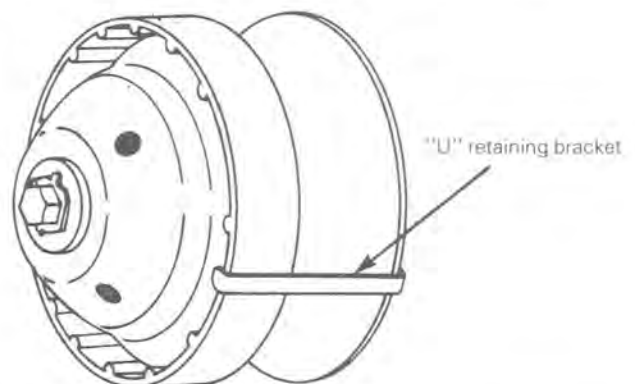
WARNING: Drive pulley repairs that include any disassembly or assembly procedures must be performed by an authorized Ski-Doo dealer, or other such qualified person. Sub-component installation and assembly tolerances require strict adherence to procedures detailed.

REMOVAL

With engine cold, remove spark plugs then bring P.T.O. (Power Take Off) piston at T.D.C. (Top Dead Center) position.

Rotate drive pulley 45° clockwise then insert enough starter rope into cylinder to fill it completely.

Install "U" clamp (See Tools Section) over pulley halves. Open locking tab and remove retaining bolt.



Push and turn drive pulley to disengage "U" clamp then carefully remove sliding half.

WARNING: Spring pressure can force assembly apart therefore, it is imperative that the governor cup be held firmly during sliding half removal.

If it is necessary to remove fixed half, use a 1 1/8" open-end wrench on the square section, closely held against hub.

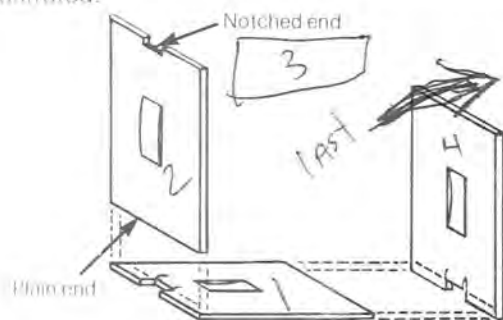
SECTION 02

SUB-SECTION 03 (DRIVE PULLEY)

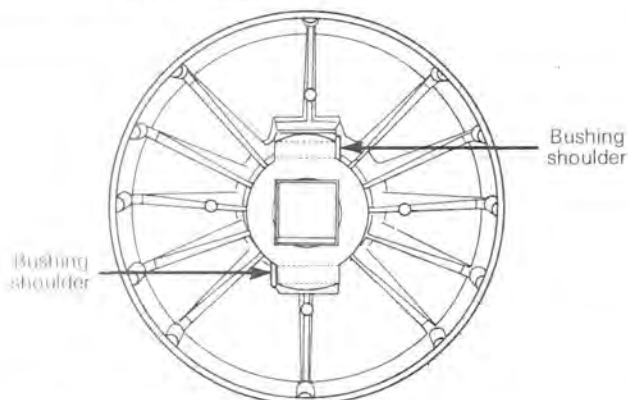
DISASSEMBLY & ASSEMBLY

④ Visually inspect wear pads. If steel backing shows through gray, Teflon lining and bronze, pad must be replaced (See Technical Data).

To remove worn pads, pry using a screwdriver blade. At assembly, position new pads into hub so that plain end of pad sits over adjoining pad notched end, as illustrated.



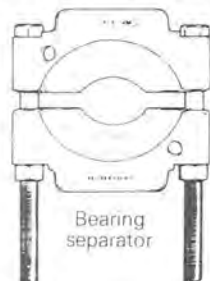
⑤ ⑭ Shouldered pin bushings must be installed in sliding half as per illustration.



⑧ ⑨ ⑩ To remove and install use a bearing separator and afterwards a standard puller and pusher.

Item ⑧ ⑨ should be press-fitted together.

NOTE: Do not remove inner half bearing unless damaged and replacement is necessary.



⑪ ⑬ Apply Loctite Lock'n Seal on threads, then torque nuts to 1.2-1.5 kg-m (9-11 ft-lbs).

CAUTION: Do not disassemble counterweight unless replacement is necessary. Shouldered pin re-

taining nut qualities will alter if tightened more than once.

⑰ These components are available only as a matched replacement kit. If part replacement is necessary all components within kit must be used.

CLEANING & INSPECTION

An easy way to check the wear pad condition without disassembling the pulley is to check the free-play of the sliding half pulley. This is achieved by restraining the inner half and checking if the sliding half rotates more than 3 mm ($\frac{1}{8}$ ") sideways. If so, replace pads. To install the correct wear pads, refer to Technical Data 08, 02-03.

Clean pulley faces and shaft with fine steel wool and a clean cloth.

Clean wear pad using only a clean cloth.

INSTALLATION

Lock crankshaft in position as explained in removal procedure. Make sure crankshaft is rotated 45° counter-clockwise from T.D.C. position and that cylinder is completely filled with a starter rope.

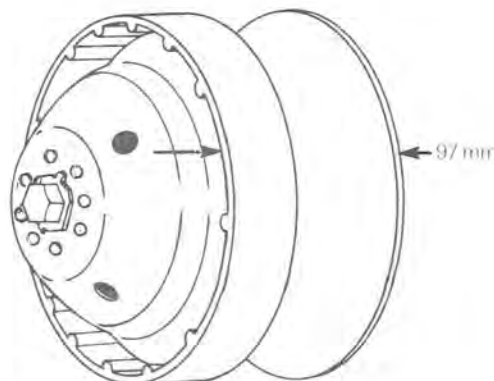
Install fixed half on crankshaft extension then position spring and sliding pulley half on fixed half shaft. Install "U" clamp to hold sliding half in position.

Install governor cup making sure that the shaft end rests in governor cup seating. Install a new tab lock.

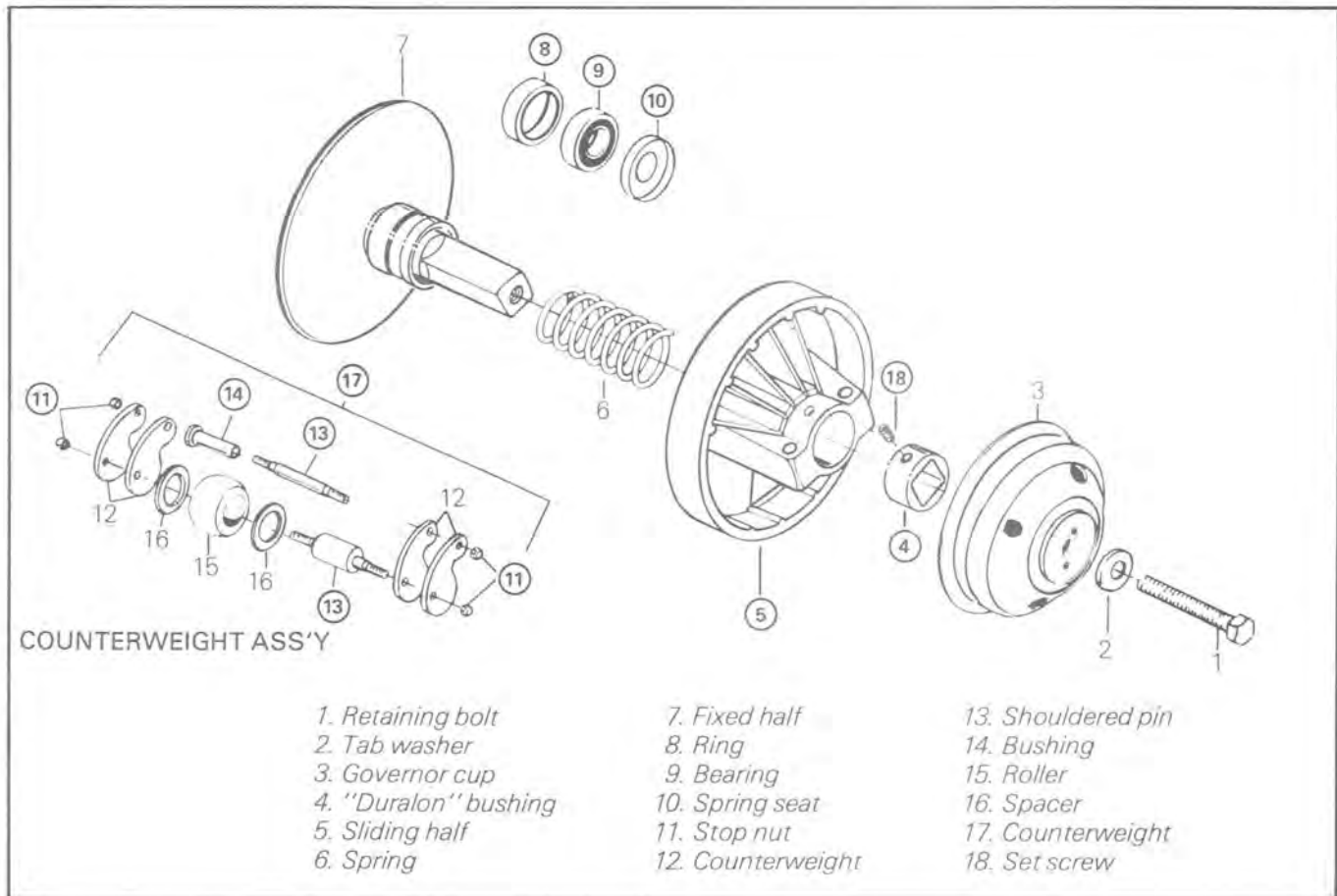
Lubricate threads of retaining bolt with light machine oil.

Install and torque bolt to 11.5-12.7 kg-m (83-92 ft / lbs). Loosen retaining bolt then retorque to specification. Bend one side of tab lock over bolt head.

CAUTION: Incorrect seating of shaft end in governor cup can cause crankshaft bending. When pulley is completely assembled always measure distance of both pulley halves to make sure that the pulley is properly installed. Distance must be 97 mm ($3\frac{13}{16}$ ").



ROLLER SQUARE SHAFT BEARING TYPE WITH DURALON BUSHING

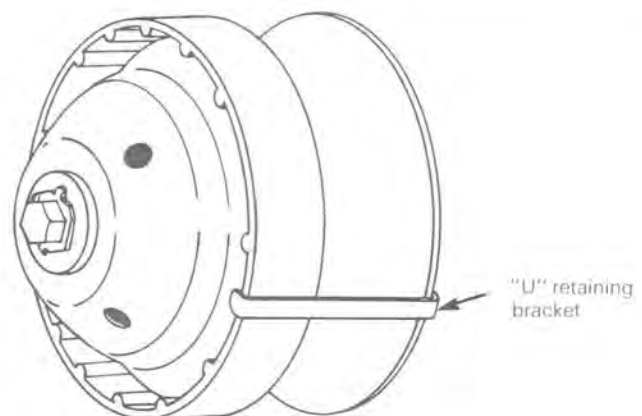


WARNING: Drive pulley repairs that include any disassembly or assembly procedures must be performed by an authorized Ski-Doo dealer, or other such qualified person. Sub-component installation and assembly tolerances require strict adherence to procedures detailed.

REMOVAL

With engine cold, remove spark plugs then bring P.T.O. (Power Take Off) piston at T.D.C. (Top Dead Center) position.

Rotate drive pulley 45° **clockwise** then insert enough starter rope into cylinder to fill it completely. Install "U" clamp (See Tools Section) over pulley halves. Open locking tab and remove retaining bolt.



Push and turn drive pulley to disengage "U" clamp then carefully remove sliding half.

WARNING: Spring pressure can force assembly apart therefore, it is imperative that the governor cup be held firmly during sliding half removal.

SECTION 02

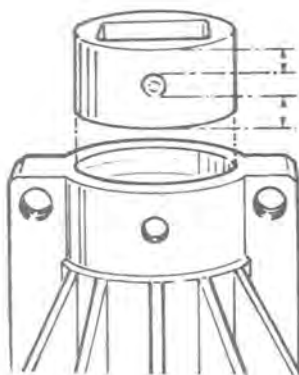
SUB-SECTION 03 (DRIVE PULLEY)

If it is necessary to remove fixed half, use a 1 1/8" open-end wrench on the square section, closely held against hub.

DISASSEMBLY & ASSEMBLY

Some bolts of the drive pulley have "Loctite" on their threads, it is advisable to use a tool such as an impact to break the "Loctite" seal before attempting to unscrew.

④ ⑤ To install or remove "Duralon" bushing from hub plug use a suitable pusher and hammer or press. Install bushing as per illustration.



▼ **CAUTION:** Be careful when installing sliding half assembly on square shaft of drive pulley to avoid scratches on "Duralon" bushing caused by square shaft edge.

⑧ ⑨ ⑩ To remove and install use a bearing separator and afterwards a standard puller and pusher.

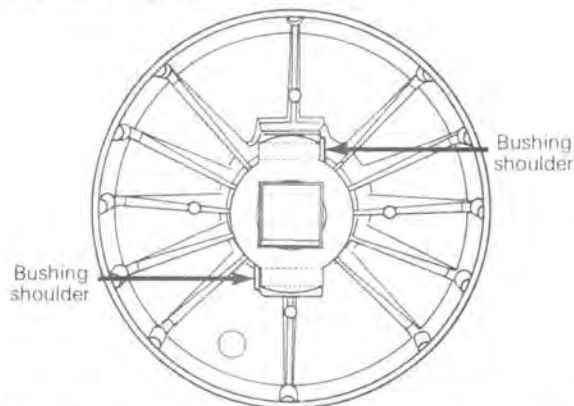
○ **NOTE:** Item ⑧ ⑨ should be press-fitted together. Do not remove inner half bearing unless damaged and replacement is necessary.



⑪ ⑬ ⑰ Counterweights are available only as a complete unit (rollers, counterweight, screw, etc.). If part replacement is necessary, all components within kit must be used (matched components). Torque shouldered pin lock nut to 1.2-1.5 kg-m (9-11 ft-lbs). Apply Loctite Lock'n Seal or equivalent on threads.

▼ **CAUTION:** Do not disassemble counterweights unless replacement is necessary. The shouldered pin lock nuts retaining qualities will alter if tightened more than once.

⑭ Shouldered pin bushings must be installed in hub plug as per illustration.

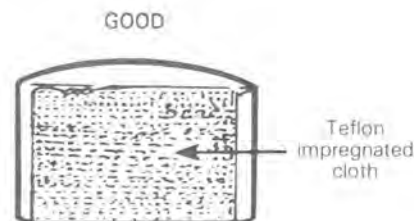
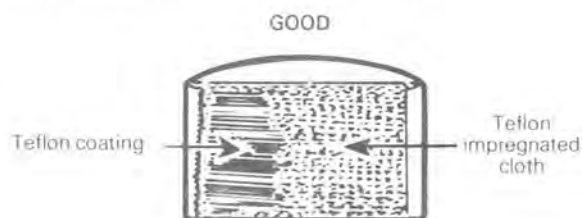


⑮ Apply "Loctite Lock'n Seal" on threads then screw in until head is flush with sliding half.

INSPECTION & CLEANING

Drive pulley should be inspected annually.

Check general condition of pulley and inspect "Duralon" bushing faces, as per illustrations.



Inside of sliding half should be cleaned with a clean cloth. The square shaft can be cleaned with fine steel wool and a clean cloth.

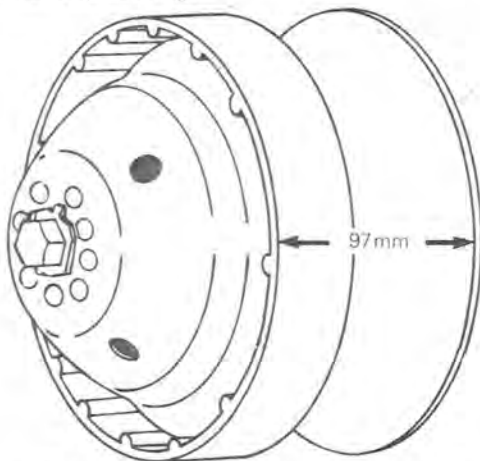
INSTALLATION

Lock crankshaft in position as explained in removal procedure. Make sure crankshaft is rotated 45° **counter-clockwise** from T.D.C. position and that cylinder is completely filled with starter rope.

Install fixed half on crankshaft extension then position sliding half assembly on fixed half square shaft.

CAUTION: Be careful when installing sliding half assembly on square shaft of drive pulley to avoid scratches on "Duralon" bushing caused by square shaft edge.

Install governor cup making sure that the shaft end rests in governor cup seating.



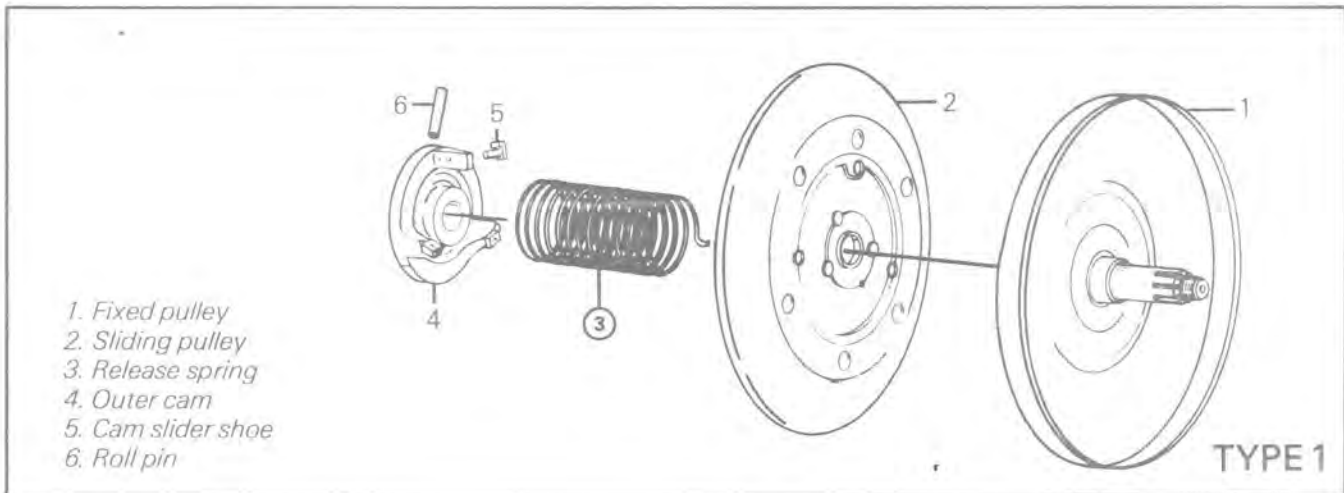
CAUTION: Incorrect seating of shaft end in governor cup can cause crankshaft bending. When pulley is completely assembled always measure distance of both pulley halves to make sure that the pulley is properly installed. Distance must be 97 mm (3 $\frac{13}{16}$ ").

Lubricate threads of retaining bolt with light machine oil. Position retaining bolt with a **new** locking tab then torque to 11.5-12.7 kg-m (83-92 ft-lbs). Bend one side of locking tab over retaining bolt head.

DRIVEN PULLEY APPLICATION CHART

TYPE 1	1974 Elan 250 & 250T 1974 Olympique 1975-76-77 Elan
TYPE 1A	1976-77 Olympique 300 Mono
TYPE 2	1974 Nordic
TYPE 3	1974 Elan 294SS & 250D, T'NT F / C & Everest 1975 Olympique, T'NT F / C & Everest, RV, 1976 Olympique Twin, T'NT F / C & Everest, RV, 1977 Olympique Twin, T'NT & Everest, RV
TYPE 4	1974-75 T'NT F / A
TYPE 5	1974-75 Alpine, Elite
TYPE 5A	1976-77 Alpine

DRIVEN PULLEY



REMOVAL

Remove pulley guard, drive belt and muffler.

Slacken steering column bolts.

Release chain tension. Remove cotter pin and nut securing pulley drive shaft to chaincase.

NOTE: On vehicle equipped with steel chaincase, attach chain to frame to prevent it falling inside of chaincase.

Pull driven pulley toward engine and remove from vehicle.

DISASSEMBLY & ASSEMBLY

③ In order to measure driven pulley spring tension, pulley halves must be separated. To do this, insert length of $\frac{1}{8}$ " 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

With drive chain tension released, hold upper sprocket and chain in position then insert assembled driven pulley shaft through chaincase and sprocket.

Install spring washer and castellated nut.

Tighten castellated nut fully then back off nut $\frac{1}{6}$ of a turn.

Lock in position with cotter pin.

CAUTION: It is important that nut is backed off or damage may occur due to a burnt or seized bearing.

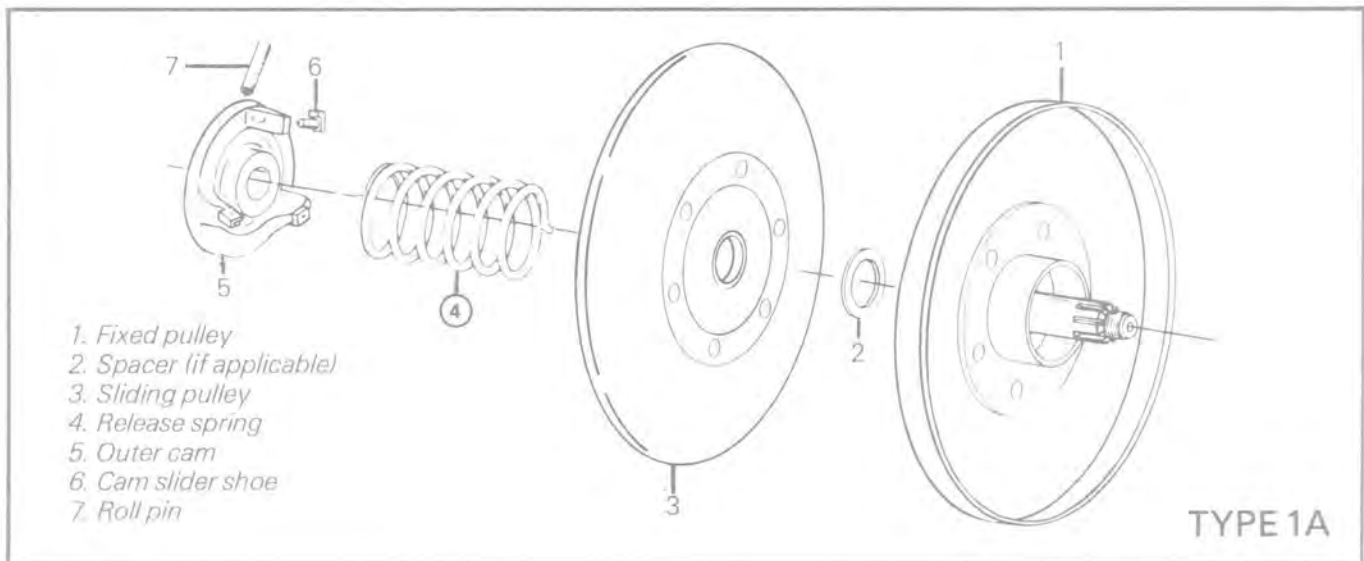
Apply chain tension.

Install muffler and tighten steering column bolts.

Install drive belt and pulley guard.

SECTION 02

SUB-SECTION 04 (DRIVEN PULLEY)



REMOVAL

Remove pulley guard and drive belt.

Remove air silencer box.

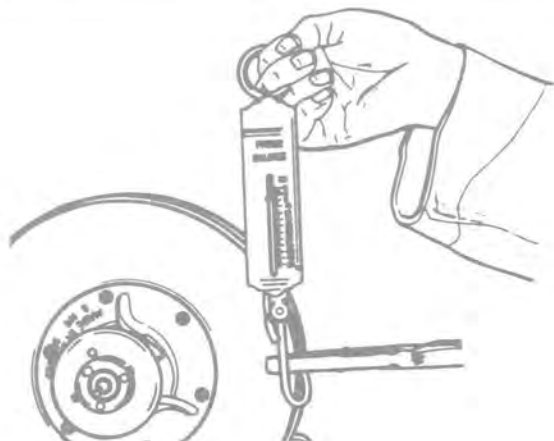
Remove chaincase cover.

Release chain tension then remove cotter pin and castellated nut securing driven pulley to chaincase.

Slacken chaincase and push backwards to clear engine support. Pull out driven pulley assembly.

DISASSEMBLY & ASSEMBLY

④ In order to measure driven pulley spring tension, the pulley halves must be separated. To do this, insert a length of $\frac{1}{8}$ " 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

With drive chain tension released, hold upper sprocket and chain in position then insert assembled driven pulley shaft through chaincase and sprocket.

Install spring washer and castellated nut.

Tighten castellated nut fully then back off nut $\frac{1}{16}$ of a turn.

Lock in position with cotter pin.

CAUTION: It is important that nut is backed off or damage may occur due to a burnt or seized bearing.

Apply chain tension.

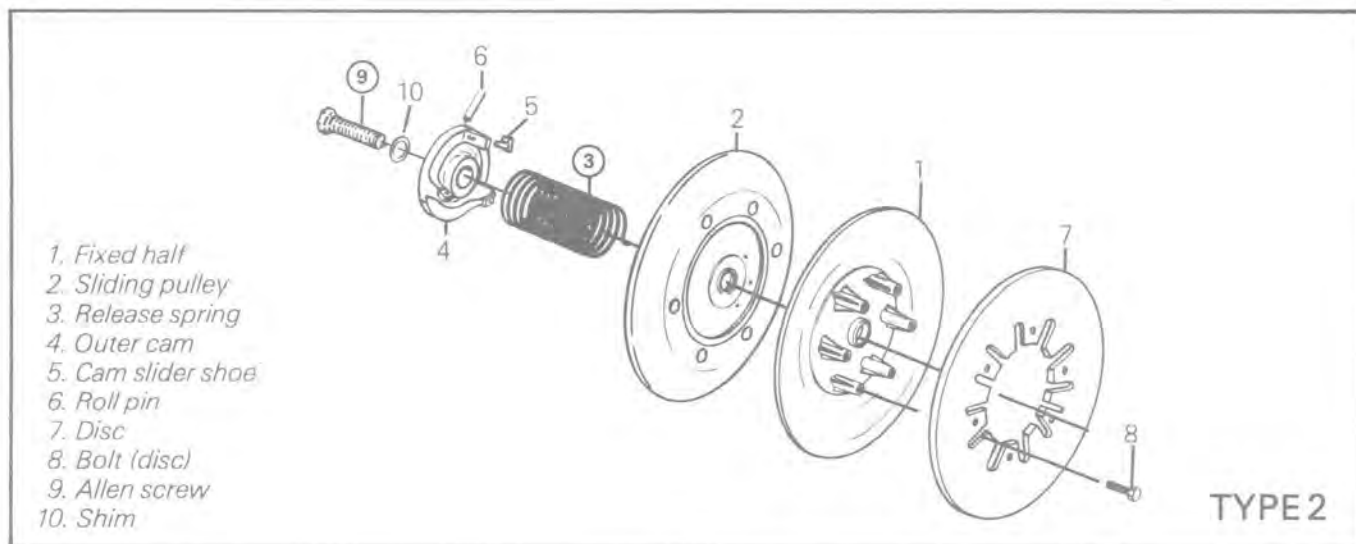
Position chaincase cover and replenish chaincase oil.

Realign pulleys and secure chaincase firmly.

Check the brake and brake lighting adjustment.

Install air silencer box.

Install drive belt and pulley guard.



REMOVAL

Remove pulley guard, drive belt and brake assembly.
Remove steering column, battery, and muffler.

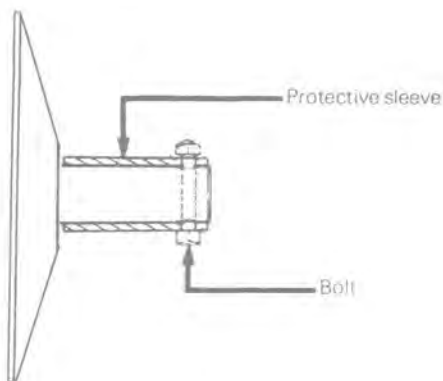
Drain chaincase oil and pry drive axle oil seal from chaincase side. Slacken chaincase 1/2 inch from frame.

Support driven pulley shaft using a wooden block then drive roll pin from outer cam on driven pulley shaft. Remove outer cam, spring and sliding pulley.

Remove Allen screw (L.H.S. thread) securing driven pulley shaft to transmission drive shaft.

Unscrew fixed half from transmission shaft.

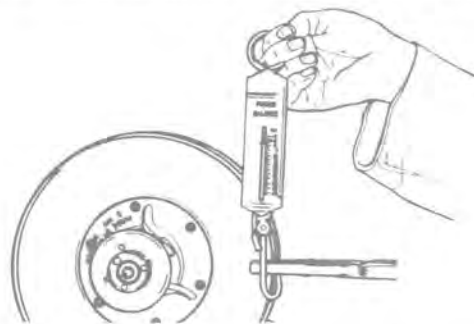
NOTE: If fixed half is difficult to remove, slide a length of steel pipe over shaft. Attach with bolt and nut as illustrated; the fixed half can then be removed using a pipe wrench.



DISASSEMBLY & ASSEMBLY

③ 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 two 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

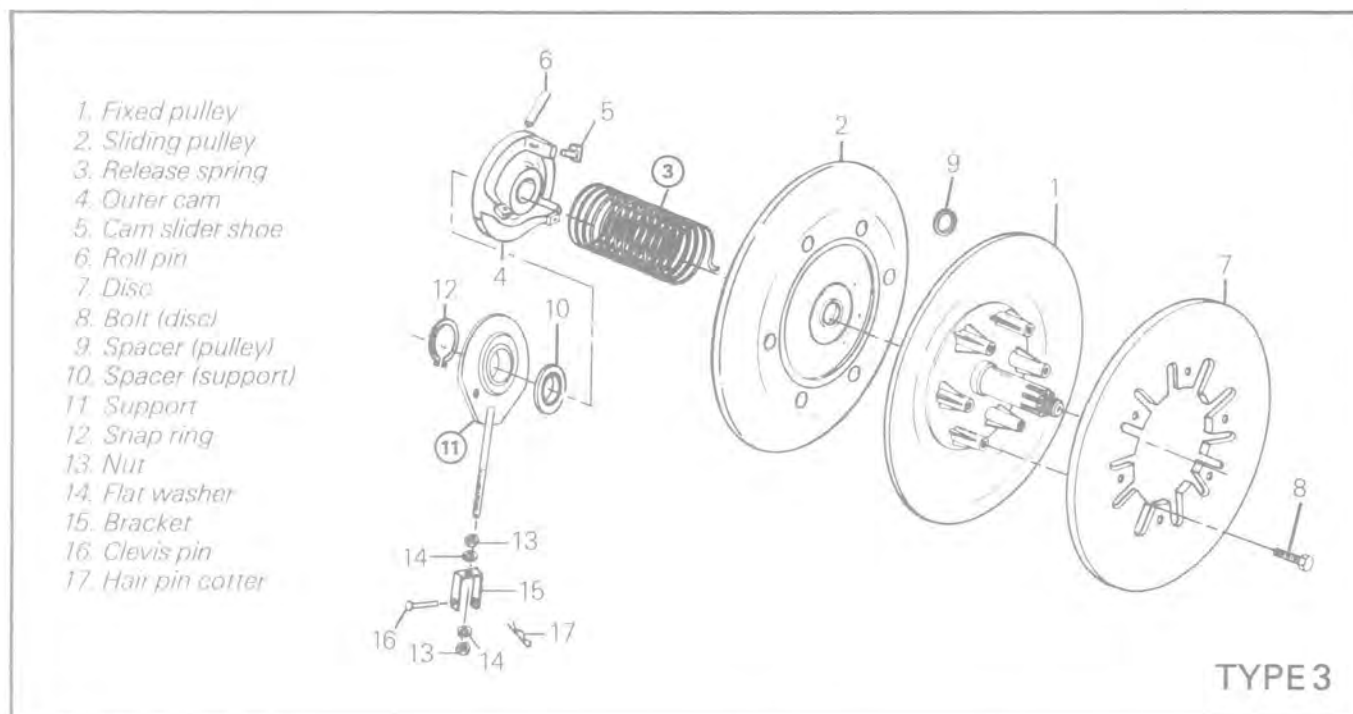
Screw fixed half pulley shaft onto transmission shaft. Install Allen screw ⑨ and torque to 2.8 kg-m (20 ft-lbs). Install sliding pulley, spring, outer cam and roll pin. Proceed with spring adjustment.

Install chaincase and oil seal. Replenish chaincase oil. Proceed with pulley alignment.

Install steering column, muffler and battery.

Install drive belt, brake assembly and pulley guard.

SECTION 02
SUB-SECTION 04 (DRIVEN PULLEY)



REMOVAL

Remove pulley guard and drive belt.

Detach driven pulley support from upper column bracket.

Remove brake assembly and tool box.

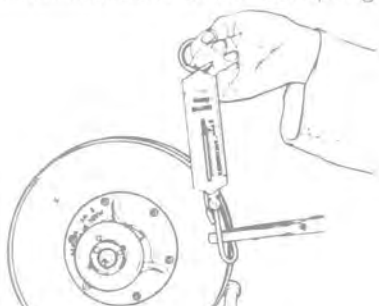
Remove chaincase cover.

Remove air silencer box and carburetor.

Release chain tension then remove cotter pin and castellated nut securing driven pulley to chaincase. Pull out driven pulley assembly.

DISASSEMBLY & ASSEMBLY

③ In order to measure driven pulley spring tension, the pulley halves must be separated. To do this, insert a length of $\frac{1}{8}$ " 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.

⑪ To remove driven pulley support it may be necessary to use a puller.

INSTALLATION

With drive chain tension released, hold upper sprocket and chain in position then insert assembled driven pulley shaft through chaincase and sprocket.

Install spring washer and castellated nut.

Tighten castellated nut fully then back off nut $\frac{1}{6}$ of a turn.

Lock in position with cotter pin.

CAUTION: It is important that nut is backed off or damage may occur due to a burnt or seized bearing.

Apply chain tension. Position chaincase cover and replenish chaincase oil.

Install disc brake assembly and tool box.

Install carburetor and air silencer box.

Connect driven pulley support to steering upper column.

Install drive belt and pulley guard.



13. Nut
14. Bearing
15. Collar
16. Allen screw
17. Bolt
18. Countershaft
19. Key (fixed half)
20. Brake disk
21. Key (brake disk)
22. Bolt
23. Nut
24. Support

REMOVAL

Remove pulley guard and drive belt.

Remove bolt ①, washer and pulley assembly.

DISASSEMBLY & ASSEMBLY

① At assembly torque to 3.5 kg-m (25 ft-lbs).

⑥ In order to measure driven pulley spring tension the pulley halves must be separated; to do this, insert a length of $\frac{1}{8}$ " 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.

⑨ To remove locking ring halves first press on outer cam then using a screwdriver, remove ring halves.

⑭ Bearing can be removed using a puller.

⑮ At assembly, apply Loctite Lock'n Seal or equivalent on threads.

⑮ Maximum deflection of shaft is 0.07 mm (.003").

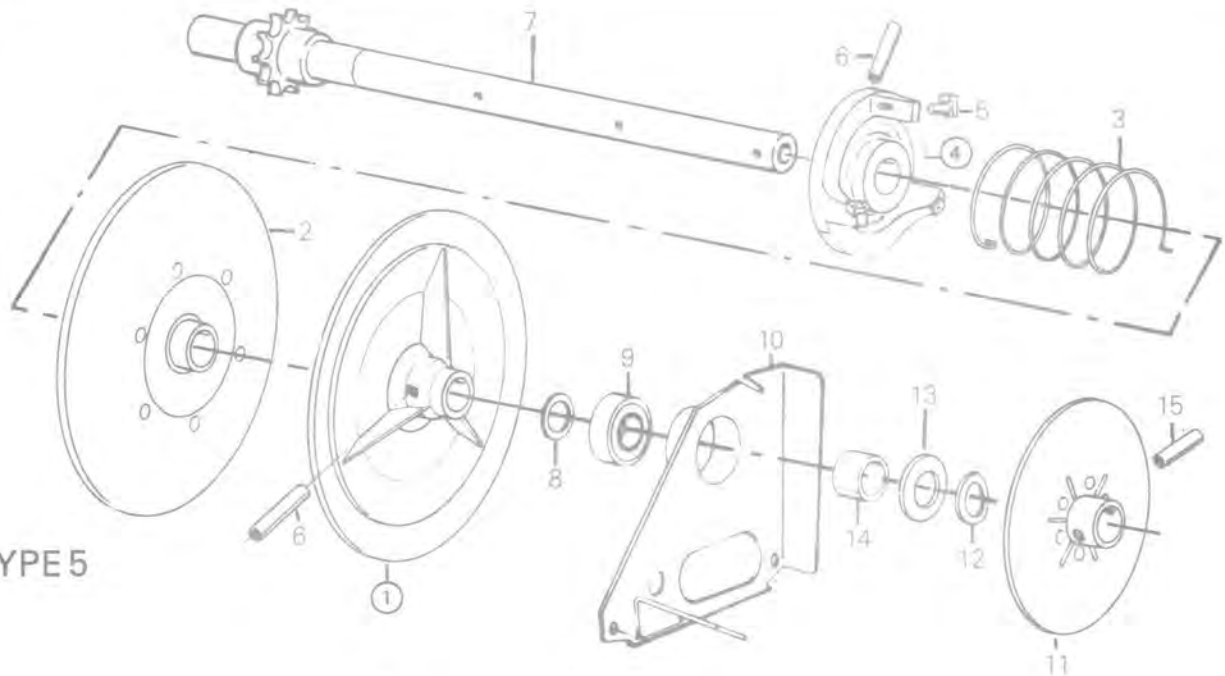
②③ Applicable on 1975 models: used to facilitate pulley alignment for parallelism.

INSTALLATION

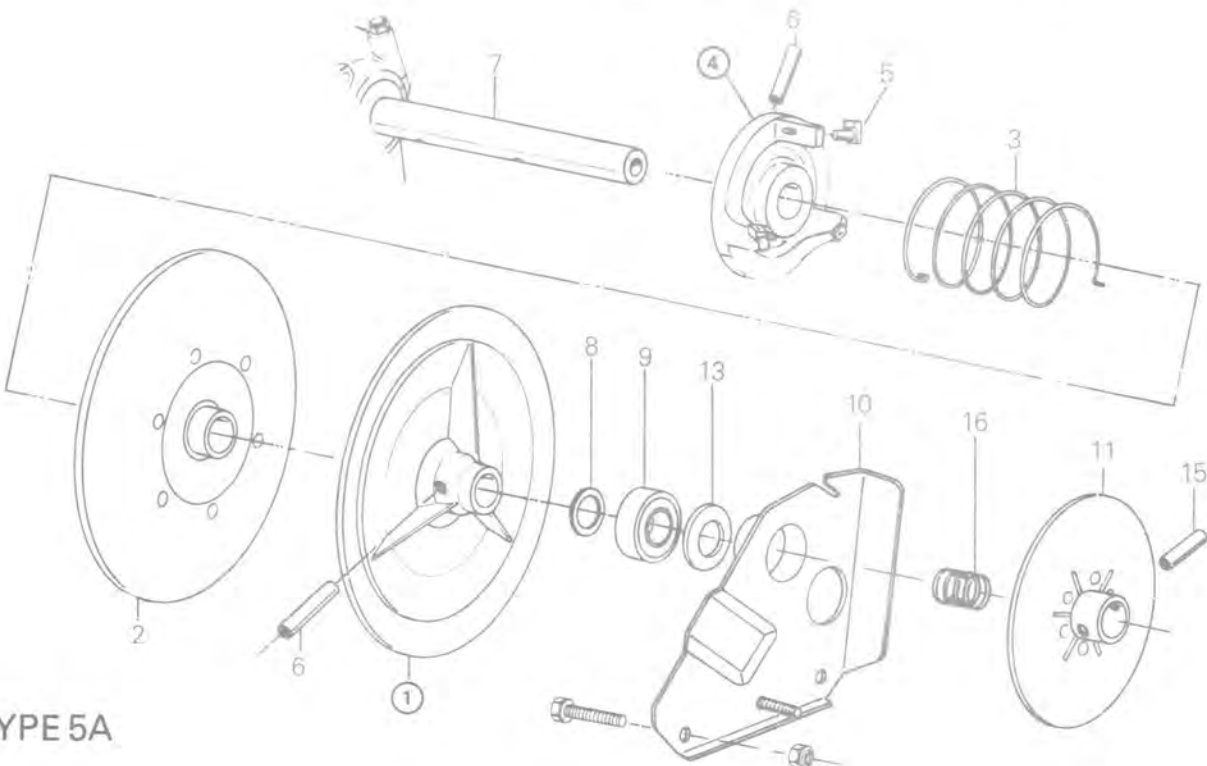
Refer to exploded view for correct position of parts. Torque driven pulley retaining bolt to 3.5 kg-m (25 ft-lbs).

Install drive belt and reposition pulley guard.

TYPE 5



TYPE 5A



- | | |
|-------------------|-------------------------------|
| 1. Fixed pulley | 5. Cam slider shoe |
| 2. Sliding pulley | 6. Roll pin |
| 3. Release spring | 7. Drive shaft (transmission) |
| 4. Outer cam | 8. Spacer |

- | |
|-------------------|
| 9. Bearing |
| 10. Support |
| 11. Disc |
| 12. Spring washer |

- | |
|--------------|
| 13. Shim |
| 14. Spacer |
| 15. Roll pin |
| 16. Spring |

SECTION 02

SUB-SECTION 04 (DRIVEN PULLEY)

REMOVAL

Remove pulley guard and drive belt.

Remove disc brake assembly.

Position a wooden block under the drive shaft then using a hammer and a pin punch, remove roll pin (16) locking disc in position. Tap on inner side of brake and bracket assembly (10) to disengage it from bearing.

Remove muffler from engine.

Remove lower bracket of steering column attached to the gearbox. Slacken upper bracket of steering column. Disconnect transmission rod from gearbox.

Remove gearbox upper housing.

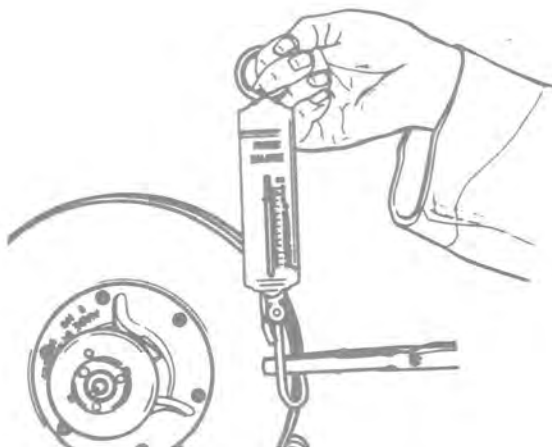
Release chain tension then separate chain at connecting link.

Withdraw driven pulley.

DISASSEMBLY & ASSEMBLY

①④ If necessary heat hub of fixed pulley and outer cam to facilitate removal.

④ In order to measure driven pulley spring tension, the pulley halves must be separated. To do this, insert a length of $\frac{1}{8}$ " dia. rod between the halves. Check tension using a fish scale positioned 90° with pulley axle. (Refer to Technical Data for correct spring tension).



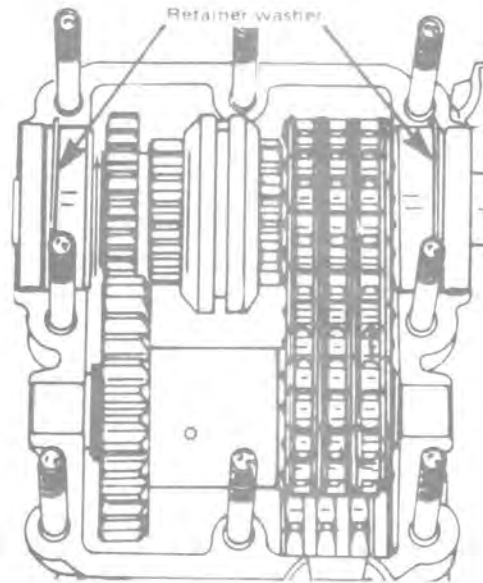
To correct spring tension either relocate spring end in sliding pulley half, or gradually rotate outer cam.

INSTALLATION

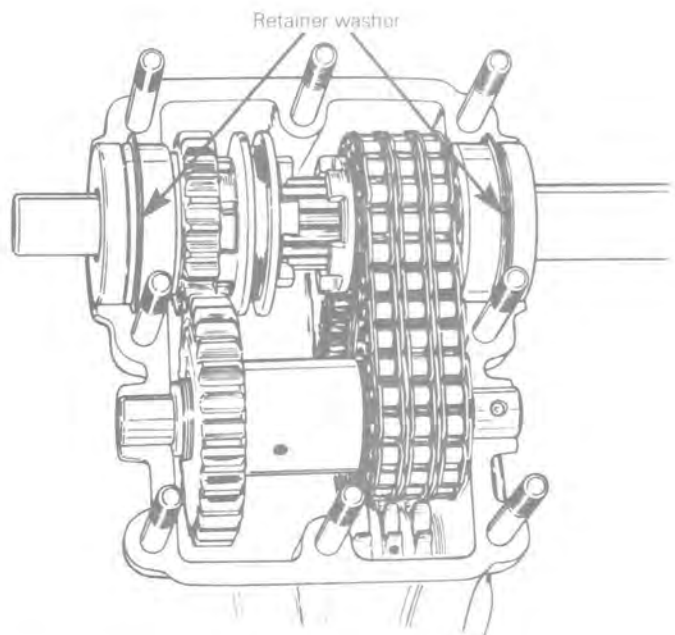
Position drive shaft of assembled driven pulley so that retainer washers align with slots of gearbox casing.

(DRIVEN PULLEY), PAGE 8

3 Position Gearbox



2 Position Gearbox



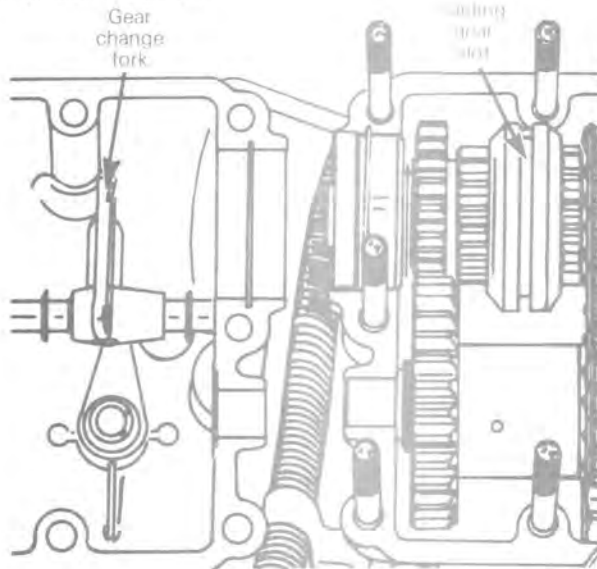
Connect drive chain using a connecting link.

The locking clip should be installed on opposite side of driven pulley.

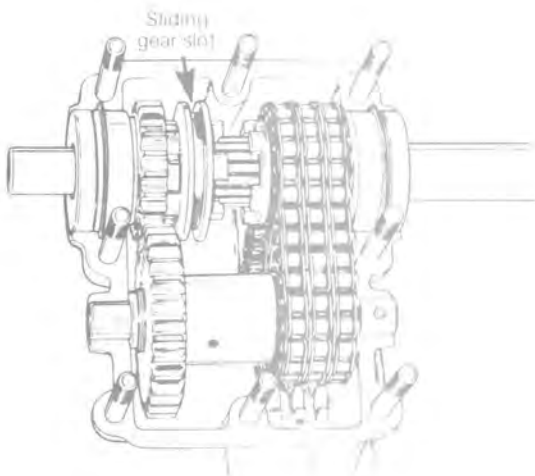
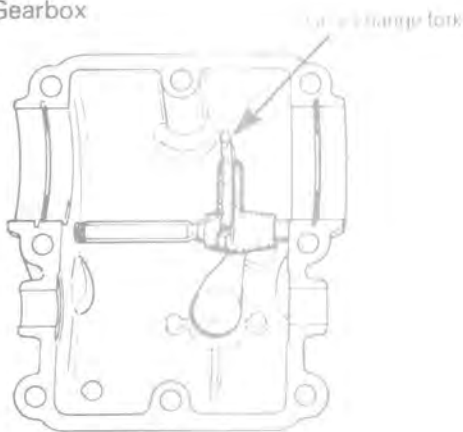
(1977 Supplement)

Position gear change fork in gearbox cover so that it aligns with slot of sliding gear in gear housing.

3 Position Gearbox

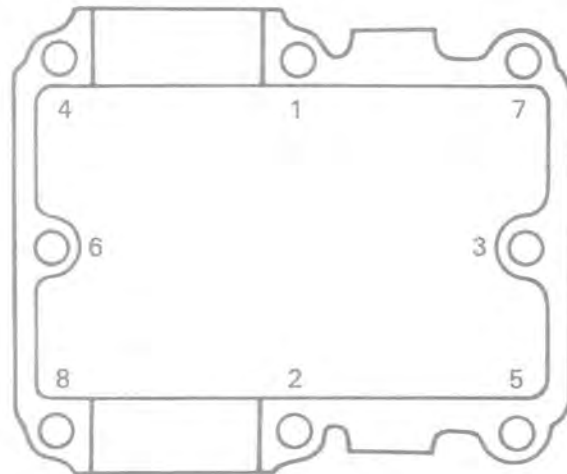


2 Position Gearbox



Apply a thin coat of "Loctite crankcase sealant", or equivalent, on contact surface of gearbox casing.

Install gearbox cover and secure with eight nuts. Torque nuts to 2.7 kg-m (20 ft-lbs) in the following sequence:



Install gearbox rod and adjust. (See Section 02-07).

Install steering column.

The distance between the upper retainer plate (steering column) and the gearbox bracket must be 39,4 cm (15½").

Install drive belt and muffler.

Install brake assembly and bracket. Install roll pin securing disc to shaft.

Adjust chain tension. Check gearbox oil level.

Check pulley alignment.

Install pulley guard.



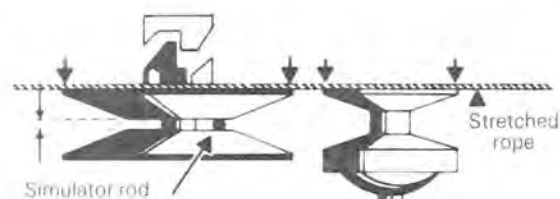
1974-1975 PULLEY ALIGNMENT

Remove pulley guard and drive belt. Check tightness of engine mount nuts.

OFFSET ADJUSTMENT

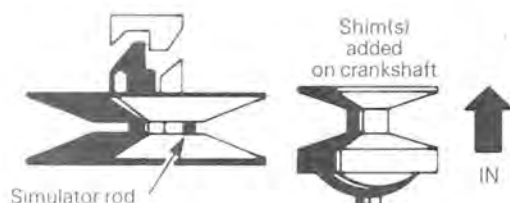
Fixed Type Driven Pulley

Insert correct diameter simulator rod between driven pulley halves. (See Technical Data). Using a rope, check that drive and driven pulley inner halves are in line.



If drive pulley is too far in, remove drive pulley and add shim(s) on crankshaft.

CAUTION: Never use more than 5 shims on crankshaft.

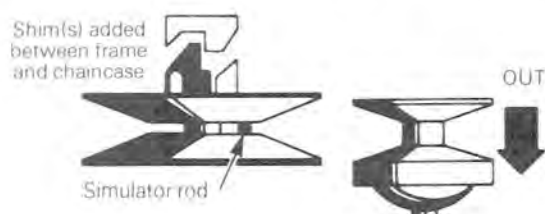


WARNING: Always torque drive pulley bolt within specifications. (See Technical Data).

If drive pulley is too far out, twin track models excepted; add shim(s) between frame and chaincase.

On twin track models, check tightness of gear box attaching bolts. If necessary remove shim(s) from crankshaft.

CAUTION: On vehicles equipped with aluminum chaincase always use full length shims.

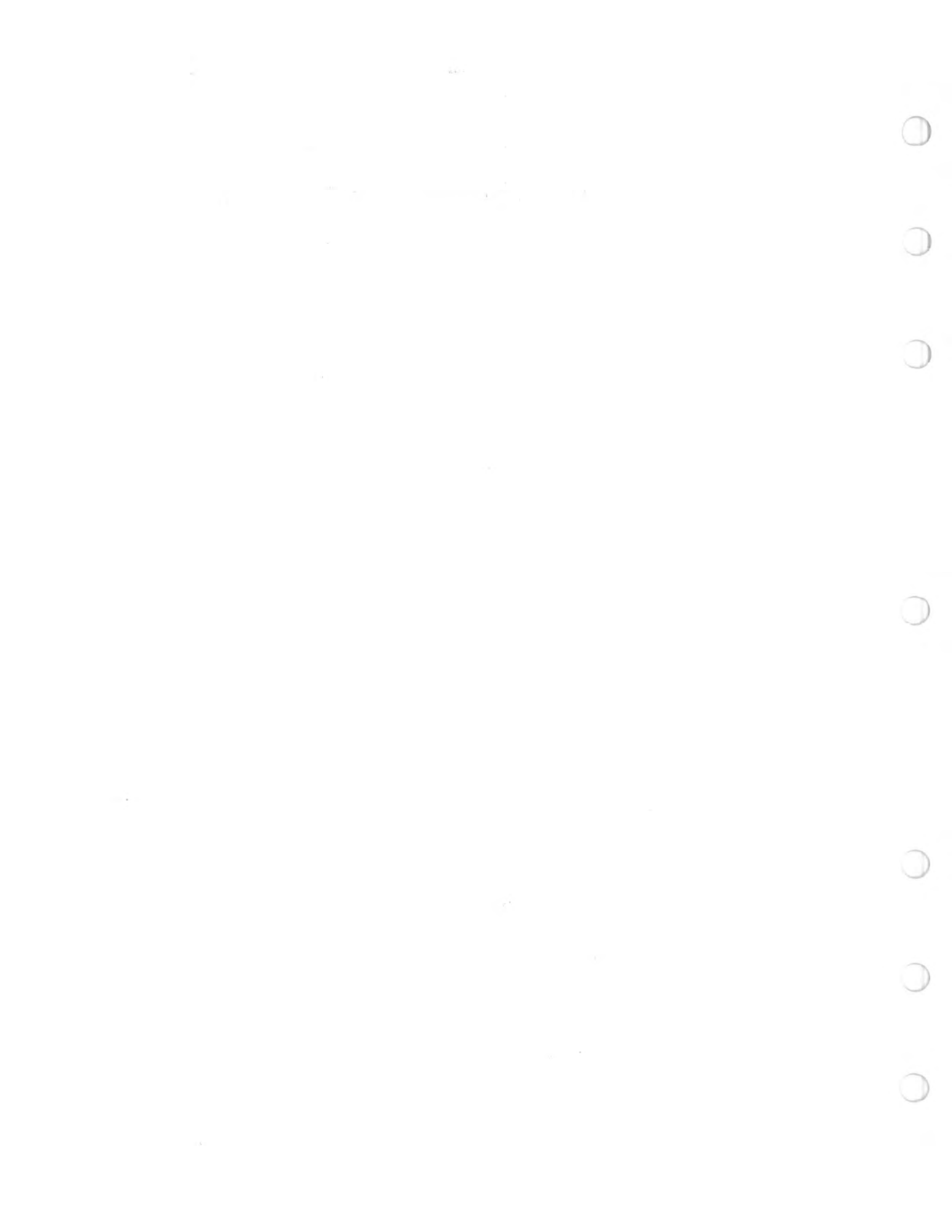


Floating Type Driven Pulley

During operation, the driven pulley slides on its' shaft and automatically aligns itself at all speeds. To retain free-floating efficiency, apply anti-seize lubricant on shaft. Torque driven pulley retaining bolt to 3.4 kg-m (25 ft-lbs).

DISTANCE ADJUSTMENT

Slacken chaincase and reposition (See Technical Data). Install drive belt and pulley guard.

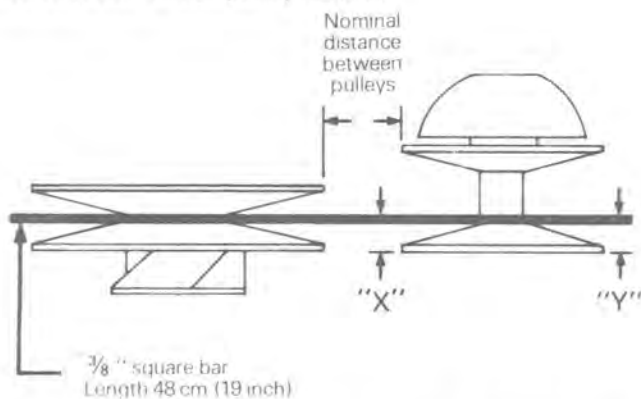


1976 AND UP PULLEY ALIGNMENT

Remove pulley guard and drive belt. Check tightness of engine mount nuts.

OFFSET ADJUSTMENT

Insert a 48 cm (19 inch) length of $\frac{3}{8}$ " to $\frac{5}{8}$ " square bar between driven pulley halves.



- Dimension "X" must never exceed dimension "Y".
- Dimension "Y" can exceed dimension "X" by 1.6 mm ($\frac{1}{16}$ ").

(Refer to Technical Data for dimension value).

Front mounted engine

If the drive pulley is too far in or too far out, it can be corrected by sliding the slotted engine support toward appropriate side.

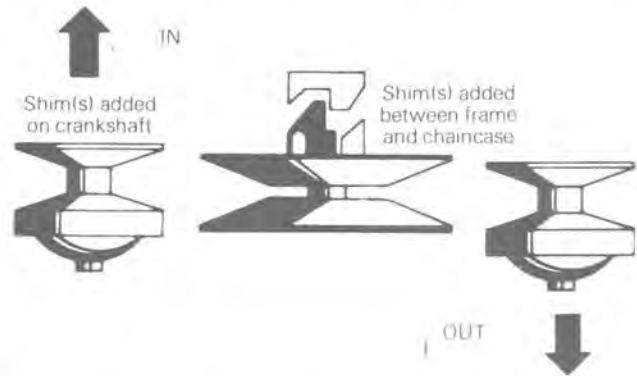
Center mounted engine

If drive pulley is too far in, remove drive pulley and add shim(s) on crankshaft.

CAUTION: Never use more than 5 shims on crankshaft.

If drive pulley is too far out, twin track models excluded; add shim(s) between frame and chaincase.

On twin track models, check tightness of gearbox attaching bolts. If necessary, remove shim(s) from crankshaft. The engine can also be slid on either side by slackening the engine bracket from the support, for better adjustment.

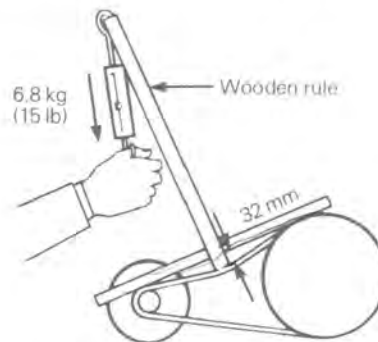


WARNING: Always torque drive pulley bolt within specifications. (See Technical Data).

DISTANCE ADJUSTMENT

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

1. Adjust pulley distance to **nominal** distance. (Refer to Technical Data).
2. Install a **new** drive belt on vehicle.
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 as follows:
 - Position reference rule on drive belt. Using wooden rule and fish scale, apply 6.8 kg (15 pounds) pressure on drive belt.
 - Deflection must be 32 mm ($1\frac{1}{4}$ ")



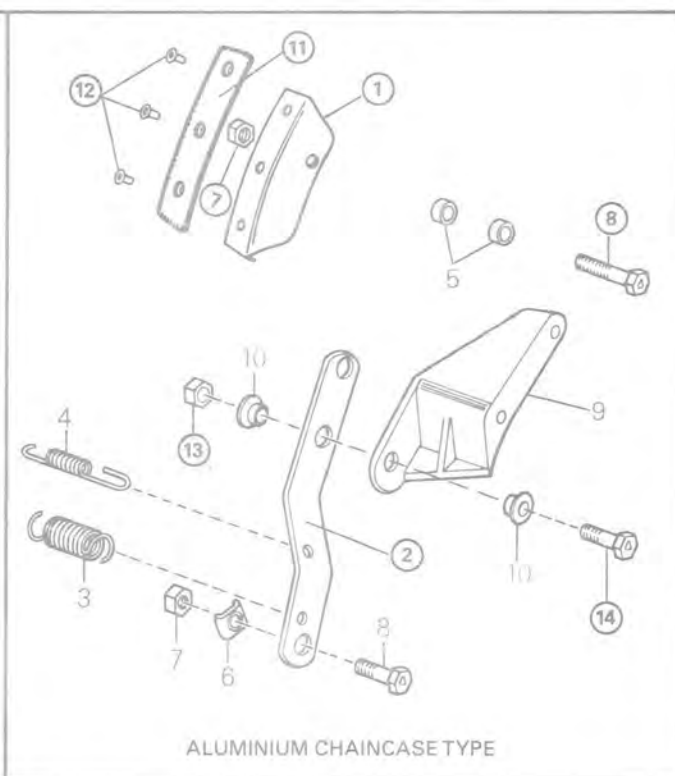
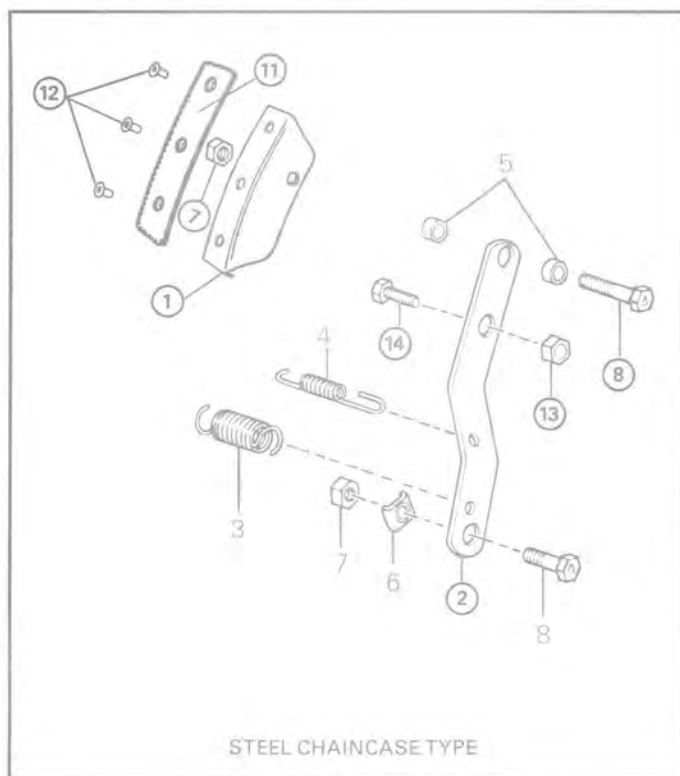
To correct, decrease or increase distance between pulleys by moving chaincase either forward or backward.



BRAKE APPLICATION CHART

DRUM BRAKE	1974 Elan, Olympique 1975 Elan 1976 Elan, Olympique 300 M 1977 Elan, Olympique 300M
DISC BRAKE REGULAR TYPE	1974 Alpine 1975 Alpine 1st serie (000 3307)
DISC BRAKE HEAVY DUTY TYPE	1974-75 Elite
SELF-ADJUSTING BRAKE	1974 Nordic, T'NT F / C & Everest, T'NT F / A 1975 T'NT F / C & Everest, RV 1976 T'NT F / C & Everest, RV
BOMBARDIER SELF-ADJUSTING FLOATING DISC TYPE	1975 T'NT F / A
BOMBARDIER SELF-ADJUSTING FLOATING CALIPER TYPE	1975 Olympique, Alpine 2nd serie (000 3308) 1976 Olympique 300T, 340, 440, Alpine 1977 Everest, T'NT, RV

DRUM BRAKE

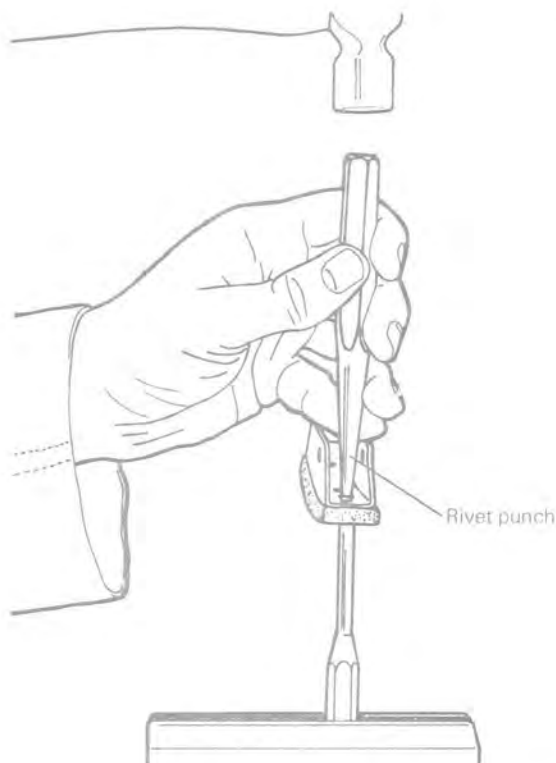


1. Brake shoe
2. Brake lever
3. Spring
4. Brake light switch spring
5. Spacer
6. Cable lock
7. Nut
8. Bolt
9. Brake lever bracket
10. Brass bushing
11. Lining
12. Rivet
13. Nut
14. Bolt

DISASSEMBLY & ASSEMBLY

① ⑪ ⑫ Certain models have riveted linings. Rivets head must be below lining surface. If worn, remove rivets using a $1\frac{1}{64}$ " dia. bit.

To secure new lining to shoe, use a flat head punch and a rivet punch, as illustrated.



SECTION 02

SUB-SECTION 06 (BRAKE)

② ⑬ ⑭ When attaching brake lever assembly to chain-case bracket, tighten nut until lever pivots freely and all side play is eliminated.

① ⑦ ⑧ At assembly torque brake shoe retainer nut to 0.3-0.4 kg-m (2-3 ft-lbs). Shoe must pivot easily under light pressure.



NOTE: Lubricate all moving metal parts of brake with light machine oil.



WARNING: Avoid getting oil on brake shoe.

INSPECTION

Check brake lining for wear. If necessary, replace.



NOTE: If oil traces are found on lining or drum, check chaincase oil seal for correct installation position or damage. Replace as needed. Wipe oil from pulley and replace brake lining.

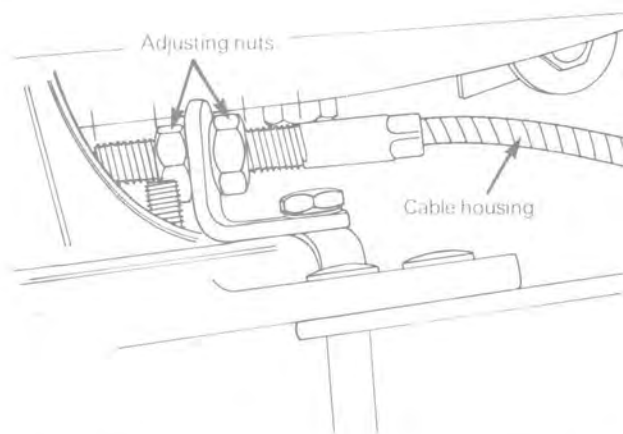
INSTALLATION & ADJUSTMENT

Connect brake cable to brake lever and adjust so that brake applies fully when lever is 25 mm (1") from handlebar grip.



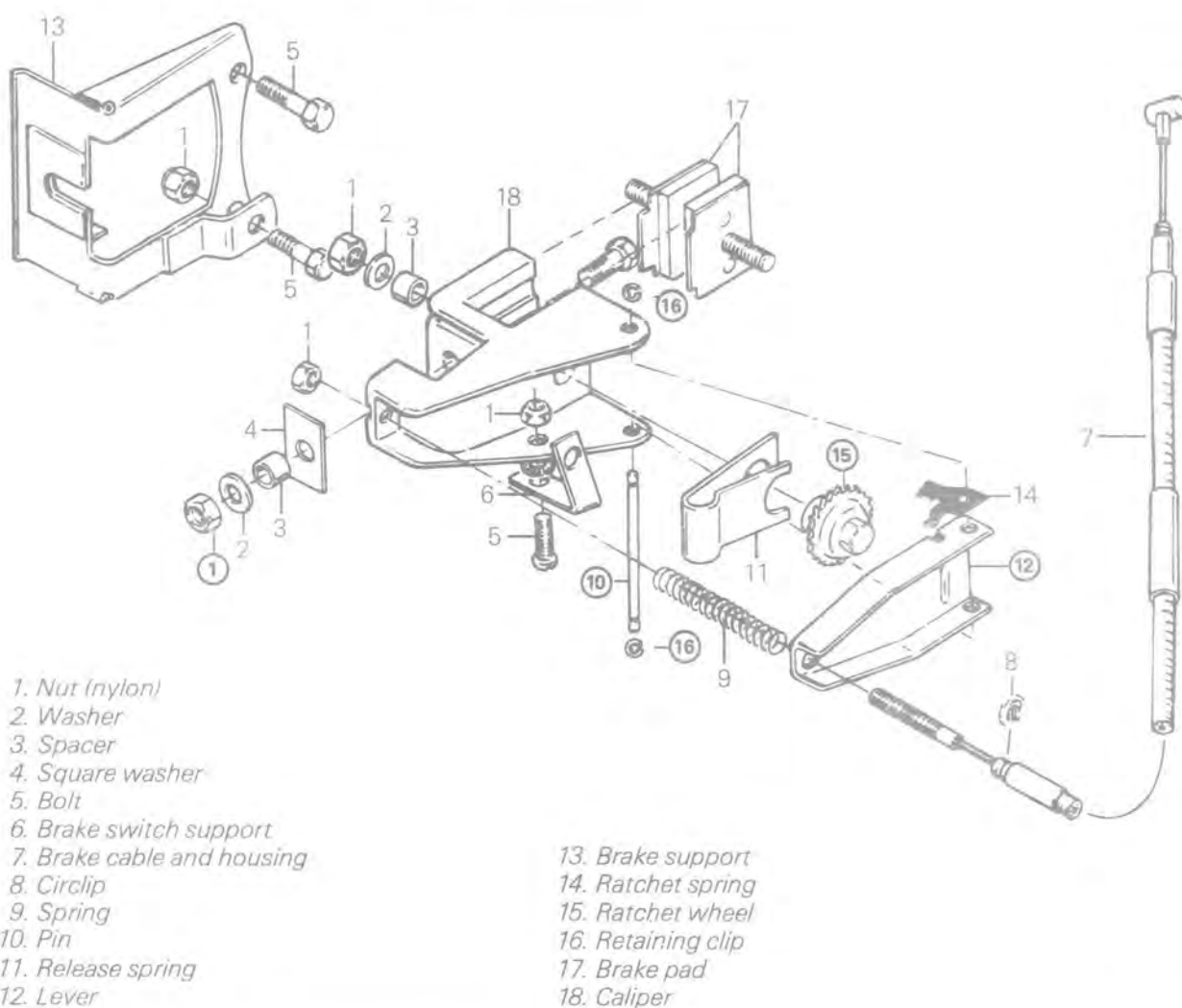
NOTE: Prior to cable installation, make sure cable housing adjusting nuts are located half way on adjuster threads.

If a final adjustment is indicated, use housing adjusting nuts.



Check brake light operation. If necessary, loosen brake light switch lock nuts and adjust.

BOMBARDIER SELF-ADJUSTING FLOATING CALIPER TYPE

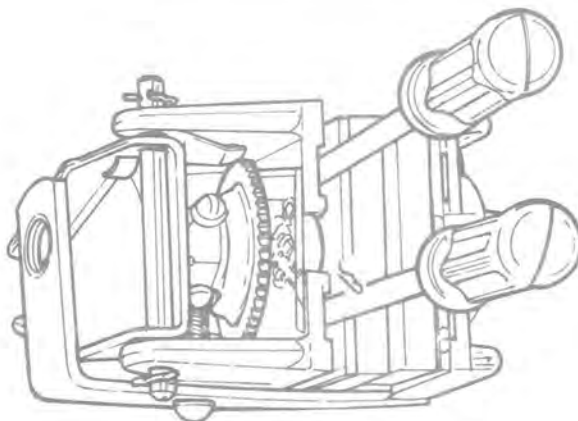


REMOVAL

- Disconnect brake switch and brake cable.
- Remove the two (2) nuts and bolts securing brake support to chaincase.
- Slide brake caliper ass'y from brake support.

DISASSEMBLY & ASSEMBLY

⑩ ⑫ ⑯ At assembly, activate lever and wedge two (2) screwdriver blades between caliper and brake pad to release lever tension.



SECTION 02

SUB-SECTION 06 (BRAKE)

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

① At assembly, torque to 1.9-2.4 kg-m (14-17 ft-lbs).

CLEANING & INSPECTION

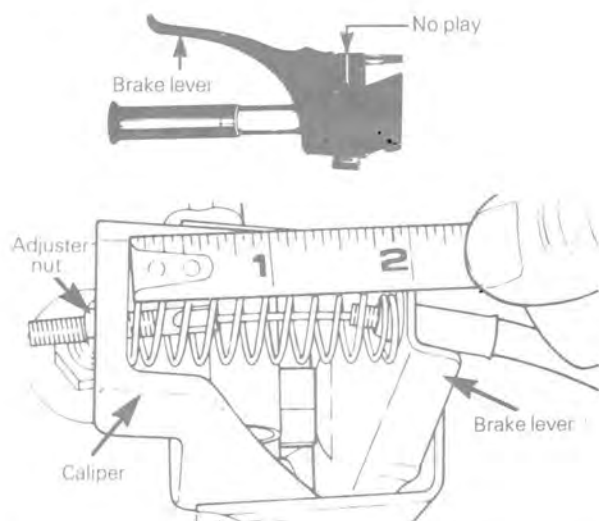
Measure thickness of brake pad. If less than 3 mm ($\frac{1}{8}$ "), the pad should be replaced.

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.

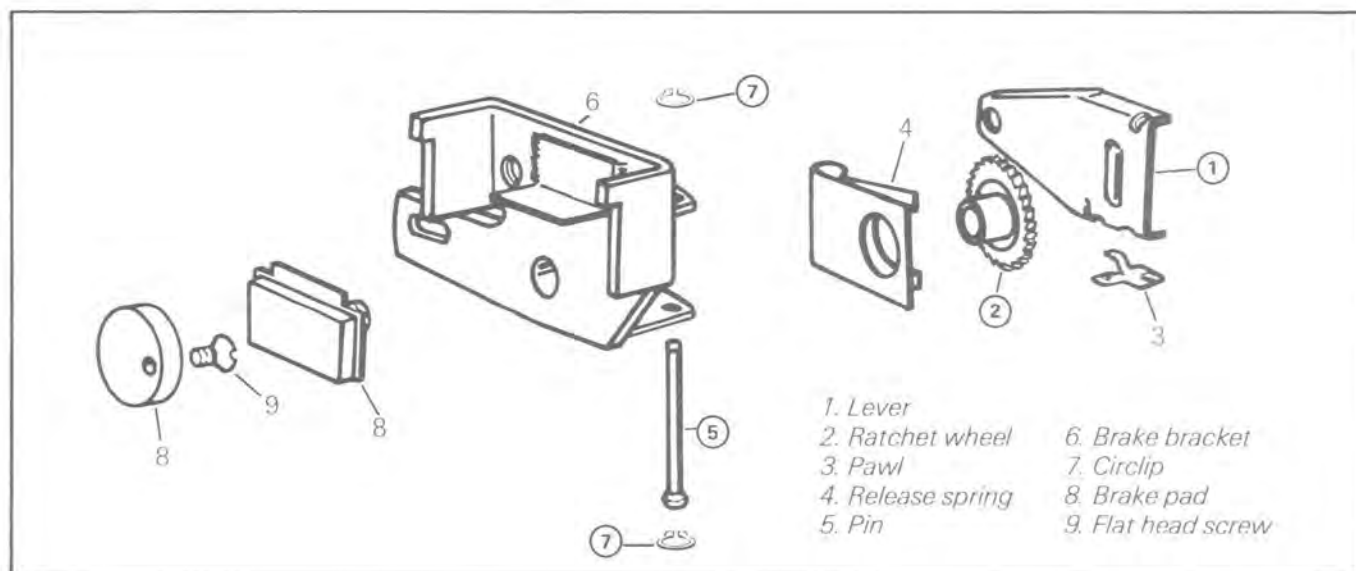
- Activate lever by hand until ratchet click is no longer heard.
- Secure brake cable housing to lever, slide spring over cable and then attach cable to housing with adjuster nut.
- Using adjuster nut, adjust until there is no free-play between the brake lever and its housing, and there is a gap of 50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

BOMBARDIER SELF-ADJUSTING FLOATING DISC TYPE



REMOVAL

Disconnect brake switch and brake cable.

Remove the two (2) bolts securing brake bracket to chaincase.

DISASSEMBLY & ASSEMBLY

①⑤⑦ At assembly, activate lever and wedge two (2) screwdriver blades between brake bracket and brake pad to release lever tension.

② Apply low temperature grease on threads and spring seat prior to installation. At assembly, fully tighten then back off ½ turn.

CLEANING & INSPECTION

Measure thickness of brake pad. If less than 3 mm (⅛ "), the pad should be replaced.

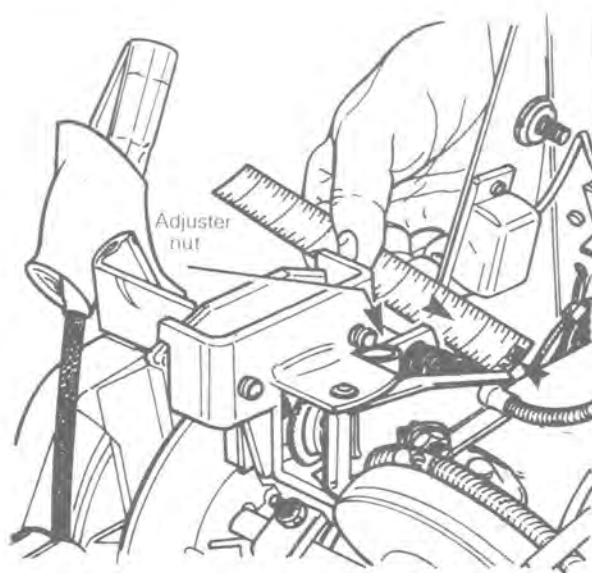
Clean all metal components in a general purpose solvent. Dry using clean cloth.

INSTALLATION & ADJUSTMENT

Secure brake bracket to chaincase.
Activate lever by hand until ratchet click is no longer heard.

Secure brake cable housing to lever, slide spring over cable and 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 38 mm ± 3 (1½" ± ⅛") between lever and bracket.



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

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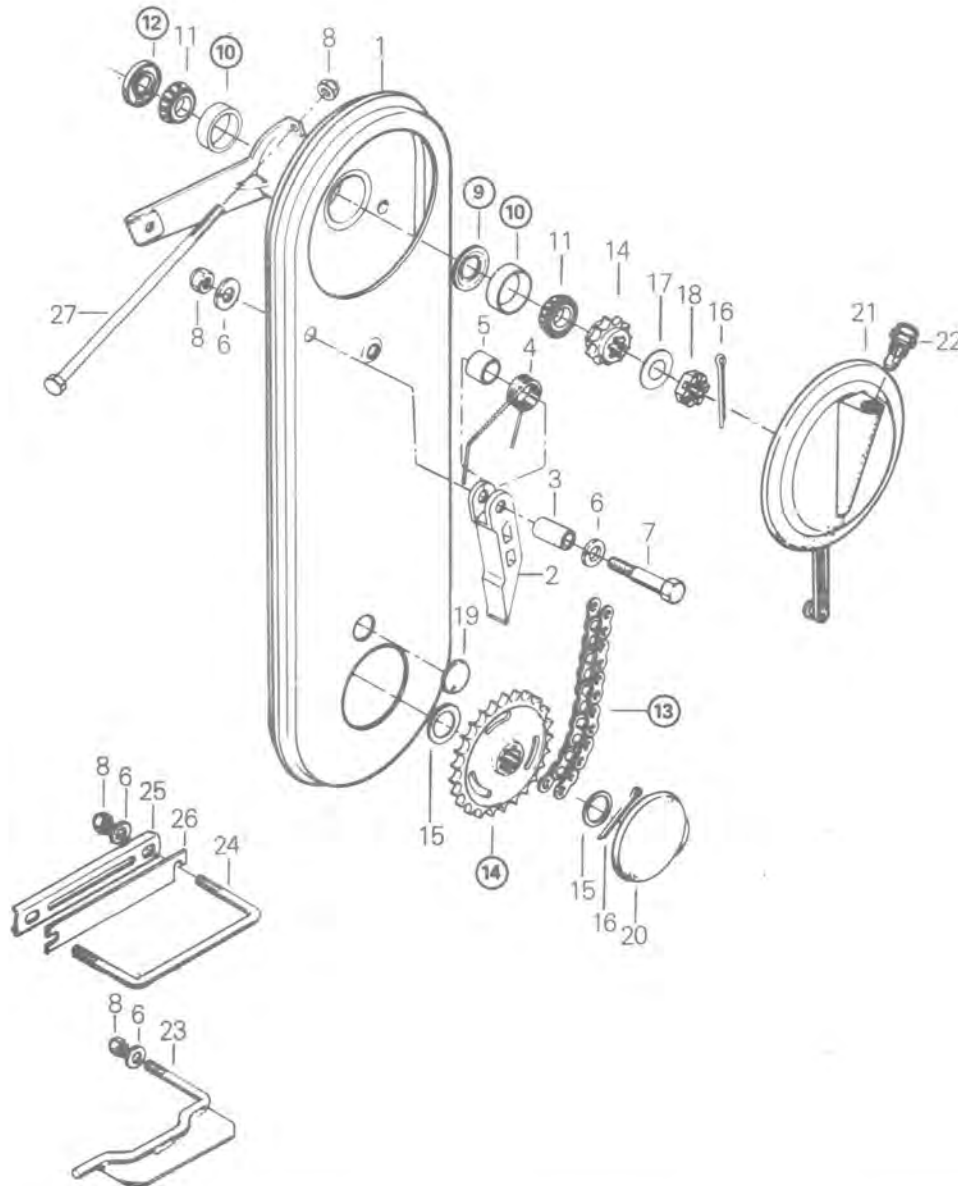
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STEEL CHAINCASE



- 1. Chaincase
- 2. Chain tensioner
- 3. Bushing
- 4. Spring
- 5. Spacer
- 6. Washer
- 7. Bolt
- 8. Nut
- 9. Oil retainer ring

- 10. Bearing cup
- 11. Cone bearing
- 12. Oil seal
- 13. Chain
- 14. Sprocket
- 15. Spacer
- 16. Cotter pin
- 17. Spring washer
- 18. Castellated nut

- 19. Chaincase plug
- 20. Access plug
- 21. Inspection cover
- 22. Breather
- 23. Bracket
- 24. "U" clamp
- 25. Spacer plate
- 26. Shim
- 27. Special screw

SECTION 02

SUB-SECTION 07 (CHAINCASE)

REMOVAL

Remove pulley guard, drive belt and inspection cover.
Release chain tension.

Release track tension.

Pry oil seal from chaincase and drain oil.

Disconnect brake cable.

Pry out lower access plug. Remove cotter pin and spacer.

Remove nut on hinge rod at chaincase bracket.

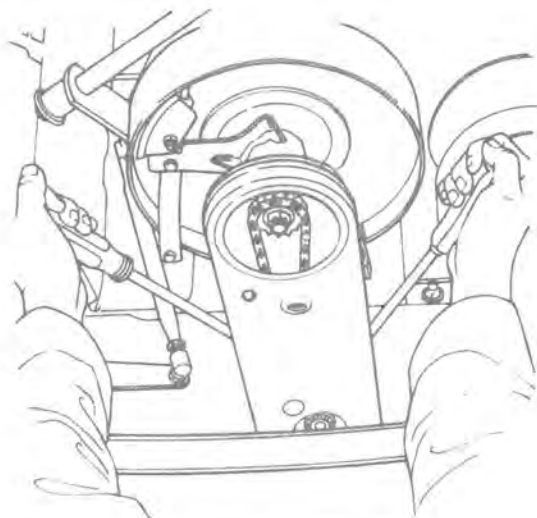
From the inner side of frame, remove the nut securing chaincase lower bracket. Remove bracket.

Remove nuts, washers and "U" clamp holding the chaincase to the frame.

Remove chaincase shim(s) if applicable. Move chaincase towards drive pulley to disengage hinge rod.

Remove drive axle.

Using two (2) large screwdrivers inserted between chaincase and frame, pry complete assembly from vehicle.

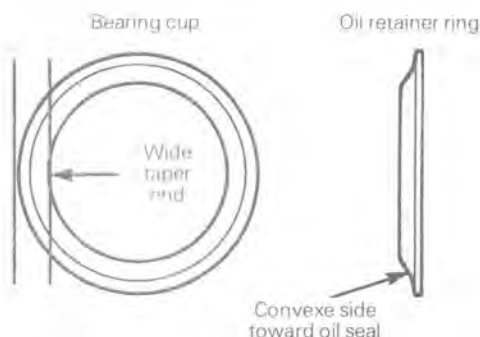


INSPECTION

Visually inspect chain for cracked, damaged or missing link rollers. Inspect for defective bearing cones, bearing cups and oil retainer ring. Inspect sprockets for damage, wear.

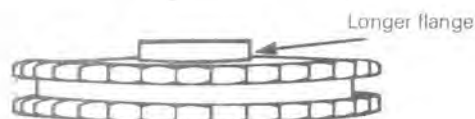
DISASSEMBLY & ASSEMBLY

⑨⑩ Position oil retainer ring then sit bearing cup in chaincase aperture. Cup must be seated so that wide taper end is facing oil retainer ring.



⑫ Using an appropriate pusher, press oil seal into chaincase hub. Oil seal must sit flush with case hub edge.

⑬⑭ Place lower sprocket with longer flange toward track side of chaincase. (For proper sprocket and chain use, see Technical Data.)

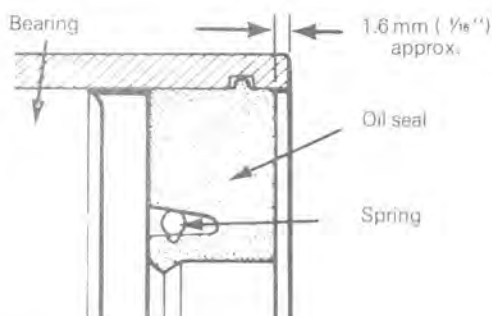


INSTALLATION

Position assembled chaincase and driven pulley in location. Install drive axle. (Ensure that spacer has remained on axle). Install spacer and cotter pin to secure lower sprocket to axle. Install lower access plug. Install hinge rod, lower bracket, "U" clamp and previously removed aligning shim(s).

Install oil seal into chaincase flange.

○ NOTE: A gap of approximately 1.6 mm ($\frac{1}{16}$ ") should exist between the end chaincase flange and oil seal.



Proceed with pulley alignment.

Apply chain tension.

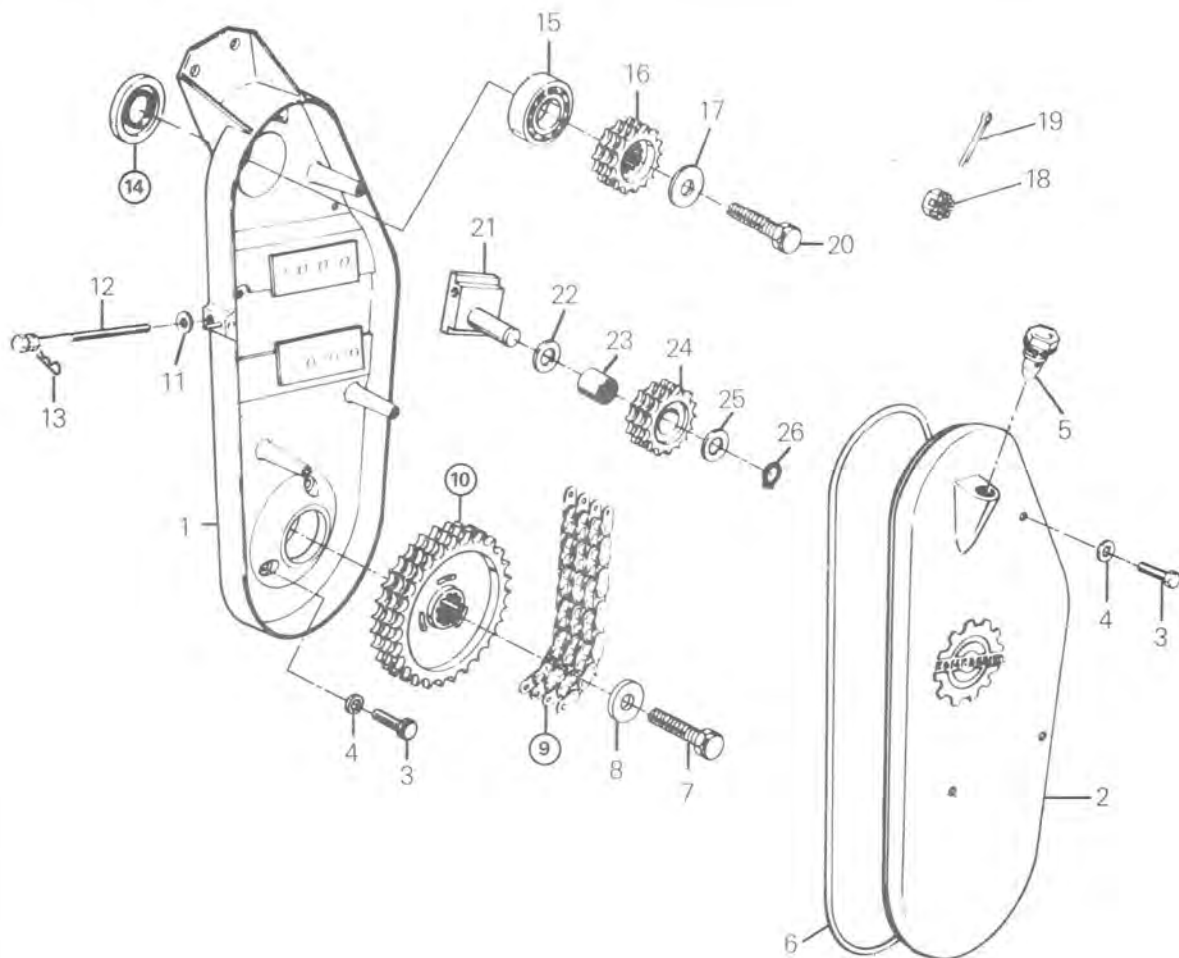
Pour Bombardier chaincase oil into chaincase until flush with chaincase plug.

Connect and adjust brake.

Apply track tension.

Install drive belt and pulley guard.

ALUMINIUM CHAINCASE WITH ADJUSTABLE CHAIN TENSIONER



1. Chaincase
2. Cover
3. Screw
4. Washer
5. Breather plug
6. Gasket
7. Screw (sprocket)
8. Washer
9. Chain

10. Sprocket
11. Washer
12. Tensioner bolt
13. Cowling clip
14. Oil seal
15. Bearing
16. Sprocket
17. Washer

18. Castellated nut
19. Cotter pin
20. Screw
21. Sliding block
22. Washer
23. Bearing
24. Sprocket (idler)
25. Washer
26. Circlip

SECTION 02

SUB-SECTION 07 (CHAINCASE)

REMOVAL

Remove muffler, rewind starter guide and disc brake assembly.

Remove chaincase cover and drive axle oil seal, (chaincase side).

Release track tension.

Release chain tension.

Remove upper and lower sprockets.

Remove bolt securing chaincase to frame. Remove chaincase.

INSPECTION

Visually inspect chain for cracked, damaged or missing link rollers.

Inspect for defective bearing.

Inspect sprockets for damage or wear.

DISASSEMBLY & ASSEMBLY

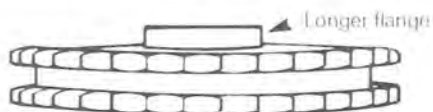
⑭ Oil seal must be pushed in until flush with chaincase hub edge.

⑨ ⑩ For proper sprocket and chain use, see Technical Data.

INSTALLATION

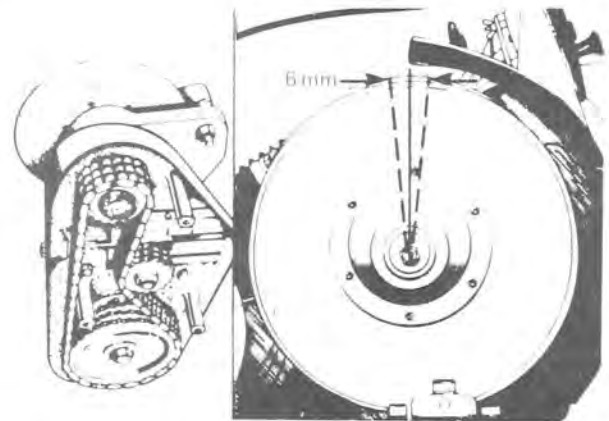
Position chaincase and secure it to frame.

Position upper and lower sprockets and chain. Secure sprockets. Ensure longer flange of lower sprocket faces inside of case. Install drive axle oil seal.



Adjust chain tension.

The correct chain tension is 6 mm ($\frac{1}{4}$ ") at driven pulley level. To check, with engine **off**, move driven pulley from side to side. To correct, unlock tensioner bolt ⑫ then turn bolt clockwise or counter-clockwise. Install hair pin to lock tensioner bolt.



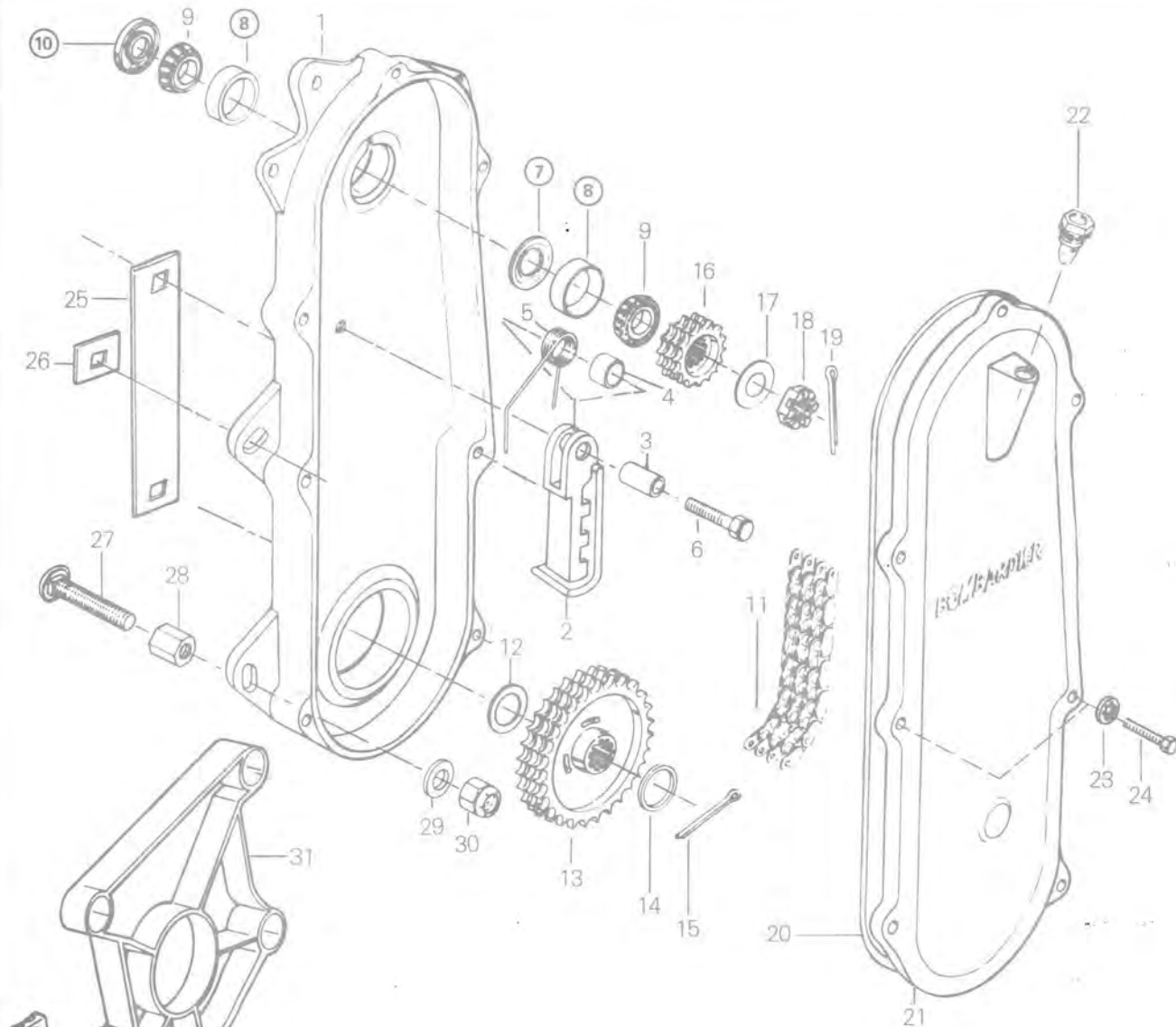
Position chaincase cover with a new gasket and silicone seal or equivalent. (Ensure gasket sits correctly into its groove). Bolts securing cover must be torqued to 0.7 kg-m (5 ft-lbs).

Pour 170 ml (6 ounces) of Ski-Doo chaincase oil into chaincase.

Apply track tension.

Install disc brake assembly, rewind starter guide and muffler.

ALUMINIUM CHAINCASE WITH AUTOMATIC CHAIN TENSIONER



- 1. Chaincase
- 2. Chain tensioner
- 3. Bushing
- 4. Spacer
- 5. Spring
- 6. Bolt
- 7. Oil retainer ring
- 8. Bearing cup

- 9. Cone bearing
- 10. Oil seal
- 11. Chain
- 12. Spacer
- 13. Sprocket
- 14. Spacer
- 15. Cotter pin
- 16. Sprocket
- 17. Spring washer
- 18. Castellated nut
- 19. Cotter pin
- 20. Gasket

- 21. Cover
- 22. Breather plug
- 23. Washer
- 24. Screw
- 25. Reinforcement plate (1977 T'NT)
- 26. Reinforcement plate (1977 T'NT)
- 27. Carriage bolt
- 28. Spacer (new models)
- 29. Washer
- 30. Nut
- 31. Spacer (older models)
- 32. Clip nut

SECTION 02

SUB-SECTION 07 (CHAINCASE)

REMOVAL

Remove pulley guard and drive belt.

Release track tension and unbolt the end bearing housing.

Unbolt brake assembly.

Remove chaincase cover and drain oil.

Pry oil seal from chaincase.

Release chain tension then remove cotter pin locking lower sprocket. Remove spacer.

Remove bolts and/or nuts securing chaincase to frame. Remove aligning shim(s).

Remove complete assembly from vehicle.

INSPECTION

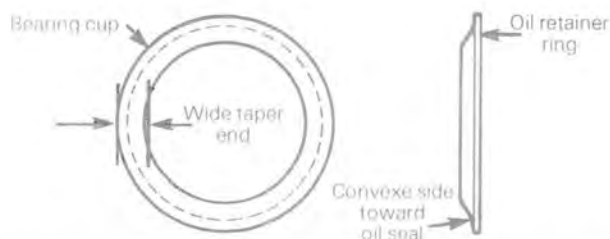
Visually inspect chain for cracked, damaged or missing link rollers. Inspect for defective cone bearings, bearing cups, sprockets and oil retainer ring.

DISASSEMBLY & ASSEMBLY

⑦ ⑧ To remove bearing cup and oil retainer ring from casing, first heat chaincase to 120° C (250° F). To install, heat chaincase to 120° C (250° F).

Position oil retainer ring with convex side toward oil seal.

Cup must be seated so that wide taper is facing oil retainer ring.



⑩ Using an appropriate pusher, press oil seal into chaincase hub. Oil seal must fit flush with case hub edge.

INSTALLATION

Install chaincase to frame (do not tighten). Position drive axle into location. Tighten the end bearing housing.

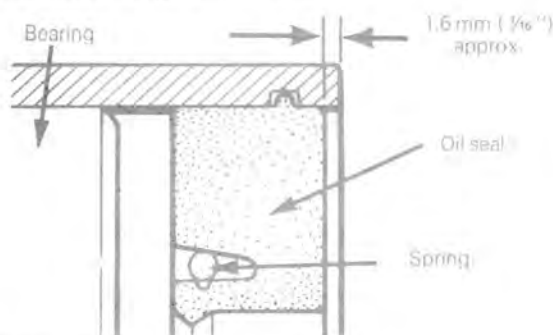
Prior lower sprocket installation ensure that the spacer is on drive axle.

Position lower sprocket with longer flange facing inside of case. (For proper sprocket and chain use, see Technical Data).



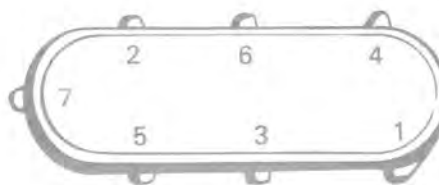
Install the other spacer and a new cotter pin.

Proceed with pulley alignment. Secure chaincase to frame. Install chaincase flange oil seal. A gap of approximately 1.6 mm (1/16") should exist between the end of chaincase flange and oil seal.



Apply chain tension.

Install chaincase cover with a new gasket and silicone seal or equivalent. Torque cover bolts to 0.7 kg-m (5 ft-lbs) in the following sequence.



Pour Bombardier chaincase oil into chaincase until flush with indicator level for older models.

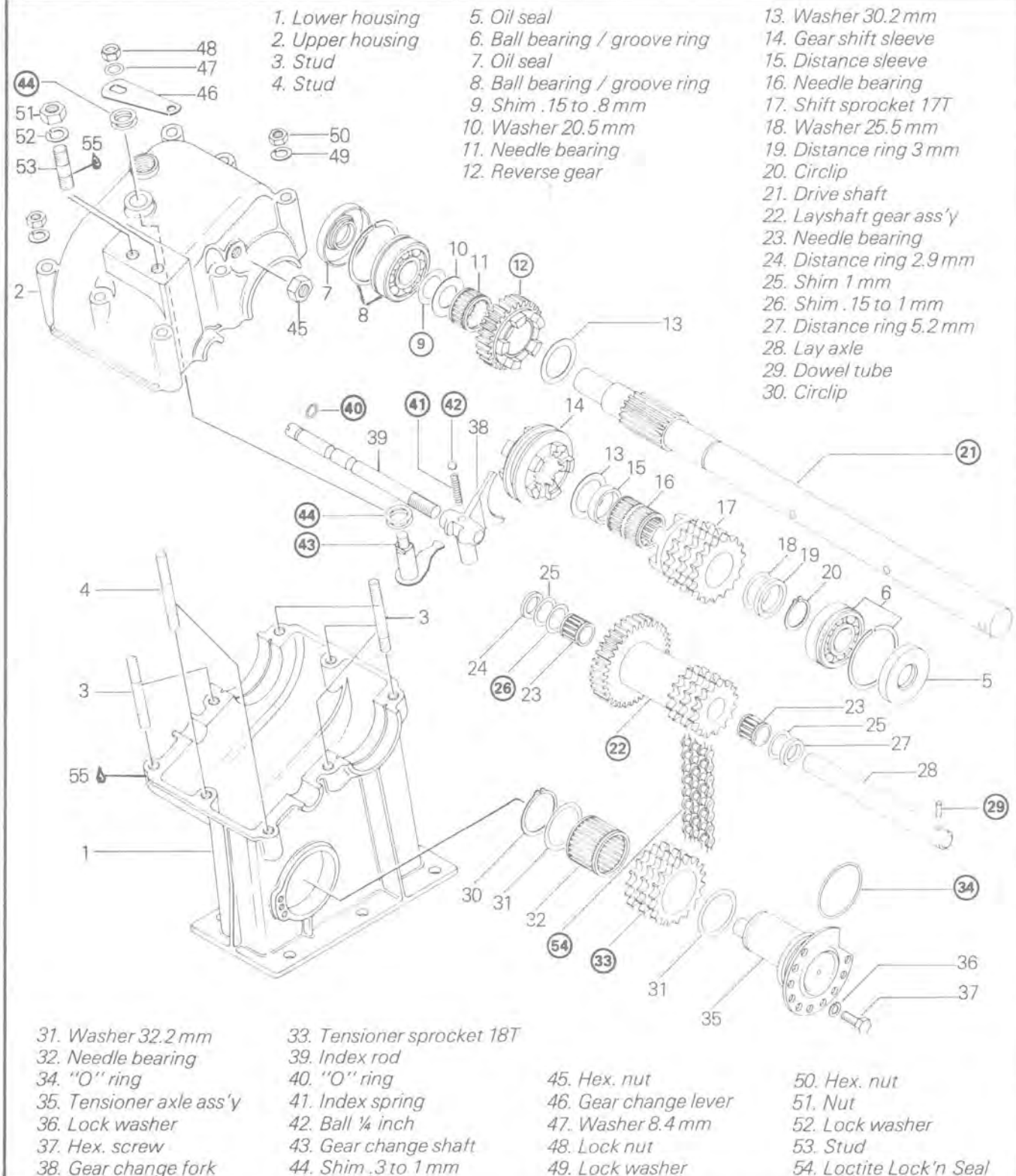
For newer models; using a rigid wire as a "dipstick". Check oil level, the oil level on the "dipstick" should be 75-90 mm (3-3 1/2").



Install brake assembly, drive belt and pulley guard.

Apply track tension.

GEARBOX (FORWARD, REVERSE)



REMOVAL

Alpine

Remove cab, pulley guard, drive belt and muffler from vehicle.

Remove brake assembly and transmission rod, (shifter).

Remove steering lower bracket from the gearbox.

Slacken upper bracket.

Release chain tension.

Release track tension by unlocking link plate springs. Insert a pry bar between structural members of center bogie wheel sets and pry sets upward to reversed installation position. Reverse front then rear bogie wheel sets. Remove rear axles.

Remove oil seals from end bearing housings and center frame.

Remove end bearing housings. (Pry out housings with two (2) screwdrivers inserted between housing and frame).

Release drive axle sprocket teeth from track notches while at the same time, pulling the drive axle towards end bearing side of frame. (This action will disengage the axle splines from the lower sprocket of the gearbox). Allow drive axles to remain within the tracks.

Remove gearbox and gasket from frame.

Elite

Remove pulley guard and drive belt.

Remove seat backs then remove plates to allow access to engine compartment.

Remove engine from vehicle.

Remove brake assembly and bracket of driven pulley.

Remove transmission shifter rod.

Release track tension. Remove rear axles and bogie wheel sets.

Remove end bearing housings.

Remove gear box tensioner.

Remove drive axles then pull back gearbox assembly and remove the two (2) tensioners from between the track tunnels.

Remove gearbox, chain and lower sprocket from vehicle.

INSPECTION

Check general condition of chain linkage. Visually inspect drive chain for cracked, damaged or missing link rollers. Inspect security of riveted heads of link pins.

Visually inspect oil seals for cuts or damage.

Inspect sprockets and gears for damage, worn teeth, or spline distortion.

Inspect general condition of bearings (pitted or missing roller bearings, freedom of movement and radial free-play).

Inspect drive shaft for deflection, worn or twisted splines.

DISASSEMBLY & ASSEMBLY

②① ⑨ Drive shaft free-play:

Install assembled drive shaft into lower housing then using a feeler gauge, check total free-play between components installed on the drive shaft side of sprocket. ⑫

Free-play must not exceed 0.15-0.30 mm (.006 to .012"). If free-play is not within tolerance, shim ⑨ to correct tolerance.

②② ②⑥ Layshaft gear free-play:

○ **NOTE:** If the dowel tube has been removed from the lay axle, install tube into axle using a soft faced hammer.

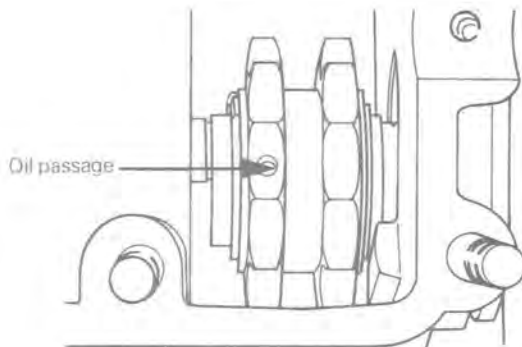
a) Slide the distance ring ②⑦, shim ②⑤, needle bearing ②③, lay the gear assembly ②②, needle bearing ②③, shims ②⑥ ②⑤ and distance ring ②④ on layshaft.

b) Place the assembled lay gear into the lower housing.

c) Using a feeler gauge, check end play between assembled layshaft and walls of lower housing. End play must be between 0.15-0.30 mm (.006 and .012"). If end play is not within tolerance, remove or add ②⑥ shims.

②⑨ Do not remove the dowel tube from layshaft unless damaged and replacement is necessary.

③③ ③④ When assembling, always position a new "O" ring into appropriate groove of tensioner axle. The sprocket oil passage must be positioned as shown in the following figure.



④⑩ When assembling gearbox, always position a new "O" ring on index rod.

④① ④② The gear change fork incorporates a spring loaded ball. Ensure that spring and ball do not fly out during removal of index rod.

④③ ④④ Gear change shaft free-play:

Install gear change shaft on upper housing then on outside of housing, position shim ④④, gear change lever ④⑥, washer ④⑦ and nut ④⑧. Torque to 2.3 kg-m (17 ft-lbs).

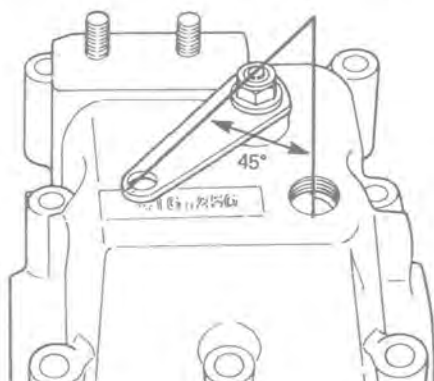
Using a feeler gauge, check that free-play of gear change shaft is within tolerance of 0.15-0.30 mm (.006 to .012"). If free-play is not within tolerance, record discrepancy. Remove nut ④⑧, washer ④⑦, gear change lever ④⑥, shim ④④, and gear change shaft ④③.

Divide discrepancy by two and install that amount of shim ④④ on gear change shaft ④③. Install shaft into upper housing.

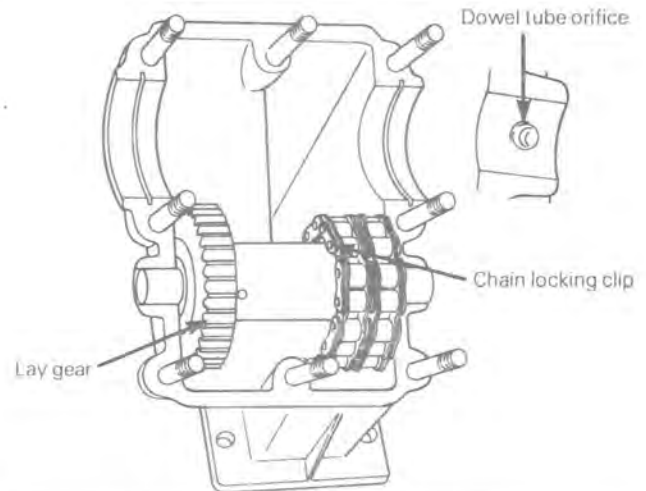
Install standard shim and balance of shims ④④ on gear change shaft.

Install gear change lever ④⑥ on shouldered end of change shaft so that lever and vent plug hole form a 45 degree angle.

Install washer ④⑦ and nut ④⑧. Torque to 2.3 kg-m (17 ft-lbs).

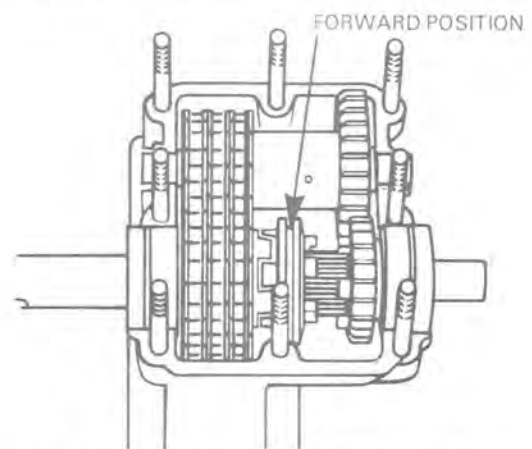


⑤④ Drive chain must be positioned on lay gear sprocket with the locking clip facing the lay gear ②②. (For correct chain, See Technical Data).

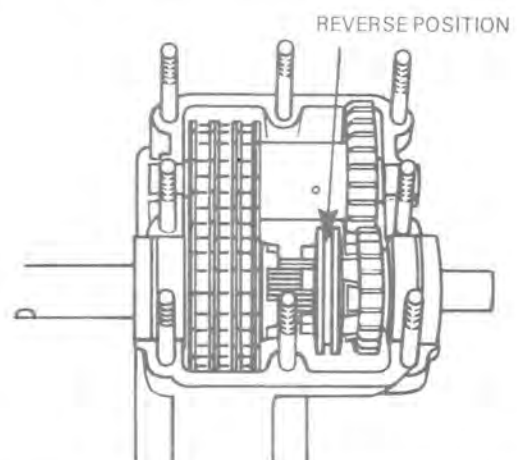


INSTALLATION

Prior to installation, with the gearbox removed, adjust gearbox to obtain correct engagement. At "forward" position, sleeve must be as shown,



At "reverse" position, sleeve must be as shown,



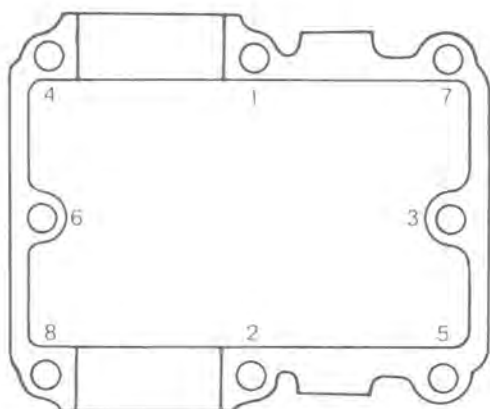
SECTION 02

SUB-SECTION 08 (GEARBOX)

If any of these positions are unobtainable, use a screwdriver to turn index rod (39) and obtain proper meshing of teeth. Recheck sleeve engagement after adjusting index rod.

Position gear change fork in gearbox cover so that it aligns with slot of sliding gear in gearbox housing.

Install gearbox cover on gearbox using "Loctite crank-case sealant" or equivalent. Torque nuts in the following sequence to 2.8 kg-m (20 ft-lbs).



Alpine

Position gasket on frame studs.


Place lower sprocket in drive chain.

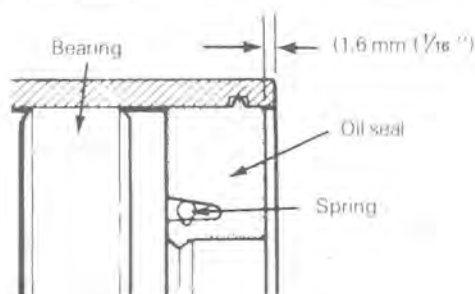
Secure gearbox to frame. Torque nuts to 2.2 kg-m (16 ft-lbs).

From the left side of vehicle, place the drive axle within the track. Push the end bearing side of axle through the orifice in left side of frame. Push the splined end of axle into gearbox lower sprocket. Install opposite drive axle.

Press each end bearing housing into frame and over axle bearing. Secure housings to frame.

Install oil seals.

 **NOTE:** A gap of approximately 1.6 mm ($\frac{1}{16}$ ") should exist between the end of bearing housing and the oil seal.



Install rear axles and bogie wheel sets to their original position.

Connect transmission rod to gearbox lever (46).

Install steering column. (The distance between upper retainer plate and gearbox bracket must be 39.4 cm (15½").

Rotate the tensioner axle (25) to obtain 6 mm ($\frac{1}{4}$ ") maximum drive chain free-play.

Fill gearbox with 450 ml (16 ounces) of Ski-Doo chain-case oil.

Install muffler, drive belt and brake assembly. Proceed with pulley alignment.

Proceed with track tension and alignment.


Install pulley guard and cab.

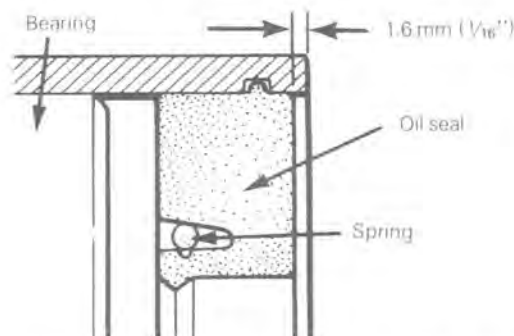
Elite

Position gasket of gearbox on frame studs.

Place lower sprocket in drive chain and push it forward between the track tunnels. Insert splined end of drive axles into lower gearbox sprocket.

Press each end bearing housing into frame and over drive axle bearing. Secure housings to frame. Install oil seals.

 **NOTE:** A gap of approximately 1.6 mm ($\frac{1}{16}$ ") should exist between the end of bearing housing and oil seal.



Install the two (2) tensioners between the track tunnels. Secure gearbox to frame. Torque nuts to 2.2 kg-m (16 ft-lbs).

Install transmission shifter rod and brake and bracket of driven pulley.

Apply chain tension by rotating tensioner axle (35) to obtain 6 mm ($\frac{1}{4}$ ") maximum chain free-play.

Fill gearbox with 450 ml (16 ounces) of Ski-Doo chain-case oil.

Install engine and carry out pulley alignment.

Install rear axles and bogie wheel sets. Proceed with track tension and alignment.

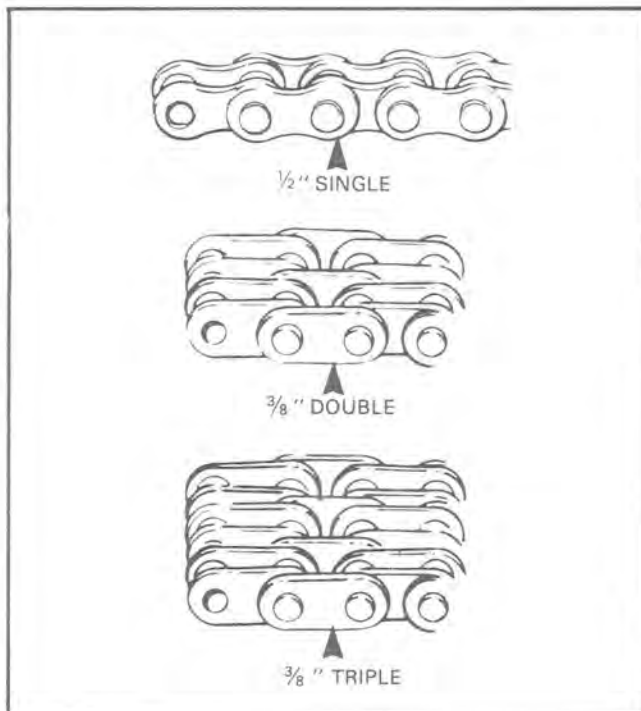
Install drive belt and pulley guard.

Install plates and seat backs.

DRIVE CHAIN

GENERAL

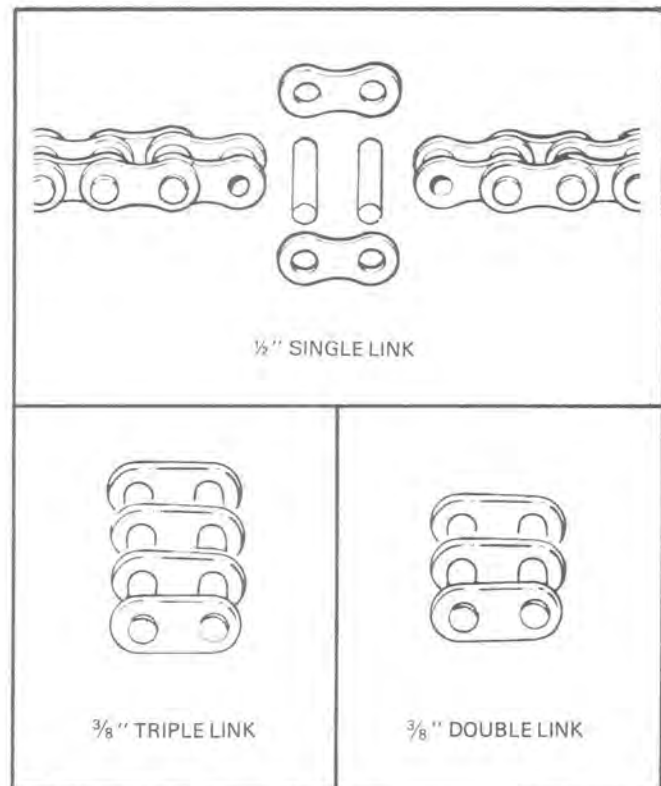
There are three (3) types of the Bombardier drive chains; a single $\frac{1}{2}$ " pitch, a double $\frac{3}{8}$ " pitch, and a triple $\frac{3}{8}$ " pitch. For proper use refer to Technical Data.



There are two (2) variations of chains; detachable and endless.

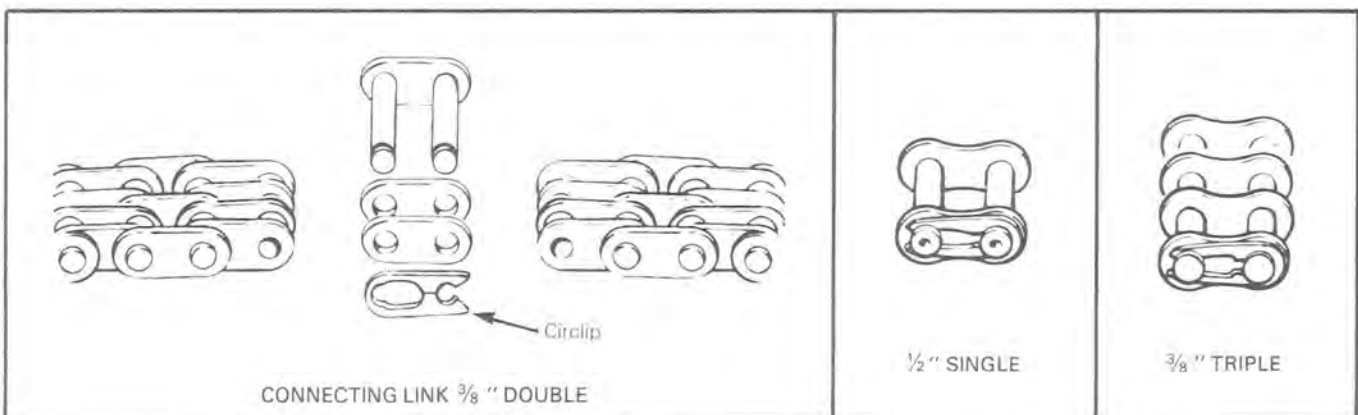
CHAIN SEPARATION

When separating an endless chain, always use a chain bearing pin extractor. Also, make sure to remove one complete link.

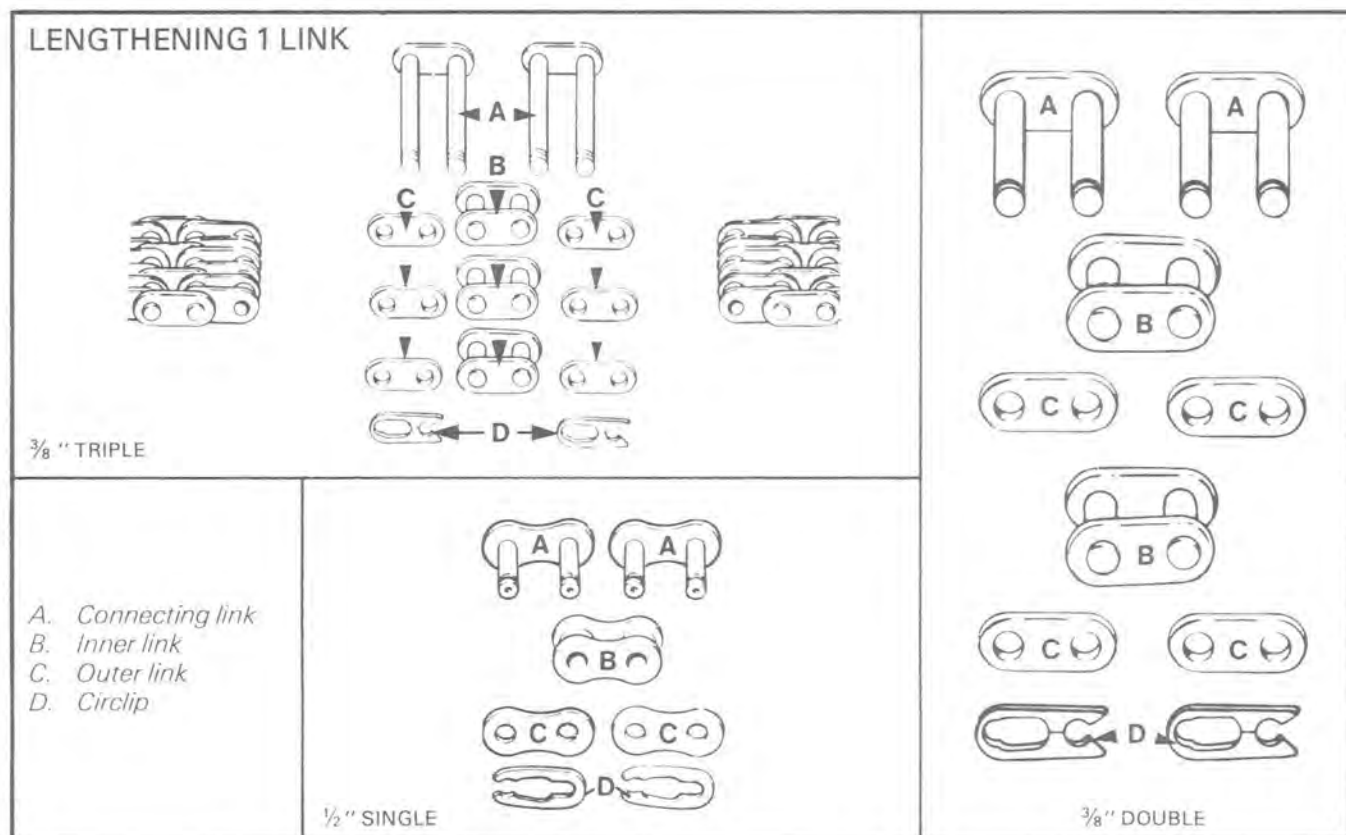
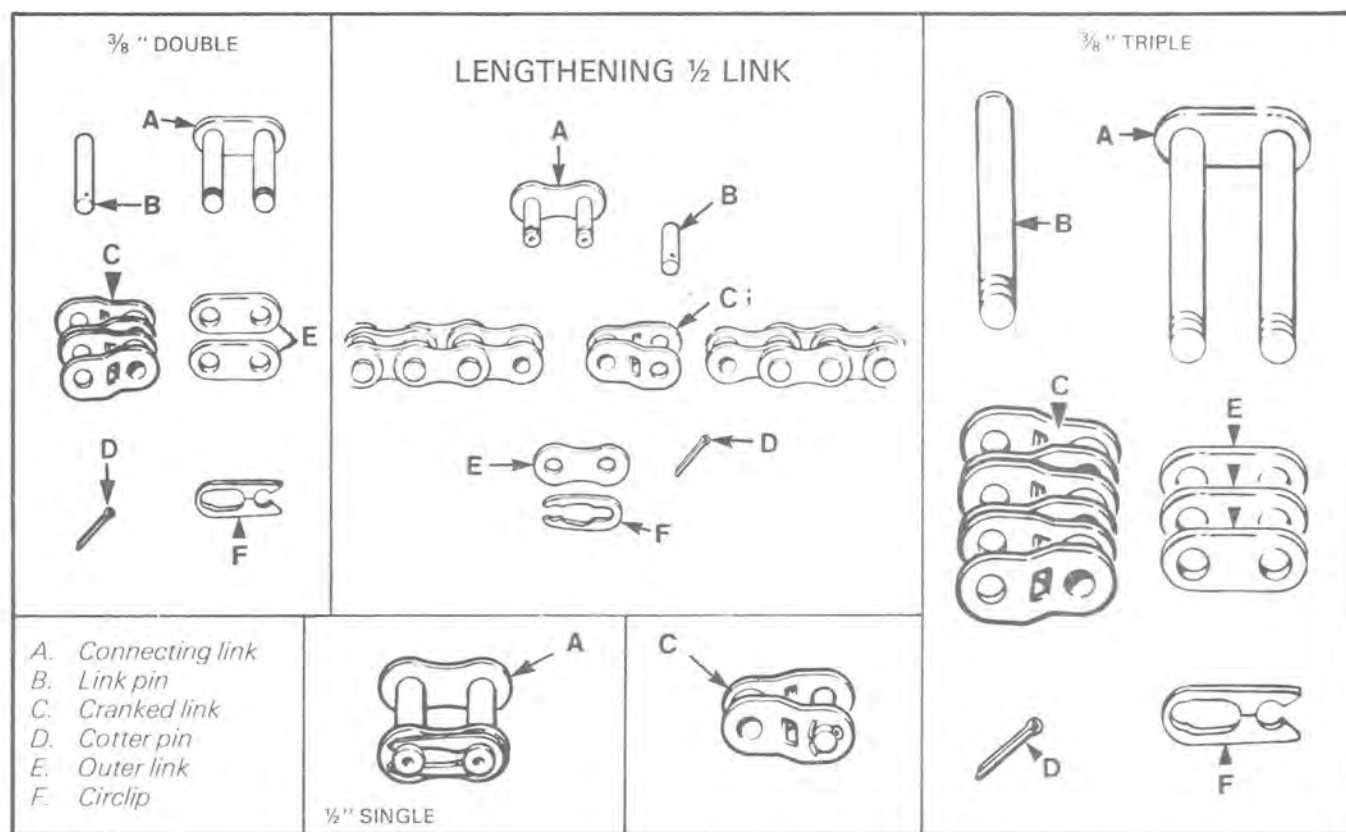


CHAIN ATTACHMENT

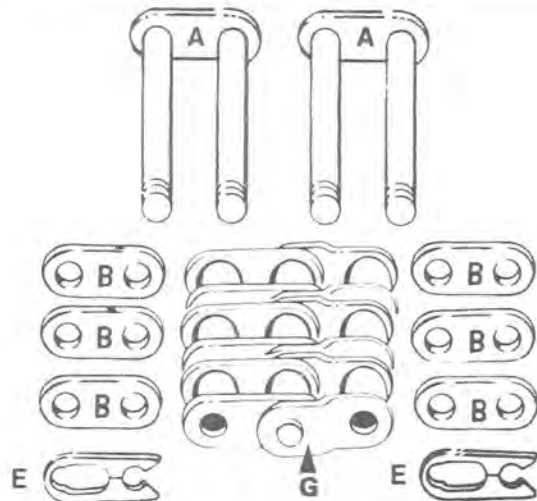
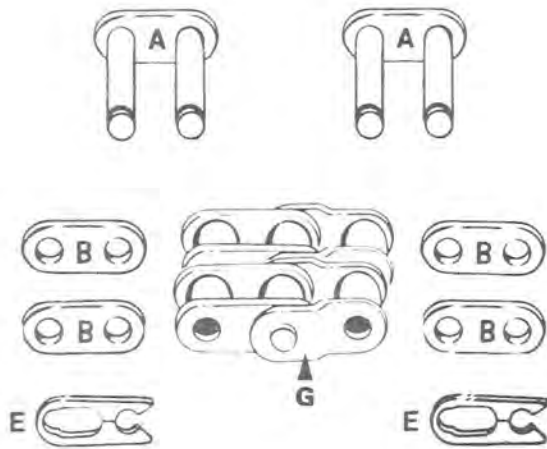
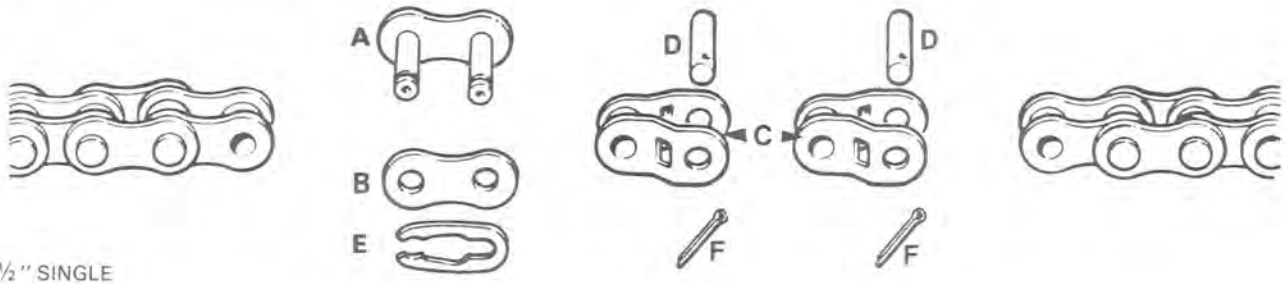
When joining chain ends, the open end of the circlip must be on opposite side of chain rotation. The circlip should also be facing the outer side of chaincase.



SECTION 02
SUB-SECTION 09 (DRIVE CHAIN)



LENGTHENING 1 1/2 LINK



- A. Connecting link
- B. Outer link
- C. Cranked link
- D. Link pin
- E. Circlip
- F. Cotter pin
- G. Double cranked link

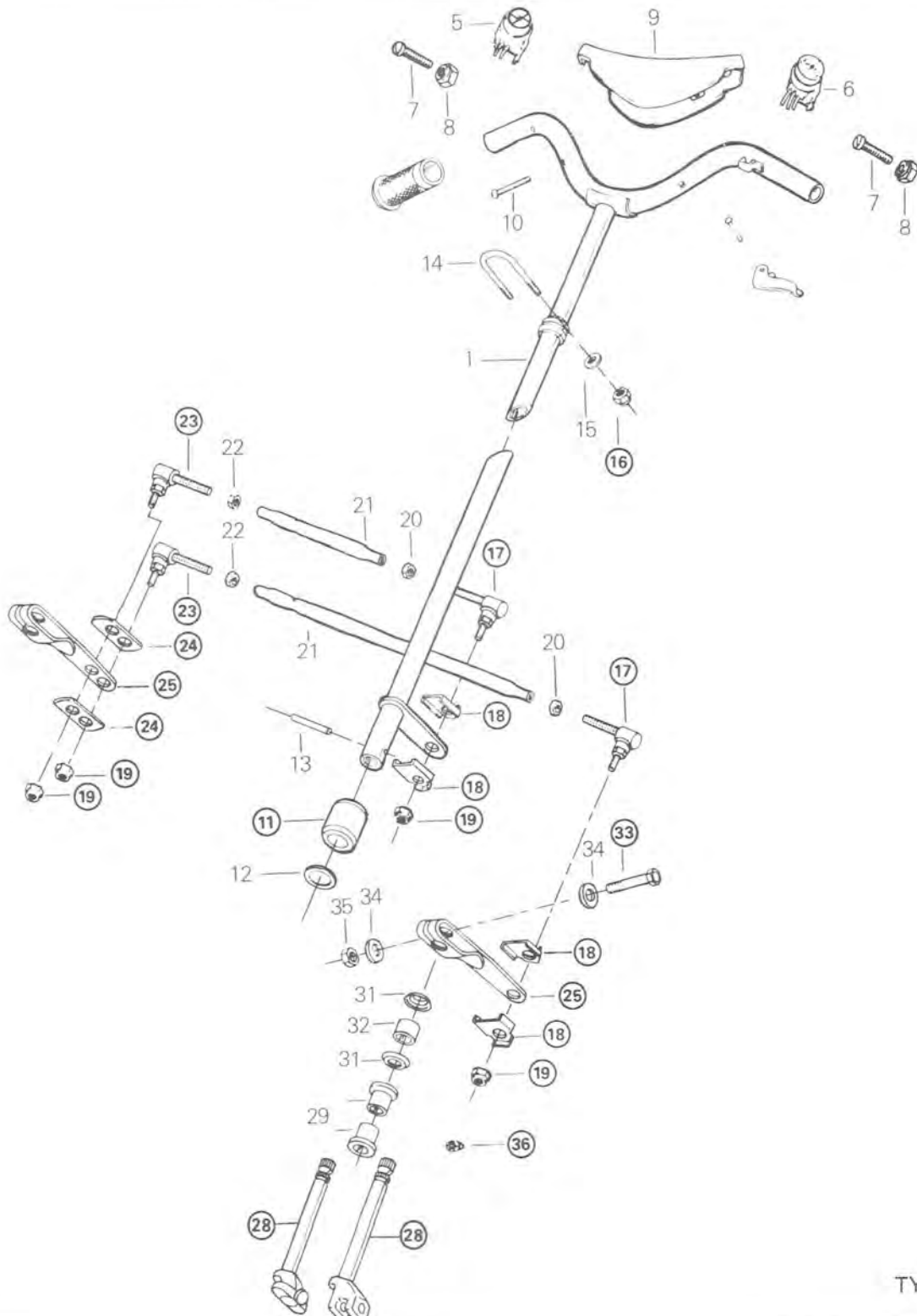


STEERING SYSTEM APPLICATION CHART

TYPE 1	Elan 1974-75-76-77
TYPE 2	Olympique 1974
TYPE 3	Nordic 1974
TYPE 4	T'NT F / C & Everest 1974-75-76
TYPE 5	T'NT F / A 1974
TYPE 6	Alpine 1974-75-76
TYPE 7	Elite 1974-75
TYPE 8	T'NT R / V 1975-76
TYPE 9	T'NT F / A 1975
TYPE 10	Olympique 1975-76-77, Everest 1977, T'NT 1977
TYPE 11	Alpine 1977
TYPE 12	R / V 1977

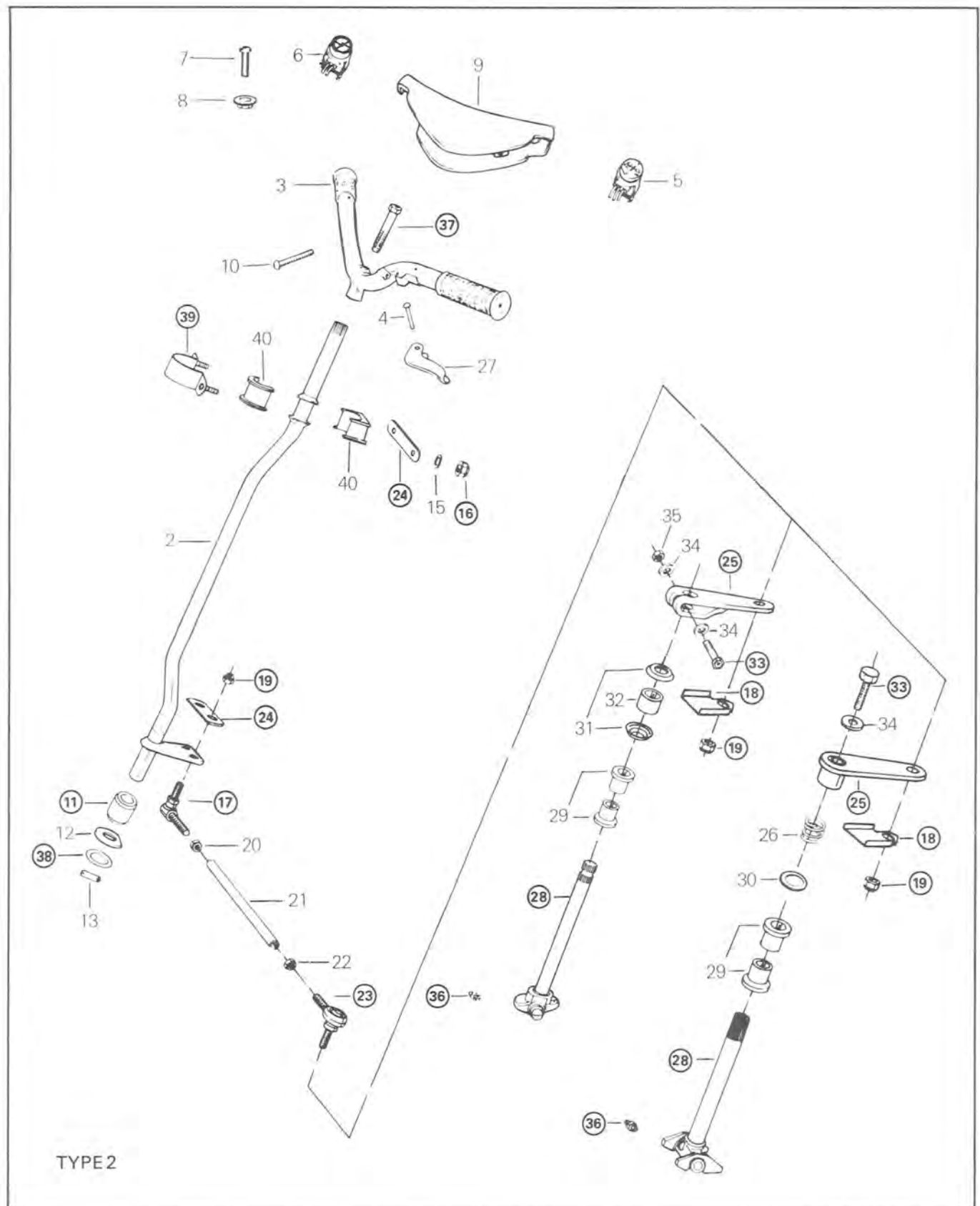


STEERING SYSTEM

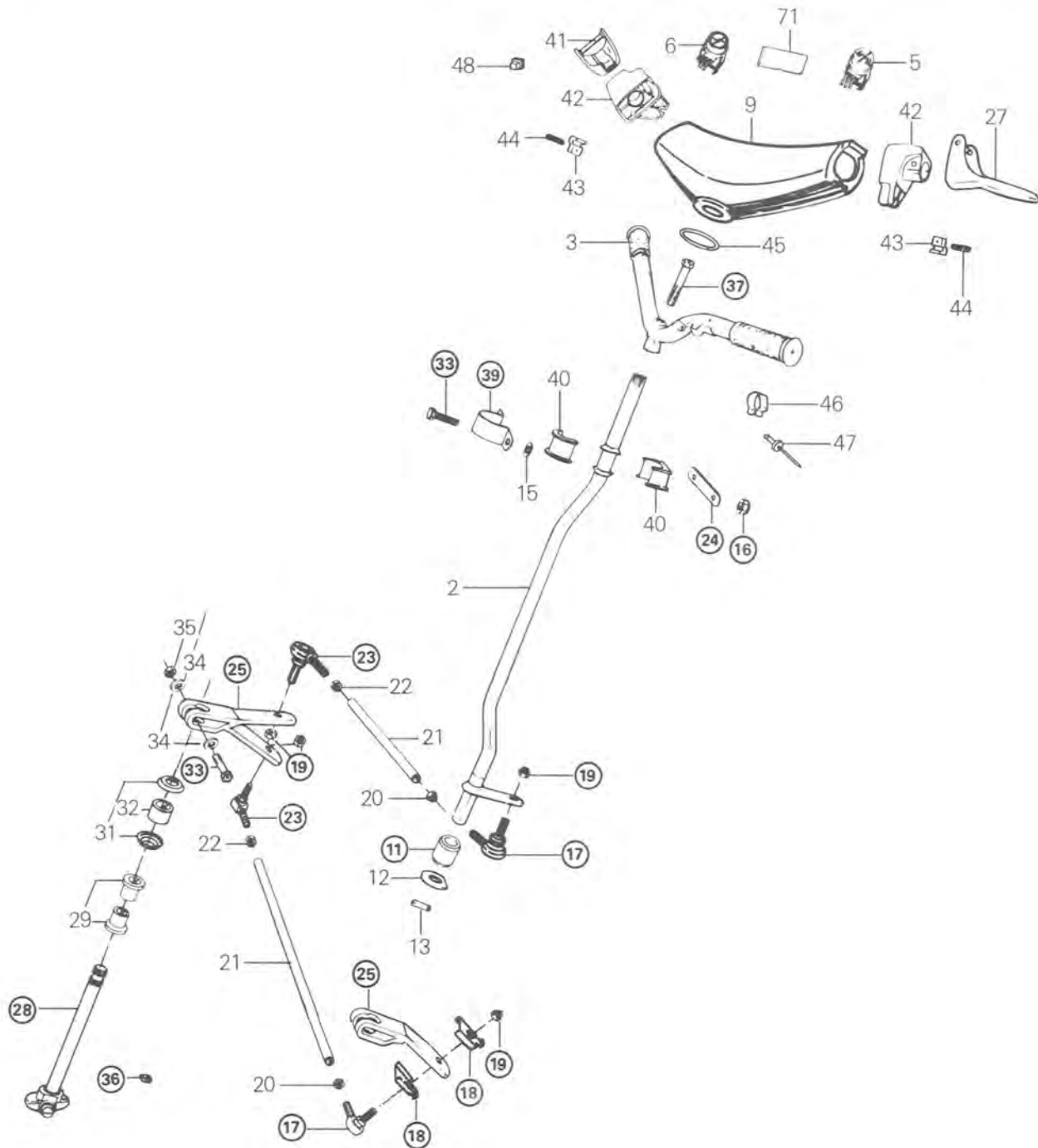


TYPE 1

SECTION 03
SUB-SECTION 01 (STEERING SYSTEM)

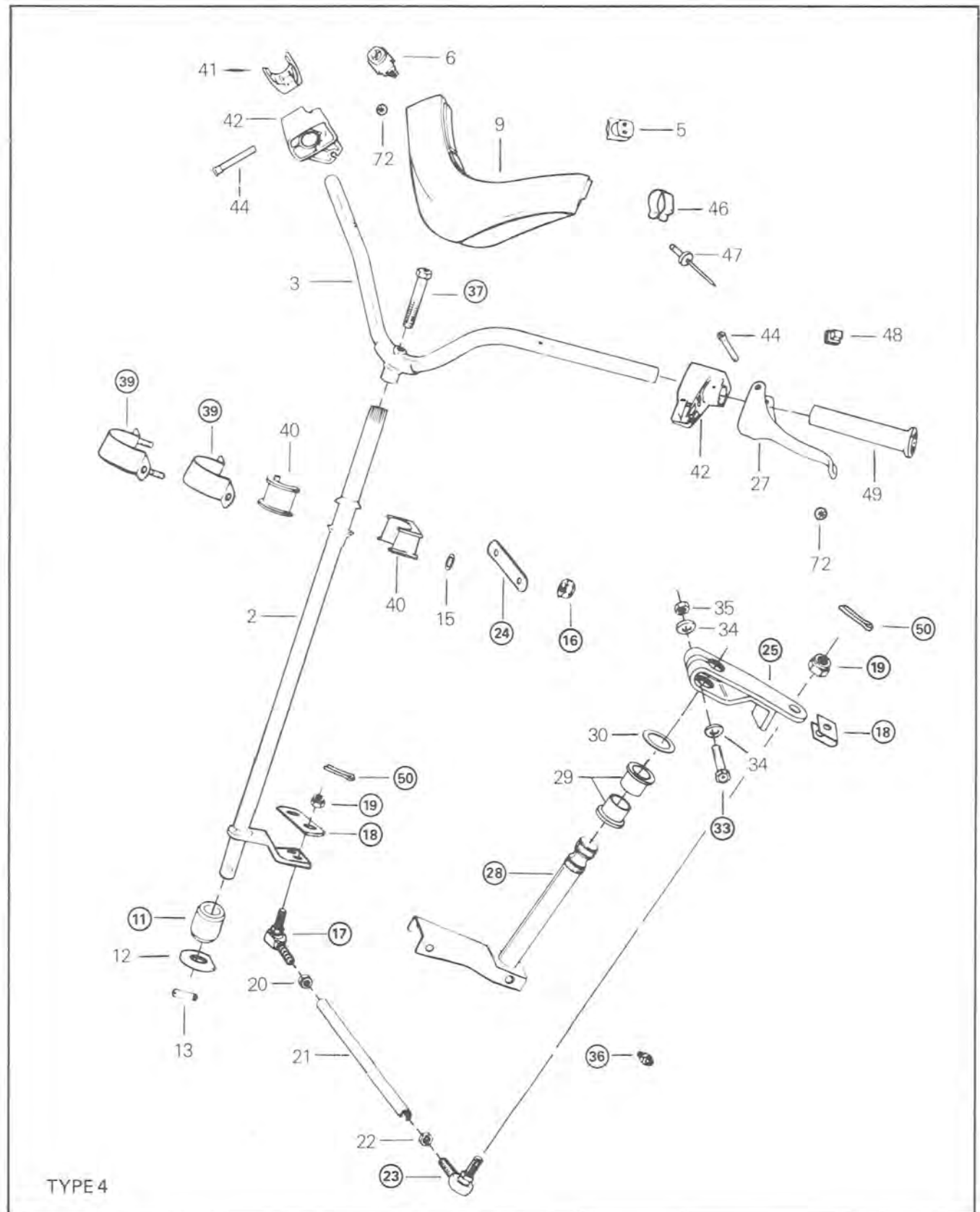


SECTION 03
SUB-SECTION 01 (STEERING SYSTEM)

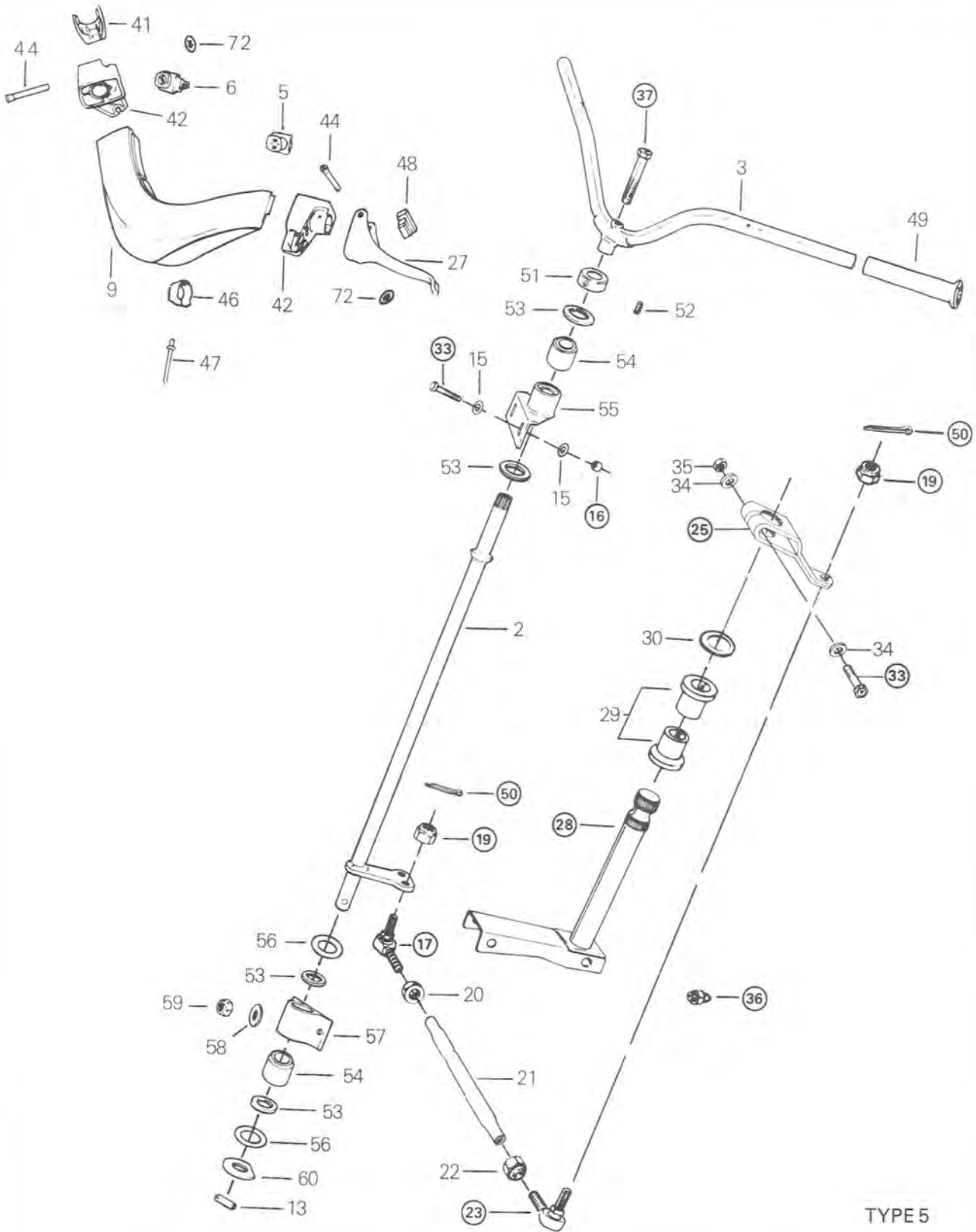


TYPE 3

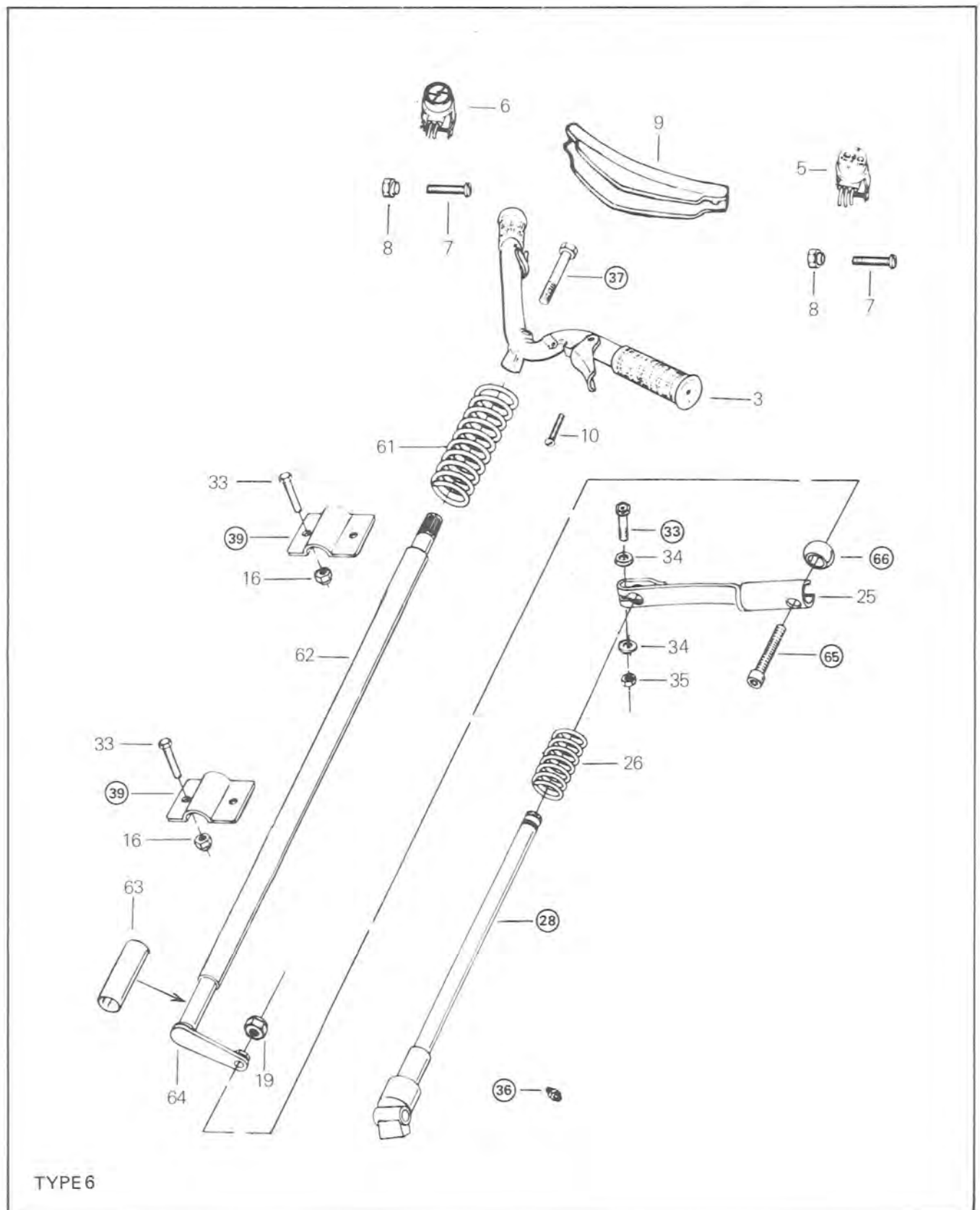
SECTION 03
SUB-SECTION 01 (STEERING SYSTEM)



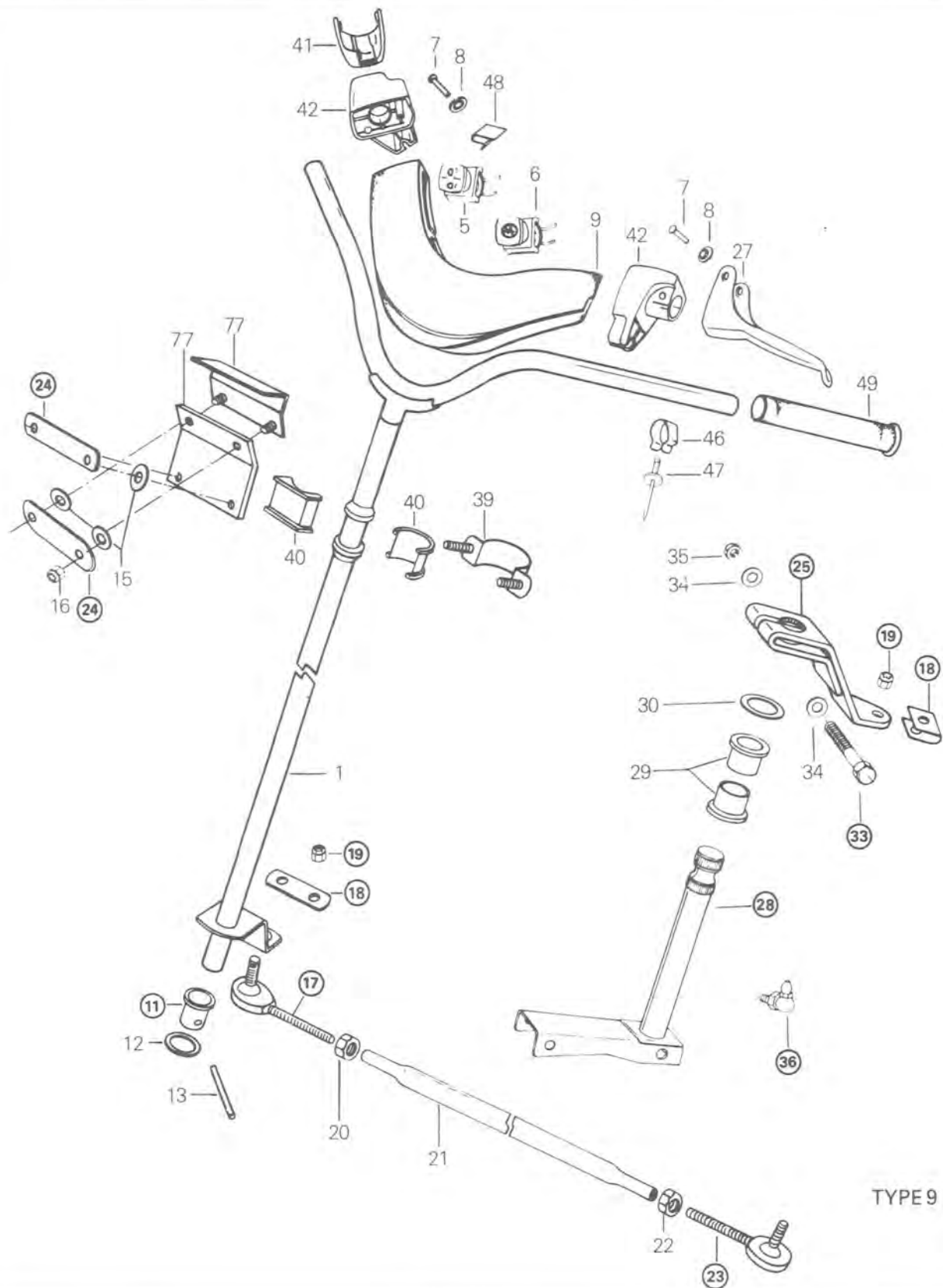
SECTION 03
SUB-SECTION 01 (STEERING SYSTEM)



SECTION 03
SUB-SECTION 01 (STEERING SYSTEM)

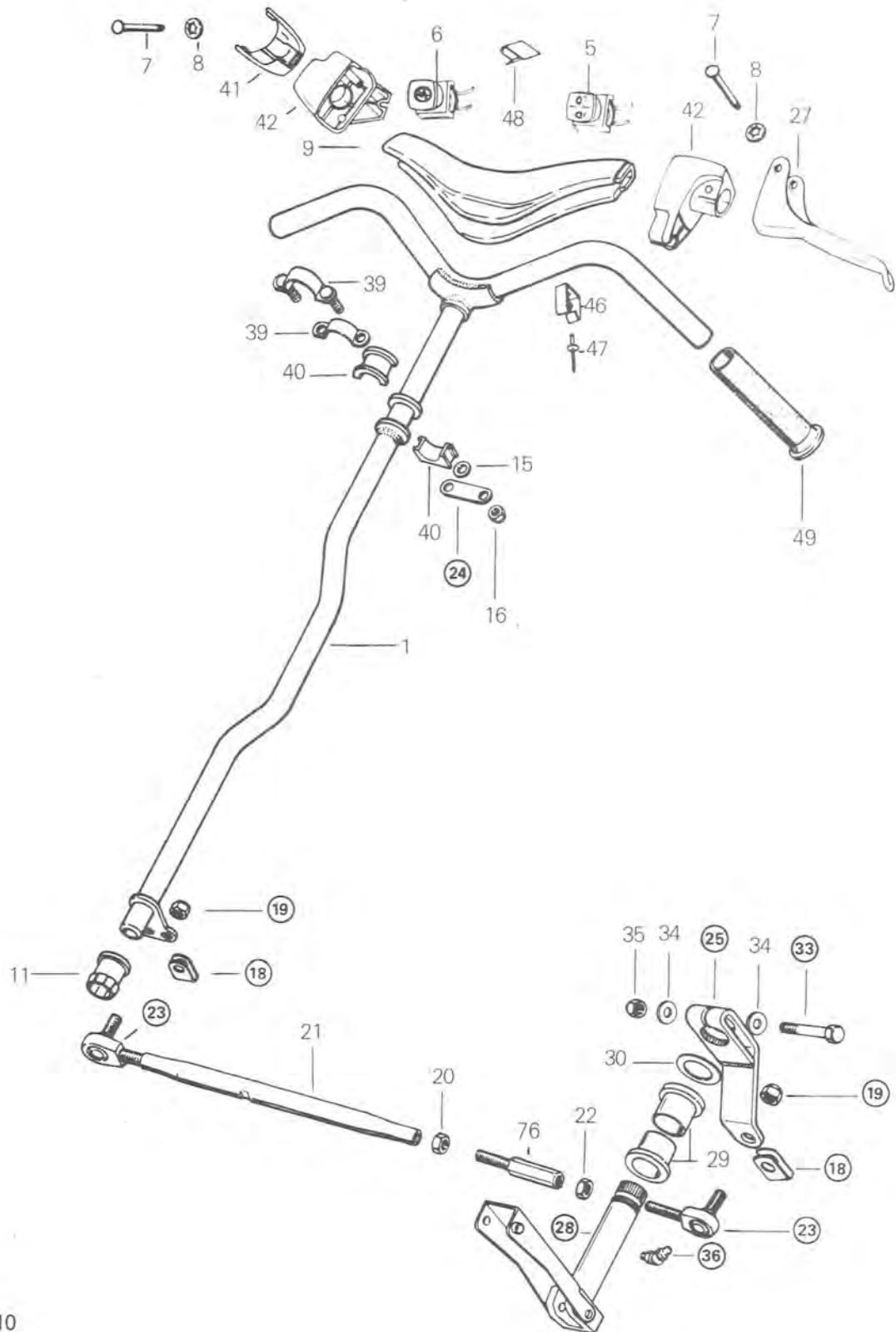


SECTION 03
SUB-SECTION 01 (STEERING SYSTEM)



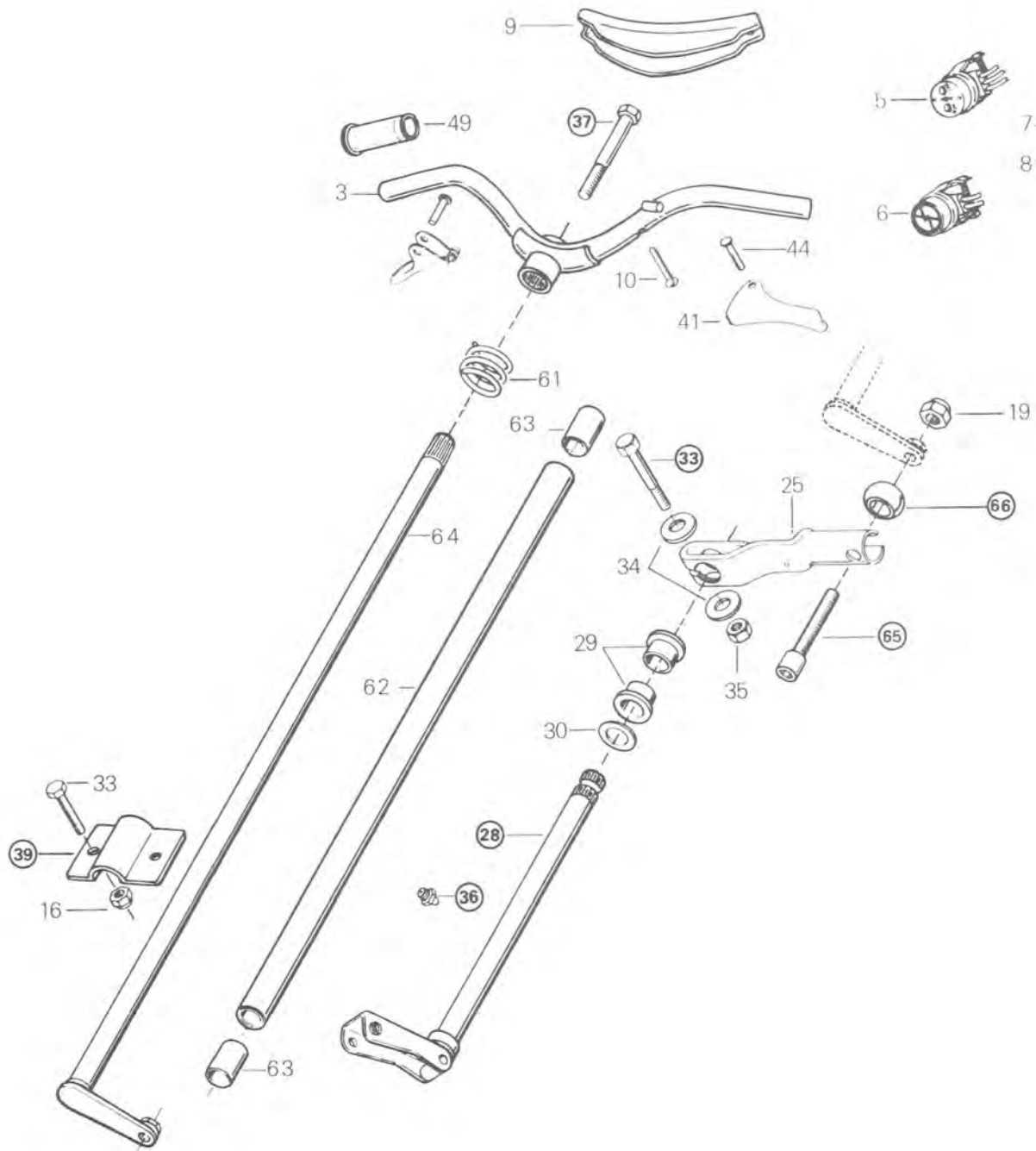
TYPE 9

SECTION 03
SUB-SECTION 01 (STEERING SYSTEM)



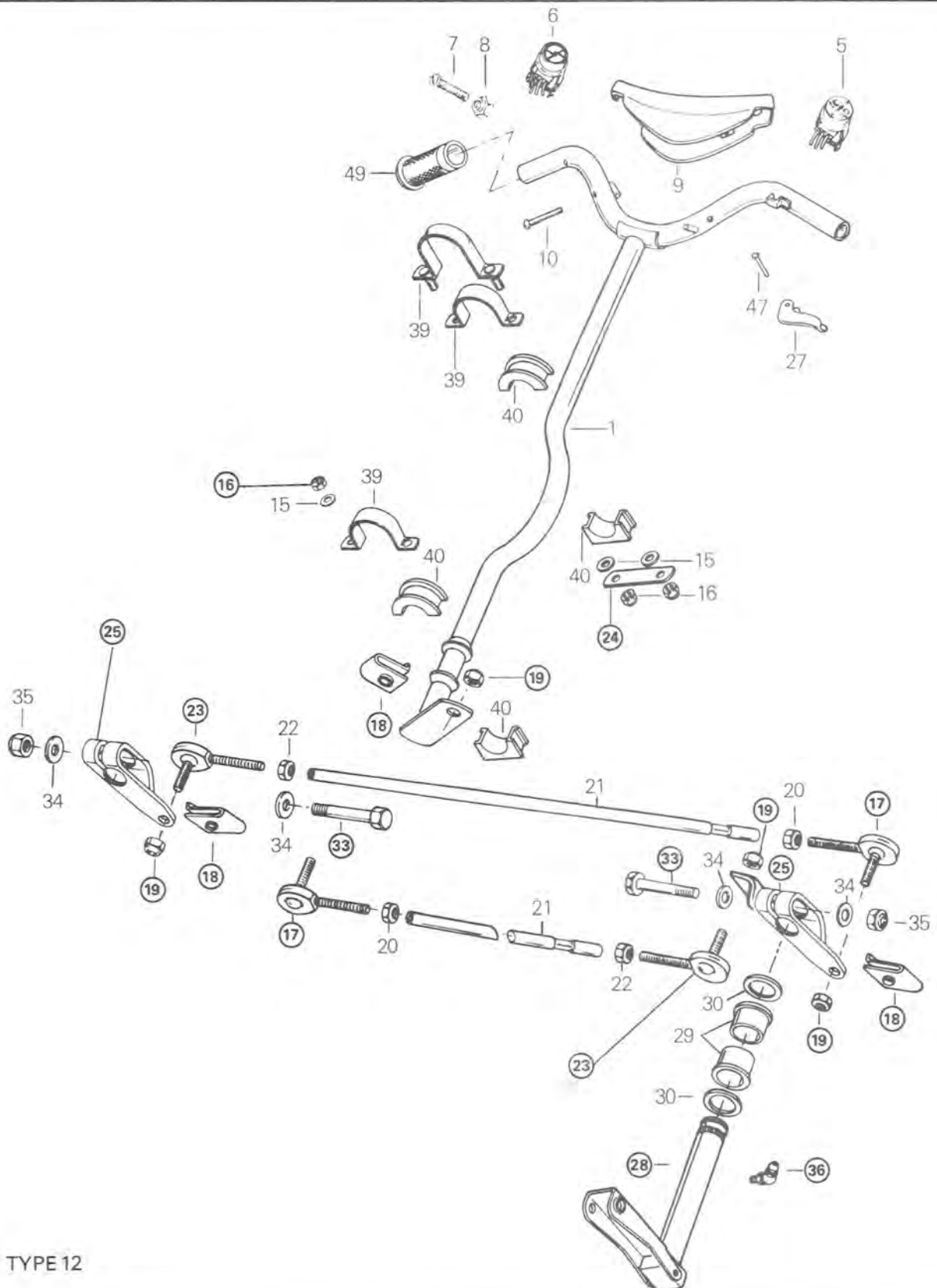
TYPE 10

SECTION 03
SUB-SECTION 01 (STEERING SYSTEM)



TYPE 11

SECTION 03
SUB-SECTION 01 (STEERING SYSTEM)



TYPE 12

- | | | | |
|----------------------|----------------------|------------------------------|----------------------|
| 1. Handlebar | 21. Tie rod | 40. Rubber bushing | 59. Nut |
| 2. Main tube | 22. Jam nut RH | 41. Throttle handle | 60. Washer |
| 3. Handle | 23. Tie rod end | 42. Housing | 61. Spring |
| 4. Rivet | 24. Tab lock | 43. End cap | 62. Steering column |
| 5. Dimmer switch | 25. Steering arm | 44. Pin | 63. Bushing |
| 6. Cut-out button | 26. Spring | 45. Retaining ring | 64. Steering shaft |
| 7. Bolt | 27. Brake handle | 46. Clip | 65. Capscrew |
| 8. Nut | 28. Ski leg | 47. Rivet | 66. Ball bushing |
| 9. Steering padding | 29. Bushing | 48. Retainer (stop plug) | 67. Column shaft |
| 10. Screw | 30. Shim | 49. Grip | 68. Steering bushing |
| 11. Steering bushing | 31. Washer | 50. Cotter pin | 69. Upper column |
| 12. Washer | 32. Rubber spacer | 51. Collar | 70. End cap |
| 13. Spiral pin | 33. Bolt | 52. Allen screw | 71. Crest |
| 14. "U" clamp | 34. Washer | 53. Rubber washer | 72. Push nut |
| 15. Washer | 35. Nut | 54. Bushing | 73. Block |
| 16. Nut | 36. Grease fitting | 55. Bar bracket | 74. Washer |
| 17. Tie rod end | 37. Bolt | 56. Shim | 75. Bolt |
| 18. Tab lock | 38. Shim | 57. Steering bushing bracket | 76. Turnbuckle |
| 19. Nut | 39. Retainer bracket | 58. Washer | 77. Bracket |
| 20. Jam nut LH | | | |

INSPECTION

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

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

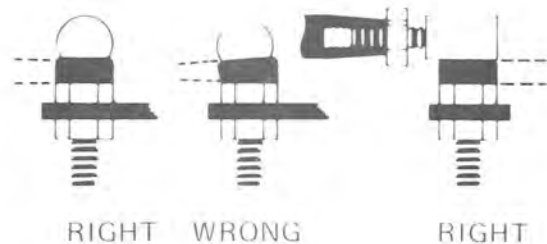
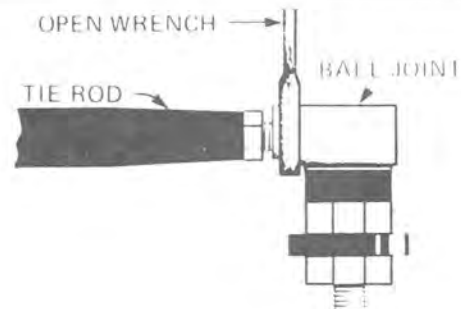
⑪ Do not remove steering bushing from vehicle unless damaged and replacement is necessary.

⑫ ⑬ ⑭ ⑮ ⑯ For torque specifications, see Technical Data.

⑰ ⑱ Inspect ball joints for wear or looseness, if excessive, replace.

○ **NOTE:** The tie rod end attached to the steering column incorporates left hand threads while the tie rod end attached to the steering arm has right hand threads. Screw the longer threaded end of tie rod end 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 joint must run parallel with the horizontal line of the steering arm when assembled on vehicle. The joint should be restrained when tightening tie rod end lock nut. For torque specifications see Technical Data.



⑲ ⑳ ㉑ When assembling steering components, always position new tab locks and cotter pins.

㉒ The steering arm angles should be equal on both sides when skis are parallel with vehicle.

㉓ Grease ski leg at the grease fitting ㉔

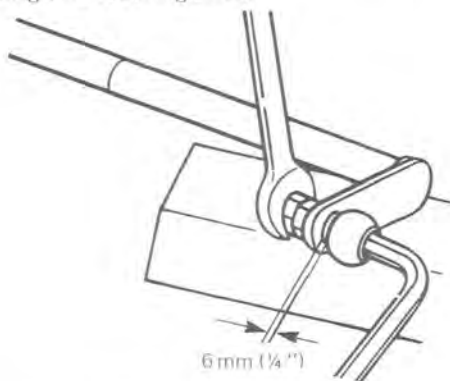
㉕ Steering column free-play can be adjusted by inserting .025 inch shim(s) as required.

㉖ On type 6 system, the distance from upper edge of lower retainer plate to lower edge of upper column bracket should be approximately 39.4 cm (15 1/2"). For torque specifications see Technical Data.

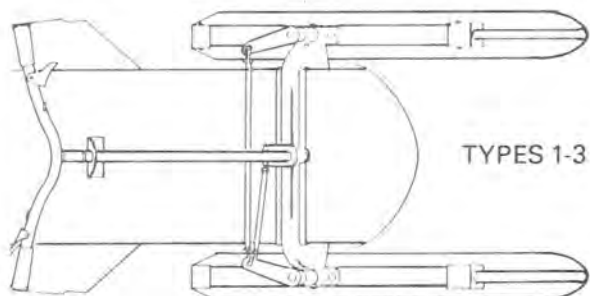
SECTION 03

SUB-SECTION 01 (STEERING SYSTEM)

⑥⑤⑥⑥ Affix the ball bushing to steering shaft using appropriate Allen head bolt. Tighten bolt until there is approximately 6 mm (1/4") free-play existing between ball bushing and steering shaft.



STEERING ADJUSTMENT (SKIS)



TYPES 1-3

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

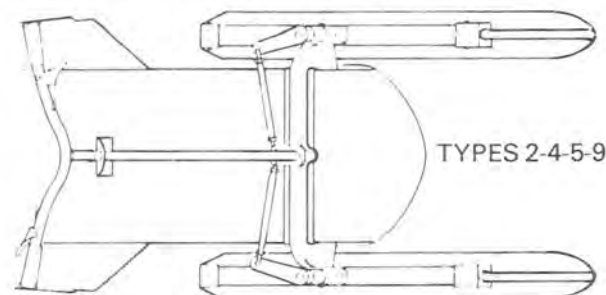
Loosen the jam nuts locking the longer tie rod in place. Turn tie rod manually until alignment is correct. Tighten jam nuts firmly.

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

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

Turn tie rod manually until handlebar is horizontal.

Tighten jam nuts firmly.



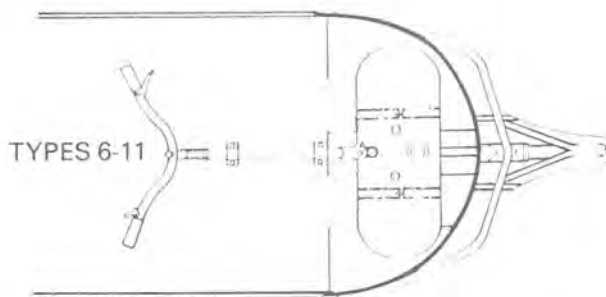
TYPES 2-4-5-9

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

Loosen the tie rod jam nuts. Turn one or both tie rods manually until alignment is correct.

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

Tighten the jam nuts firmly.

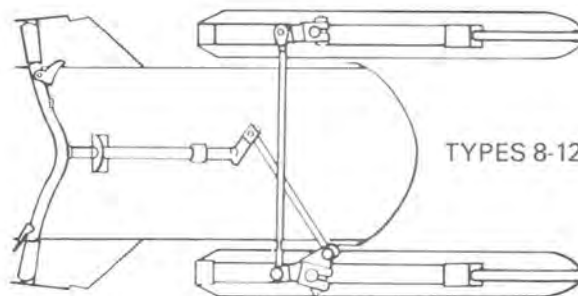


TYPES 6-11

When assembling steering arm ②⑤ and ski ②⑧, the handlebar must be horizontal with the ski parallel with vehicle.

TYPE 7

Similar to type 2, except for handlebar position. Handlebar must be horizontal. To correct, turn smaller tie rod manually.



TYPES 8-12

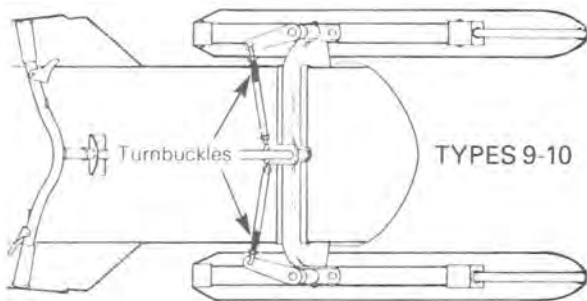
Skis should have a toe out of 3 mm (1/8"). To check, measure distance between each ski at front and rear of leaf springs. The front distance should be 3 mm (1/8") more than the rear when the handlebar is horizontal. If adjustment is required:

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 smaller tie rod jam nuts.

Turn tie rod manually until handlebar is horizontal. Tighten jam nuts firmly.



Skis should have a toe out of 3 mm ($\frac{1}{8}$ "). To check, measure distance between each ski at front and rear of leaf springs. The front distance should be 3 mm ($\frac{1}{8}$ ") more than the rear when the handlebar is horizontal. If adjustment is required.

Loosen the tie rod jam nuts. Turn one or both turnbuckles manually until alignment is correct.

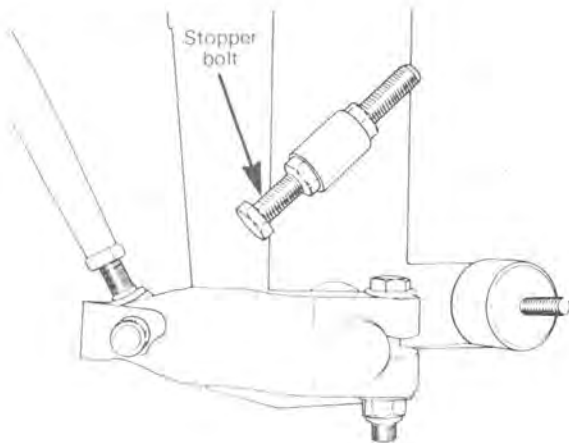
IMPORTANT: Close front of skis manually to take all slack from steering mechanism.

Tighten the jam nuts firmly.

STEERING TRAVEL ADJUSTMENT (if applicable)

Turn handlebar fully right until a gap of 3 mm ($\frac{1}{8}$ ") exists between the lower nut of the left ball joint and the bottom plate.

Adjust stopper bolt on right side of reinforcing cross member so that it touches right steering arm. Repeat procedure for left stopper.

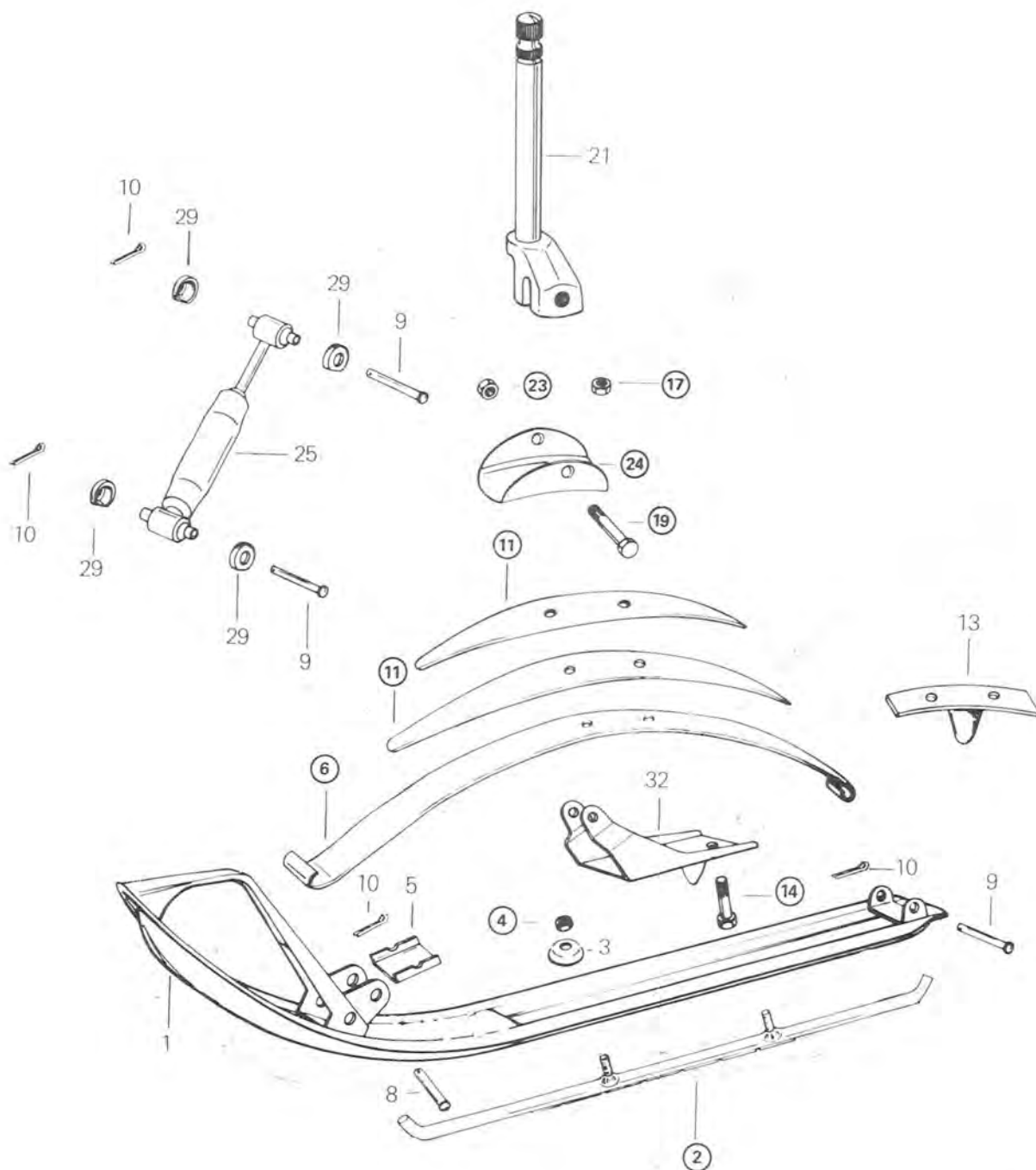




SKI SYSTEM APPLICATION CHART

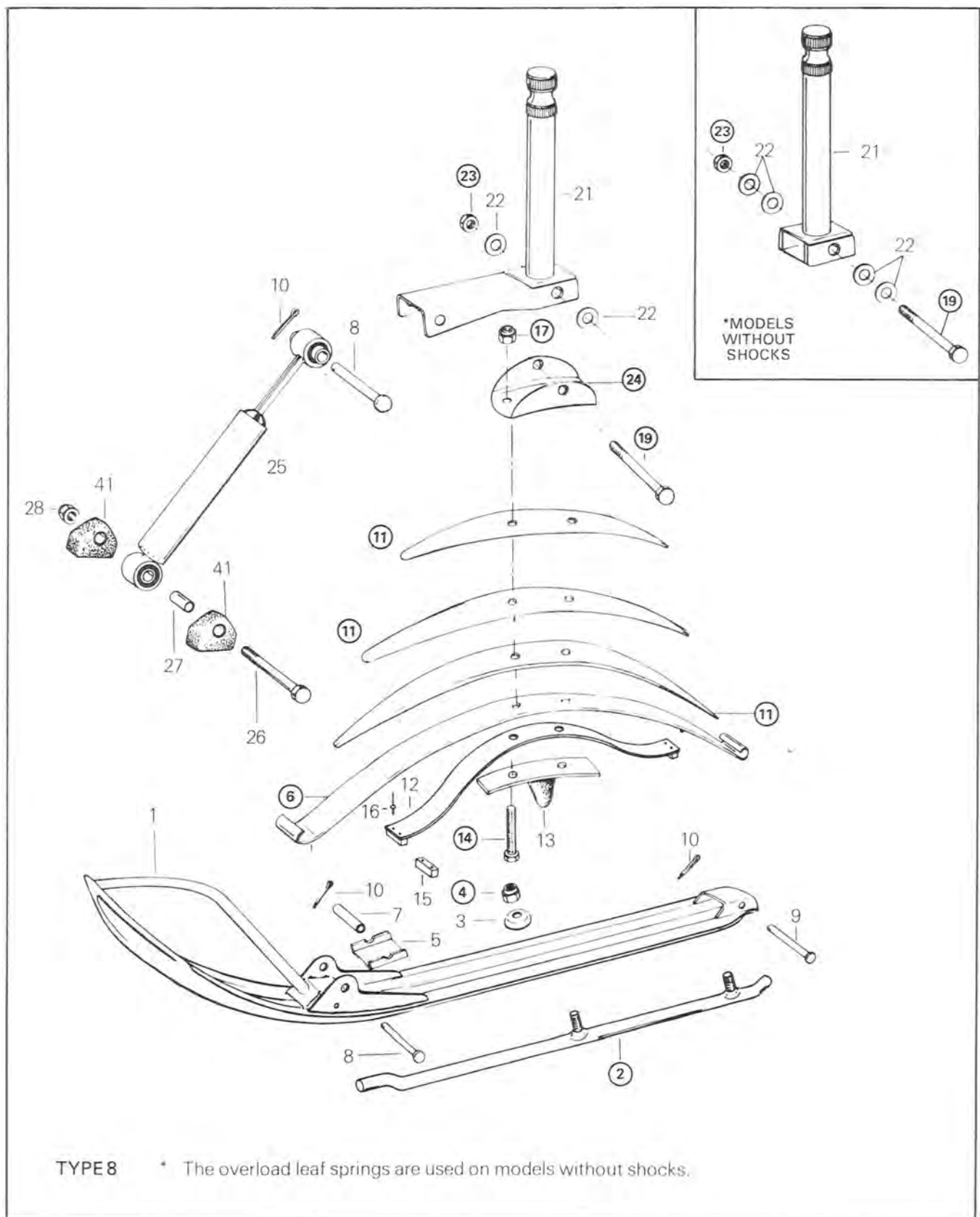
TYPE 1	Elan 1974
TYPE 2	Olympique 1974
TYPE 3	T'NT F / A, F / C & Everest 1974
TYPE 4	Alpine 1974
TYPE 5	Nordic 1974
TYPE 6	Elite 1974-75
TYPE 7	Elan 1975-76-77
TYPE 8	Olympique 1975-76-77
TYPE 9	T'NT F / C & Everest 1975-76 T'NT 1977, Everest 1977
TYPE 10	T'NT F / A 1975
TYPE 11	R / V 1975-76-77
TYPE 12	Alpine 1975-76
TYPE 13	Alpine 1977

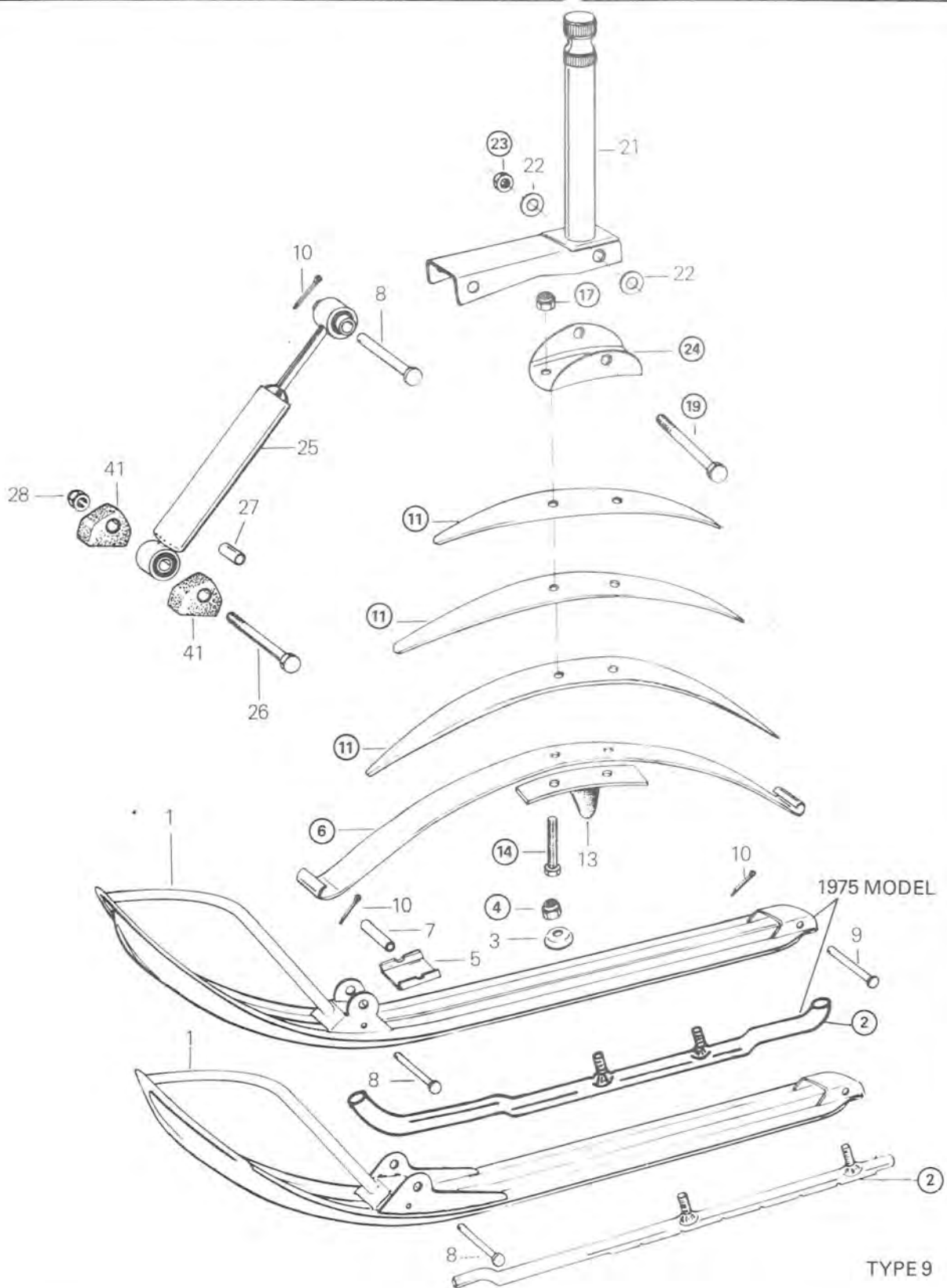




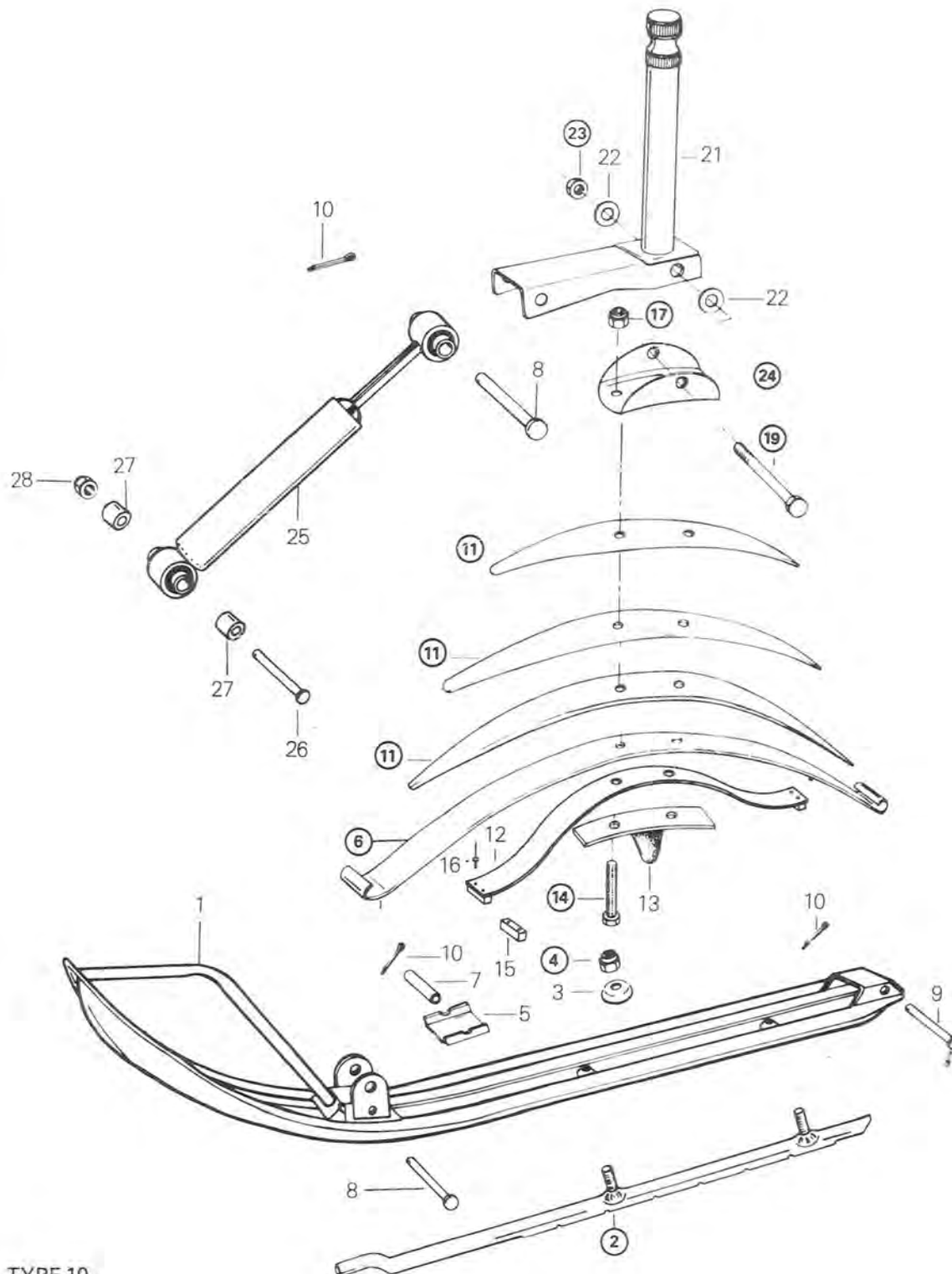
TYPE 7

SECTION 03
SUB-SECTION 02 (SKI SYSTEM)

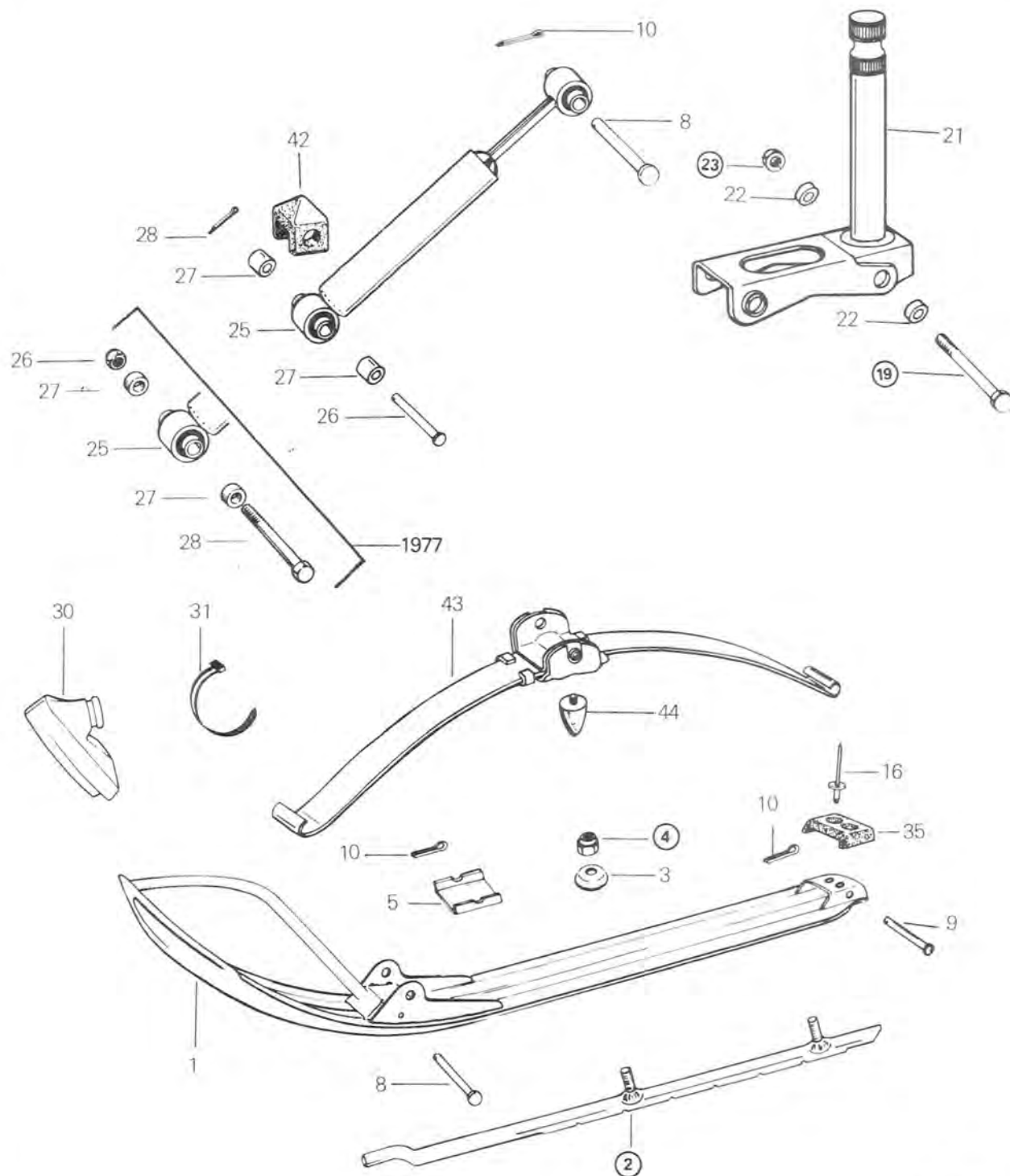




SECTION 03
SOUS-SECTION 02 (SKIS)



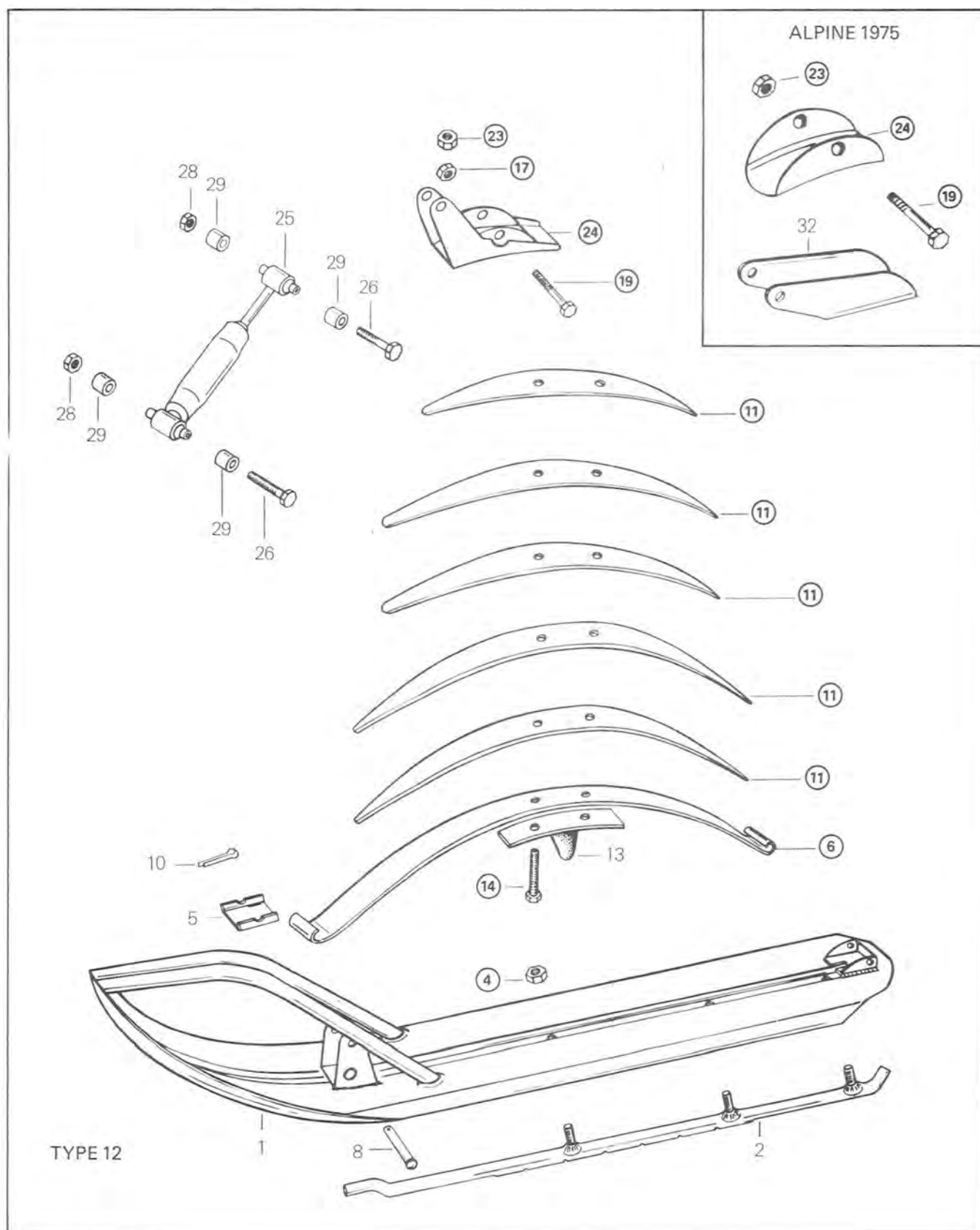
TYPE 10

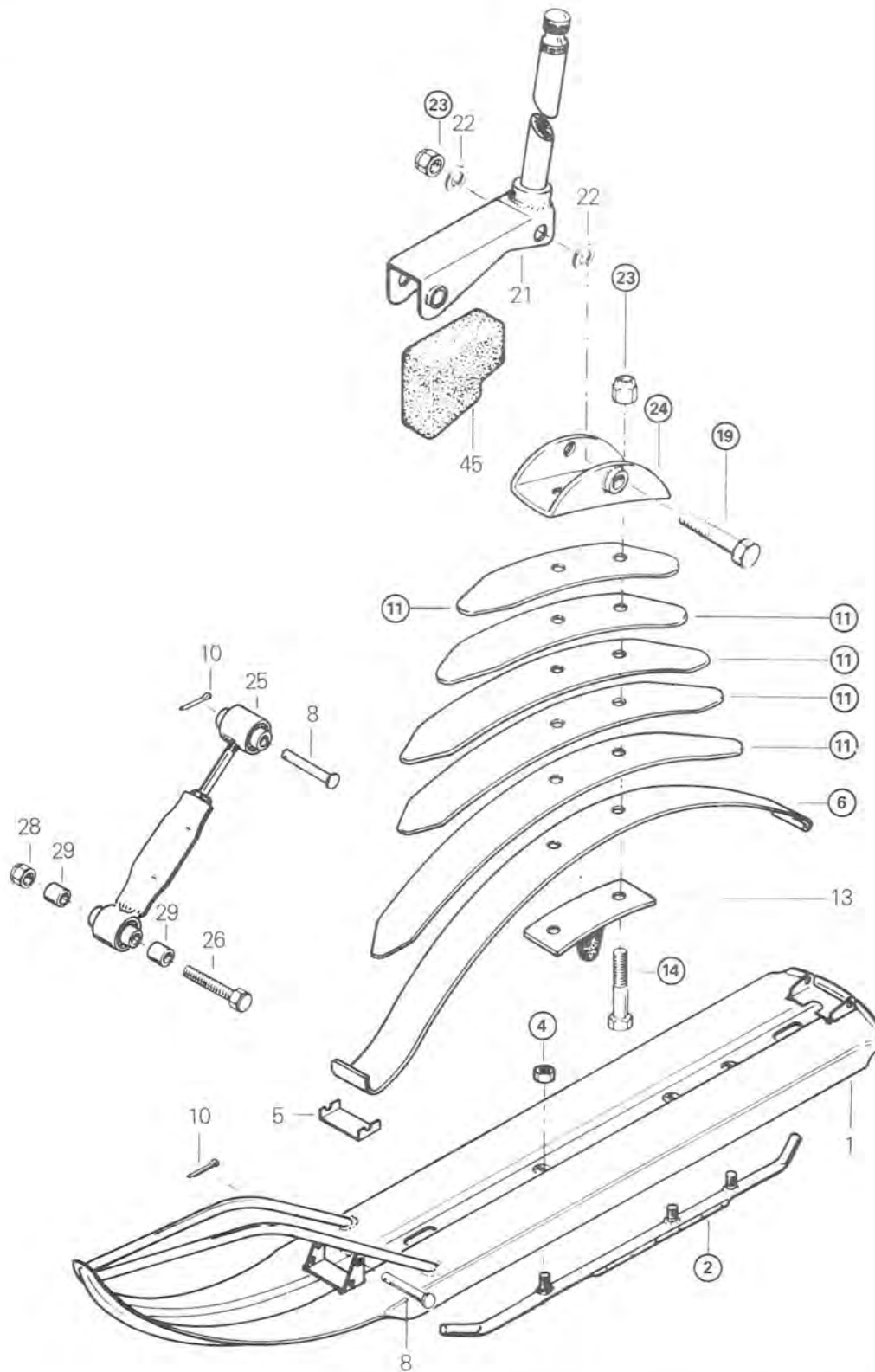


TYPE 11

* Items 42, 35 are not applicable on 1975 model.

SECTION 03
SUB-SECTION 02 (SKI SYSTEM)





TYPE 13

SECTION 03
SUB-SECTION 02 (SKI SYSTEM)

- | | | | |
|---------------------------|------------------|--------------------|-------------------------|
| 1. Ski | 13. Rebound leaf | 24. Spring coupler | 35. Rear cap protector |
| 2. Runner shoe | 14. Screw | 25. Shock | 36. Retainer bracket |
| 3. Cup | 15. Cushion | 26. Bolt | 37. Spacer |
| 4. Nut | 16. Rivet | 27. Spacer | 38. Rubber absorber |
| 5. Spring slider cushion | 17. Nut | 28. Nut | 39. Screw |
| 6. Main leaf spring | 18. Spacer plate | 29. Bushing | 40. Spacer |
| 7. Bushing | 19. Bolt | 30. Ski tip | 41. Rubber spacer |
| 8. Retainer pin | 20. Washer | 31. Tie rap | 42. Ski bumper |
| 9. Retainer pin | 21. Ski leg | 32. Shock bracket | 43. Tapered leaf spring |
| 10. Cotter pin | 22. Washer | 33. Stabilizer | 44. Rubber bumper |
| 11. Auxiliary leaf spring | 23. Nut | 34. Bushing | 45. Rubber stopper |
| 12. Overload leaf spring | | | |

INSPECTION

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

Make sure steering arm and ski leg splines interlock.

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

DISASSEMBLY & ASSEMBLY

②

⚠ **WARNING:** Observe caution while prying or removing steel runner shoes from ski slots as the shoes are under tension. Check that ski runner shoes are not worn more than half of their original thickness.

⑥ ⑪ ②④

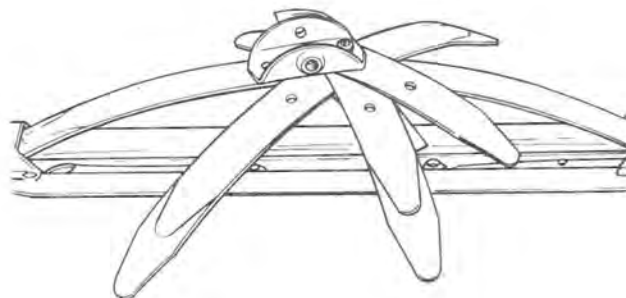
⚠ **CAUTION:** When disassembling spring coupler from leaf spring be careful of the spring tension.

When assembling leaf springs, cross the leaf springs and temporarily insert one (1) nut and bolt then position the springs leaf parallel to each other and install remaining bolt and nut. Tighten fully.

⑭ ⑰ ④ For proper torque see Technical Data.

⑲ ⑳ Torque ski coupler bolt to 6.4-6.9 kg-m (46-50 ft-lbs) on all types except on type 10 which should be torqued to 3.5 kg-m (25 ft-lbs).

Torque locking nut to 6-7.6 kg-m (44-55 ft-lbs).



LIST OF ENGINE SECTIONS

247, 302

248, 294

248 (FROM 1975)

245 (UP TO SERIAL NO. 2 762 210)

245, 345 (FROM 1976)

305, 338, 343 401

305, 343 (FROM 1976)

346, 396, 436

346, 436 (FROM 1977)

434, 440

440 (FROM 1976)

640

640 (FROM 1976)

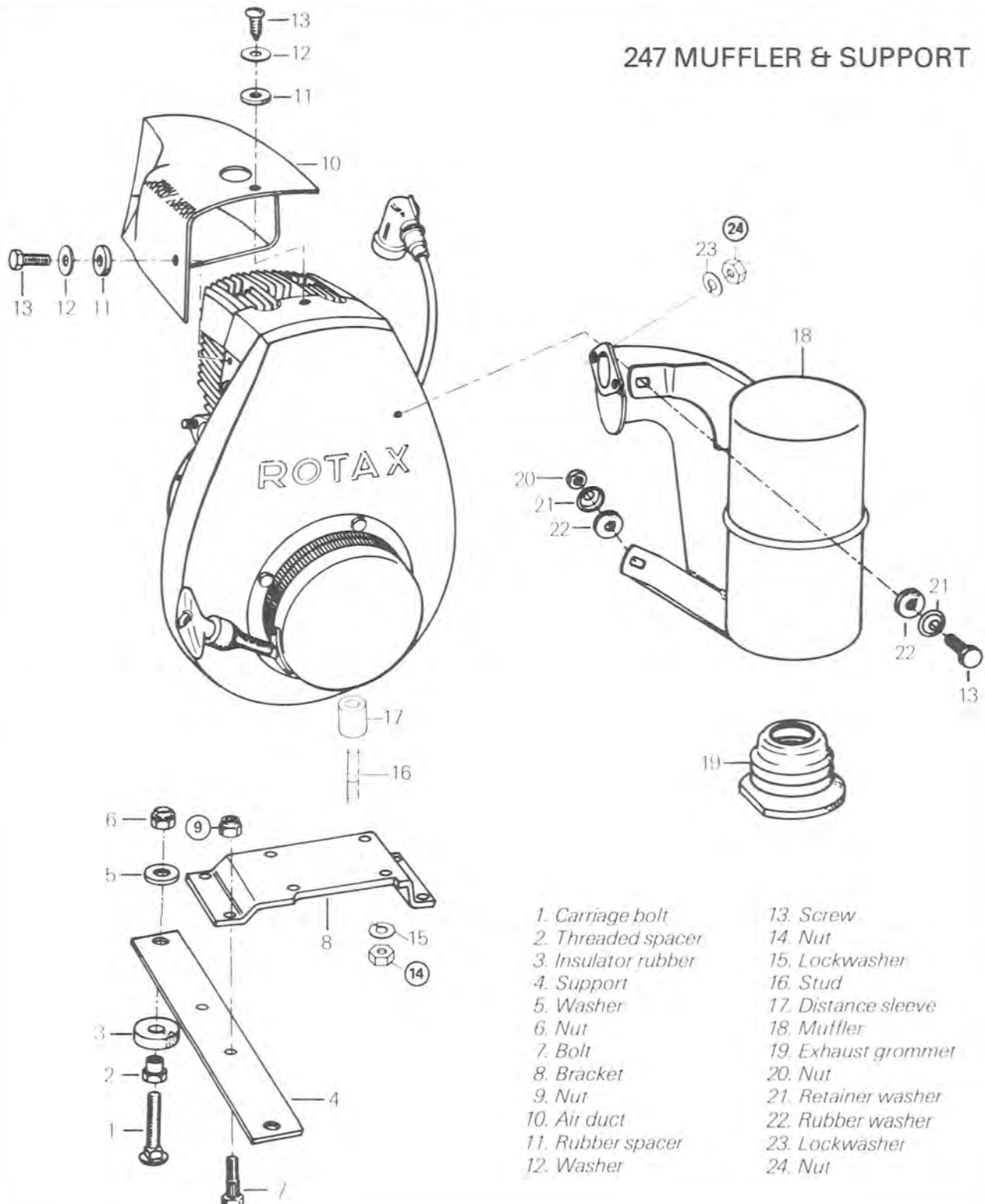
○

○

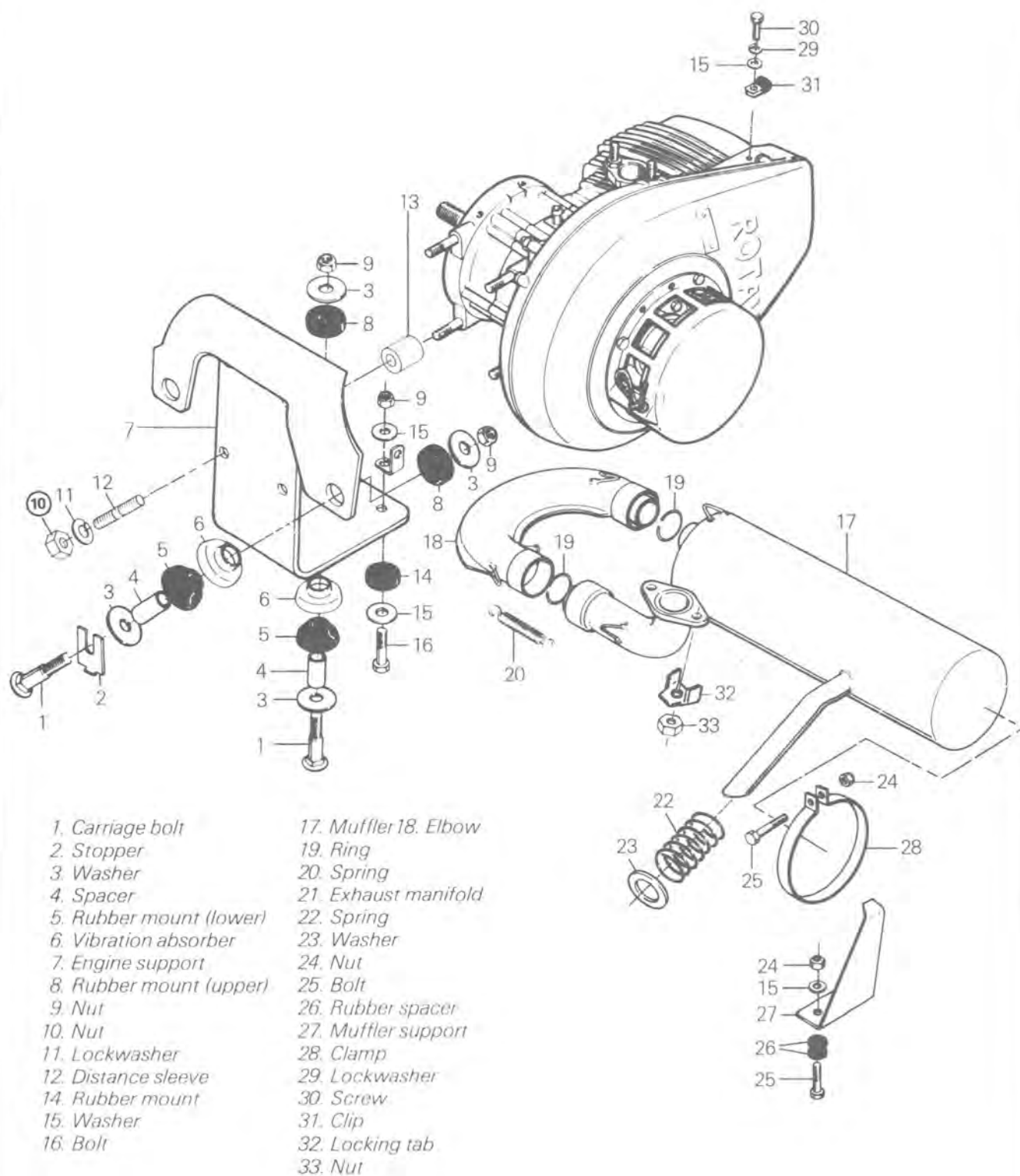
○

247, 302 ENGINE TYPE

247 MUFFLER & SUPPORT



SECTION 04
SUB-SECTION 01 (ONE CYLINDER ENGINE)




MUFFLER & SUPPORT

247 TYPE

REMOVAL FROM VEHICLE

Remove or disconnect the following then lift engine from vehicle.

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

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

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

DISASSEMBLY & ASSEMBLY

- ⑨ Torque to 3.2 kg-m (23 ft-lbs)
- ⑭ Torque to 3.6 kg-m (26 ft-lbs)
- ⑳ Torque to 2.2 kg-m (16 ft-lbs).

INSTALLATION ON VEHICLE

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

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

302 TYPE

REMOVAL FROM VEHICLE

Remove or disconnect the following then lift engine from vehicle.

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

DISASSEMBLY & ASSEMBLY

- ⑩ Torque to 3.6 kg-m (26 ft-lbs).
- ③ Torque to 2.2 kg-m (16 ft-lbs).

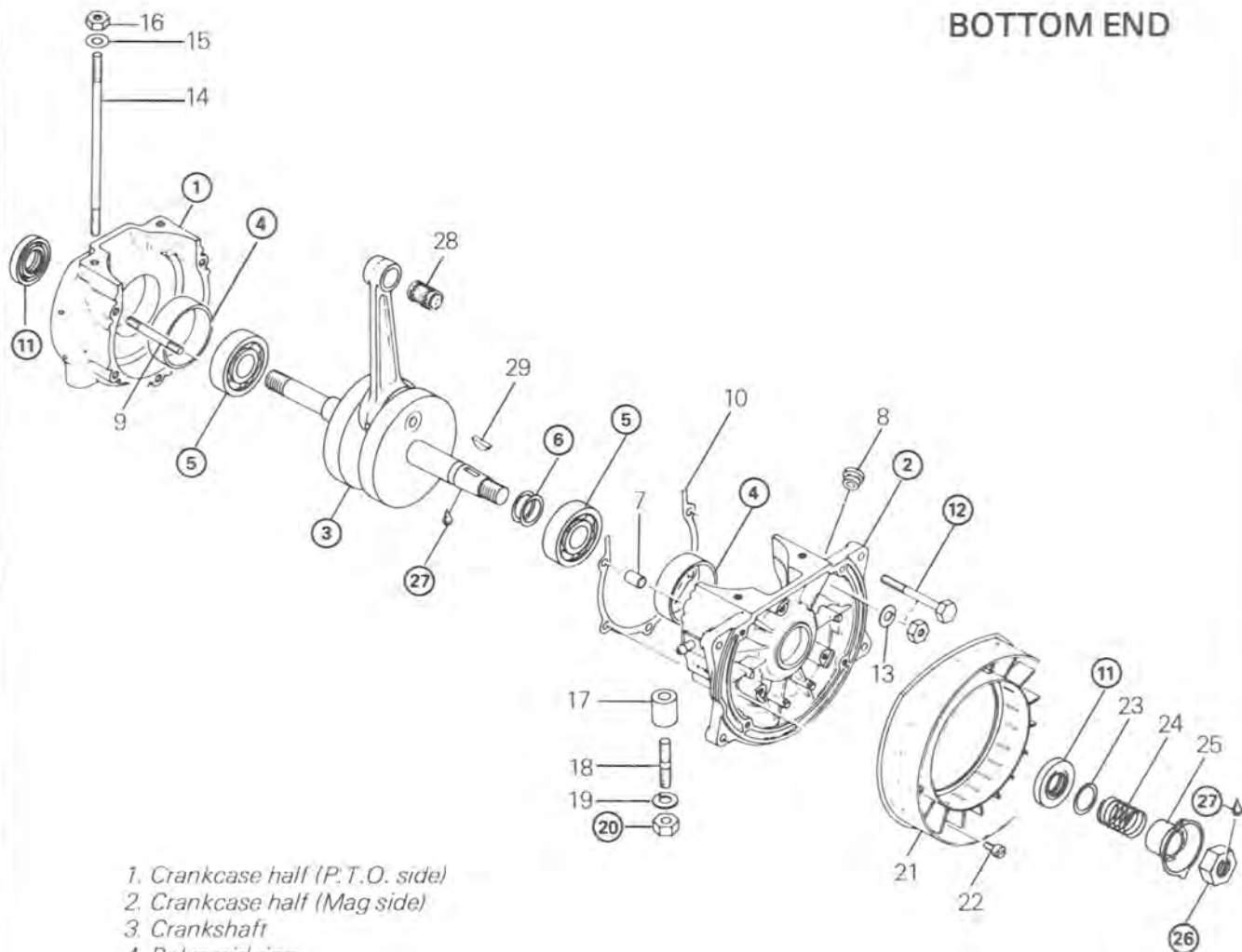
INSTALLATION

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

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

SECTION 04
SUB-SECTION 01 (ONE CYLINDER ENGINE)

BOTTOM END



1. Crankcase half (P.T.O. side)
2. Crankcase half (Mag side)
3. Crankshaft
4. Polyamid ring
5. Bearing
6. Shim
7. Dowel tube
8. Wires grommet
9. Stud
10. Gasket
11. Oil seal
12. Bolt or nut
13. Lockwasher
14. Stud (cylinder)
15. Washer (head)
16. Nut (head)
17. Distance sleeve
18. Stud
19. Lockwasher
20. Nut

21. Labyrinth ring (fan)
22. Screw
23. Shim
24. Spring
25. Breaker point cam
26. Nut
27. Loctite Lock'n Seal (no 242)
28. Needle bearing
29. Woodruff key

BOTTOM END

CLEANING

Discard all oil seals and gaskets.

Clean all metal components in a non ferrous metal cleaner.

DISASSEMBLY & ASSEMBLY

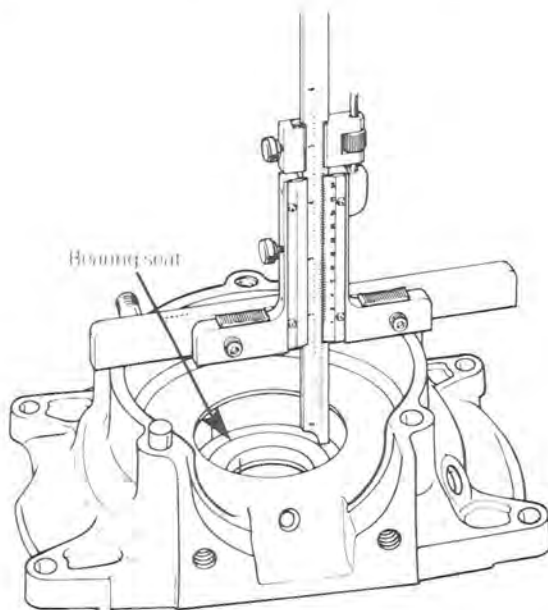
General

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

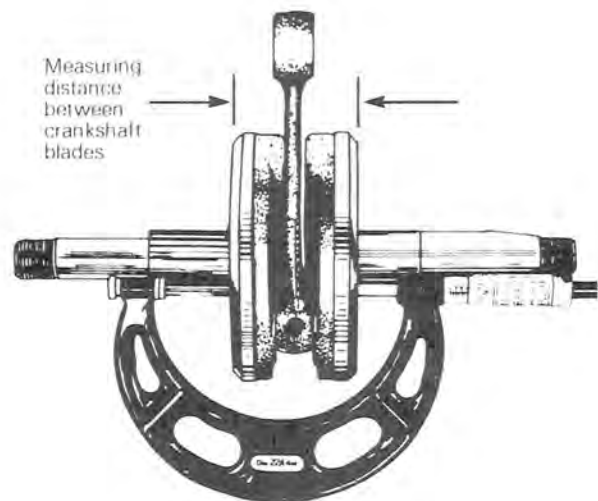
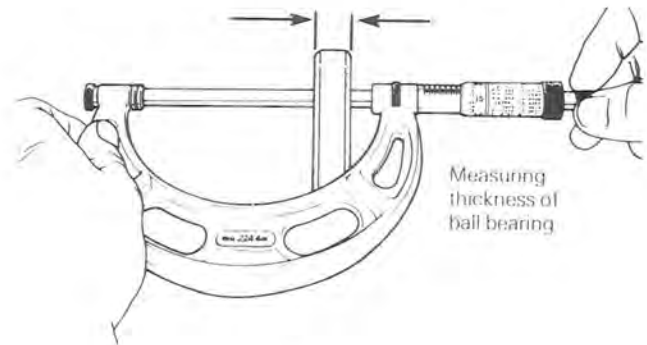
①② When disassembling / assembling crankcase halves, do not use heat the crankcase. If heat is necessary, temperature must not exceed 55° C (130° F).

③⑥ Crankshaft end-play should be between 0.10-0.40 mm (.004-.016"). To determine necessary correction:

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



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



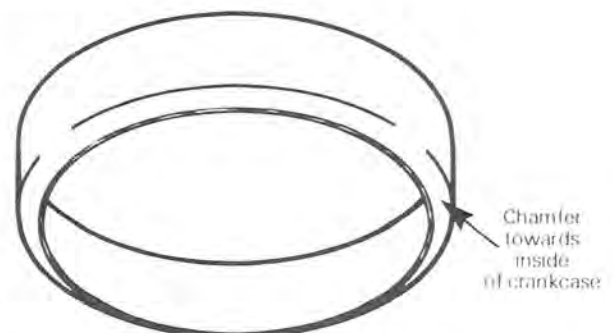
c) Subtract measurement B from measurement A minus tolerance of 0.10-0.40 mm (.004"-.016"). Total balance is distance to be shimmed. Shim(s) must be located between magneto side bearing and crankshaft blade.

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

④ Do not remove unless necessary.

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

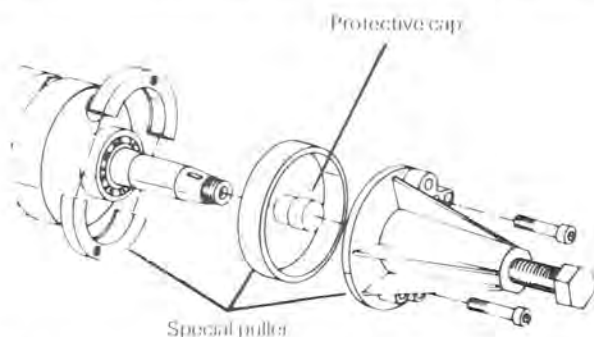
To install, apply oil on outside diameter then use a suitable pusher.



SECTION 04

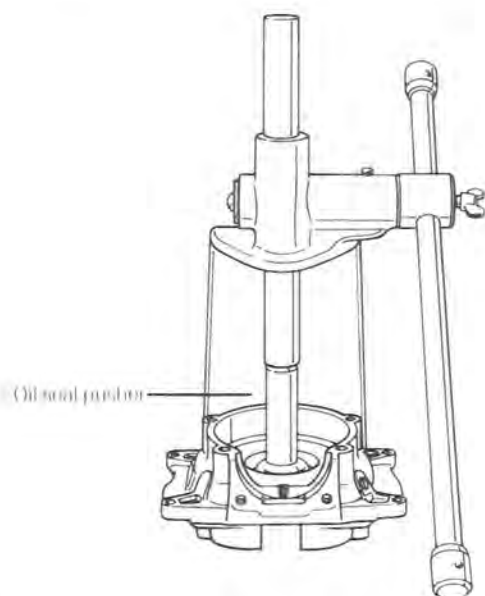
SUB-SECTION 01 (ONE CYLINDER ENGINE)

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



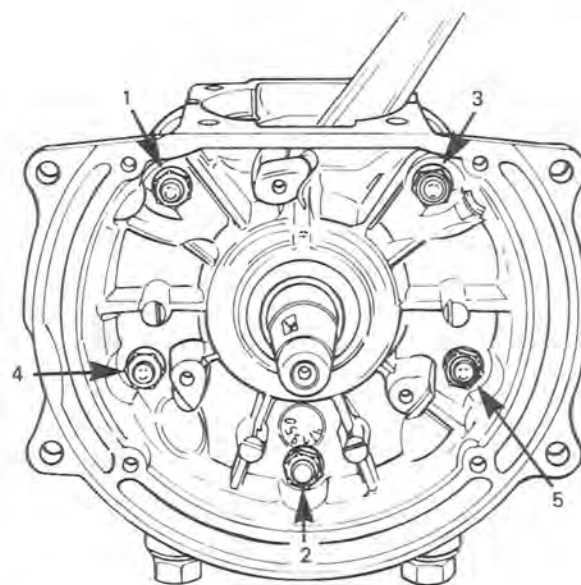
○ **NOTE:** Prior to magneto side bearing installation, install required shim(s) (crankshaft end play) on crankshaft extension. At assembly, place bearings into an oil container and heat the oil to 100° C (210° F) for 5 to 10 min. This will expand the bearings and permit them to slide easily on the shaft.

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



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

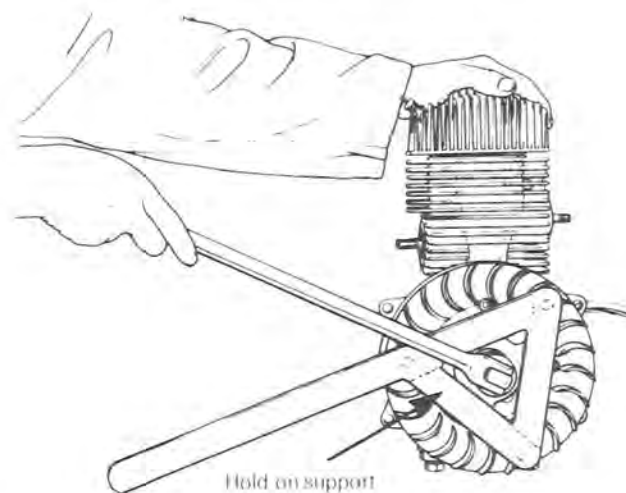
⑫ At assembly, torque to 2.2 kg-m (16 ft-lbs) following illustrated sequence.



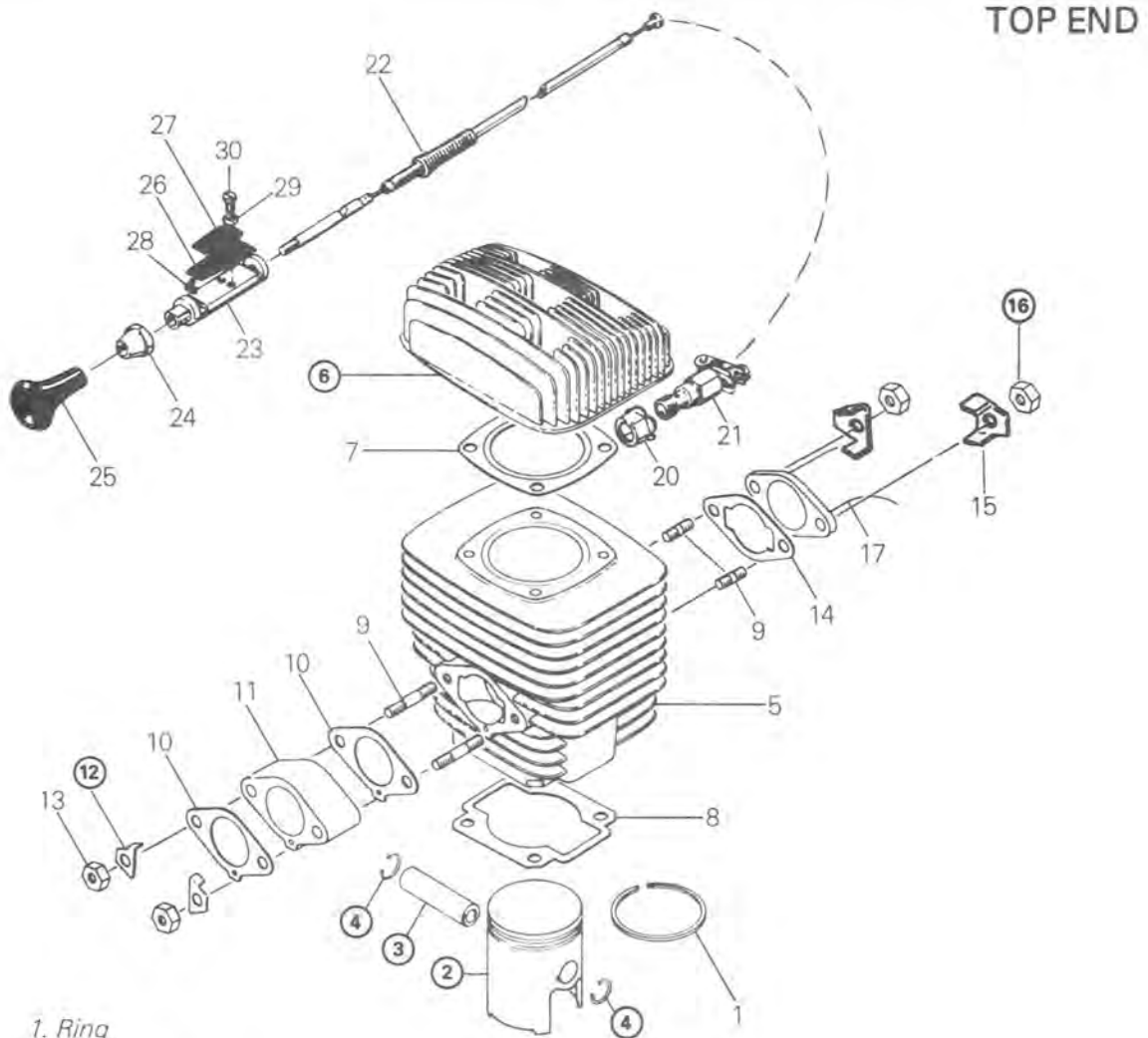
⑳ Torque to 3.6 kg-m (26 ft-lbs).

㉑ To remove or install magneto retaining nut, lock crankshaft in position with special hold-on support. (See Tool Section).

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



㉒ Clean thoroughly then apply Loctite Lock'n Seal no. 242 or equivalent.



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

247
ONLY

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

TOP END

CLEANING

Discard all gaskets.

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

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

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

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

DISASSEMBLY & ASSEMBLY

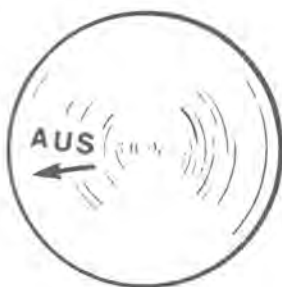
○ **NOTE:** Refer to Technical Data for component fitted tolerance and wear limit.

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

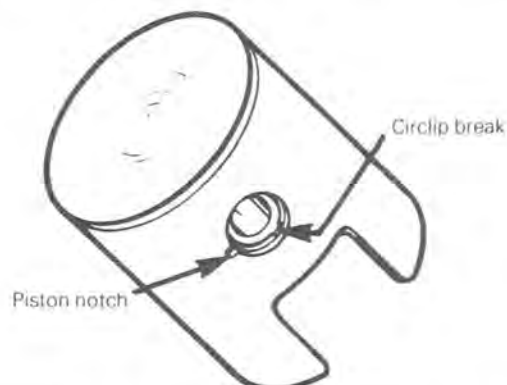
▼ **CAUTION:** When tapping out gudgeon pins, hold piston firmly in place to eliminate the possibilities of transmitting shock and pressure to the connecting rod.

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

EXHAUST



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

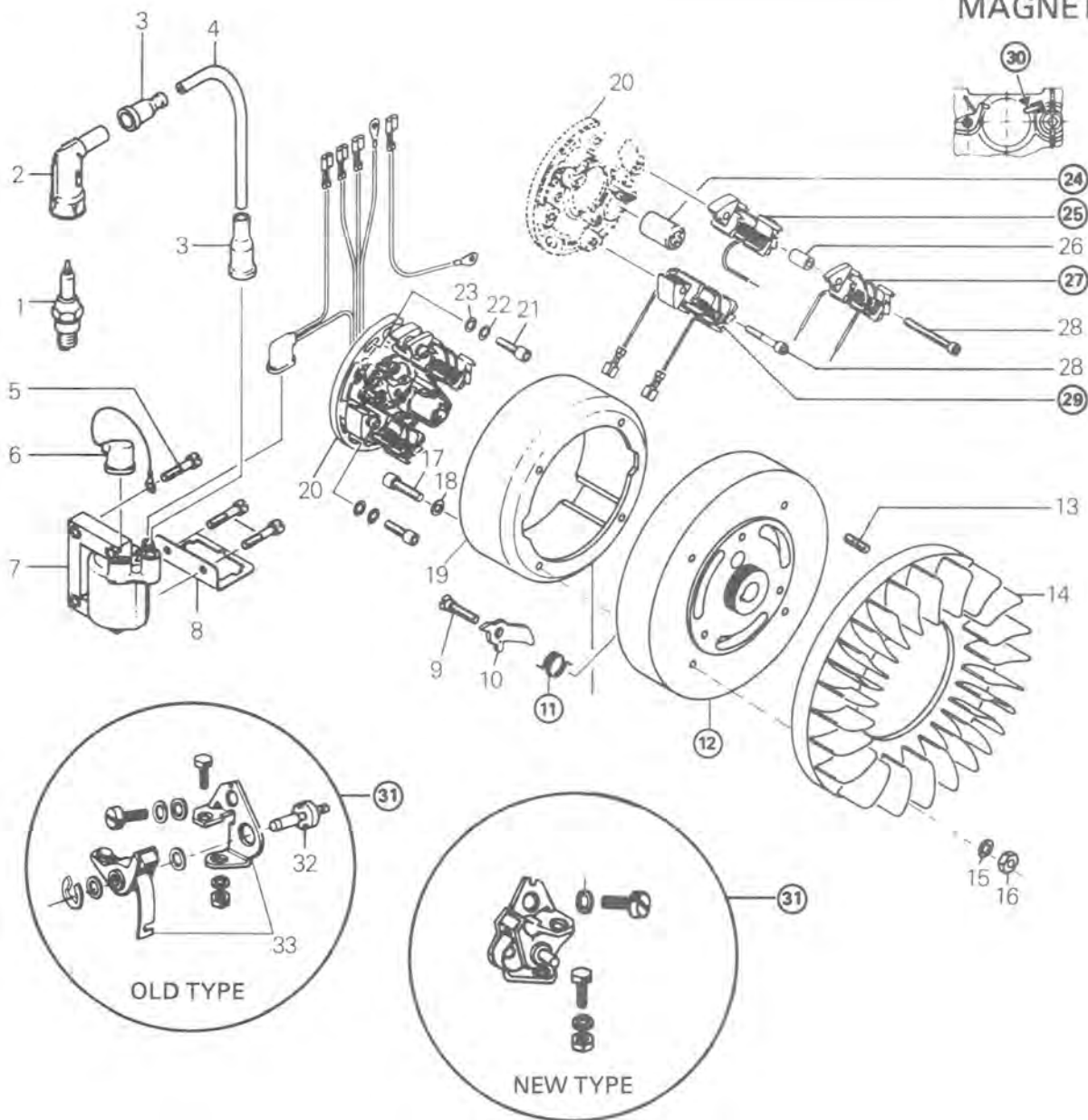


⑤⑯ Position cylinder head on cylinder with fins in line with crankshaft center line. Cross torque retaining nut to 1.9-2.2 kg-m (14-16 ft-lbs.)

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

⑮ At assembly, torque to 2.2 kg-m (16 ft-lbs.).

MAGNETO



1. Spark plug
2. Protector
3. Protection cap
4. H.T. cable
5. Screw
6. Ground connector
7. Ignition coil
8. Junction block bracket
9. Screw
10. Centrifugal weight
11. Return spring

12. Magneto housing
13. Stud
14. Fan
15. Lockwasher
16. Nut
17. Screw
18. Lockwasher
19. Magneto ring
20. Armature plate
21. Screw
22. Lockwasher

23. Flat washer
24. Condenser
25. Ignition generator coil
26. Distance sleeve
27. Brake light coil
28. Screw
29. Lighting coil
30. Lubricating wick
31. Breaker point set ass'y
32. Pivot pin
33. Breaker point set

MAGNETO

CLEANING

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

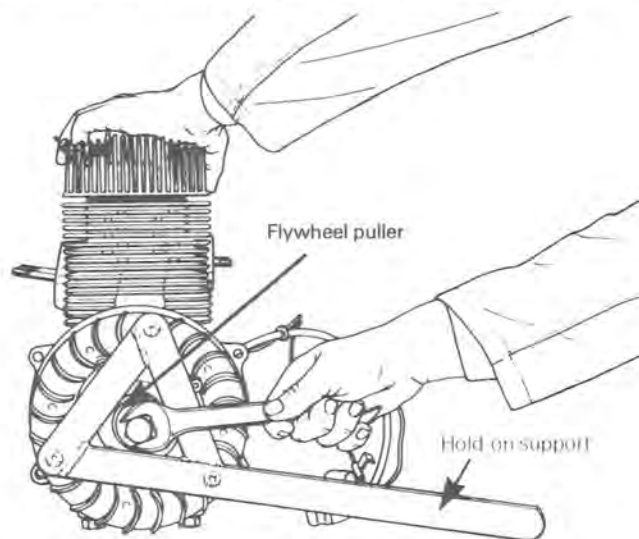
CAUTION: Clean armature using only a clean cloth.

DISASSEMBLY & ASSEMBLY

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

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

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



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

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



⑬ Apply Loctite Lock'n Seal 242 on threads.

⑭ To replace a capacitor, it is first necessary to disconnect the two (2) black leads using a soldering iron. The capacitor can then be driven out of the armature plate using a suitable drift. To reinstall, inverse procedure.

⑮ ⑰ ⑲ Whenever a coil is replaced, the air gap (distance between magnet and coil end) must be adjusted.

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

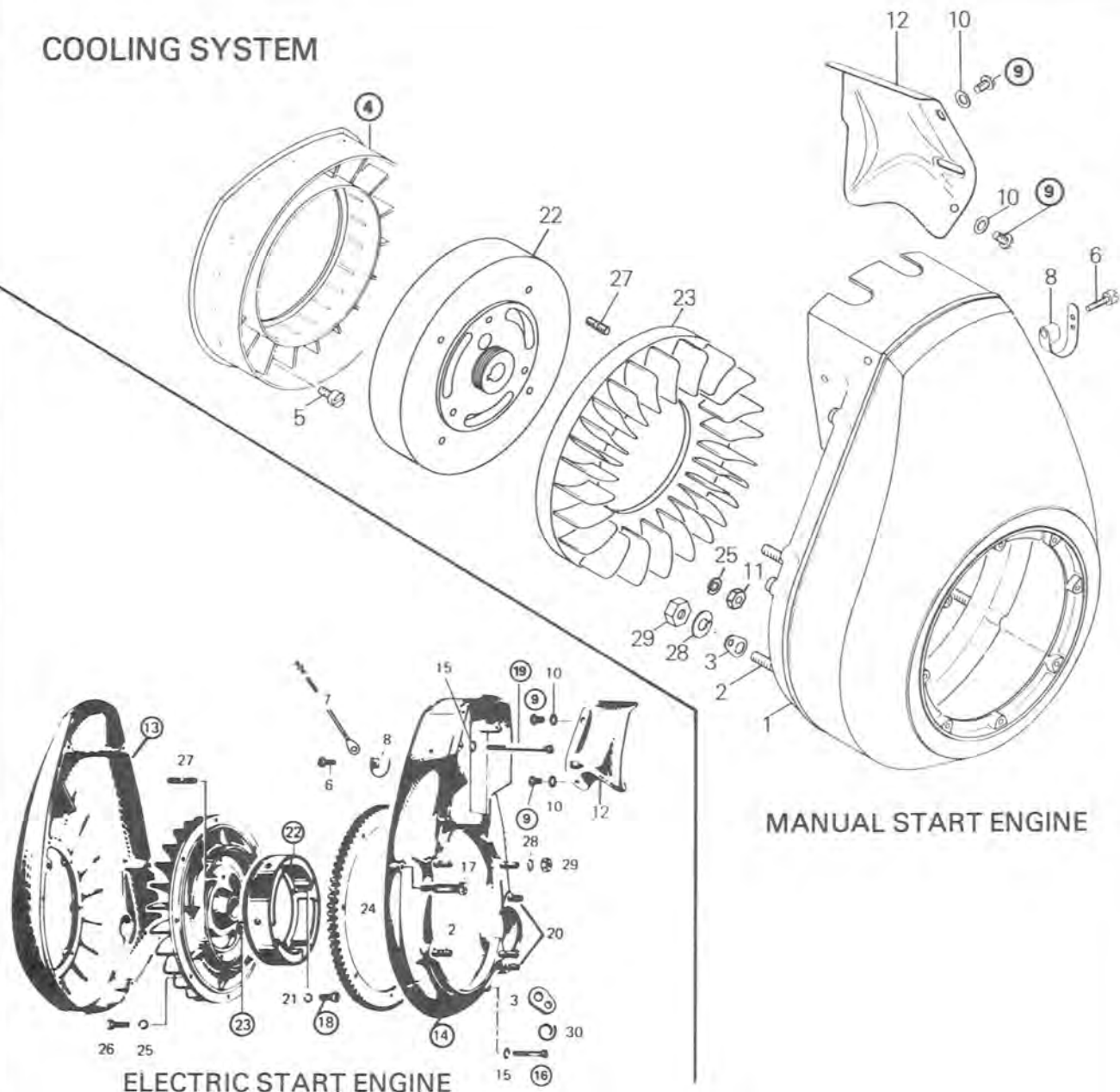


⑳ When replacing breaker point set, apply a light coat of grease on lubricating wick.

㉑ Do not remove pivot pin unless replacement is needed, if removed reinstall with Loctite Lock'n Seal on threads.

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

COOLING SYSTEM



1. Fan cowl ass'y
2. Fan cowl stud (4)
3. Spring bracket
4. Labyrinth ring (manual start only)
5. Screw (4)
6. Screw
7. Ground cable
8. Cable clamp
9. Flat head screw
10. Spring washer

11. Nut
12. Air deflector
13. Fan cowl cover
14. Fan cowl
15. Lock washer
16. Cylindrical head screw (2)
17. Dowel screw (2)
18. Allen screw (4)
19. Cylindrical head screw (long)
20. Starter stud

21. Lock washer (4)
22. Magneto ring
23. Fan ass'y
24. Starter ring gear
25. Lock washer (8)
26. Hex. cap screw (8)
27. Stud
28. Lock washer (4)
29. Nut (4)
30. Spring retainer

COOLING SYSTEM

CLEANING

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

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

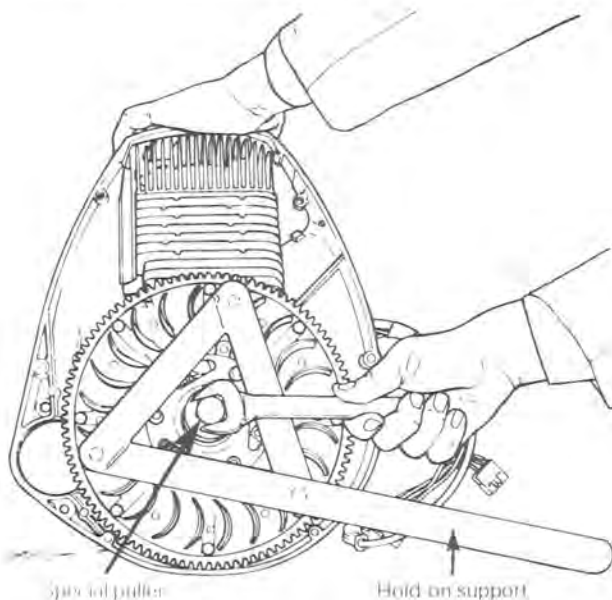
DISASSEMBLY & ASSEMBLY

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

⑬ ⑭ ②② ②③ To remove fan cowl ass'y and / or magneto from electric start engine, it is first necessary to separate fan cowl cover from fan cowl.

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

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

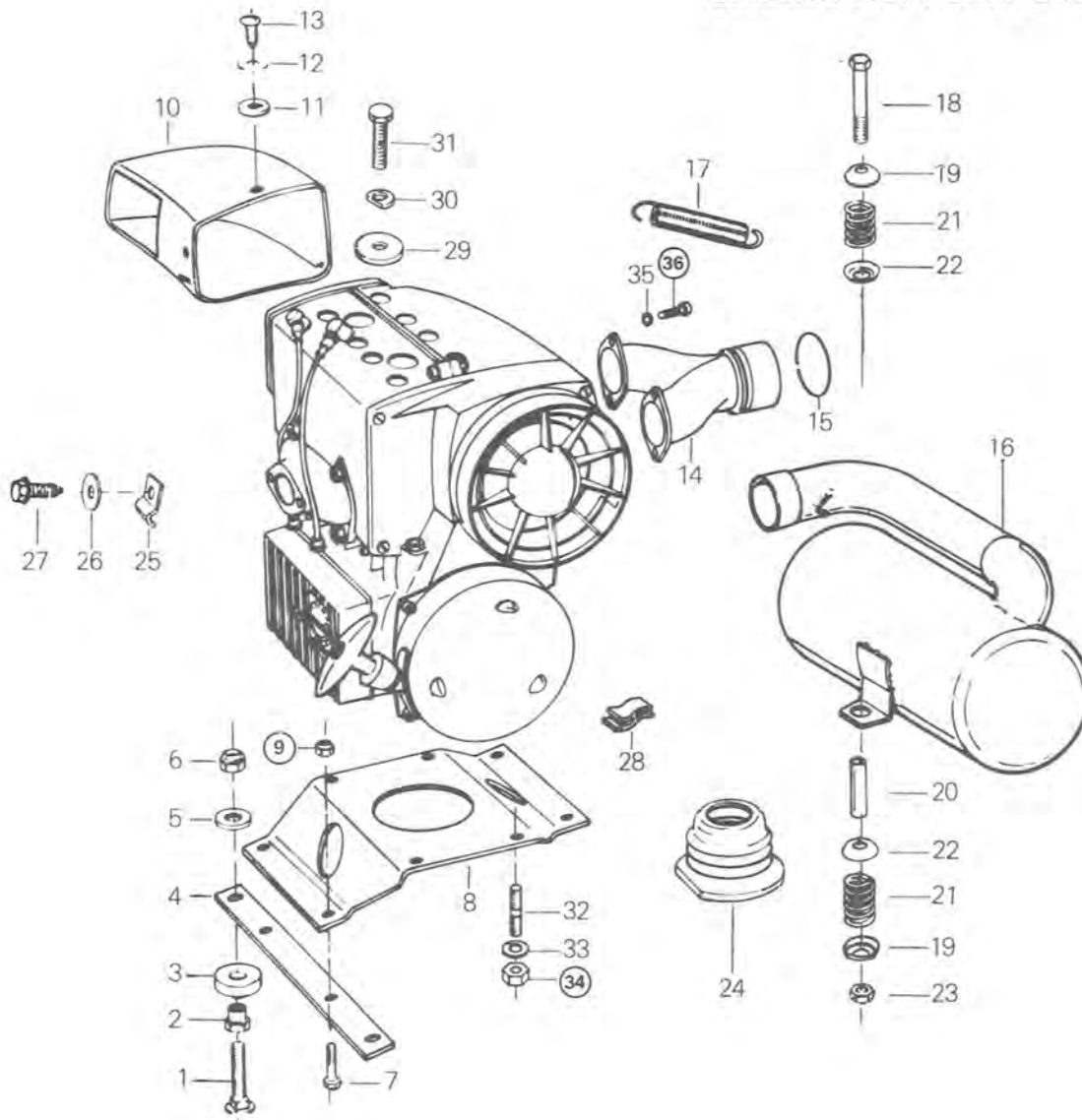


⑨ ⑬ ⑬ ⑬ ⑬ At assembly, apply Loctite "Lock'n Seal 242" on screws threads.

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

248 ENGINE TYPE (FROM 1975)

ENGINE SUPPORT & MUFFLER



1. Carriage bolt
2. Threaded spacer bushing
3. Rubber insulator
4. Engine support
5. Washer
6. Nut
7. Bolt
8. Engine bracket
9. Nut
10. Air duct
11. Rubber spacer
12. Washer

13. Screw
14. Exhaust manifold
15. Aluminum ring
16. Muffler
17. Spring
18. Bolt
19. Cup
20. Bushing
21. Spring
22. Cup
23. Nut
24. Exhaust grommet

25. Clip
26. Washer
27. Screw
28. Plug
29. Rubber washer
30. Washer
31. Screw
32. Stud
33. Lockwasher
34. Nut
35. Lockwasher
36. Screw

ENGINE SUPPORT & MUFFLER

REMOVAL FROM VEHICLE

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

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

DISASSEMBLY & ASSEMBLY

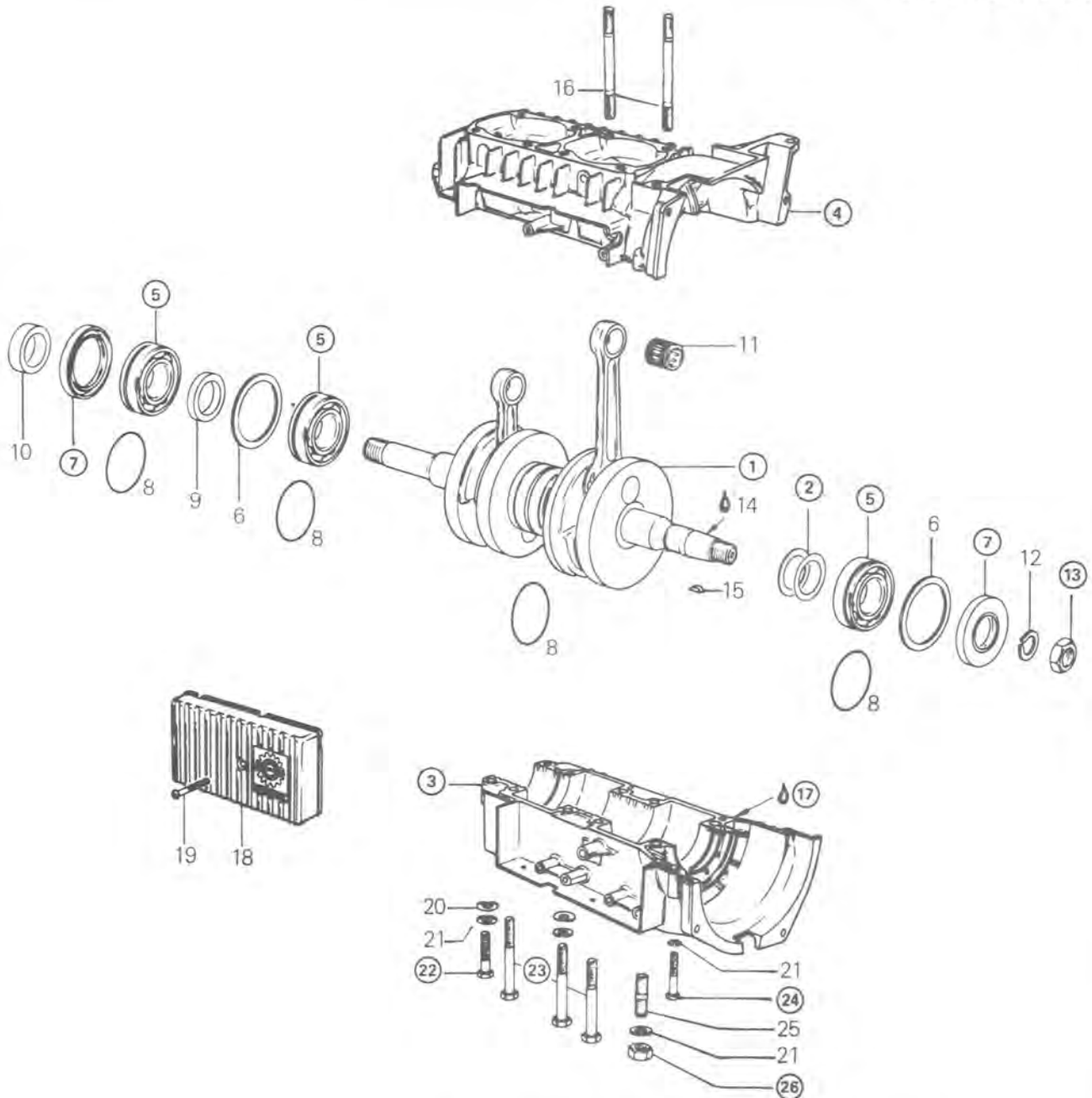
- ⑨ Torque to 3.2 kg-m (23 ft-lbs)
- ③④ Torque to 3.6 kg-m (26 ft-lbs)
- ③⑥ Torque to 2.2 kg-m (16 ft-lbs)

INSTALLATION

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

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

BOTTOM END



1. Crankshaft
2. Shim
3. Crankcase lower half
4. Crankcase upper half
5. Bearing
6. Retaining washer
7. Oil seal
8. "O" ring
9. Distance ring 6 mm

10. Distance ring 9.7 mm
11. Needle cage bearing
12. Lockwasher
13. Magneto ring nut
14. Loctite 242
15. Woodruff key
16. Stud (cylinder)
17. Crankcase sealant
18. Ignition coil cover

19. Screw
20. Spring washer
21. Lockwasher
22. Bolt or stud with nut
23. Bolt or stud with nut
24. Bolt or stud with nut
25. Stud
26. Nut

BOTTOM END

CLEANING

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

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

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

DISASSEMBLY & ASSEMBLY

General

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

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

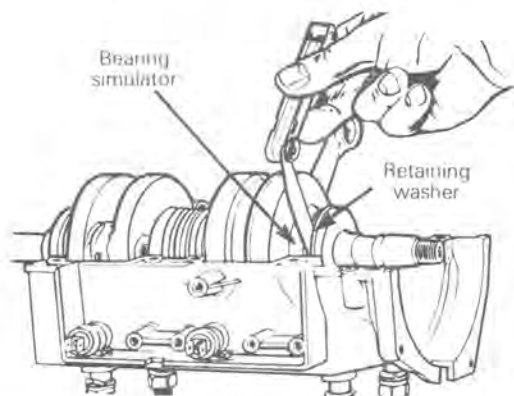
NOTE: Crankshaft end-play is adjusted only when crankshaft and / or crankcase is replaced.

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

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

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

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

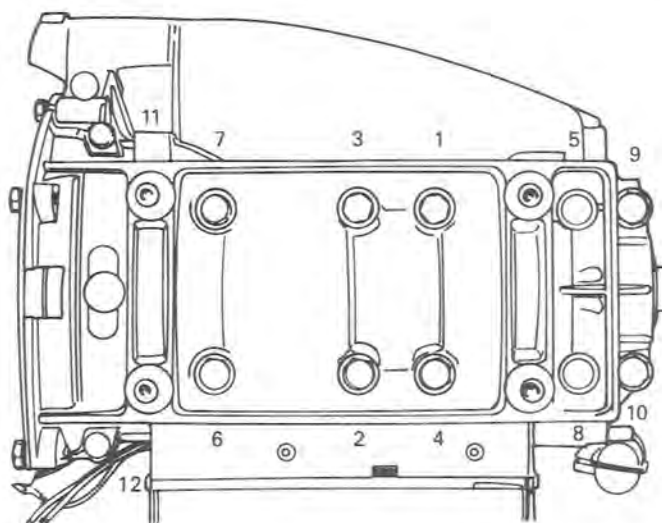


③④⑦ Crankcase halves are factory matched and therefore, are not interchangeable or available single halves.

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

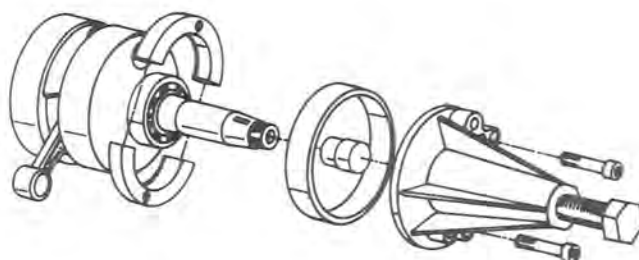
Position the crankcase halves together and tighten nuts (or bolts) by hand then install armature plate (tighten) on magneto side to correctly align the crankcase halves.

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



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

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

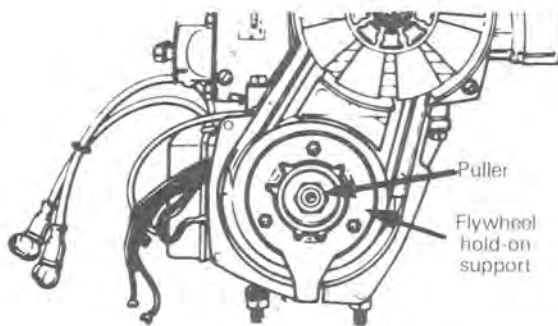


NOTE: Prior to magneto side bearing installation, determine crankshaft end-play and install required shim(s) on crankshaft extension.

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

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

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



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

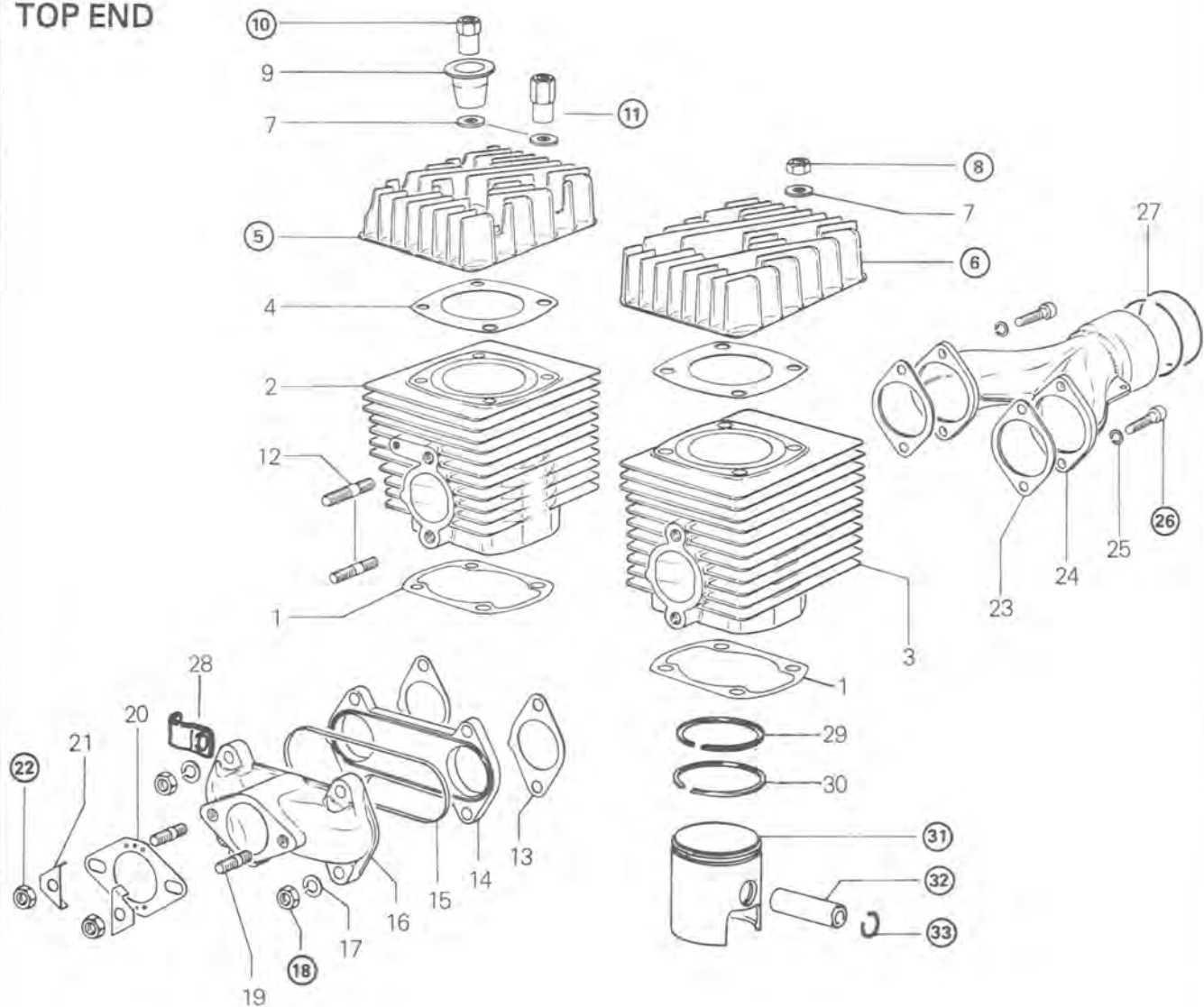
②② ②③ Torque to 2.2 kg-m (16 ft-lbs).

②④ Torque to 1.2 kg-m (9 ft-lbs).

②⑥ Torque to 3.6 kg-m (26 ft-lbs).

SECTION 04
SUB-SECTION 02 (TWO CYLINDER ENGINE)

TOP END



1. Gasket (cylinder/crankcase)
2. Cylinder (P.T.O.)
3. Cylinder (MAG)
4. Cylinder head gasket
5. Cylinder head (PTO)
6. Cylinder head (MAG)
7. Flat washer
8. Nut (head)
9. Support sleeve
10. Distance nut
11. Distance nut

12. Stud
13. Gasket
14. Isolating flange
15. Rubber ring
16. Intake manifold
17. Lockwasher
18. Nut
19. Stud
20. Gasket
21. Locking tab
22. Nut

23. Exhaust gasket
24. Exhaust manifold
25. Lockwasher
26. Allen capscrew
27. Sealing ring
28. Clip
29. "L" ring
30. Rectangular ring
31. Piston
32. Gudgeon pin
33. Circlip

TOP END

CLEANING

Discard all gaskets.

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

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

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

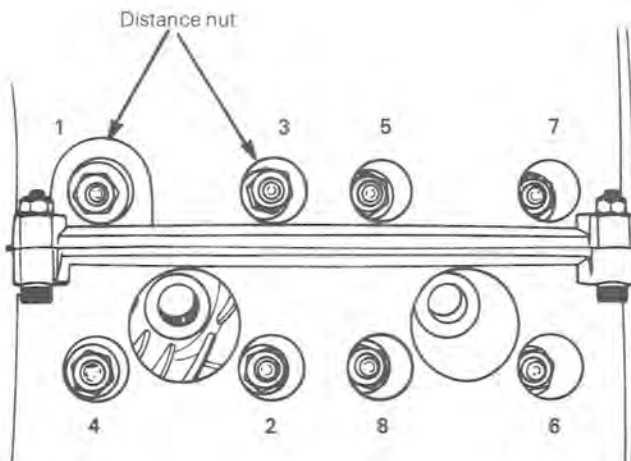
Clean the piston ring grooves with a groove cleaner tool, or with a piece of broken ring.

DISASSEMBLY & ASSEMBLY

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

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

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



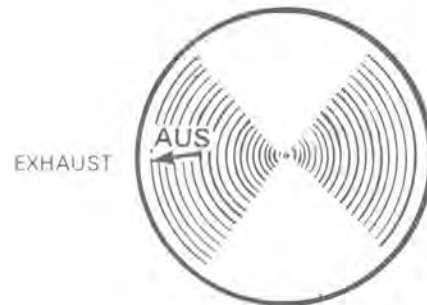
⑮ ⑲ ⑳ Torque to 2.1 kg-m (15 ft-lbs).

⑳ ㉑ ㉒ Place a clean cloth over crankcase to prevent circlip from falling into crankcase. Use apointed tool to remove circlip from piston.

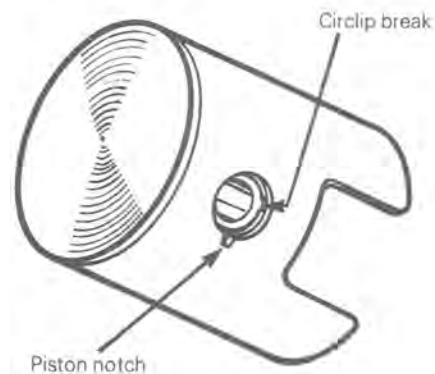
Drive the gudgeon pins in or out using a suitable drive punch and hammer.

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

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



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



D



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MAGNETO

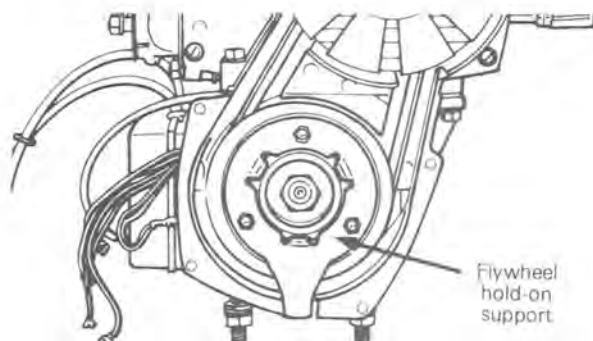
CLEANING

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

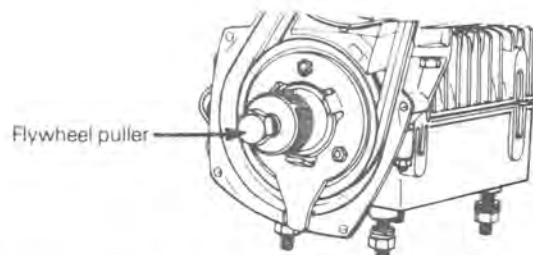
CAUTION: Clean armature ass'y using only a clean cloth.

DISASSEMBLY & ASSEMBLY

- ① Torque to 6.4 kg-m (46 ft-lbs).
- ⑤ Torque to 1.2 kg-m (9 ft-lbs).
- ⑦ ⑧ ⑨ ⑩ To remove or install magneto retaining nut, lock crankshaft in position with special hold-on support as illustrated. (See Tool Section).



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



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

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

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

⑪ ⑫ ⑬ Whenever a coil is replaced, the air gap (distance between magnet and coil end) must be adjusted.

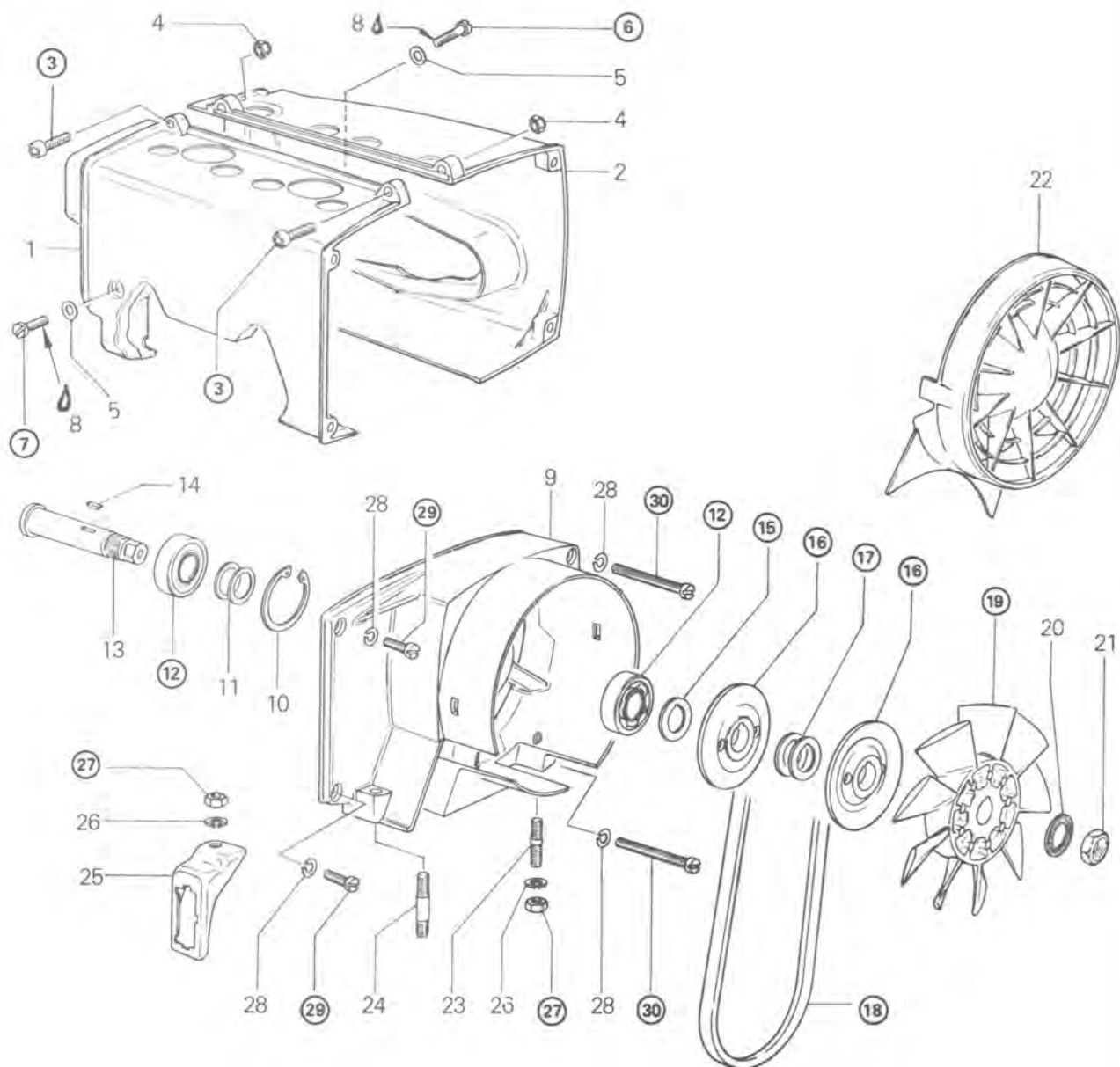


To check air gap, insert a feeler gauge of 0.25-0.39 mm (.010-.015") between magnet and coil ends. If necessary to adjust, slacken retaining screws and relocate coil.

⑭ Do not remove pivot pin unless replacement is needed. At assembly, apply Loctite "Lock'n Seal" on threads.

⑮ ⑯ When replacing breaker point set, apply a light coat of grease on pivot pin and lubricating wick.

COOLING SYSTEM



1. Cylinder cowl (intake)
2. Cylinder cowl (exhaust)
3. Screw
4. Nut
5. Spring washer
6. Screw
7. Screw
8. Loctite no. 242
9. Fan housing
10. Circlip

11. Shim
12. Bearing
13. Fan shaft
14. Woodruff key
15. Shim
16. Pulley half
17. Shim
18. Belt
19. Fan
20. Locking washer

21. Nut
22. Fan cover
23. Stud
24. Stud
25. Junction block bracket
26. Lockwasher
27. Nut
28. Lockwasher
29. Screw
30. Screw

COOLING SYSTEM

CLEANING

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

DISASSEMBLY & ASSEMBLY

③ ⑥ ⑦ ②⑦ ②⑧ ③⑩ At assembly, apply Loctite Lock'n seal or equivalent on threads to prevent loosening through vibration.

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

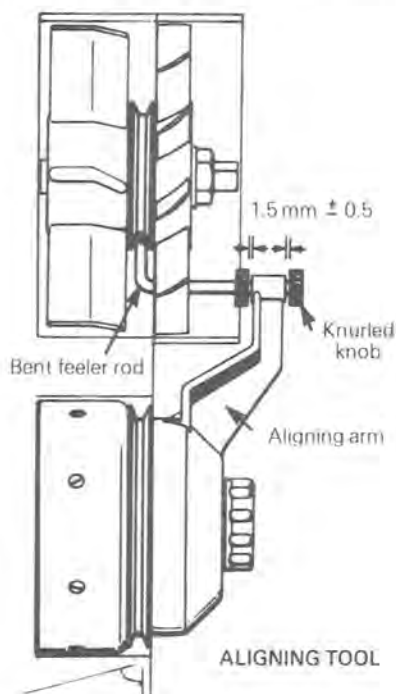
⑫ To remove or install bearing, heat bearing housing to 65° C (150° F).

⑮ Fan belt pulleys alignment

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

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

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



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

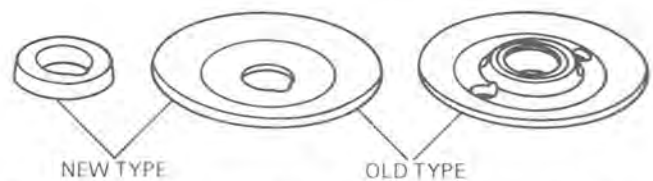
If clearance is smaller than 1 mm (.040") on one side, shim(s) must be added or removed between bearing and inner pulley half to bring both gaps within tolerance of 1.5 mm ± 0.5 (.060" ± .020").

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

⑰ ⑱ Correct fan belt free-play is 6 mm (¼"). To adjust, add or remove shim(s) (no. 17) between inner and outer pulley halves. Excess shim(s) must be positioned between outer pulley half and fan.

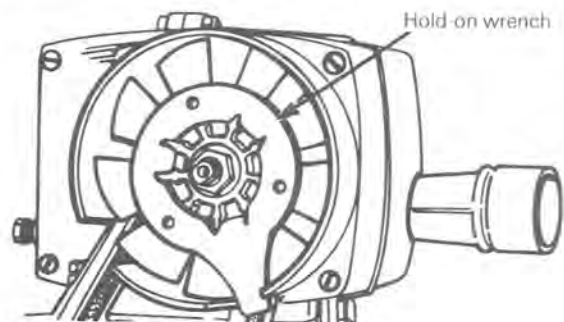
⑲ ⑳ ㉑ Newer pulley half does not have a shoulder on its inner face so it is installed with a 6 mm (0.236") spacer.

Pulley half



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

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

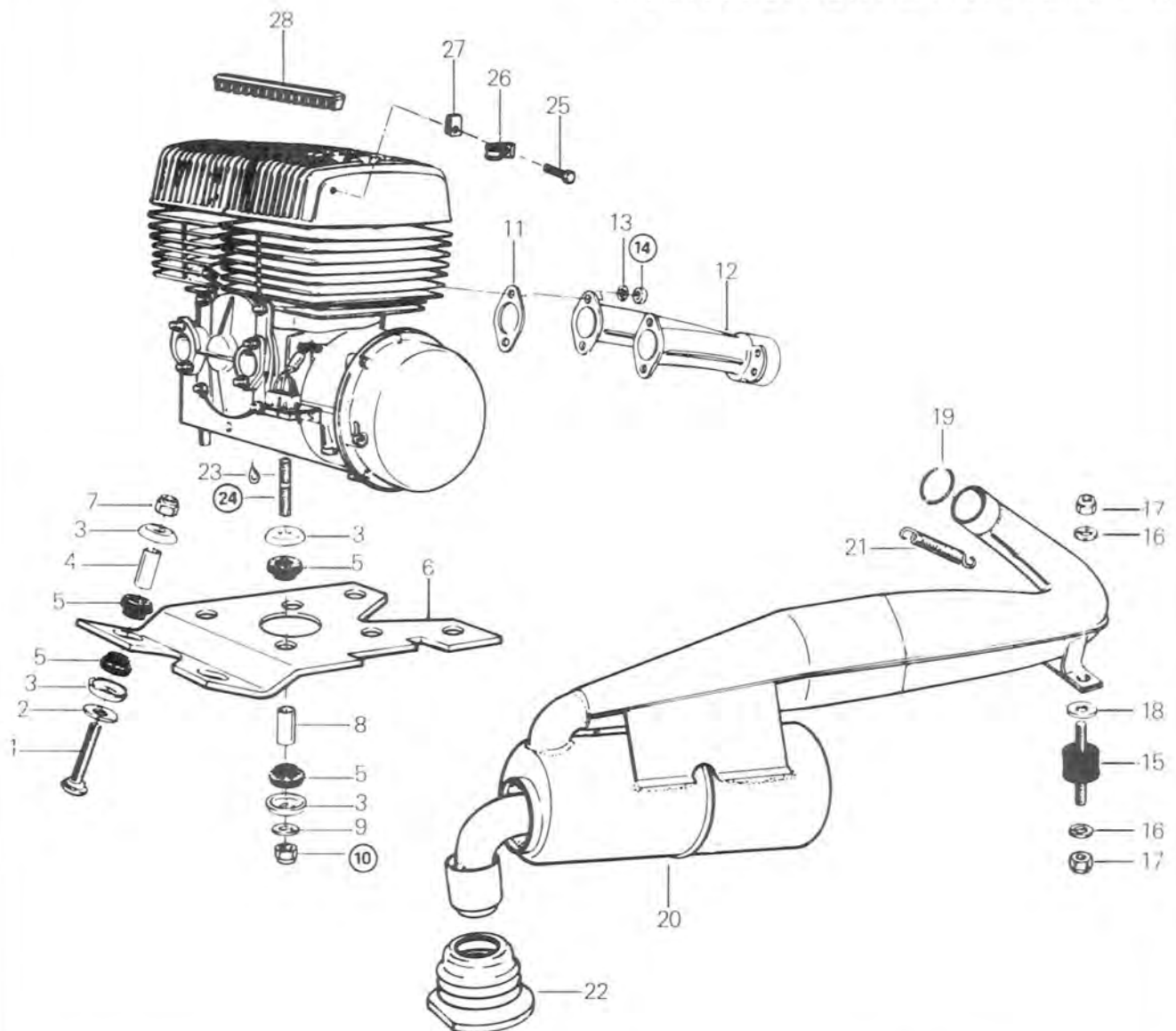


At assembly, torque retaining nut to 6.4 kg-m (46 ft-lbs). Make sure that belt is not squeezed between pulley halves.



245, 345 ENGINE TYPE (FROM 1976)

ENGINE SUPPORT & MUFFLER (1976)

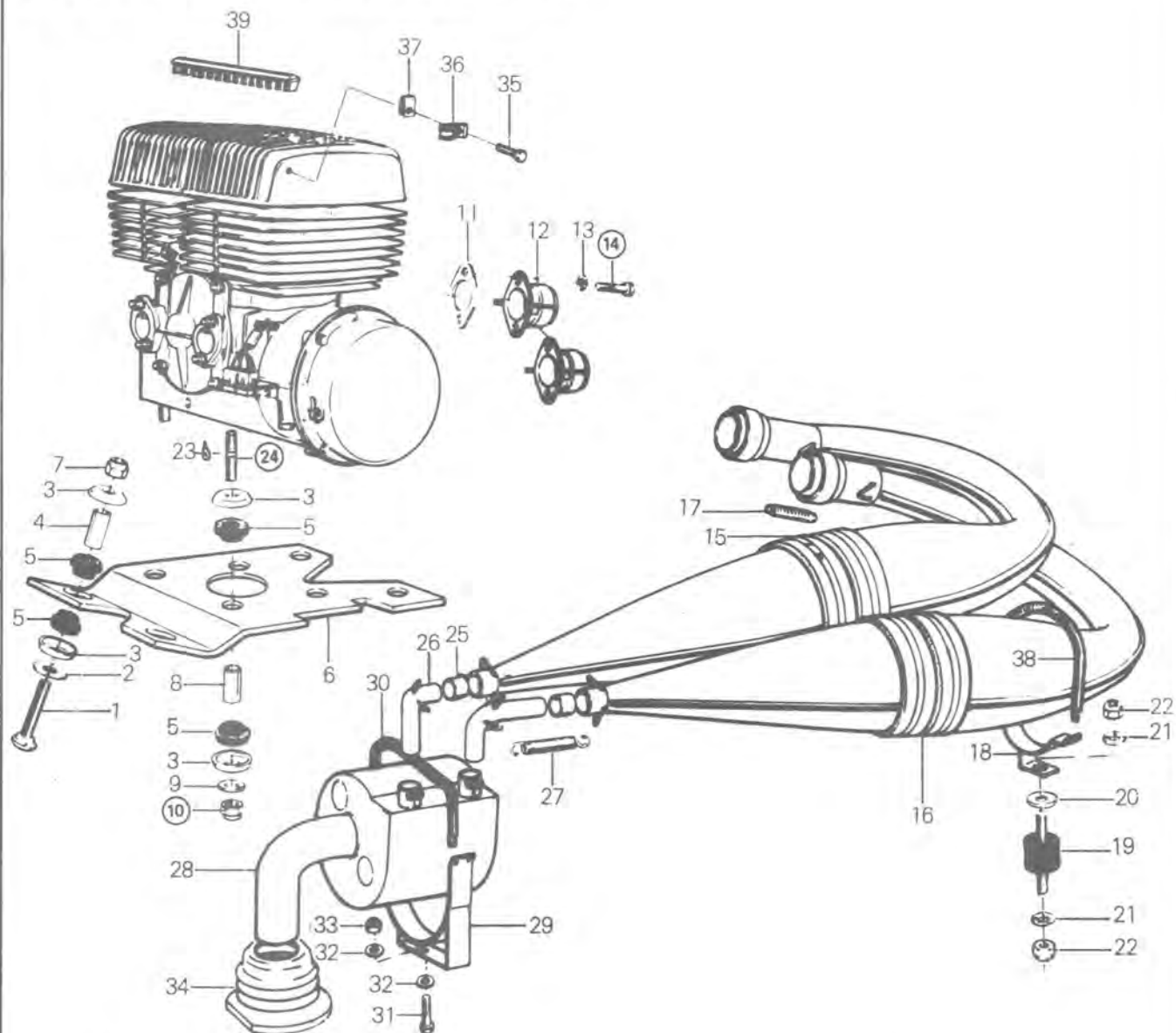


1. Carriage bolt
2. Washer
3. Cup washer
4. Spacer bushing
5. Rubber damper
6. Engine support
7. Nut
8. Spacer bushing
9. Washer
10. Nut

11. Exhaust gasket
12. Exhaust manifold
13. Lockwasher
14. Nut
15. Rubber shear mount
16. Washer
17. Nut
18. Washer
19. Aluminum ring

20. Muffler
21. Spring
22. Exhaust grommet
23. Loctite 242
24. Stud
25. Bolt
26. High tension cable clip
27. Clip nut
28. Noise damper

ENGINE SUPPORT & MUFFLER (1977)



1. Carriage bolt
2. Washer
3. Cup washer
4. Spacer bushing
5. Rubber damper
6. Engine support
7. Nut
8. Spacer bushing
9. Washer
10. Nut
11. Exhaust gasket
12. Exhaust socket
13. Lockwasher

14. Bolt
15. Tuned pipe (P.T.O.)
16. Tuned pipe (mag.)
17. Spring
18. Support
19. Rubber shear mount
20. Washer
21. Washer
22. Nut
23. Loctite 242
24. Stud
25. Coupler
26. Tail pipe

27. Spring
28. Swirl chamber
29. Support
30. Spring
31. Bolt
32. Washer
33. Nut
34. Exhaust grommet
35. Bolt
36. High tension cable clip
37. Clip nut
38. Spring
39. Noise damper

ENGINE SUPPORT & MUFFLER

REMOVAL FROM VEHICLE

Disconnect or remove the following from vehicle:

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

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

Remove engine mount nuts then lift engine from vehicle.

DISASSEMBLY & ASSEMBLY

- ⑩ Torque to 3.6 kg-m (26 ft-lbs).
- ⑭ Torque to 2.1 kg-m (15 ft-lbs).
- ⑳ At assembly on crankcase apply Loctite Lock'n Seal 242 on threads.

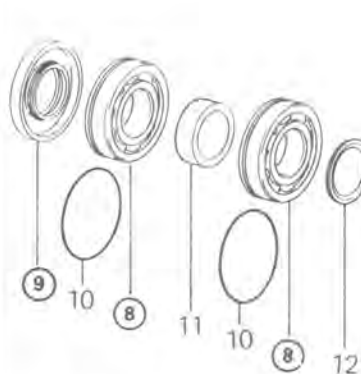
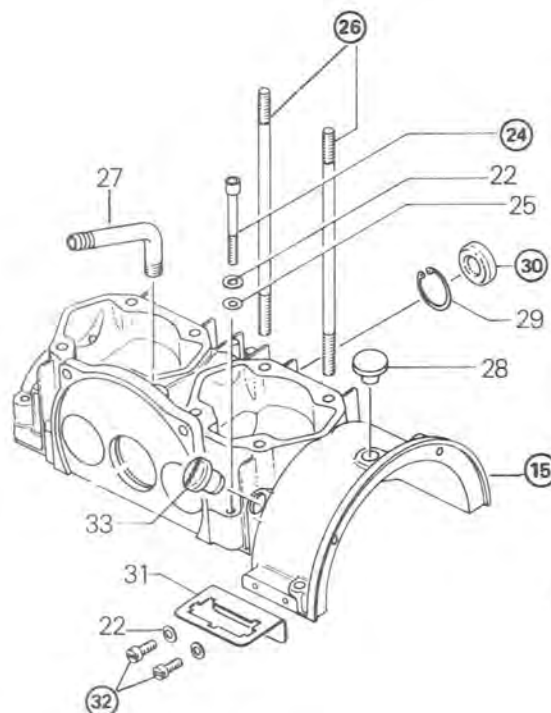
INSTALLATION ON VEHICLE

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

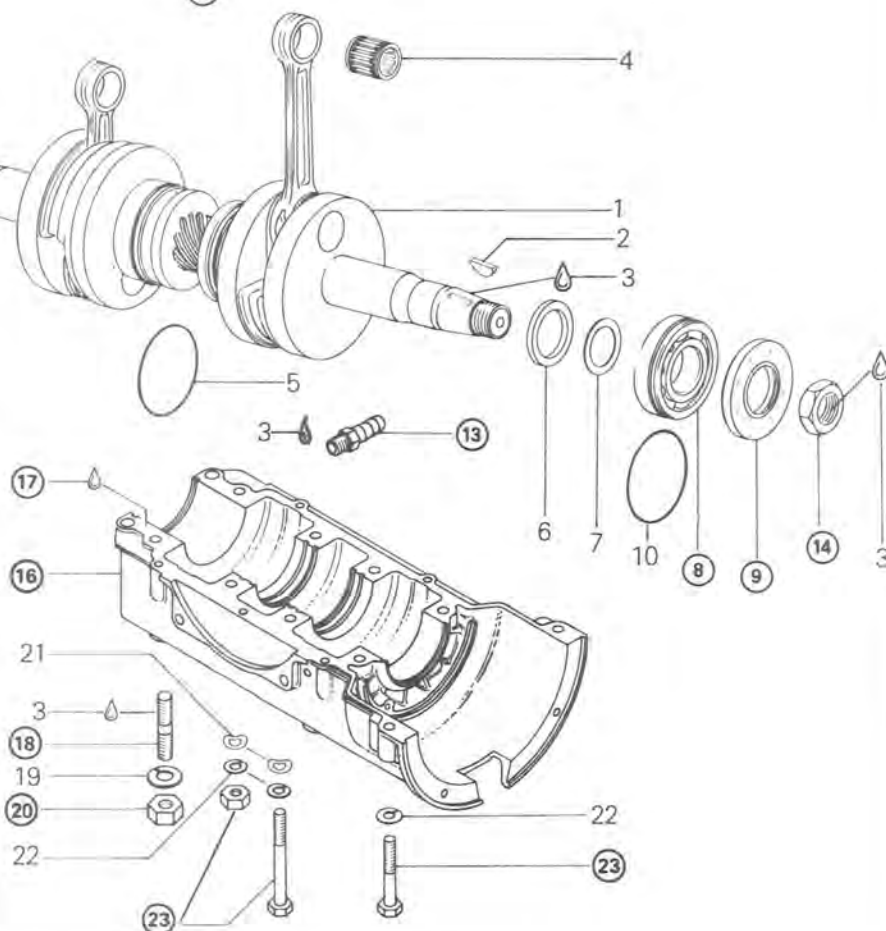
- Check tightness of engine mount nuts.
- After throttle cable installation, check carburetor maximum throttle opening.
- Check pulley alignment.

BOTTOM END

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



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



BOTTOM END

CLEANING

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

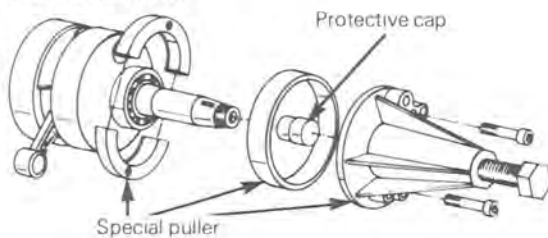
Clean all metal components in a non-ferrous metal cleaner.

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

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

DISASSEMBLY & ASSEMBLY

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



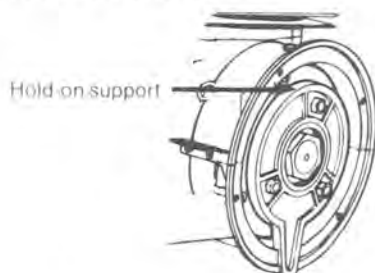
Prior to installation, place bearings into an oil container and heat the oil to 100° C (210° F) for 10 min. This will expand bearing and ease installation.

Install bearings with groove outward.

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

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

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



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

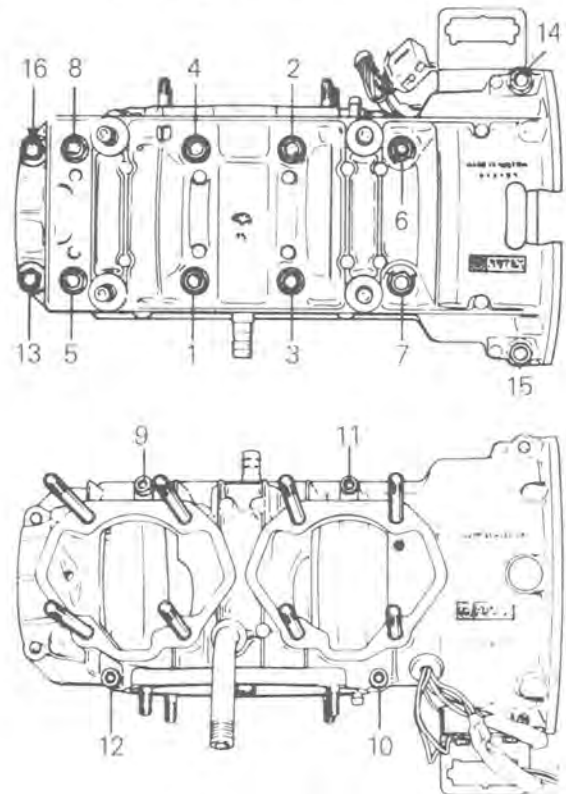
Prior to joining of crankcase halves, prepare mating surfaces with crankcase sealant primer then apply a light coat of crankcase sealant (See Tool Section) as per instructions printed on container.

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

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

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

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



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

⑲ Torque to 3.6 kg-m (26 ft-lbs).

⑳ Torque to 2.2 kg-m (16 ft-lbs).

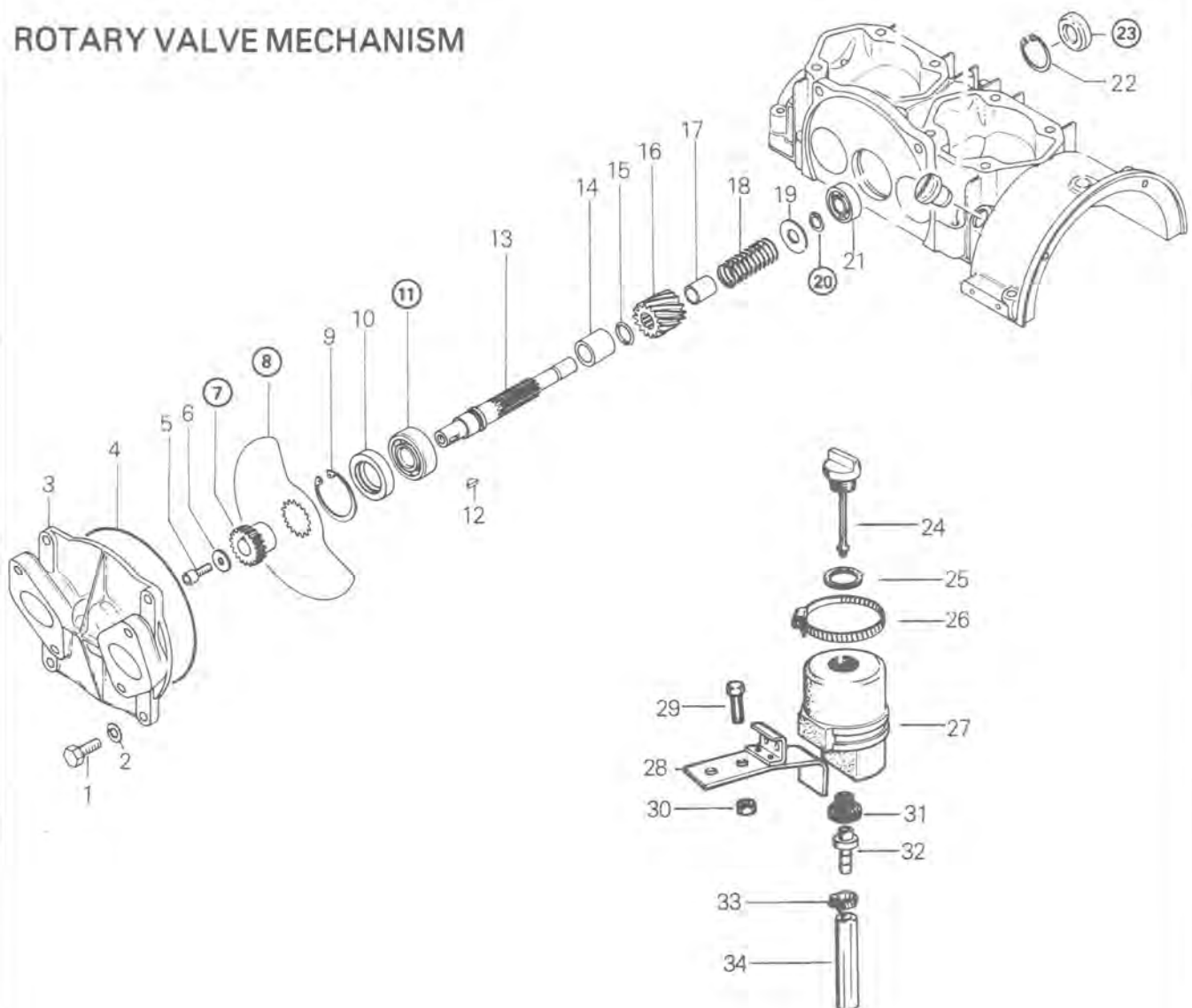
㉑ Torque to 1 kg-m (7 ft-lbs).

㉒ Apply Loctite Lock'n Seal on the threads of the two studs, screwed into the crankcase, above the intake ports.

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

㉔ Apply Loctite Lock'n Seal 242 on threads.

ROTARY VALVE MECHANISM



1. Bolt (or nut with stud)
2. Lockwasher
3. Rotary valve cover
4. "O" ring
5. Allen cap screw
6. Washer
7. Rotary valve gear
8. Rotary valve disc
9. Locking ring
10. Oil seal
11. Bearing
12. Woodruff key

13. Rotary valve shaft
14. Distance sleeve
15. "O" ring
16. Pinion
17. Spring sleeve
18. Spring
19. Shim 1 mm
20. Locking ring
21. Bearing
22. Locking ring
23. End cap

24. Oil tank cap
25. Gasket
26. Clamp
27. Oil tank
28. Support
29. Bolt
30. Nut
31. Grommet
32. Male connector
33. Clamp (hose)
34. Oil line

ROTARY VALVE MECHANISM

CLEANING

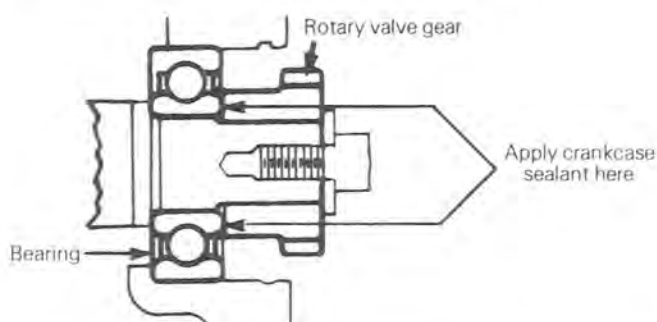
Discard all oil seals and "O" rings.

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

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

DISASSEMBLY & ASSEMBLY

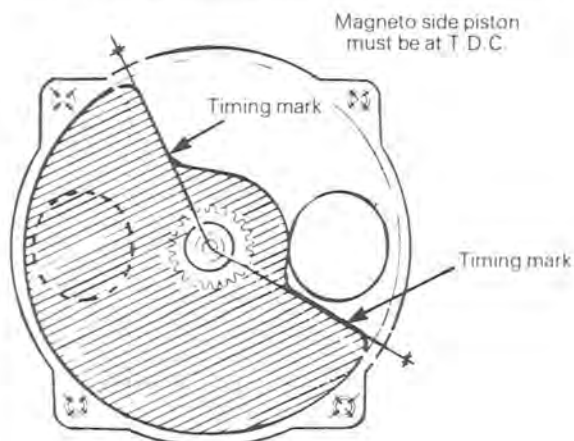
⑦ ⑪ At assembly, apply crankcase sealant on rotary valve gear and bearing mating surfaces.



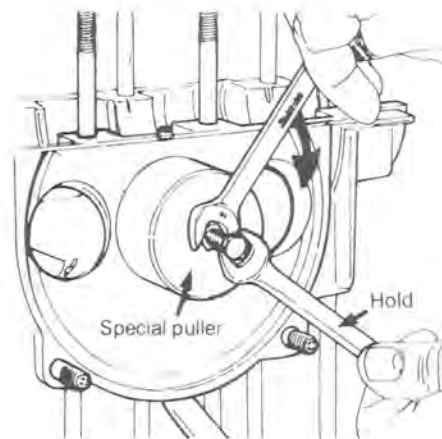
⑧ To correctly install the rotary valve disc proceed as follows:

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

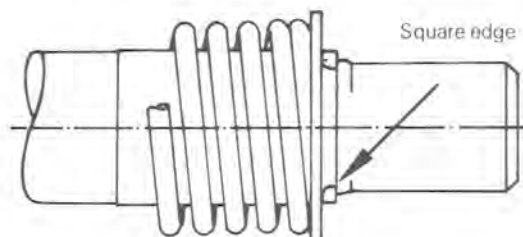
○ **NOTE:** The rotary valve disc is asymetrical, there fore, at assembly try positioning each side of disc on gear to determine best installation position.



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

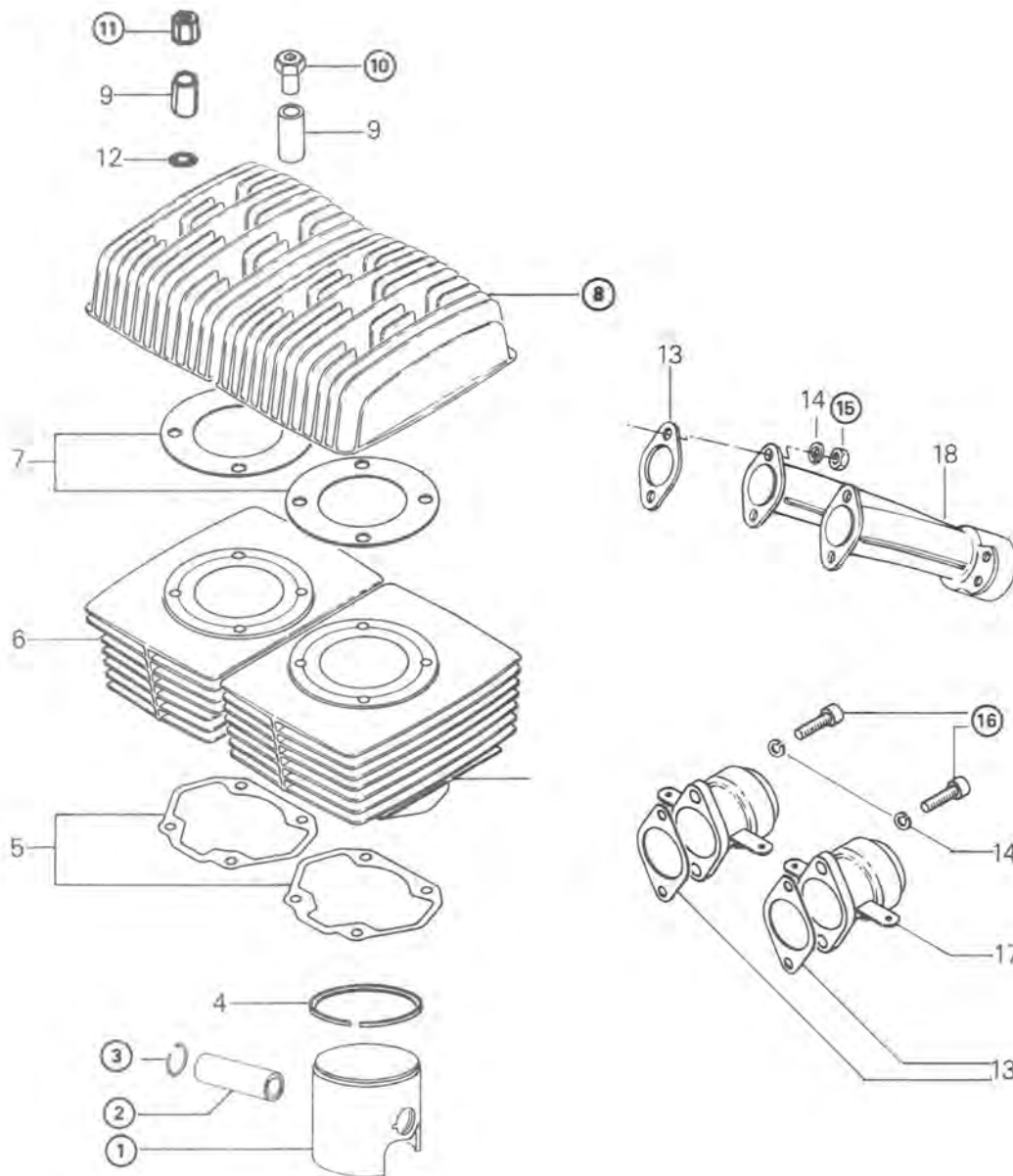


⑳ At assembly, position square edge of locking ring against shaft shoulder as illustrated.



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

TOP END



1. Piston
2. Gudgeon pin
3. Circlip
4. Ring
5. Gasket (cylinder / crankcase)
6. Cylinder
7. Gasket (Cylinder head)
8. Cylinder head
9. Expansion sleeve

10. Nut (1977)
11. Nut (1976)
12. Washer
13. Exhaust gasket
14. Lockwasher
15. Nut
16. Cap screw
17. Exhaust socket
18. Exhaust manifold

TOP END

Discard all gaskets.

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

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

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

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

DISASSEMBLY & ASSEMBLY

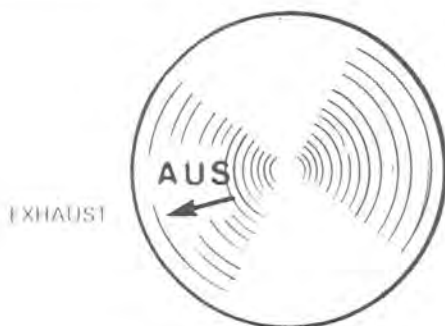
○ **NOTE:** Refer to Technical Data Section for component fitted tolerance and wear limit.

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

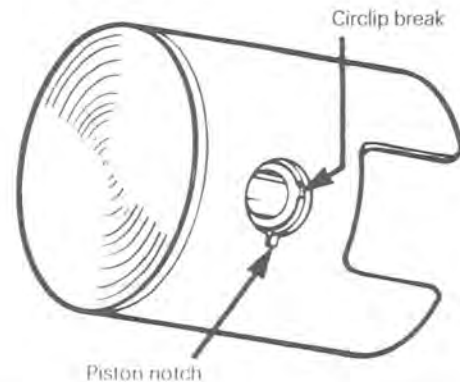
Drive the gudgeon pins in or out using a suitable drive punch and hammer.

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

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

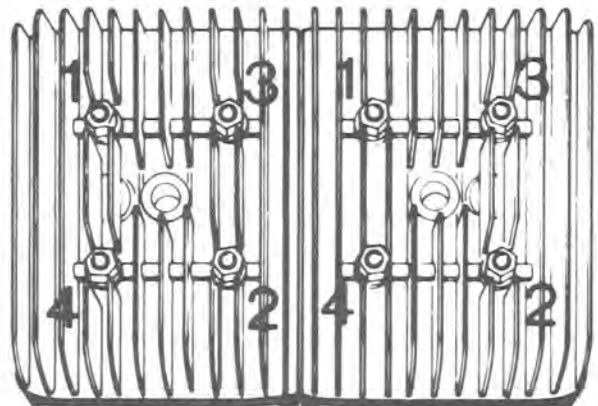


Once the circlips are installed, turn each circlip so that the circlip break is not directly in line with piston notch. Using very fine emery cloth, remove any burrs on piston caused through circlip installation.



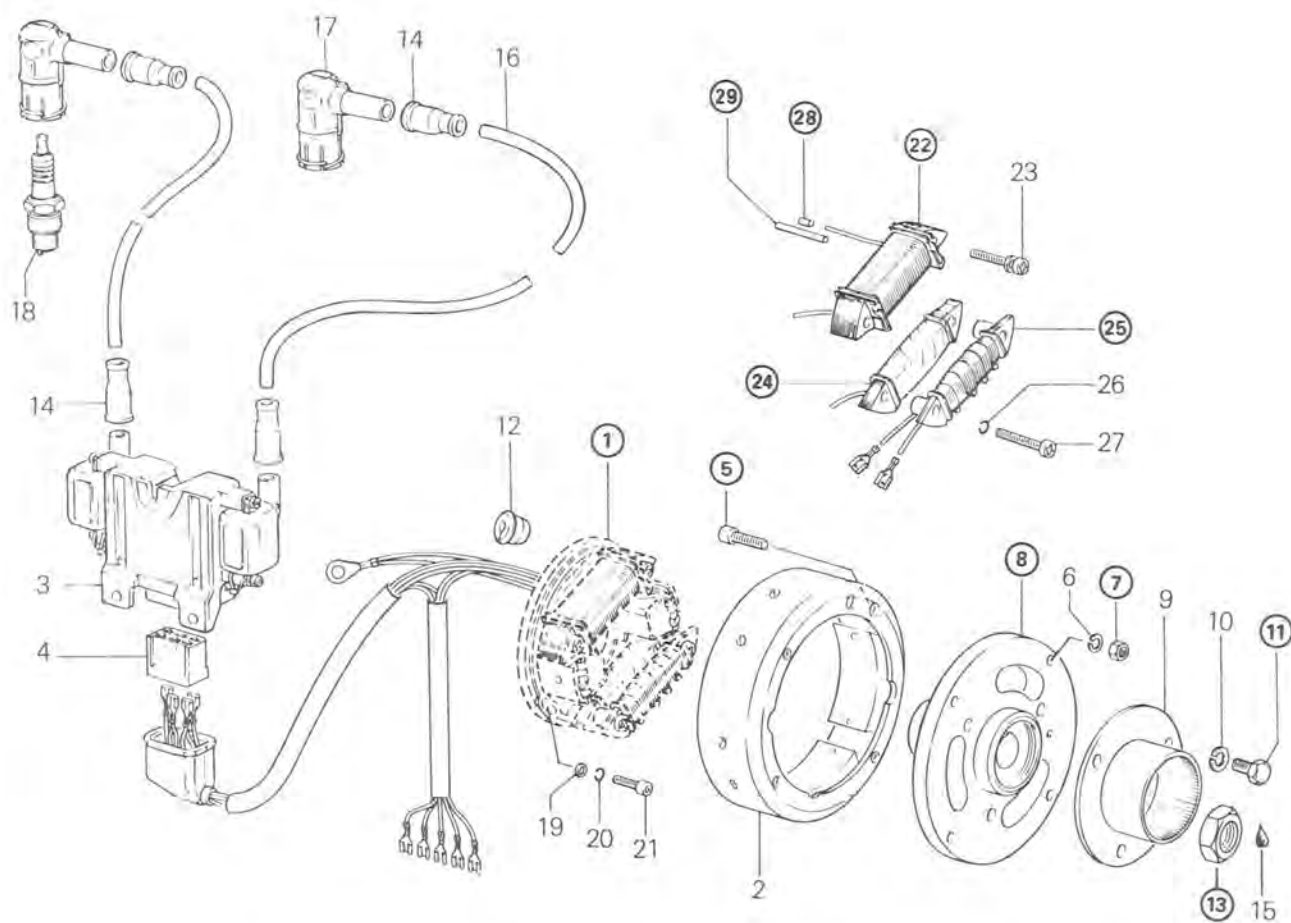
○ **NOTE:** To prevent leakage, install exhaust manifold prior to cylinder head tightening.

⑧⑩⑪ Torque cylinder head nuts to 1.6 kg-m (12 ft-lbs) following illustrated sequence.



⑮⑯ Torque to 2.2 kg-m (16 ft-lbs).

MAGNETO



1. Armature plate
2. Magneto ring
3. Electronic box
4. Junction block
5. Screw
6. Lockwasher
7. Nut
8. Magneto housing
9. Starting pulley
10. Lockwasher
11. Screw (for nut with std)
12. Wire grommet
13. Magneto nut
14. Protection cap
15. Loctite Lock'n Seal 242

16. H. T. wire
17. Spark plug protector
18. Spark plug
19. Flat washer
20. Lockwasher
21. Screw
22. Lighting coil 110 W
23. Screw
24. Charging coil
25. Lighting coil 30W
26. Lockwasher
27. Screw
28. Wire function terminal
29. Protection hose

MAGNETO

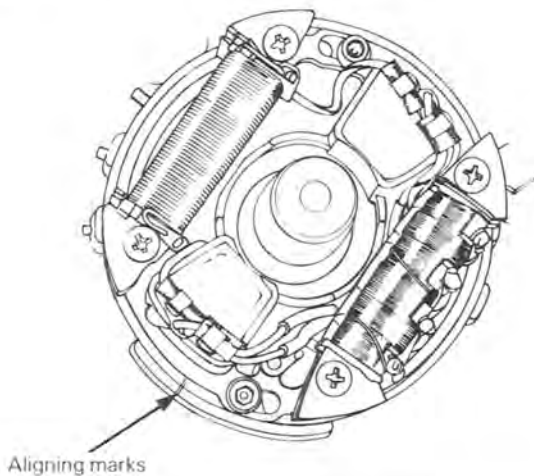
CLEANING

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

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

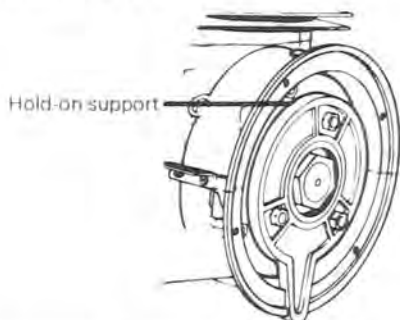
DISASSEMBLY & ASSEMBLY

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

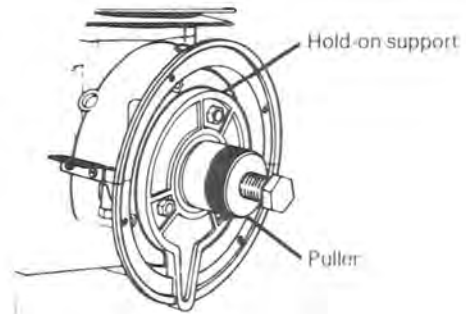


⑤ ⑦ Apply Loctite Lock'n Seal 242 on threads then torque to 1.2 kg-m (9 ft-lbs).

⑧ ⑬ To remove or install magneto retaining nut, lock crankshaft in position with special hold-on support, as illustrated (See Tool Section).



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



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

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

⑪ Torque to 2.2 kg-m (16 ft-lbs).

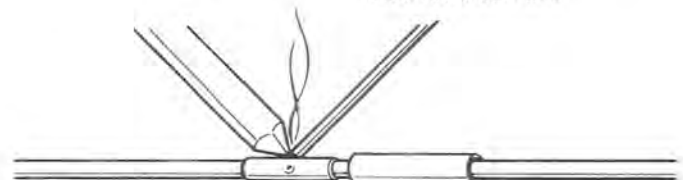
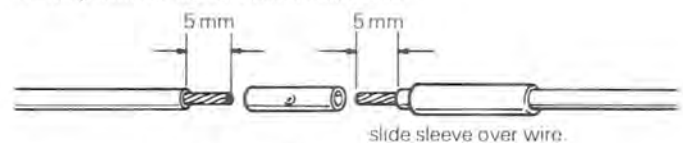
⑫ ⑭ ⑮ Whenever a coil is replaced, the air gap (distance between coil end and magnet) must be adjusted.

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



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

1. Strip 5 mm of insulation from each end



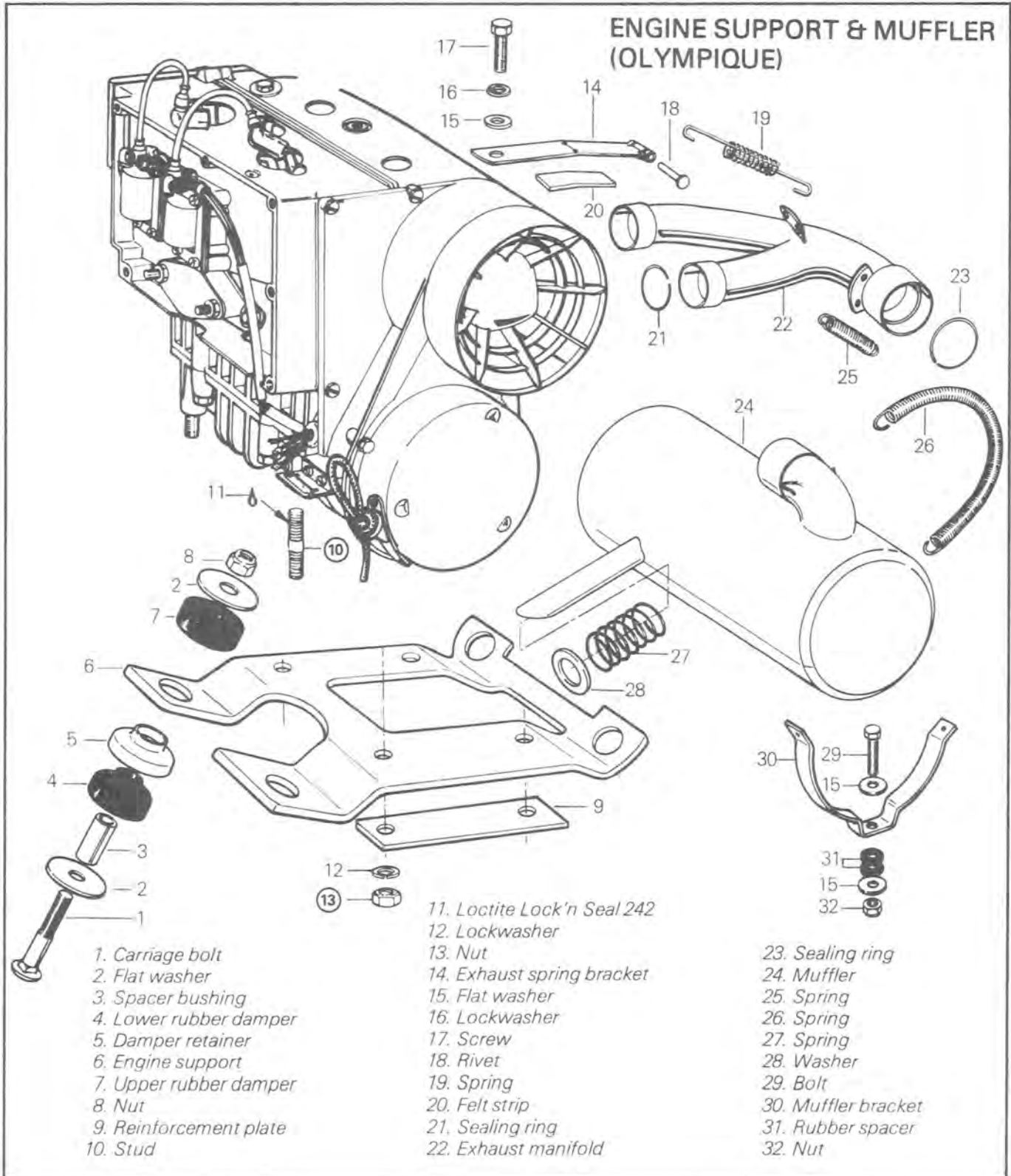
2. Solder wires into connector with resin core type solder.



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

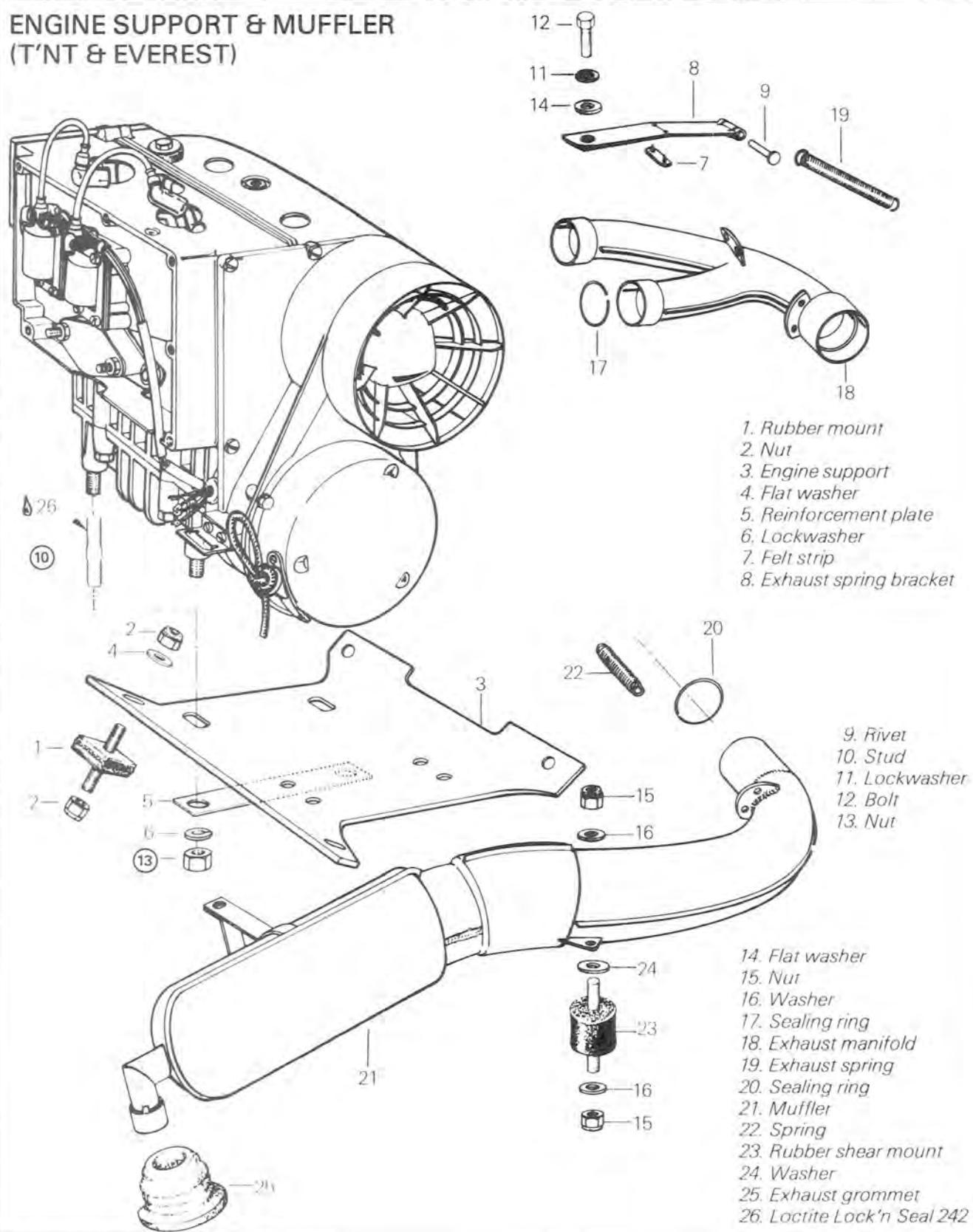


305, 343 ENGINE TYPES (FROM 1976)



SECTION 04
SUB-SECTION 02 (TWO CYLINDER ENGINE)

ENGINE SUPPORT & MUFFLER
(T'NT & EVEREST)




ENGINE SUPPORT & MUFFLER

REMOVAL FROM VEHICLE

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

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

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

- Rewind starter
- Engine mount nuts

DISASSEMBLY & ASSEMBLY

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

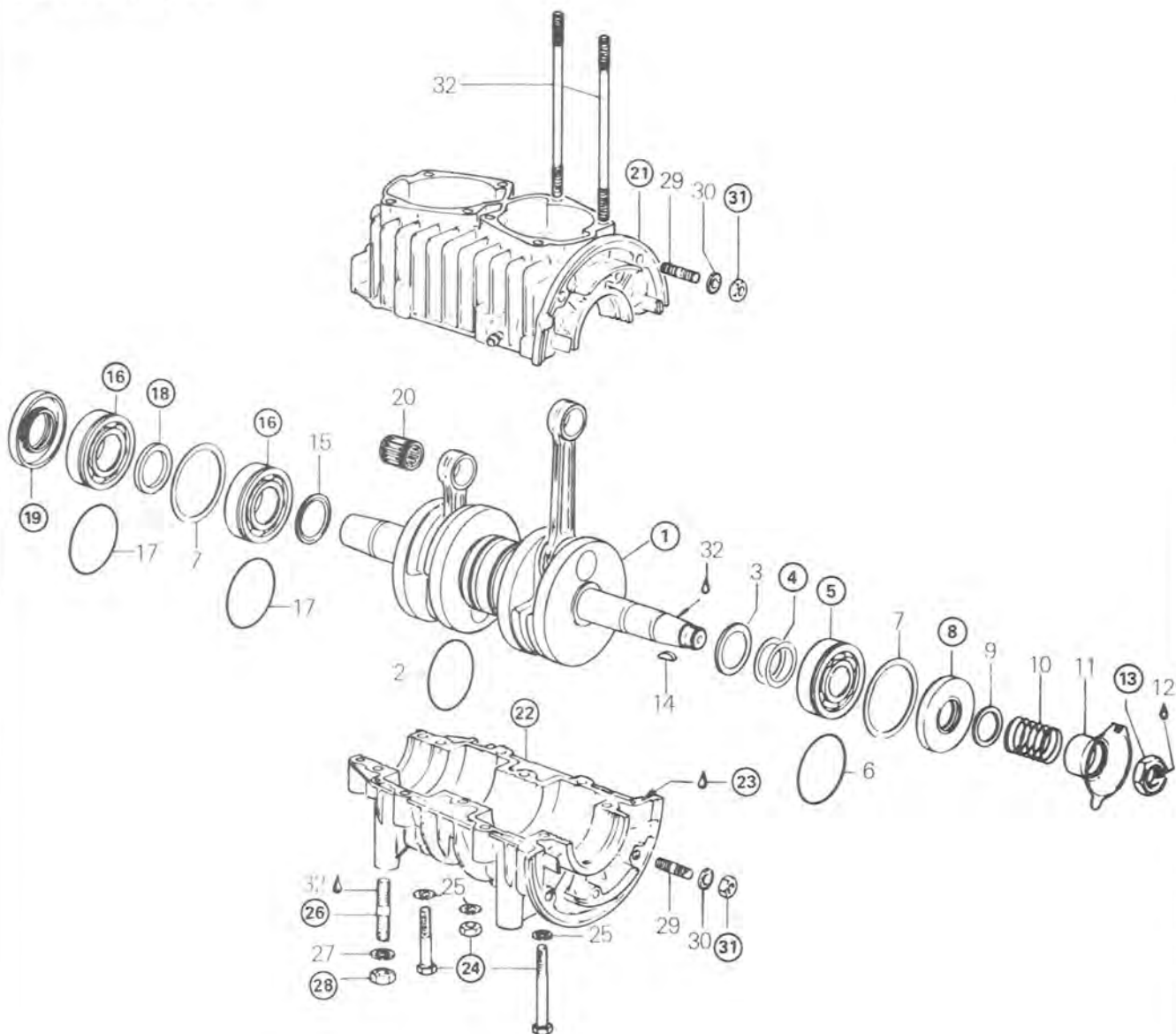
⑬ Torque to 3.6 kg-m (26 ft-lbs).

INSTALLATION ON VEHICLE

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

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

BOTTOM END



1. Crankshaft
2. Sealing ring
3. Distance ring 1 mm (1977)
4. Shim
5. Bearing (MAG)
6. "O" ring
7. Retainer washer
8. Oil seal (MAG)
9. Washer
10. Spring
11. Breaker point cam

12. Loctite Lock'n Seal 242
13. Magneto nut
14. Woodruff key
15. Distance ring 2 mm
16. Bearing (P.T.O.)
17. "O" ring
18. Distance ring 3 mm
19. Oil seal (P.T.O.)
20. Needle cage bearing
21. Crankcase upper half
22. Crankcase lower half

23. Crankcase sealant
24. Bolt or nut with stud
25. Lockwasher
26. Stud
27. Lockwasher
28. Nut
29. Stud
30. Washer
31. Nut
32. Loctite Lock'n Seal 242

BOTTOM END

CLEANING

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

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

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

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

DISASSEMBLY & ASSEMBLY

General

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

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

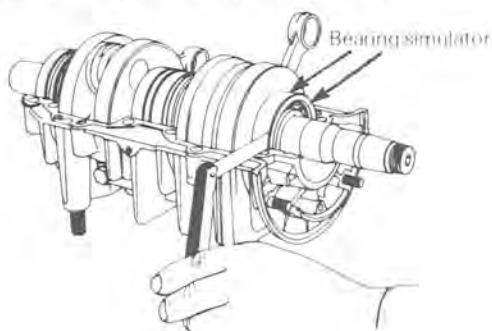
○ **NOTE:** Crankshaft end-play requires adjustment only when crankshaft and / or crankcase is replaced.

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

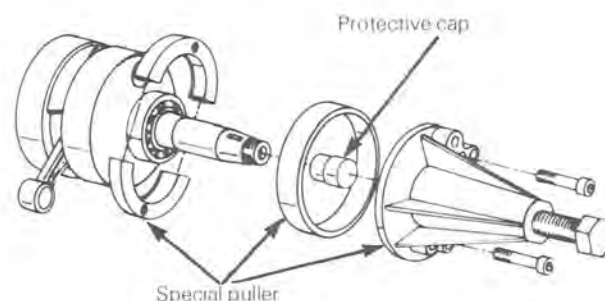
Position crankshaft assembly into crankcase lower half. Make sure that retaining washers are correctly seated in the grooves.

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

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



⑤⑩ To remove bearing from crankshaft use a protective cap and special puller, as illustrated. (See Tool Section).



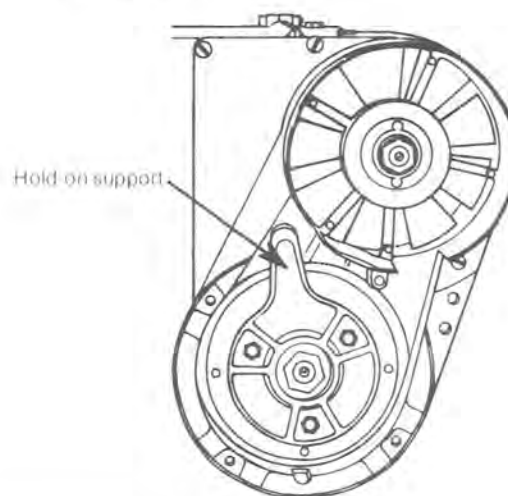
Prior to installation, place bearings into an oil container and heat the oil to 100° C (210° F) for 10 min. This will expand bearings and ease installation.

Install bearings with groove outward.

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

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

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



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

⑮ A 4 mm (0.160") distance ring is used on P.T.O. side with crankcase upper half having the oil passage between the two bearings. When the oil passage is between oil seal and outer bearing, a 3 mm (0.120") must be used.

SECTION 04

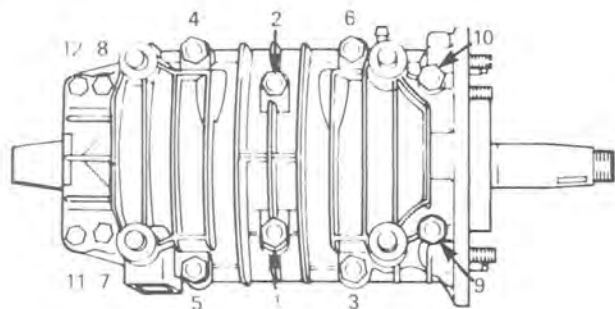
SUB-SECTION 02 (TWO CYLINDER ENGINE)

⑳㉔㉕ Crankcase halves are factory matched and therefore, are not interchangeable or available as single halves.

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

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

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

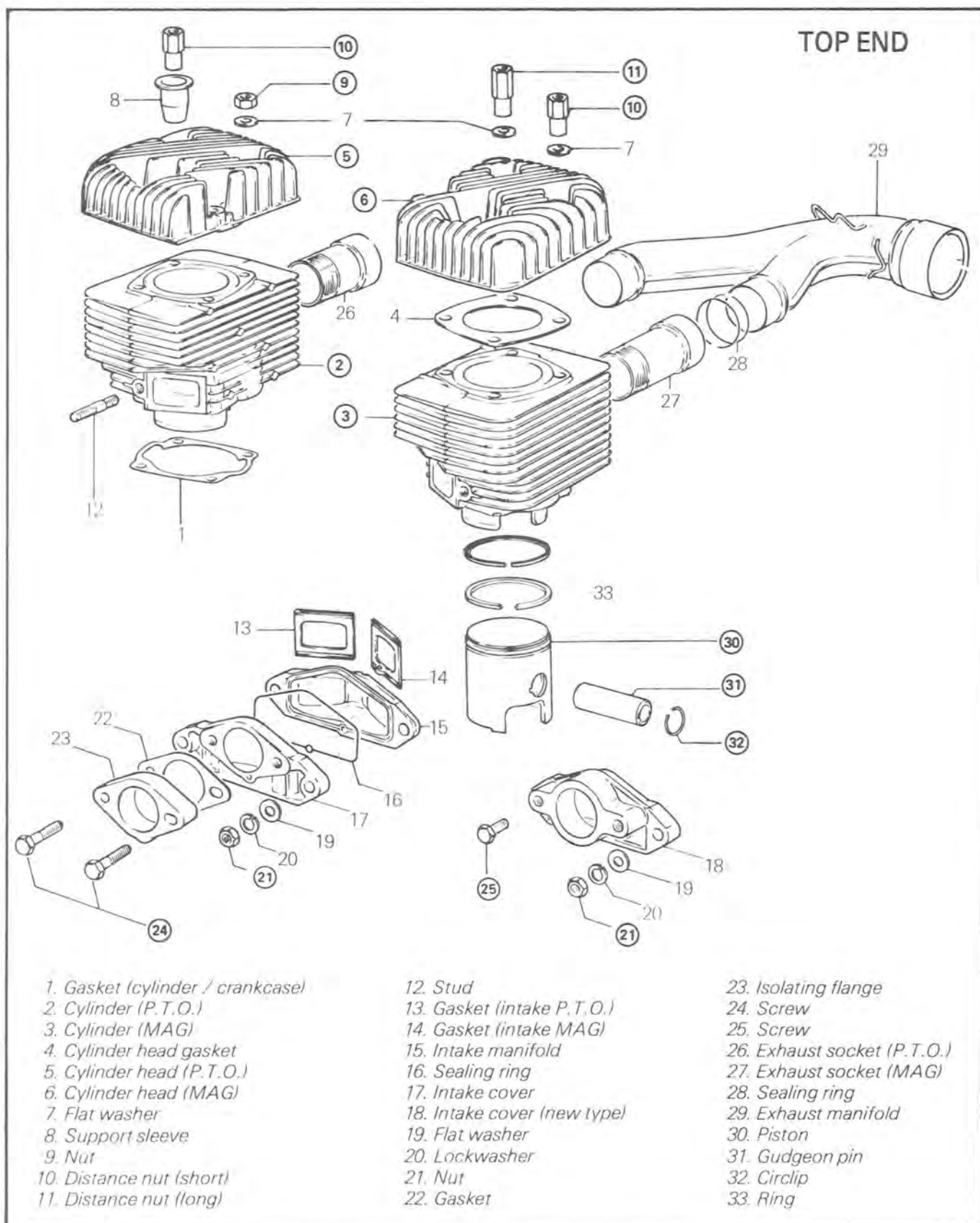


㉔ Torque to 2.1 kg-m (15 ft-lbs).

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

㉔ Torque to 3.6 kg-m (26 ft-lbs).

㉕ Torque to 2.1 kg-m (15 ft-lbs).



TOP END

CLEANING

Discard all gaskets.

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

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

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

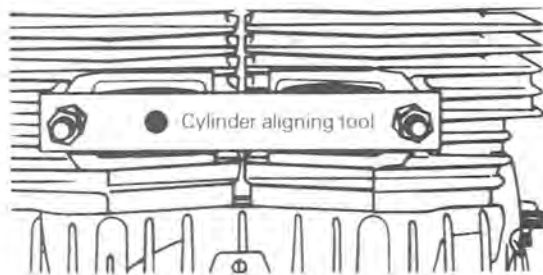
Clean the piston mag grooves with a groove cleaner tool, or with a piece of broken ring.

DISASSEMBLY & ASSEMBLY

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

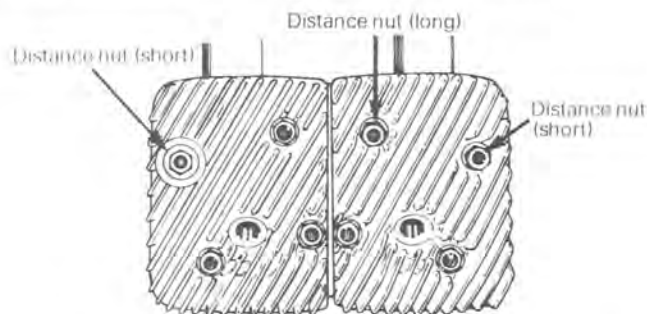
②③⑤⑥ When installing cylinder and / or cylinder head, the cylinder aligning tool must be used to ensure sealing of intake manifold and cylinders. (See Tool Section).

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



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

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

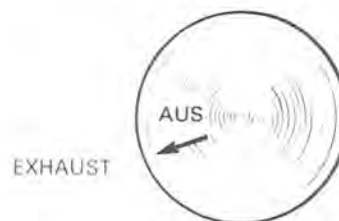


②①②④②⑤ Apply Loctite Lock'n Seal 242 on threads then torque to 2.1 kg-m (15 ft-lbs).

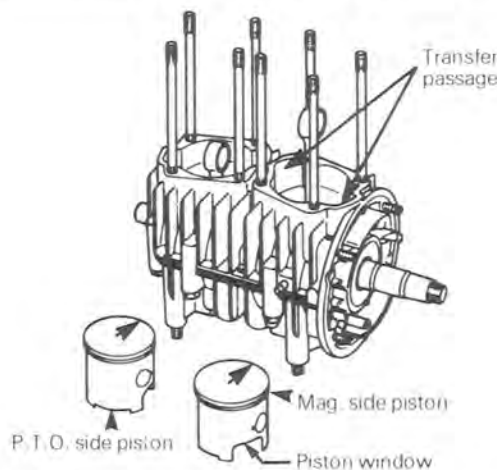
③⑩③①③② Place a clean cloth over crankcase to prevent circlip from falling into crankcase. Use a pointed tool to remove circlips from piston.

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

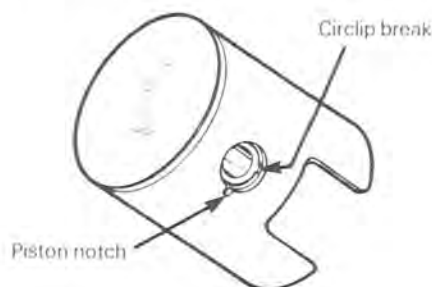
At assembly, place the pistons over the connecting rods with the letters "AUS" (over an arrow on the piston dome) facing in direction of the exhaust port.



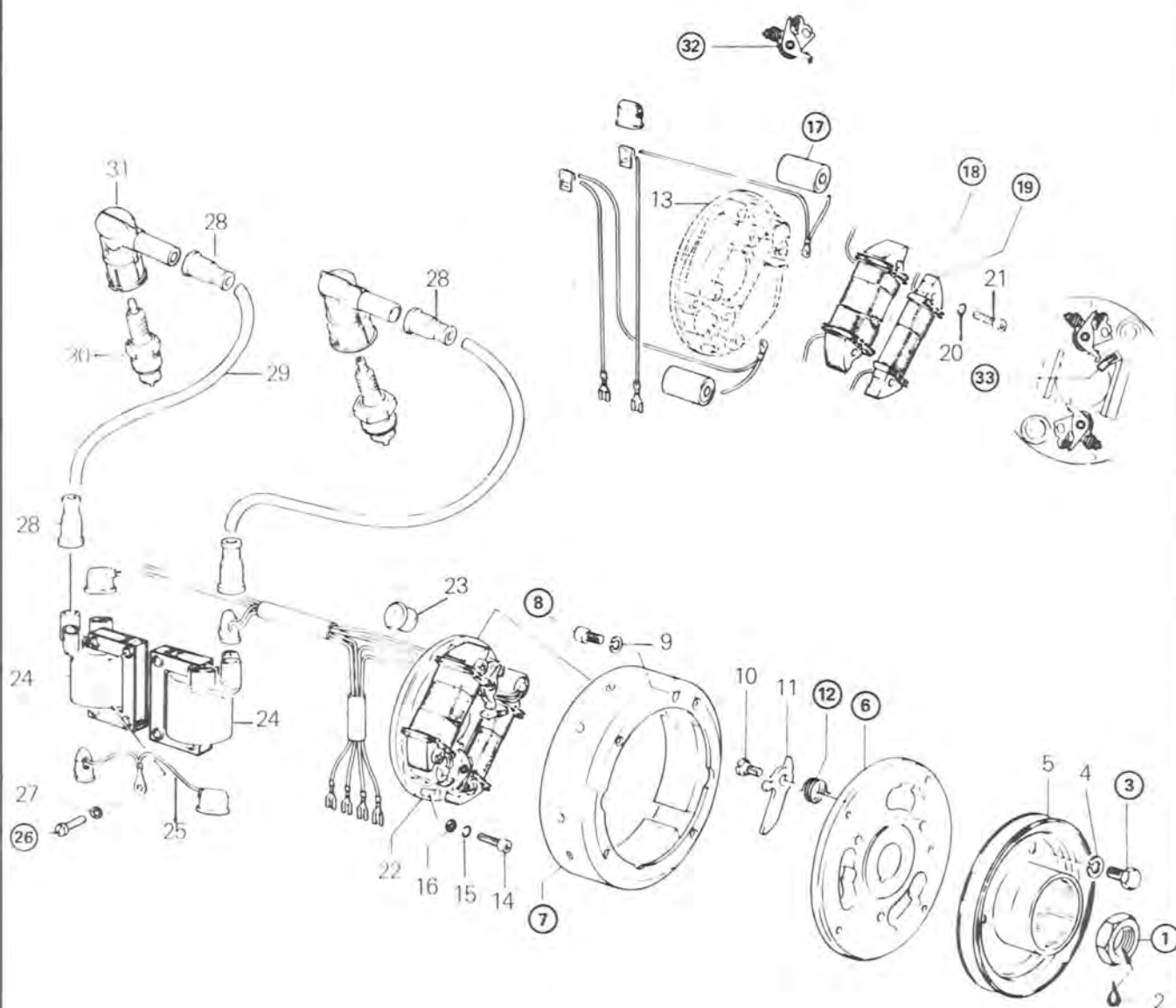
Also make sure that the piston window is aligned with the crankcase transfer passage when the gudgeon pin orifice is in-line with the connecting rod bore.



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



MAGNETO



1. Magneto nut
2. Loctite Lock'n Seal 242
3. Screw
4. Lockwasher
5. Starting pulley
6. Magneto housing
7. Magneto ring
8. Screw
9. Lockwasher
10. Screw
11. Centrifugal lever

12. Spring
13. Armature plate
14. Screw
15. Lockwasher
16. Flat washer
17. Capacitor
18. Lighting coil
19. Ignition generator coil
20. Washer
21. Screw
22. Armature plate ass'y

23. Wire grommet
24. H.T. coil
25. Ground wire
26. Screw
27. Lockwasher
28. Protector
29. H.T. cable
30. Spark plug
31. Spark plug protector
32. Breaker point set
33. Lubricating wick

MAGNETO

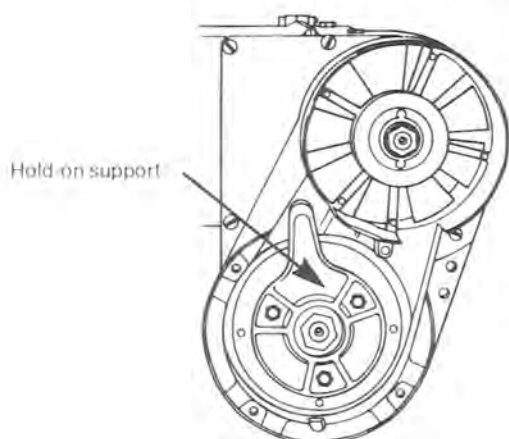
CLEANING

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

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

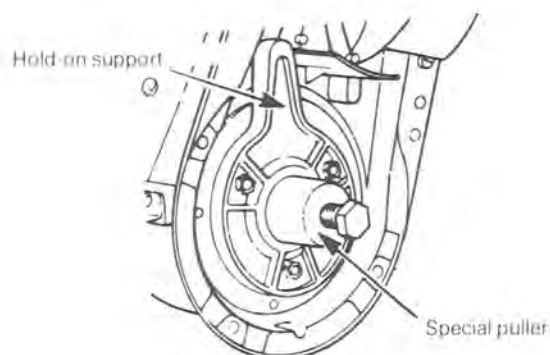
DISASSEMBLY & ASSEMBLY

①⑤⑦ To remove or install magneto retaining nut, lock crankshaft in position with special hold-on support as illustrated. (See tool Section).

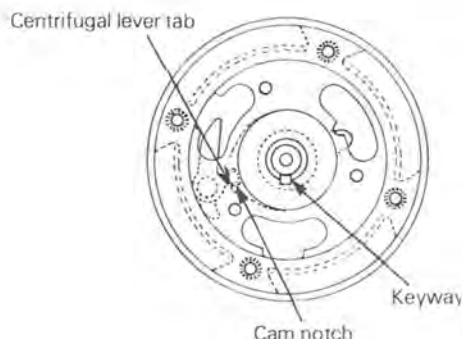


With magneto retaining nut removed and hold-on support in place, install special puller onto support.

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



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



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

③ Torque to 2.2 kg-m (16 ft-lbs).

⑧ Apply Loctite Lock'n Seal 242 on threads.

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

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

⑱ 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 Apply Loctite Lock'n Seal 242 on threads.

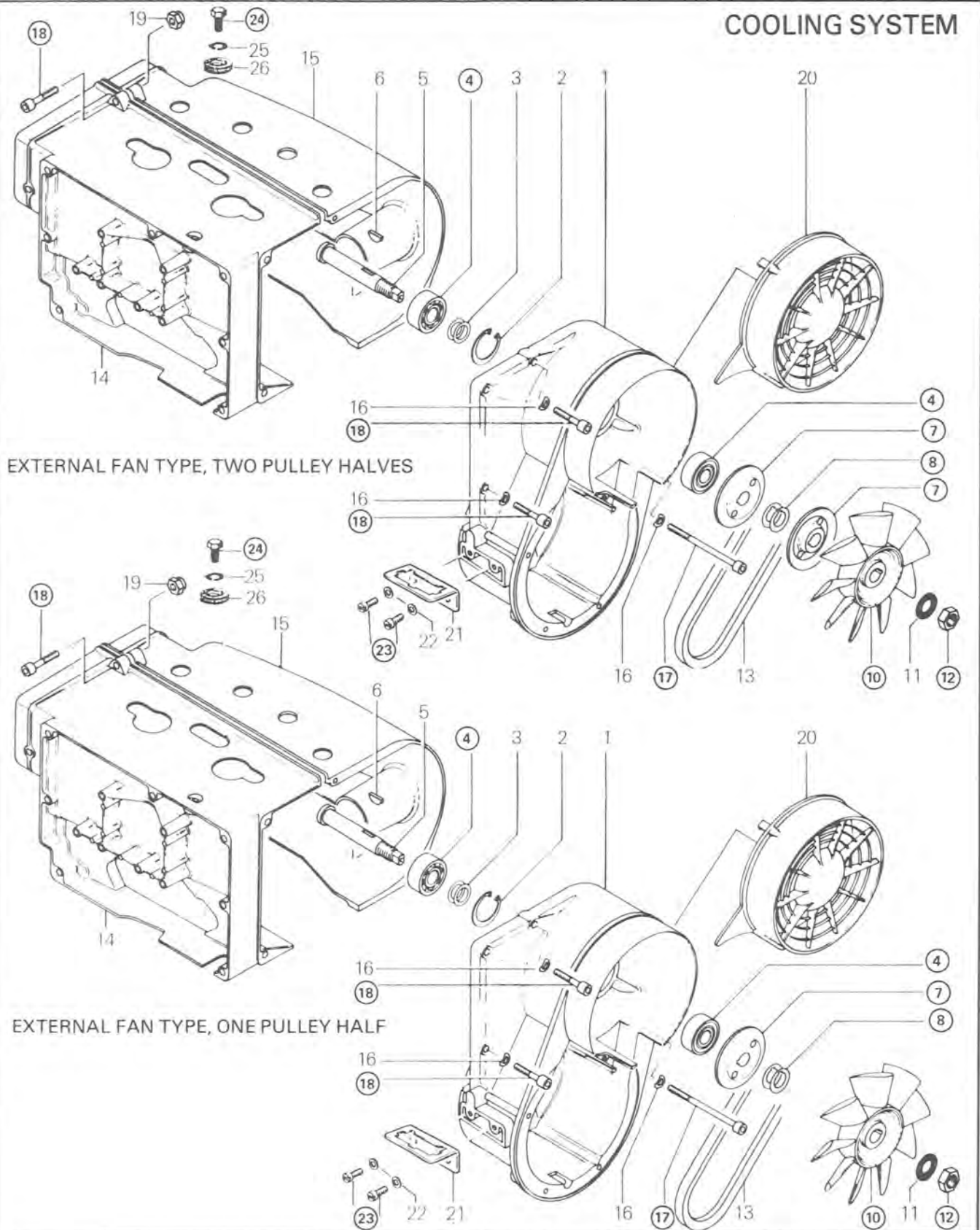


㉓ Do not remove pivot pin unless replacement is needed, if removed, reinstall with Loctite Lock'n Seal 242 on threads.

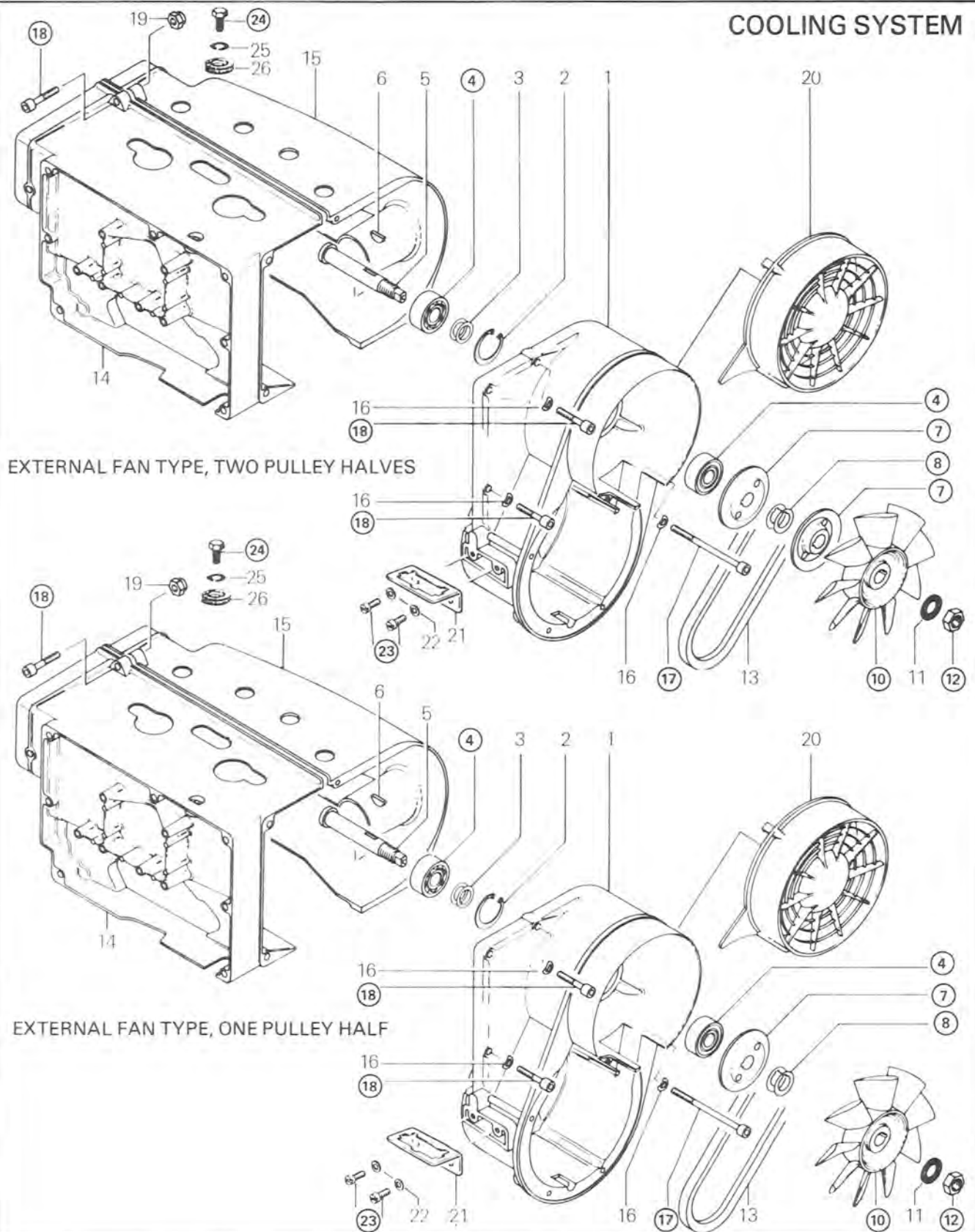
Old type breaker point set can be replaced by new type if pivot pin is removed. When installing new breaker point type it is advisable to fill the pivot pin cavity of the armature plate with Loctite 277 (thick red solution).

㉕ When replacing breaker point set, apply a light coat of grease on lubricating wick.

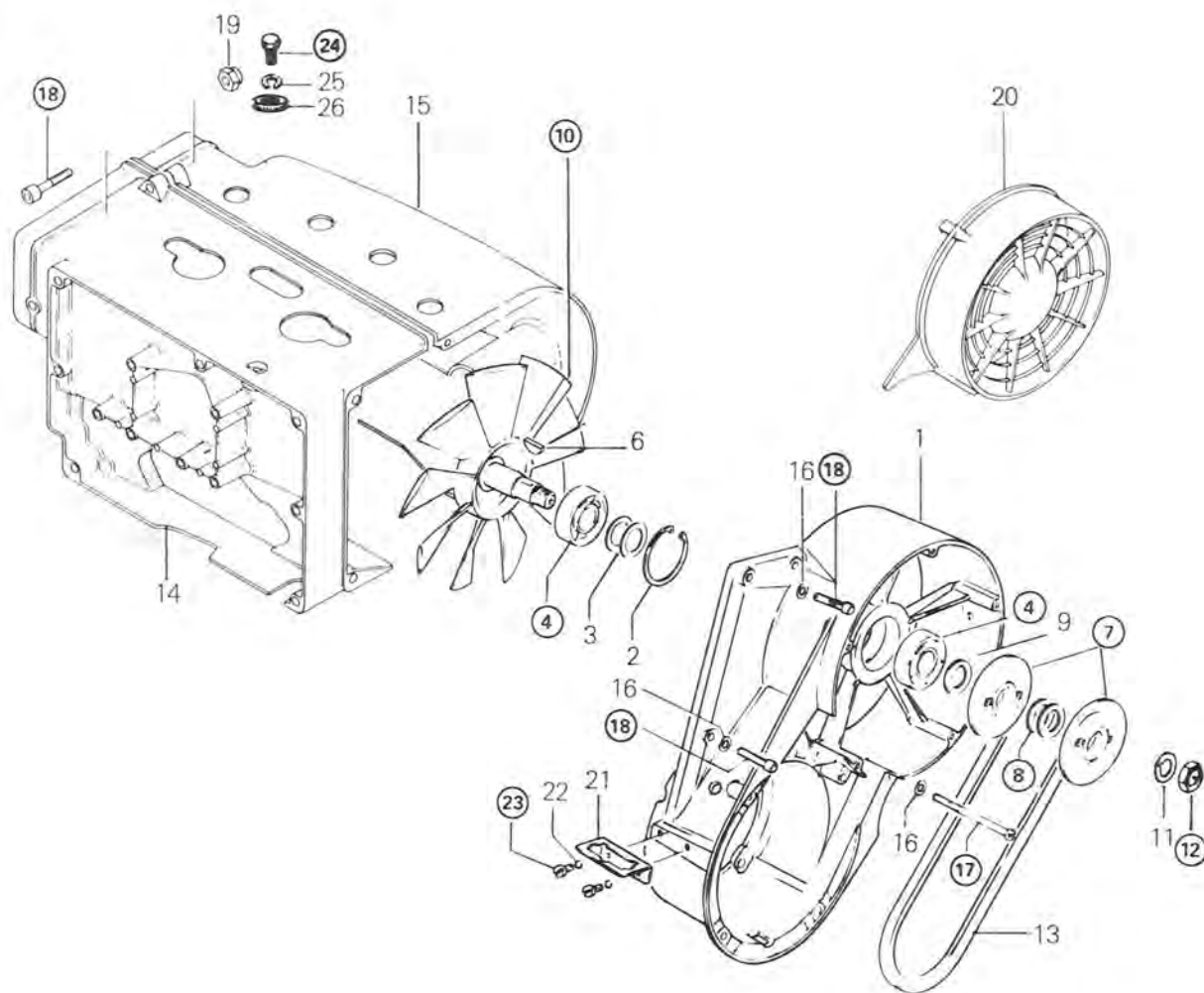
COOLING SYSTEM



COOLING SYSTEM



INTERNAL FAN TYPE



1. Fan housing
2. Circlip
3. Shim(s)
4. Bearing
5. Fan shaft
6. Woodruff key
7. Pulley half
8. Shim
9. Shim
10. Fan
11. Washer
12. Nut
13. Belt

14. Fan cowl (intake)
15. Fan cowl (exhaust)
16. Spring washer
17. Screw
18. Screw
19. Nut
20. Fan cover
21. Junction block bracket
22. Lockwasher
23. Screw
24. Screw
25. Lockwasher
26. Rubber washer

COOLING SYSTEM

CLEANING

Clean all components in a non-ferrous metal cleaner.

DISASSEMBLY & ASSEMBLY

- ④ Heat bearing housing to 70° C (160° F) prior to bearing removal or installation.
- ⑦ Newer pulley half does not have a shoulder on its inner face so it is installed with a 6 mm (0.230") spacer.

Pulley half



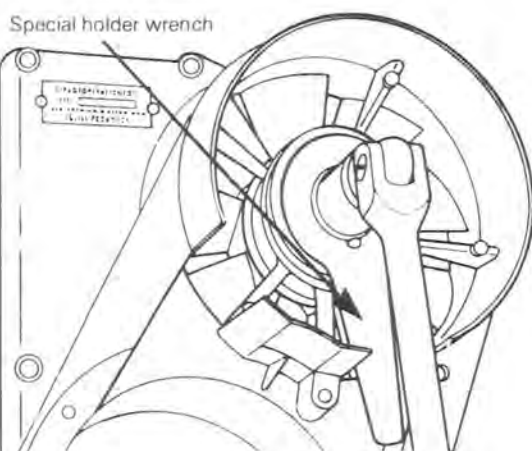
NEW TYPE

OLD TYPE

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

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

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



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

- ⑰ ⑱ ⑲ Apply Loctite Lock'n Seal 242 on threads.

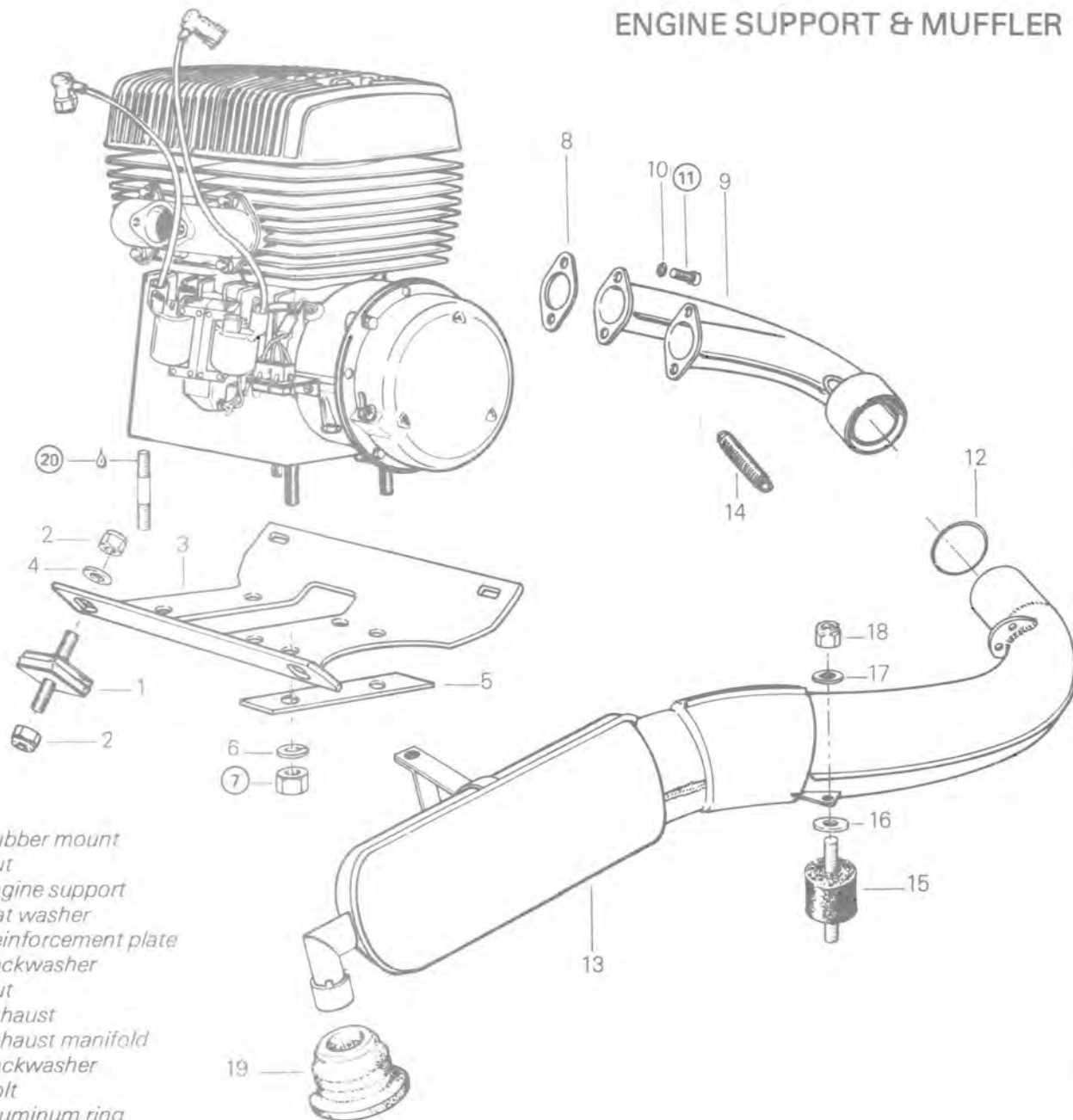
○ **NOTE:** It should be noted that to correctly remove a Loctite locked screw, it is first necessary to tap on head of screw to break Loctite bond. This will eliminate the possibility of screw breakage.

- ⑳ Apply Loctite Lock'n Seal 242 on threads then torque to 1 kg-m (7 ft-lbs).



346, 436 ENGINE TYPE (FROM 1977)

ENGINE SUPPORT & MUFFLER



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

SECTION 04
SUB-SECTION 02 (TWO CYLINDER ENGINE)

REMOVAL FROM VEHICLE

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

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

DISASSEMBLY & ASSEMBLY

⑦ Torque to 4.4 kg-m (32 ft-lbs).

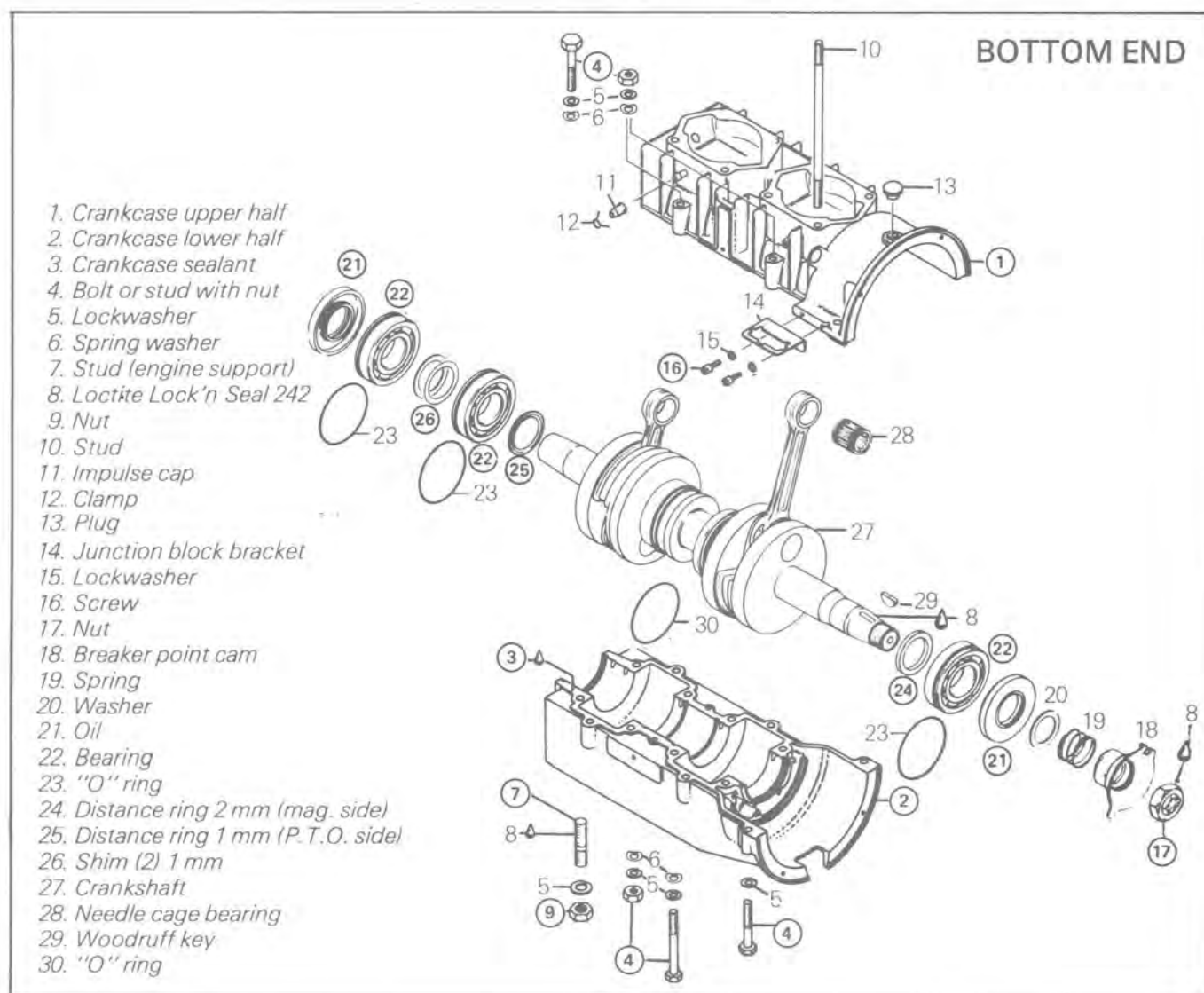
⑪ Torque to 2.1 kg-m (15 ft-lbs).

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

INSTALLATION ON VEHICLE

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

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



BOTTOM END

CLEANING

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

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

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

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

DISASSEMBLY & ASSEMBLY

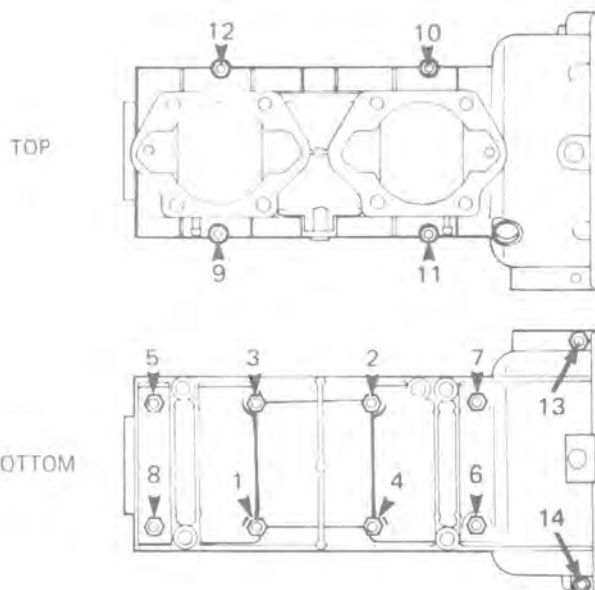
①②③ Crankcase halves are factory matched and therefore, are not interchangeable as single halves.

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

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

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

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



④ Torque to 2.1 kg-m (15 ft-lbs).

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

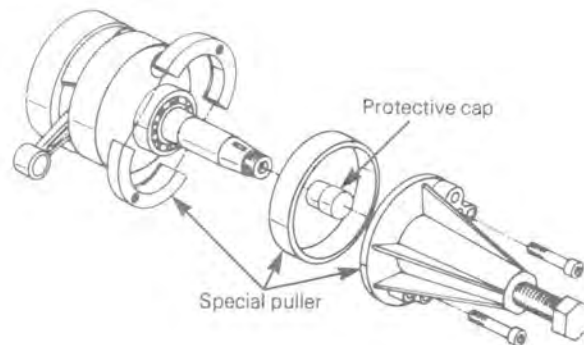
⑨ Torque to 4.4 kg-m (32 ft-lbs).

⑩ Apply Loctite Lock'n Seal 242 or equivalent on threads.

⑪ Apply Loctite Lock'n Seal on threads then torque to 8.3 kg-m (60 ft-lbs).

⑫ At assembly apply a light coat of lithium grease on seal lips then position oil seal with outer surface flush with crankcase.

⑭⑮⑯⑰ To remove bearing from crankshaft use a protective cap and special puller, as illustrated. (See Tool Section).



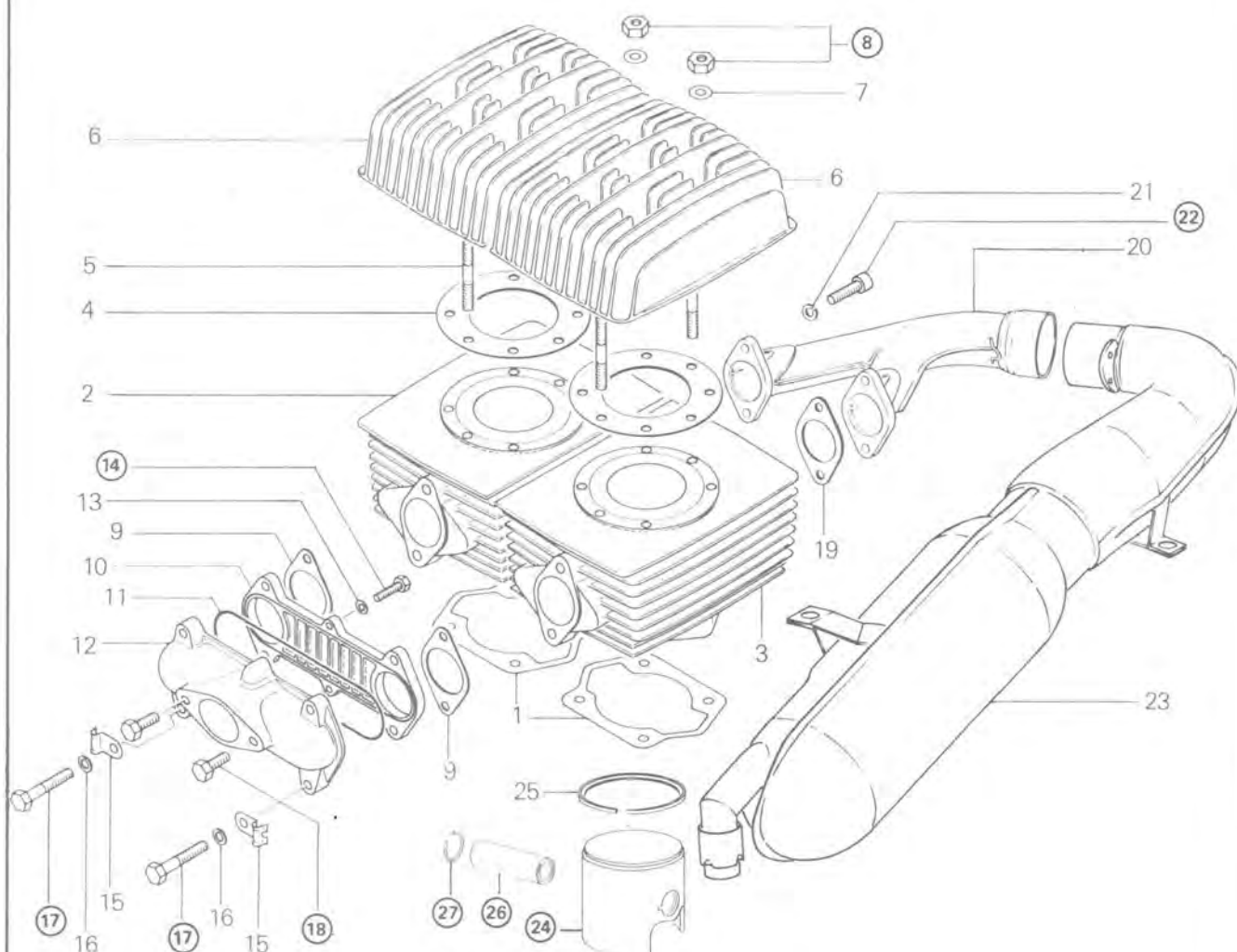
Prior to installation, place bearings into an oil container and heat the oil to 100° C (210° F) for 10 min. This will expand bearings and ease installation.

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

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

SECTION 04
SUB-SECTION 02 (TWO CYLINDER ENGINE)

TOP END



1. Gasket (crankcase / cylinder)
2. Cylinder (P.T.O.)
3. Cylinder (mag.)
4. Cylinder head gasket
5. Stud
6. Cylinder head
7. Flat washer
8. Nut
9. Gasket (intake / cylinder)
10. Intake cover
11. Gasket
12. Intake manifold
13. Lockwasher
14. Screw

15. Ignition cable bracket
16. Lockwasher
17. Bolt
18. Bolt
19. Exhaust gasket
20. Exhaust manifold
21. Lockwasher
22. Screw
23. Muffler
24. Piston
25. Ring
26. Gudgeon pin
27. Circlip

TOP END

CLEANING

Discard all gaskets.

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

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

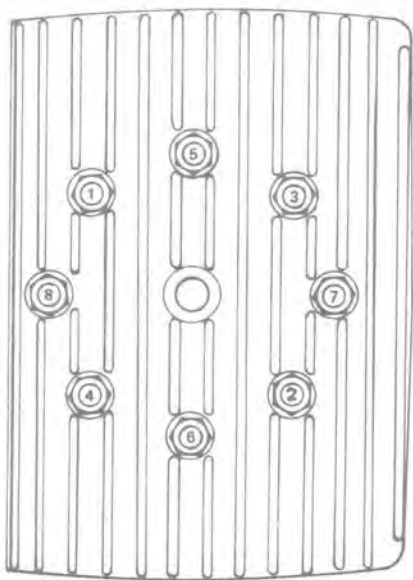
○ **NOTE:** The letter "AUS" (over an arrow on the piston dome) must be visible after cleaning.

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

DISASSEMBLY ; ASSEMBLY

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

⑧②② Torque to 2.1 kg-m (15 ft-lbs) following illustrated sequence for cylinder head nuts.



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

⑭ Torque to 1.4 kg-m (10 ft-lbs).

⑰ Torque to 2.1 kg-m (15 ft-lbs).

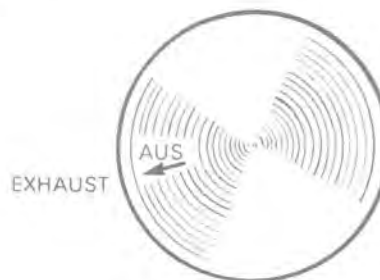
⑱ Torque to 0.5 kg-m (4 ft-lbs).

⑳㉔㉔㉔ Place a clean cloth over crankcase to prevent circlips from falling into crankcase then use a pointed tool to remove circlips from piston.

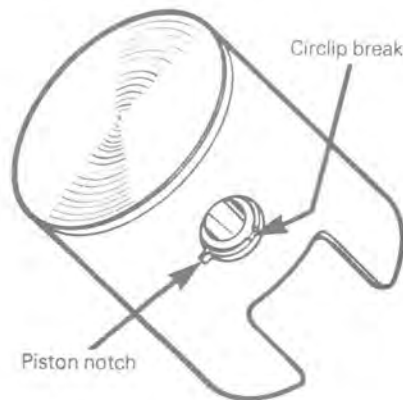
Drive the gudgeon pins in or out using a suitable drive punch and hammer.

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

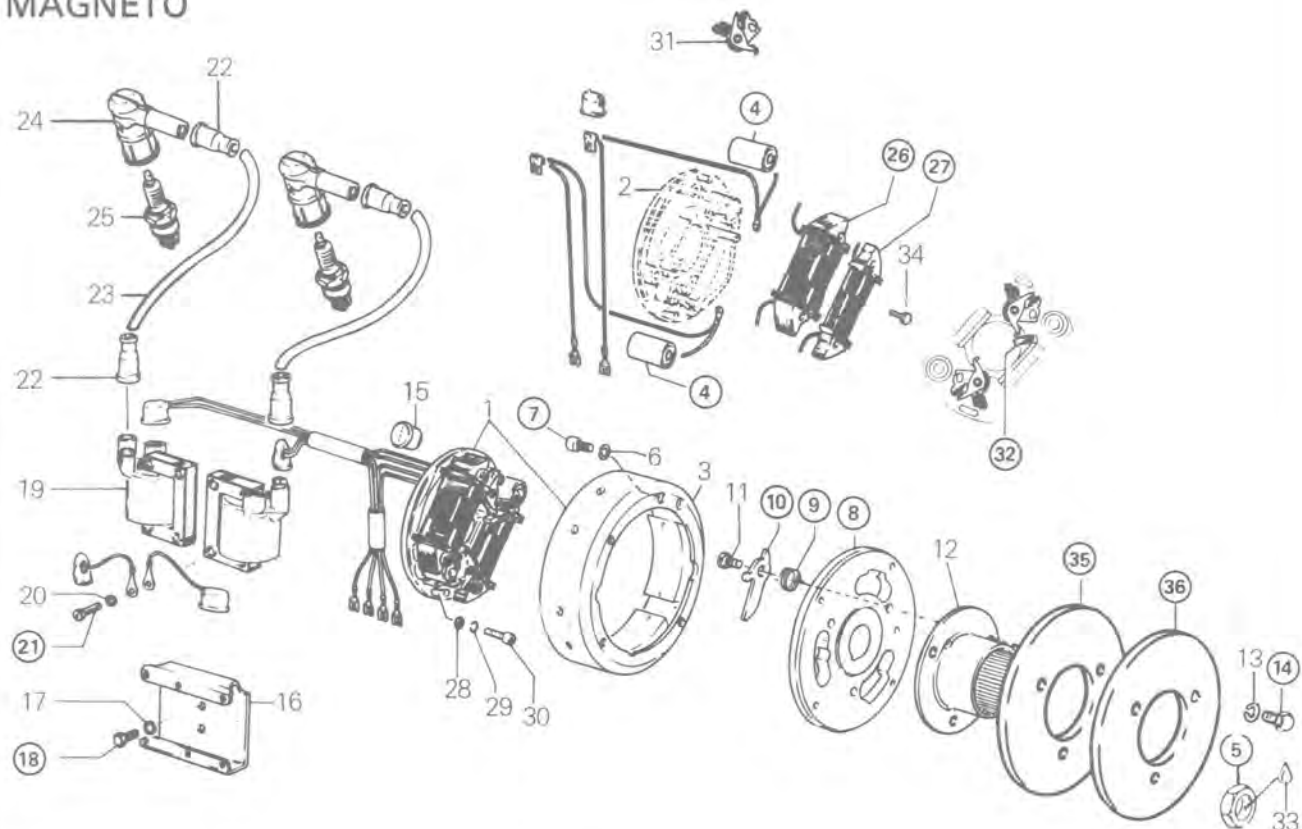
At assembly, place the pistons over the connecting rods with the letters AUS (over an arrow on the piston dome) facing direction of the exhaust port.



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



MAGNETO



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

CLEANING

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

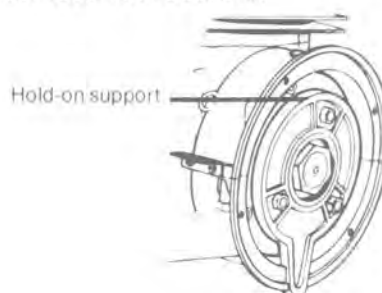
CAUTION: Clean armature and magneto using only a clean cloth.

DISASSEMBLY & ASSEMBLY

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

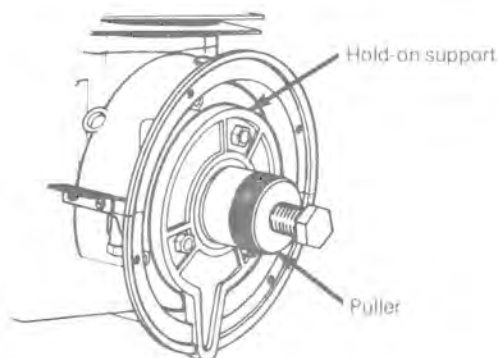
and hammer. To reinstall, inverse procedure.

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

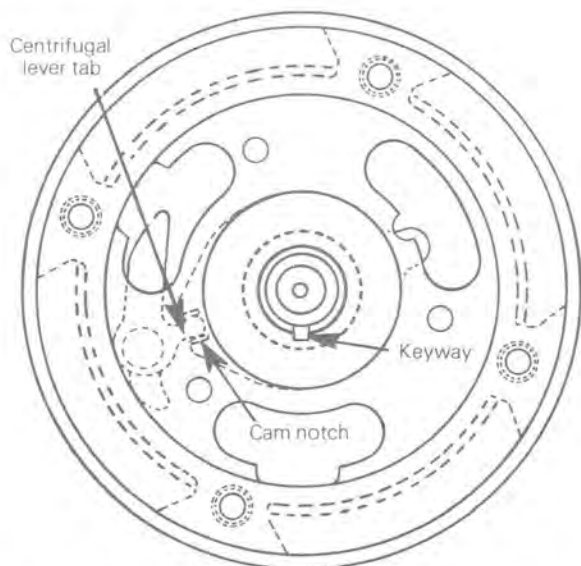


SECTION 04
SUB-SECTION 02 (TWO CYLINDER ENGINE)

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



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



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

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

⑨⑩ At assembly, apply a small amount of low temperature grease into spring seating.

⑱⑳ Apply Loctite Lock'n Seal 242 or equivalent on threads.

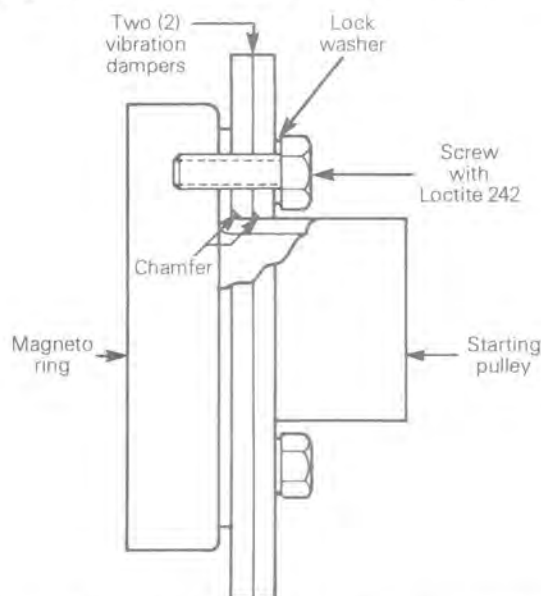
㉔㉕ Whenever a coil is replaced, the air gap (distance between coil end and magnet) must be adjusted.

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.



㉔ When replacing breaker point set, apply a small amount of grease on lubricating wick.

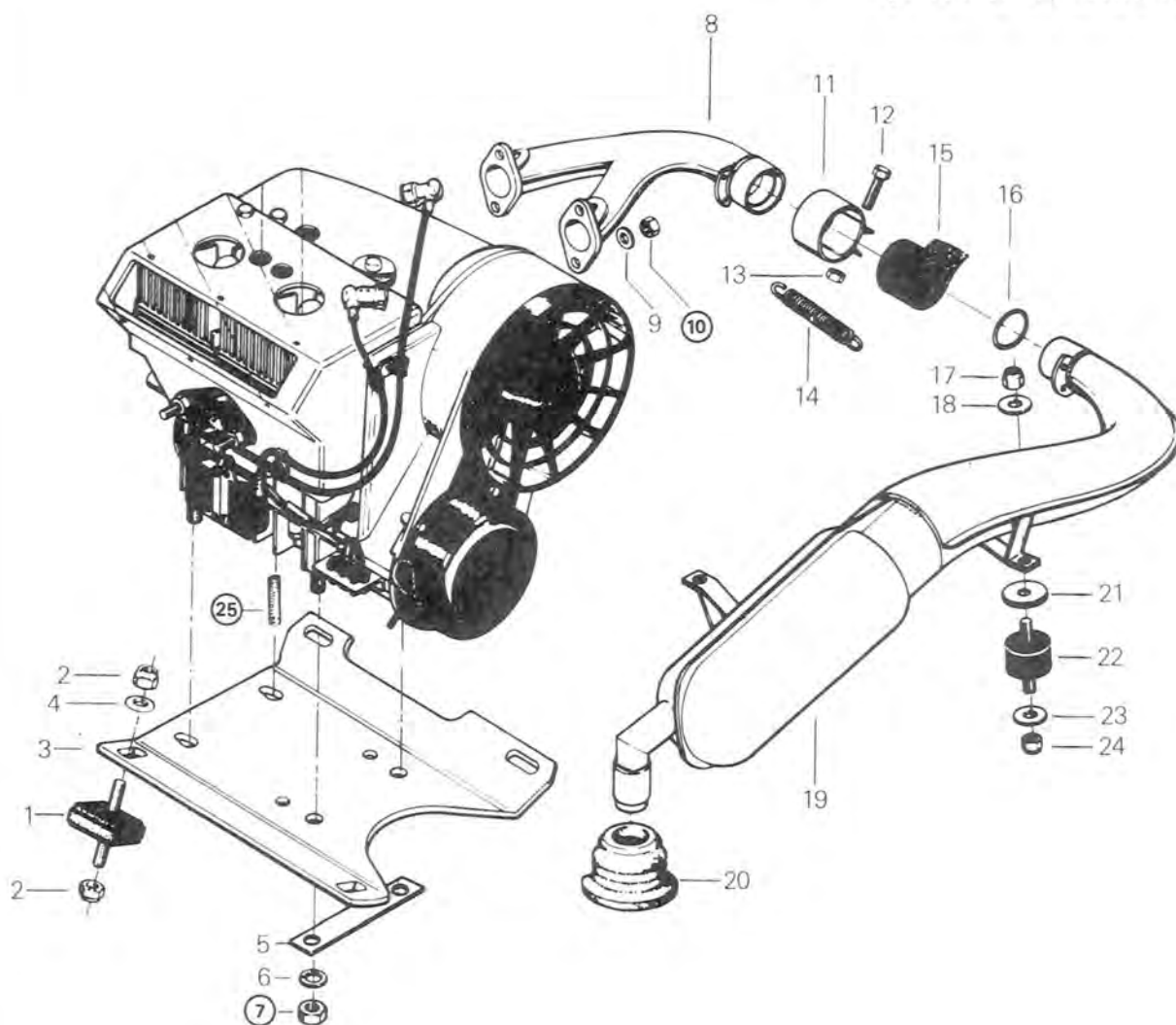
㉕㉖㉗ Install vibration dampers as per illustration.



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

440 ENGINE TYPE (FROM 1976)

ENGINE SUPPORT & MUFFLER
(T'NT & EVEREST)

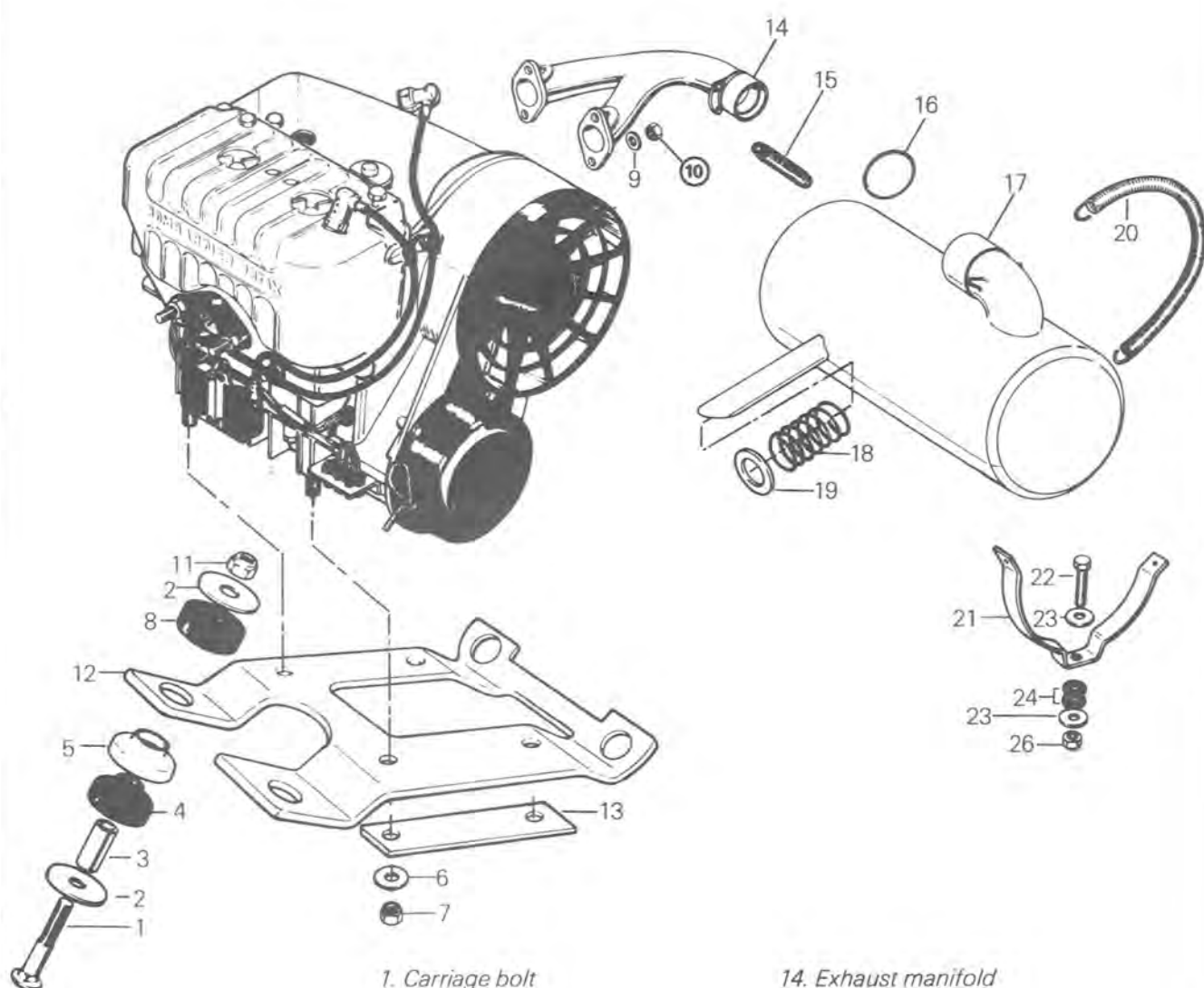


1. Rubber mount
2. Nut
3. Engine bracket
4. Washer
5. Reinforcement plate
6. Lockwasher
7. Nut
8. Exhaust manifold

9. Washer
10. Nut
11. Exhaust collar
12. Bolt
13. Nut
14. Spring
15. Asbestos tape
16. Aluminum ring

17. Nut
18. Washer
19. Muffler
20. Exhaust grommet
21. Washer
22. Rubber shear mount
23. Washer
24. Nut

ENGINE SUPPORT & MUFFLER (OLYMPIQUE 1977)



1. Carriage bolt
2. Flat washer
3. Spacer
4. Vibration absorber (lower)
5. Retainer
6. Lockwasher
7. Nut
8. Vibration absorber (upper)
9. Washer
10. Nut
11. Nut
12. Engine bracket
13. Reinforcement plate


14. Exhaust manifold
15. Spring
16. Sealing ring
17. Muffler
18. Spring
19. Washer
20. Spring
21. Muffler support
22. Bolt
23. Washer
24. Rubber spacer
25. Stud
26. Nut

ENGINE SUPPORT & MUFFLER

REMOVAL FROM VEHICLE

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

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

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

- Rewind starter.
- Engine mount nuts.

DISASSEMBLY & ASSEMBLY

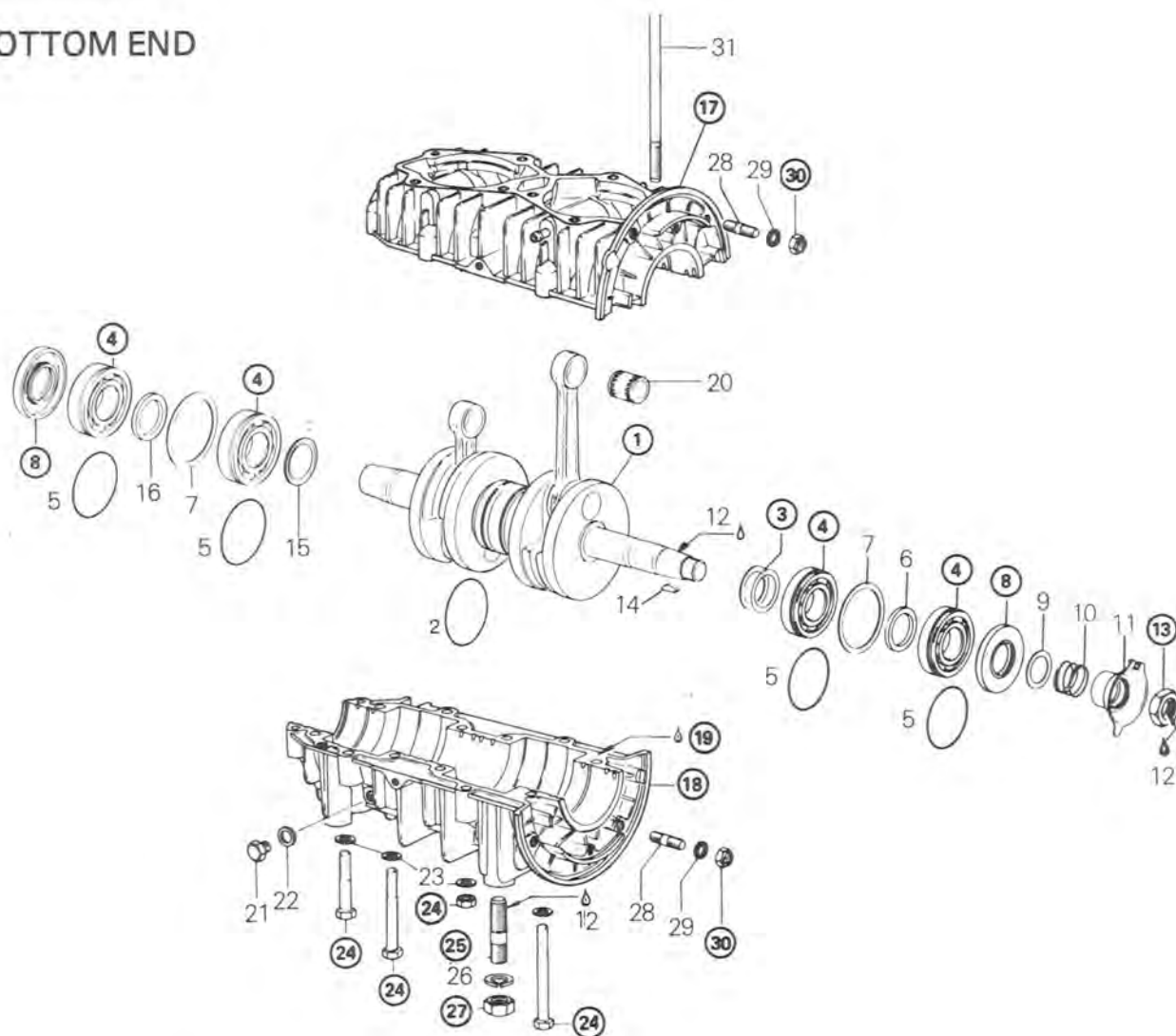
- ⑦ Torque to 4.4 kg-m (32 ft-lbs).
- ⑩ Torque to 2.1 kg-m (15 ft-lbs).
- ②⑤ At assembly on crankcase, apply Loctite Lock'n Seal 242 or equivalent on threads.

INSTALLATION ON VEHICLE

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

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

BOTTOM END



1. Crankshaft
2. "O" ring (sealing ring)
3. Shim
4. Bearing
5. "O" ring
6. Distance ring (4 mm)
7. Retaining washer
8. Oil seal
9. Washer
10. Cam spring
11. Breaker point cam
12. Loctite 242
13. Magneto ring nut
14. Woodruff key
15. Distance ring 1 mm
16. Distance sleeve

17. Upper crankcase half
18. Lower crankcase half
19. Crankcase sealant
20. Needle cage bearing
21. Drain plug
22. Sealing ring
23. Lockwasher
24. Bolt or stud with nut
25. Stud
26. Lockwasher
27. Nut
28. Stud (fan housing)
29. Washer (fan housing)
30. Nut (fan housing)
31. Stud (cylinder)

BOTTOM END

CLEANING

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

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

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

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

DISASSEMBLY & ASSEMBLY

General

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

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

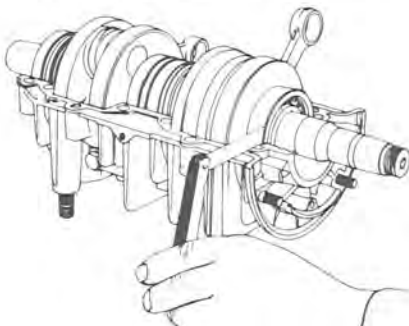
NOTE: Crankshaft end-play requires adjustment only when crankshaft and /or crankcase is replaced.

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

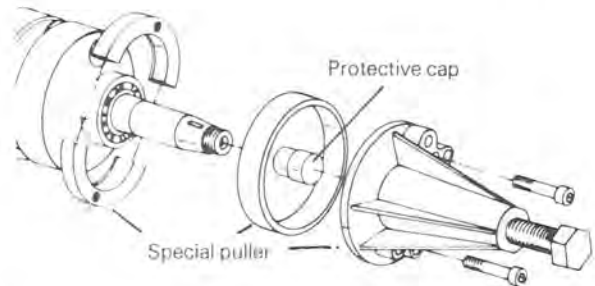
Position crankshaft assembly into crankcase lower half. Make sure that retaining washers are correctly seated in the grooves.

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

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



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



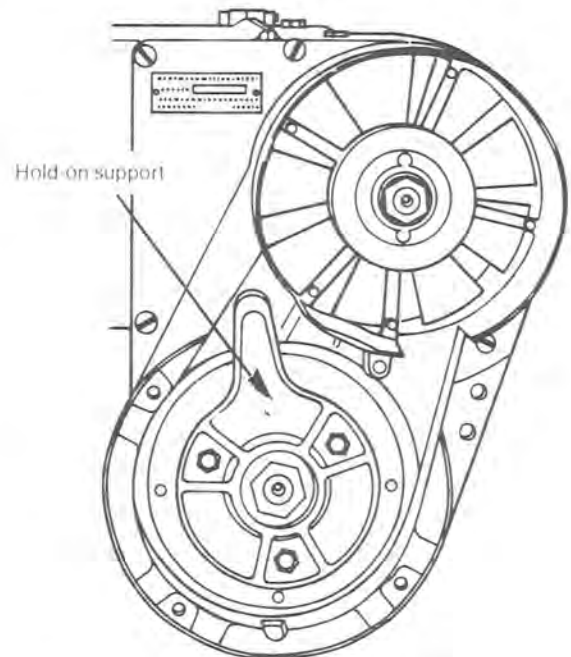
Prior to installation, place bearings into an oil container and heat the oil to 100° C (210° F) for 10 min. This will expand bearings and ease installation.

Install bearings with groove outward.

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

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

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



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

SECTION 04

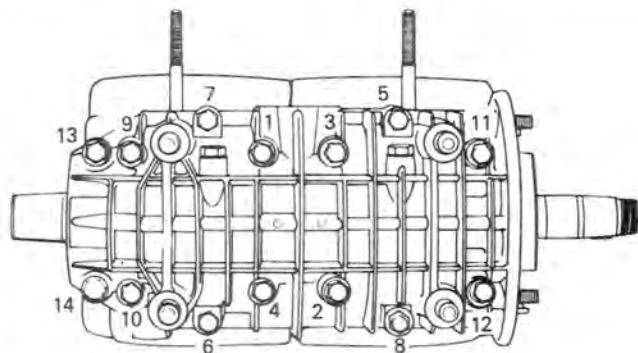
SUB-SECTION 02 (TWO CYLINDER ENGINE)

⑰ ⑱ ⑲ Crankcase halves are factory matched and therefore, are not interchangeable or available as single halves.

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

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

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

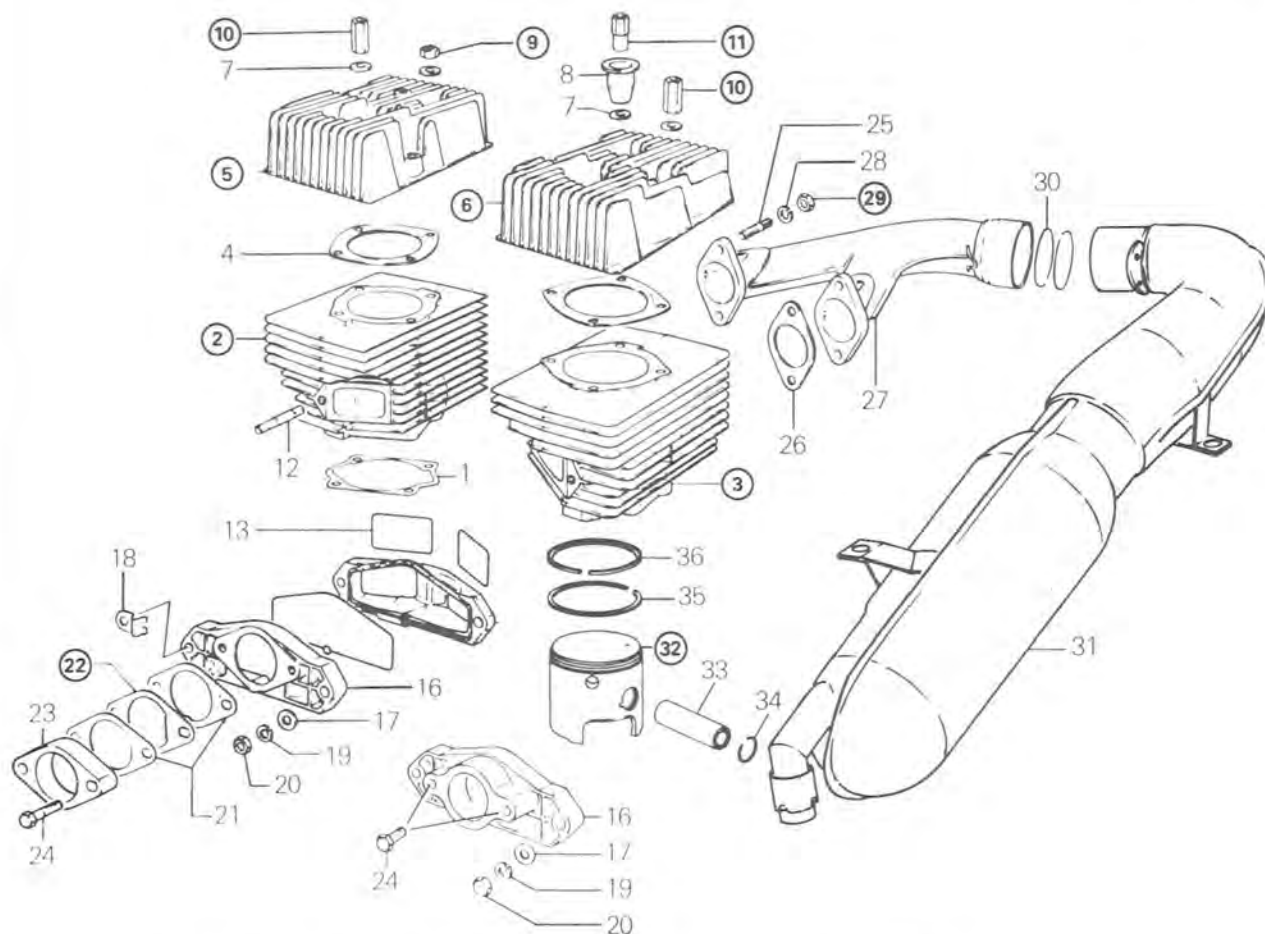


⑳ ㉑ Torque to 2.2 kg-m (16 ft-lbs).

㉒ At assembly on crankcase apply Loctite Lock'n Seal 242 or equivalent on threads.

㉓ Torque to 4.4 kg-m (32 ft-lbs).

TOP END



1. Gasket (cylinder / crankcase)
2. Cylinder (P.T.O.)
3. Cylinder (mag.)
4. Cylinder head gasket
5. Cylinder head (P.T.O.)
6. Cylinder head (Mag.)
7. Flat washer
8. Support sleeve
9. Nut
10. Distance nut
11. Distance nut
12. Stud
13. Gasket
14. Intake manifold
15. Gasket
16. Intake cover
17. Flat washer
18. H.T. cable bracket

19. Lockwasher
20. Nut
21. Gasket
22. Intake deflector
23. Isolating flange
24. Bolt
25. Stud or bolt
26. Exhaust gasket
27. Exhaust manifold
28. Lockwasher
29. Nut or bolt
30. Sealing ring
31. Muffler
32. Piston
33. Gudgeon pin
34. Circlip
35. Rectangular ring
36. "L" ring

TOP END

CLEANING

Discard all gaskets.

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

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

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

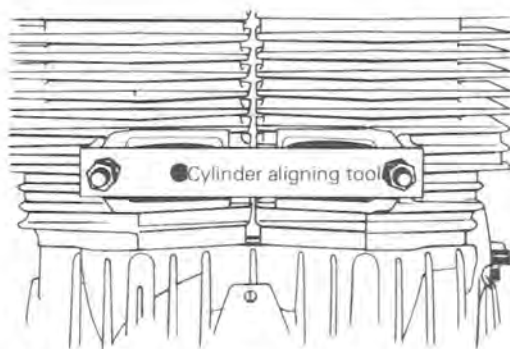
Clean the piston ring grooves with a groove cleaner tool, or with a piece of broken ring.

DISASSEMBLY & ASSEMBLY

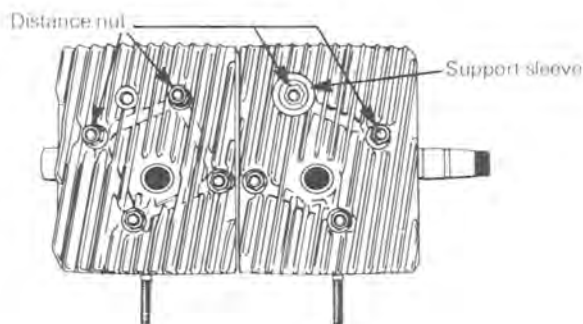
NOTE: Refer to Technical Data for component fitted tolerance and wear limit.

②③⑤⑥ When installing cylinder and / or cylinder head, the cylinder aligning tool must be used to ensure sealing of intake manifold and cylinders. (See Tool Section).

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



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



NOTE: Torque each cylinder head individually.

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

②⑨ Torque to 2.1 kg-m (15 ft-lbs).

③② ③③ ③④ Place a clean cloth over crankcase to prevent circlip from falling into crankcase. Use a pointed tool to remove circlips from piston.

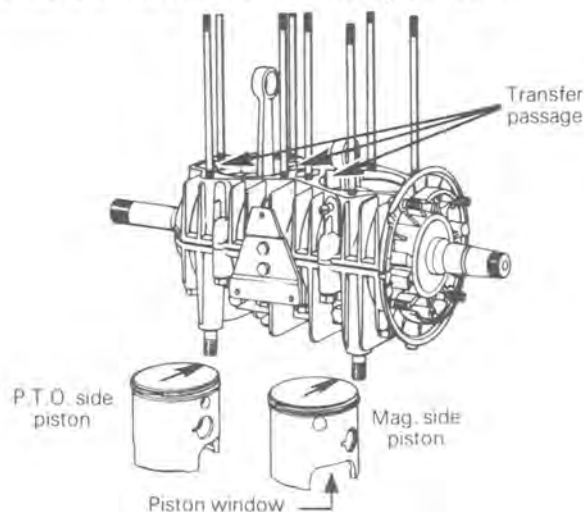
CAUTION: When tapping out gudgeon pins, hold piston firmly in place to eliminate the possibilities of transmitting shock and pressure to the connecting rod.

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

EXHAUST



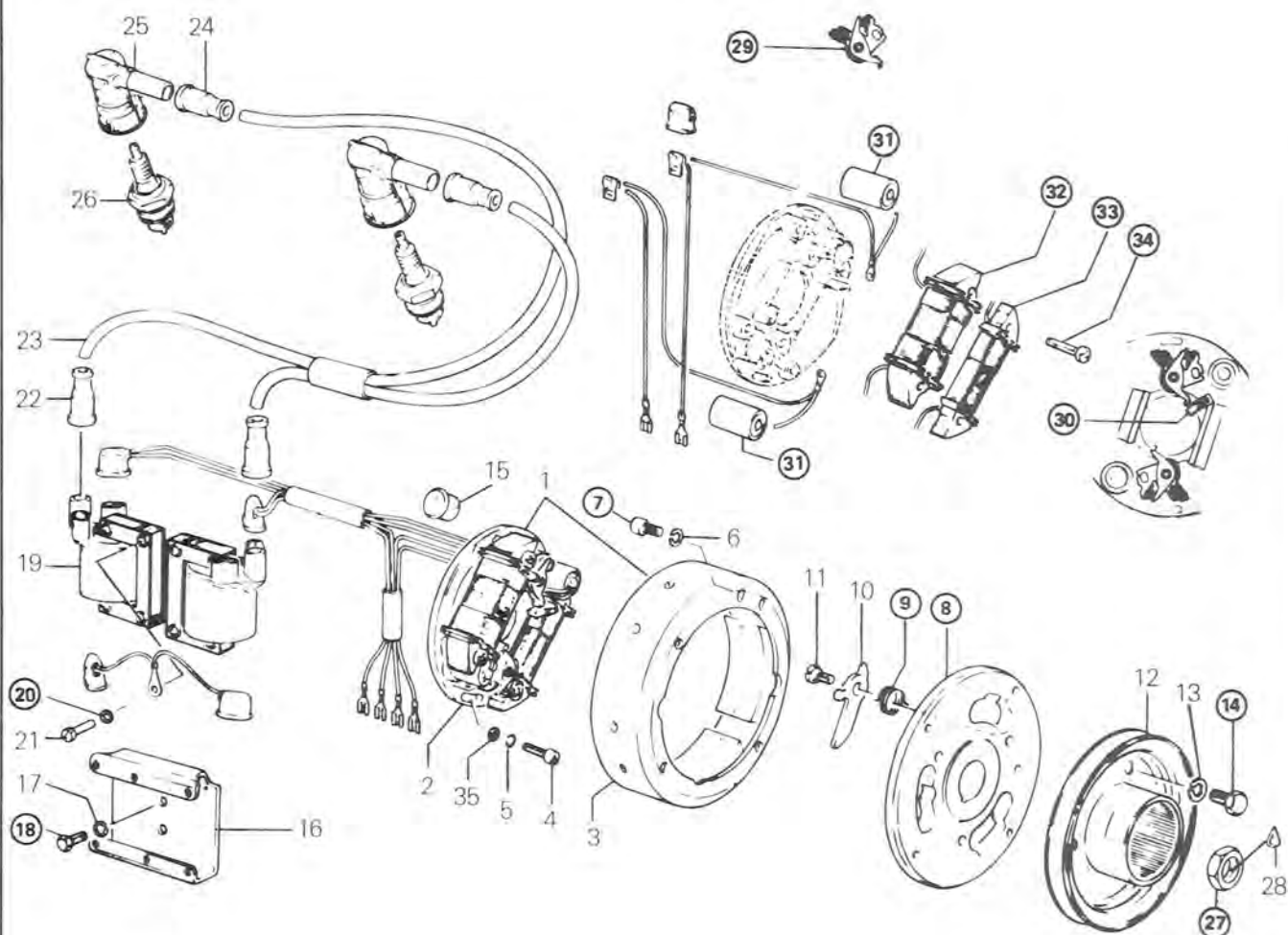
Also make sure that the piston window is aligned with the crankcase transfer passage when the gudgeon pin orifice is in-line with the connecting rod bore.



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



MAGNETO



1. Armature ass'y
2. Armature plate
3. Magneto ring
4. Screw
5. Lockwasher
6. Lockwasher
7. Screw
8. Magneto housing
9. Spring
10. Centrifugal level
11. Screw
12. Starting pulley

13. Lockwasher
14. Screw
15. Wire grommet
16. Coil bracket
17. Lockwasher
18. Screw
19. Ignition coil
20. Lockwasher
21. Screw
22. Protection cap
23. H. T. cable
24. Protection cap

25. Spark plug protector
26. Spark plug
27. Magneto ring nut
28. Loctite 242
29. Breaker point
30. Lubricating wick
31. Capacitor
32. Lighting coil
33. Ignition generator coil
34. Screw
35. Flat washer

MAGNETO

CLEANING

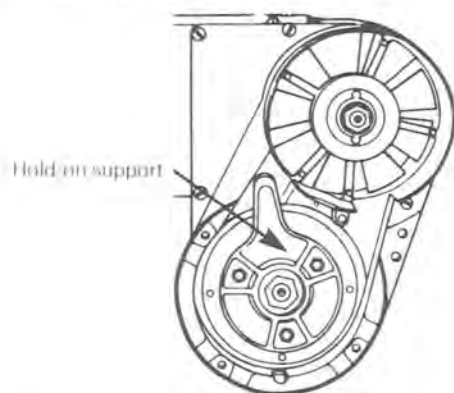
Clean all metal components in a non-ferrous metal cleaner.

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

DISASSEMBLY & ASSEMBLY

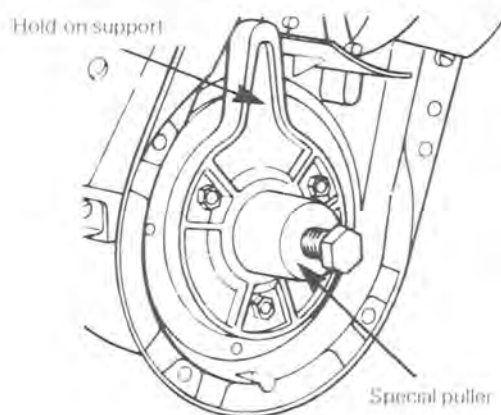
⑦ At assembly apply Loctite Lock'n Seal 242 on threads.

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

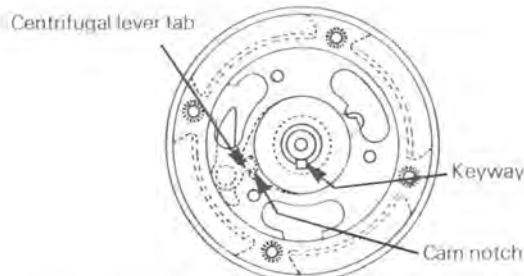


With magneto retaining nut removed and hold-on support in place, install special puller onto support.

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



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



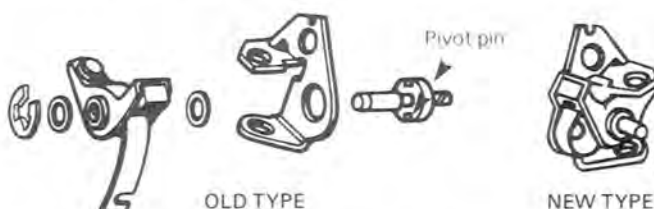
Install magneto retaining nut (with Loctite Lock'n Seal 242 on threads) and torque to 8.3 kg-m (60 ft-lbs).

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

⑭ Torque to 2.1 kg-m (15 ft-lbs).

⑮ ⑳ Apply Loctite Lock'n Seal 242 or equivalent on threads.

㉓ Apply Loctite Lock'n Seal 242 on threads then torque to 8.3 kg-m (60 ft-lbs).



㉔ Do not remove pivot pin unless replacement is needed, if removed, reinstall with Loctite Lock'n Seal 242 on threads.

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

㉕ When replacing breaker point set, apply a light coat of grease on lubricating wick.

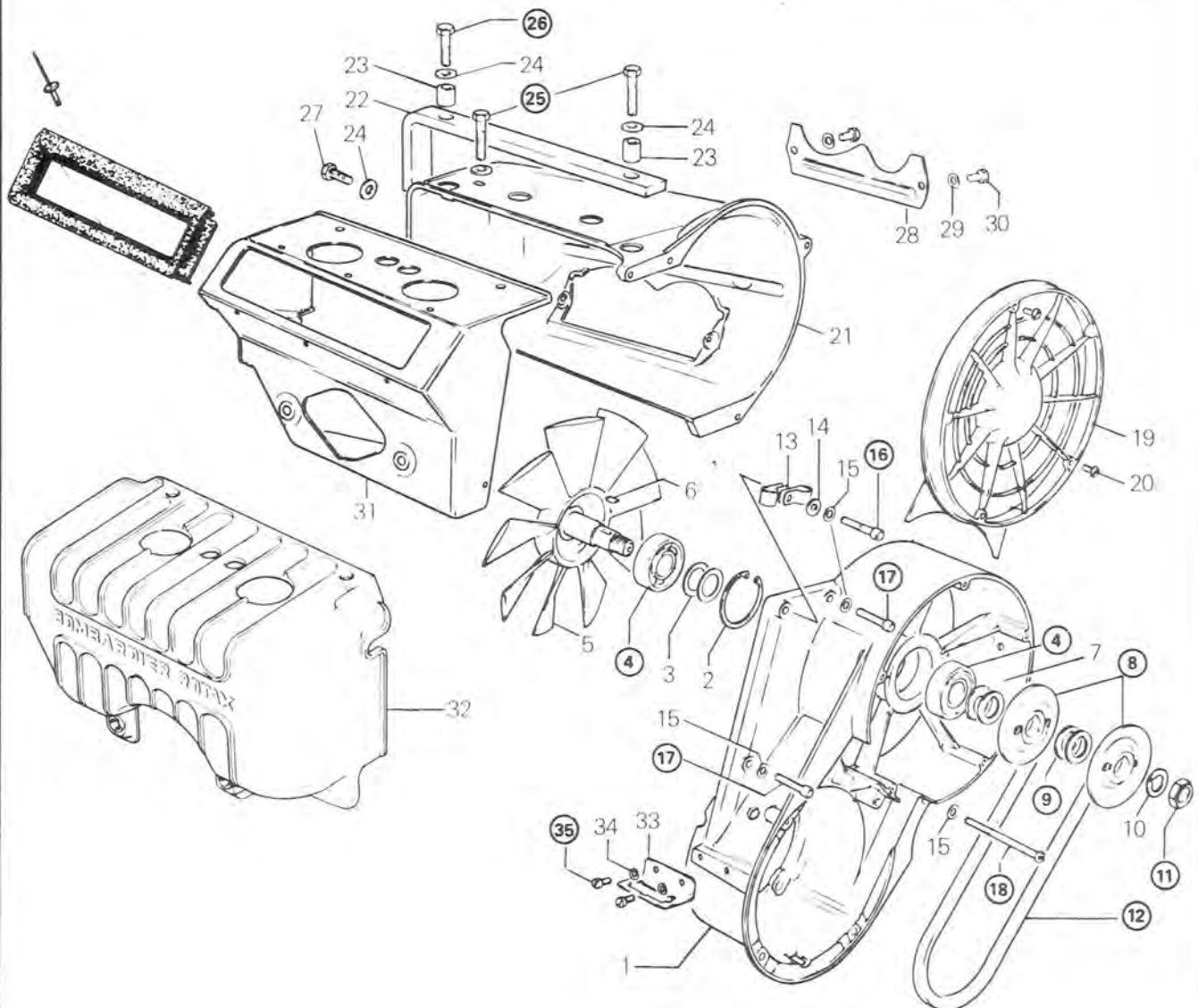
㉖ To replace a capacitor, it is first necessary to unsolder the two (2) black leads using a soldering iron. The capacitor can then be driven out of the armature plate using a suitable drift. To reinstall, inverse procedure.

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

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



COOLING SYSTEM



1. Fan housing
2. Circlip
3. Washer (2)
4. Bearing
5. Fan
6. Woodruff key
7. Shim (2)
8. Pulley halves
9. Shim
10. Lockwasher
11. Nut
12. Belt

13. Cable clamp
14. Washer
15. Spring washer
16. Screew M6 x 35
17. Screw M6 x 30
18. Screw M6 x 80
19. Fan cover
20. Screw
21. Fan cowl (exhaust)
22. Sealing strip
23. Distance sleeve
24. Washer

- 25. Screw M8 x 35
- 26. Screw M8x 28
- 27. Screw M8 x 20
- 28. Fan cowl cover
- 29. Spring washer
- 30. Washer
- 31. Fan cowl (intake) T'NT Everest
- 32. Fan cowl (intake) Olymp.
- 33. Electrical junction block bracket
- 34. Lockwasher
- 35. Screw

COOLING SYSTEM

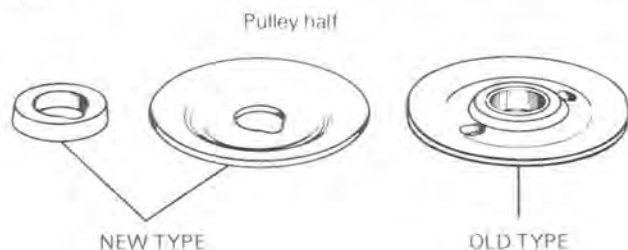
CLEANING

Clean all components in a non ferrous metal cleaner.

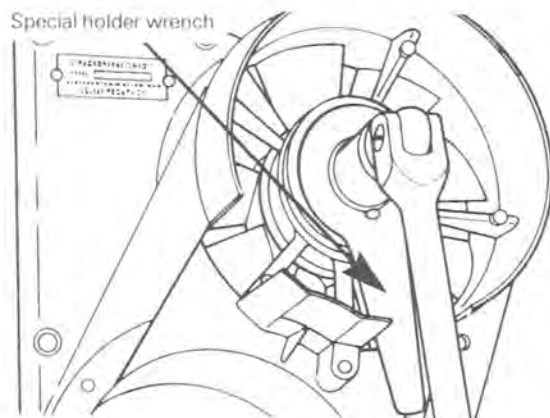
DISASSEMBLY & ASSEMBLY

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

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



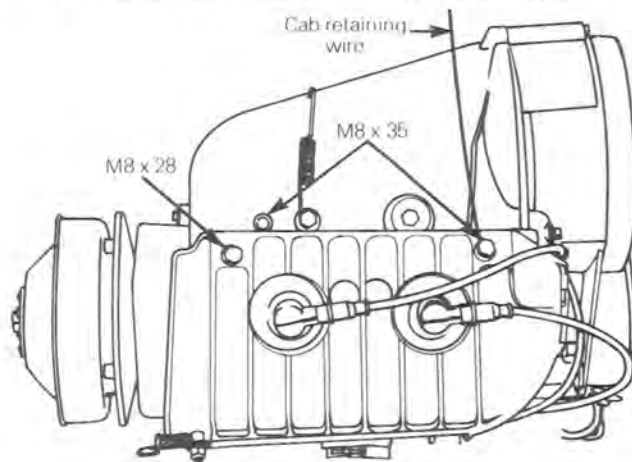
⑪ To remove or install pulley retaining nut lock fan pulley with special holder wrench (See Tools Section). At assembly torque nut to 6.4 kg-m (46 ft-lbs).



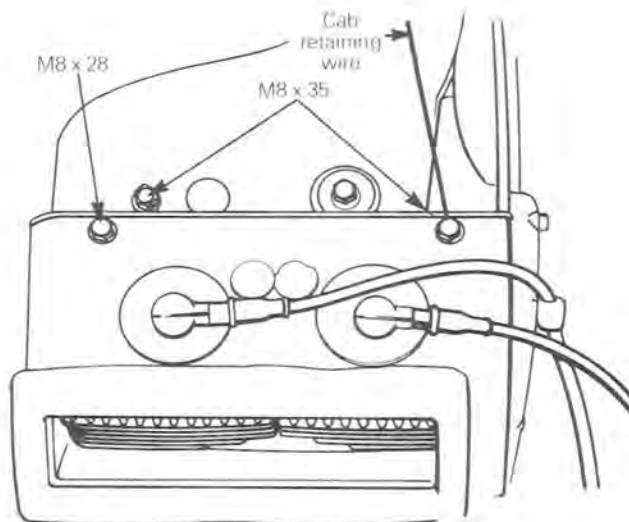
⑨ ⑫ Shim(s) located between pulley halves are used to adjust fan belt free-play. Correct free-play is 6 mm (1/4"). If necessary to adjust install or remove shim(s) between pulley halves. Install excess shim(s) between outer pulley half and washer.

⑯ ⑰ ⑱ ⑳ Apply Loctite Lock'n Seal 242 on threads.

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



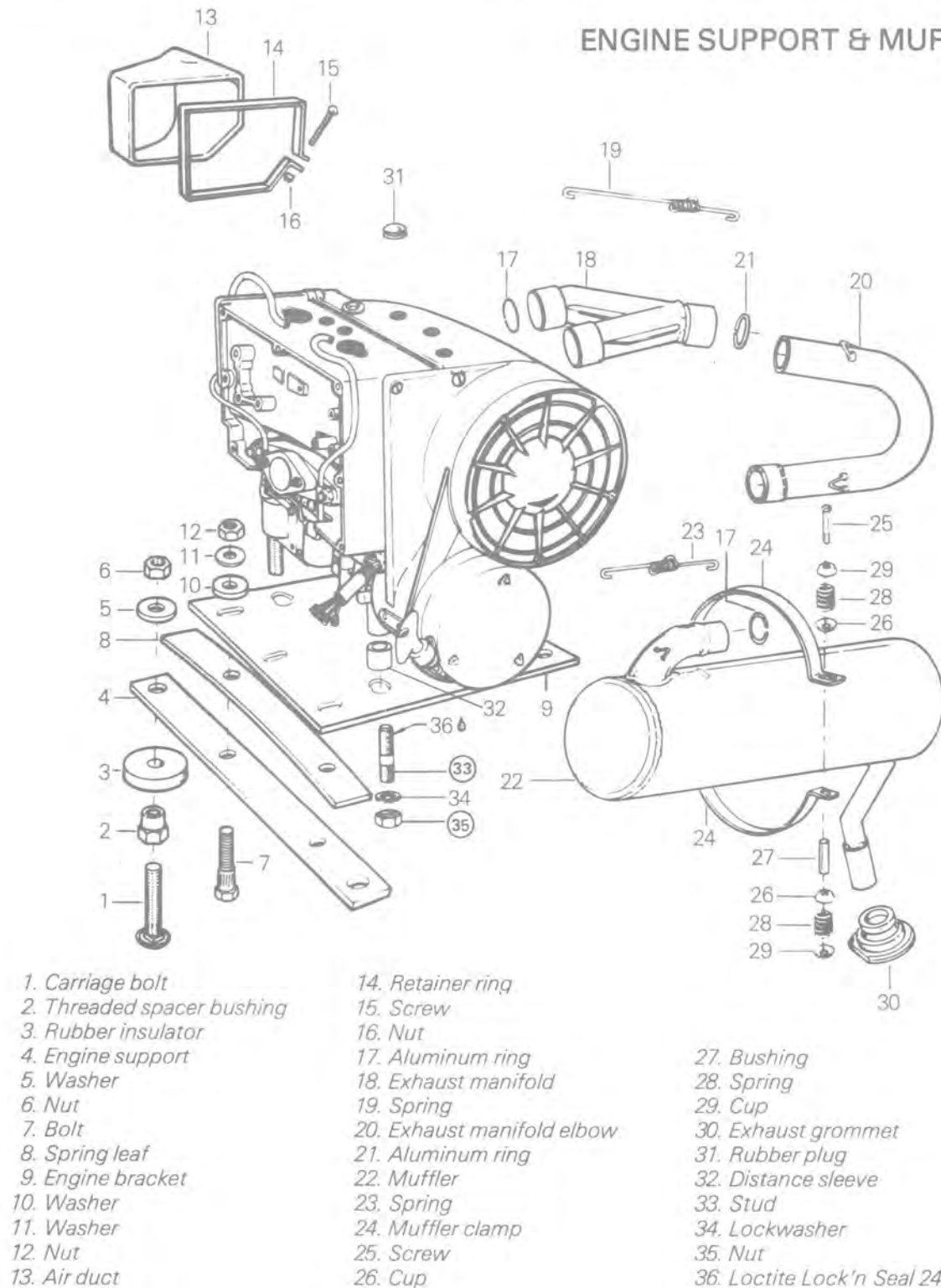
OLYMPIQUE



T'NT & EVEREST

640 ENGINE TYPE (FROM 1976)

ENGINE SUPPORT & MUFFLER



ENGINE SUPPORT & MUFFLER

REMOVAL FROM VEHICLE

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

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

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

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

DISASSEMBLY & ASSEMBLY

③ At assembly on crankcase, apply Loctite Lock'n Seal 242 or equivalent on threads.

③ Torque to 4.4 kg-m (32 ft-lbs).

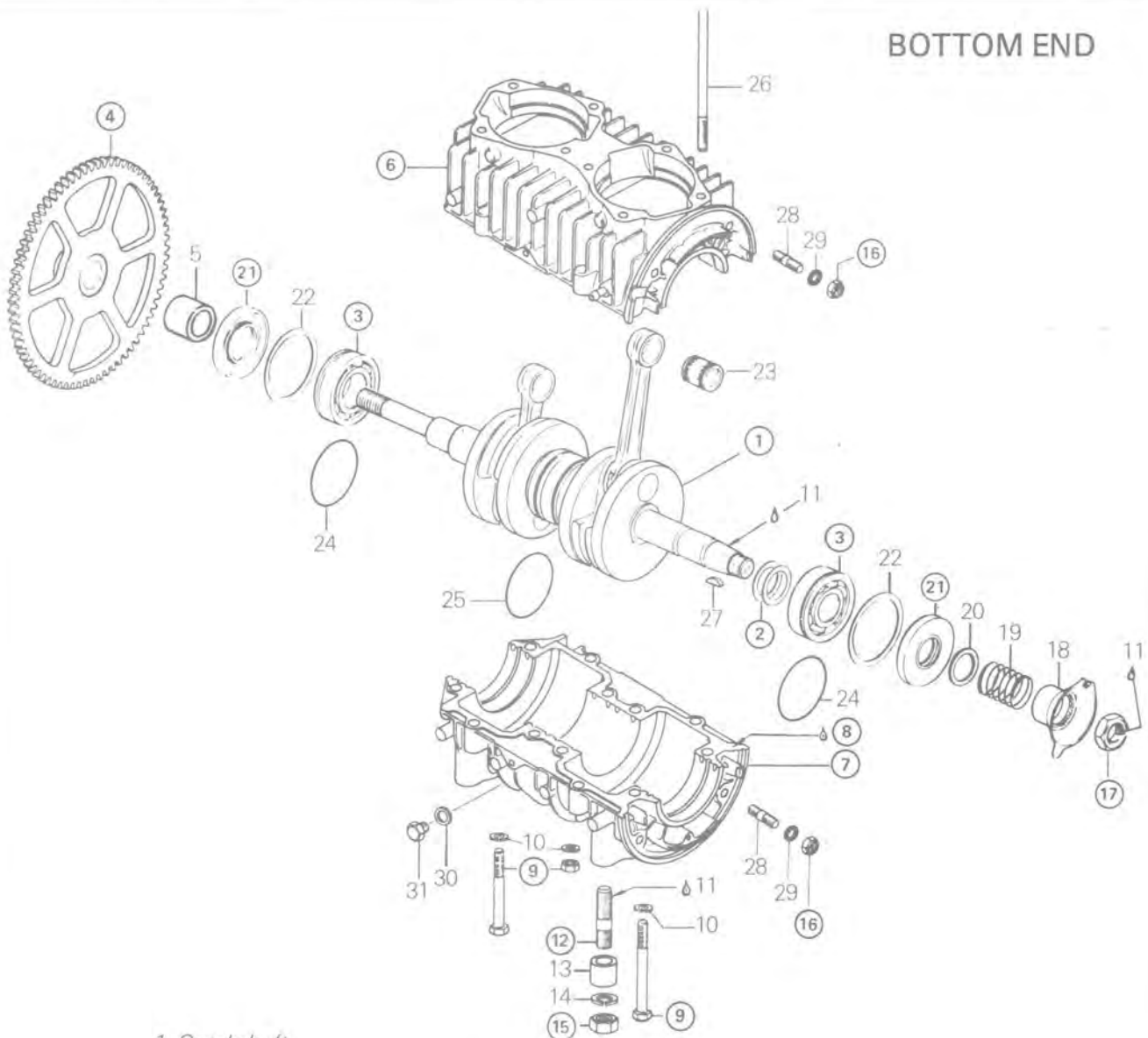
INSATALLATION IN VEHICLE

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

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

SECTION 04
SUB-SECTION 02 (TWO CYLINDER ENGINE)

BOTTOM END



1. Crankshaft
2. Shim
3. Bearing
4. Starter gear
5. Bushing (manual model)
6. Crankcase upper half
7. Crankcase lower half
8. Crankcase sealant
9. Bolt or stud with nut
10. Lockwasher
11. Loctite Lock'n Seal 242
12. Stud
13. Spacer bushing
14. Lockwasher
15. Nut
16. Nut

17. Nut (magneto)
18. Breaker point cam
19. Spring
20. Washer
21. Oil seal
22. Retaining washer
23. Needle cage bearing
24. "O" ring (bearing)
25. "O" ring
26. Stud
27. Woodruff key
28. Stud
29. Washer
30. Washer
31. Screw

BOTTOM END

CLEANING

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

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

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

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

DISASSEMBLY & ASSEMBLY

General

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

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

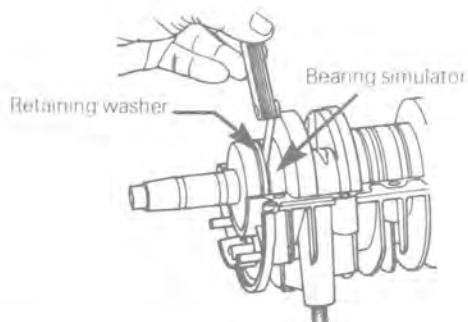
○ **NOTE:** Crankshaft end-play requires adjustment only when crankshaft and / or crankcase is replaced.

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

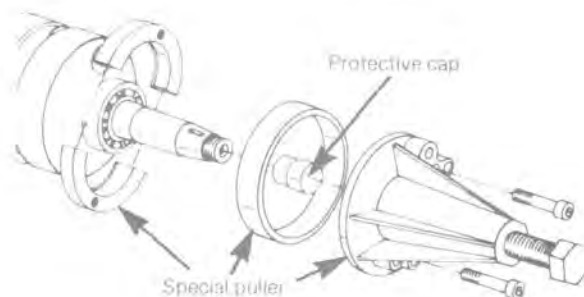
Position crankshaft assembly into crankcase lower half. Make sure that retaining washers are correctly seated in the grooves.

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

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



③ To remove bearing from crankshaft use a protective cap and special puller, as illustrated. (See Tool Section).

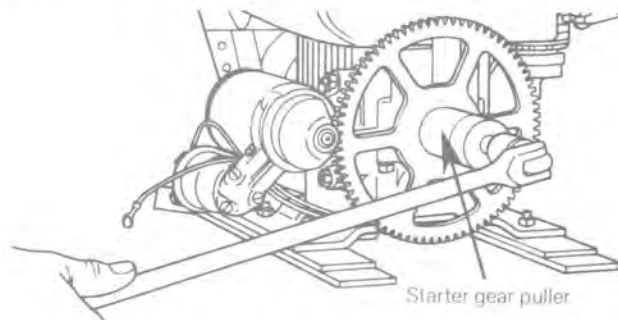


Prior to installation, place bearings into an oil container and heat the oil to 100° C (210° F) for 10 min. This will expand bearings and ease installation.

Install bearings with groove outward.

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

④ To remove starter gear from crankshaft it may be necessary to use a special puller as illustrated. (See Special Tools).



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

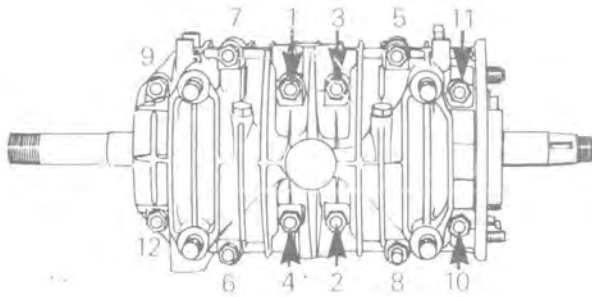
⑥⑦⑧ Crankcase halves are factory matched and therefore, are not interchangeable or available as single halves.

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

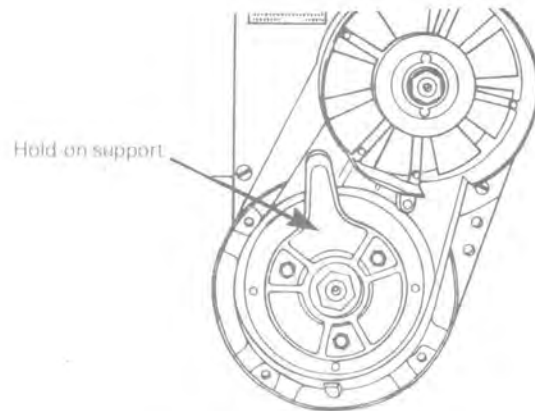
Position the crankcase halves together and tighten nuts (or bolts) by hand then install armature plate (tighten) on magneto side to correctly align the crankcase halves.

SECTION 04
SUB-SECTION 02 (TWO CYLINDER ENGINE)

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



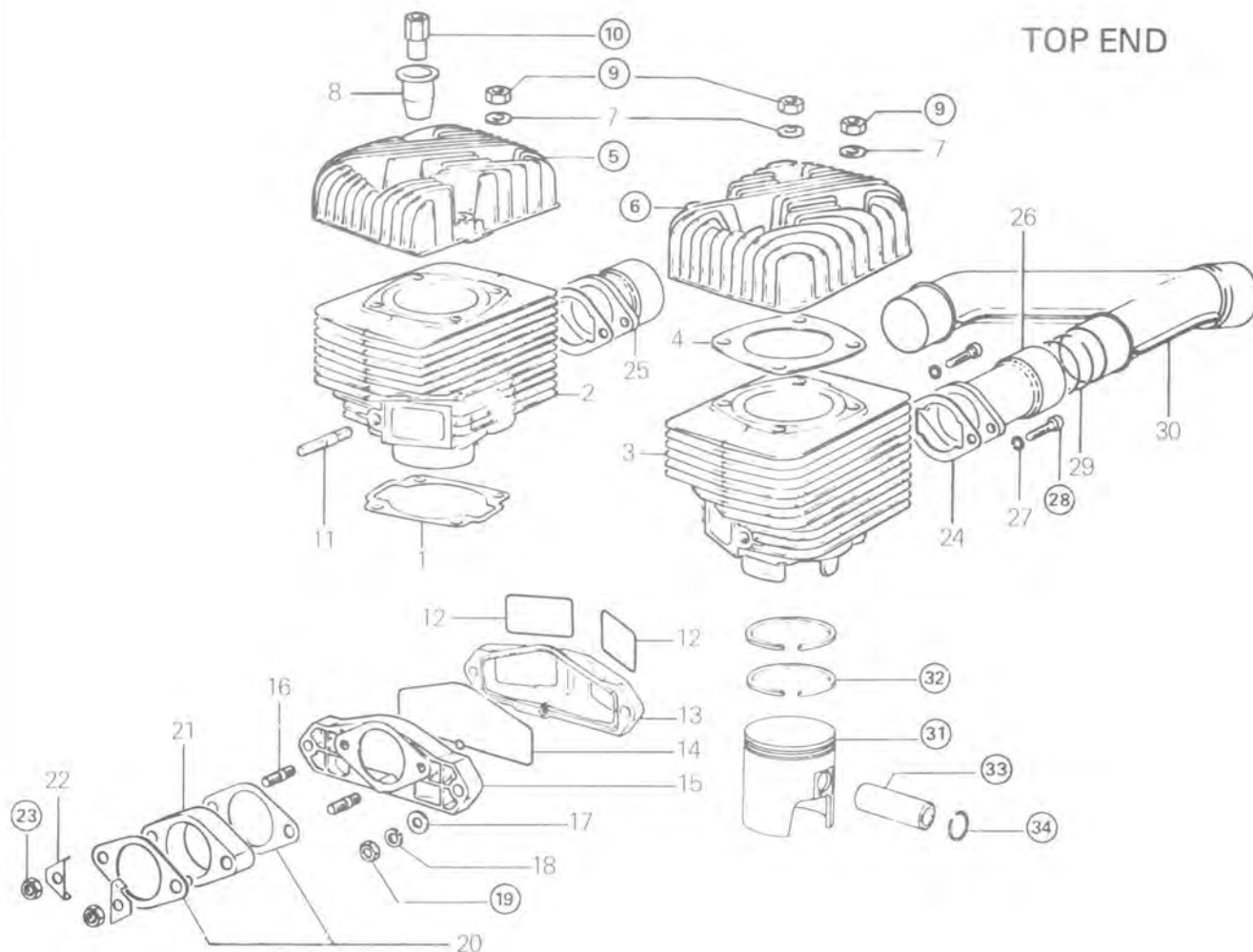
- ⑨ Torque to 2.2 kg-m (16 ft-lbs).
- ⑫ At assembly on crankcase, apply Loctite Lock'n Seal 242 or equivalent on threads.
- ⑮ Torque to 4.4 kg-m (32 ft-lbs).
- ⑯ Torque to 2.2 kg-m (16 ft-lbs).
- ⑰ To remove or install magneto retaining nut, lock crankshaft in position with special hold-on support as illustrated. (See Tool Section).



- At assembly, apply Loctite Lock'n Seal 242 or equivalent on threads then torque to 7.5 kg-m (54 ft-lbs).
- ⑳ At assembly apply a light coat of lithium grease on seal lip. Seal outer surface should be flush with crankcase.

SECTION 04
SUB-SECTION 02 (TWO CYLINDER ENGINE)

TOP END



- | | |
|----------------------------------|-------------------------------|
| 1. Gasket (cylinder / crankcase) | 18. Lockwasher |
| 2. Cylinder (P. T. O.) | 19. Nut |
| 3. Cylinder (Mag) | 20. Gasket |
| 4. Gasket (head, cylinder) | 21. Isolating flange |
| 5. Cylinder head (P. T. O.) | 22. Locking tab |
| 6. Cylinder head (Mag) | 23. Nut |
| 7. Flat washer | 24. Exhaust gasket |
| 8. Support sleeve | 25. Exhaust socket (P. T. O.) |
| 9. Nut | 26. Exhaust socket (mag) |
| 10. Distance nut | 27. Lockwasher |
| 11. Stud | 28. Screw |
| 12. Gasket | 29. Sealing ring |
| 13. Intake manifold | 30. Exhaust manifold |
| 14. Gasket | 31. Piston |
| 15. Intake cover | 32. Ring |
| 16. Stud | 33. Gudgeon pin |
| 17. Washer | 34. Circlip |


TOP END

CLEANING

Discard all gaskets.

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

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

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

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

DISASSEMBLY & ASSEMBLY

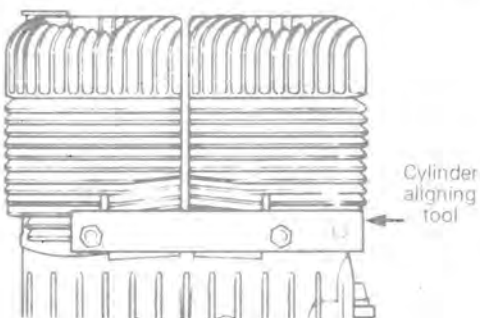
 **NOTE:** Refer to Technical Data for component fitted tolerance and wear limit.

⑤⑥ When installing cylinder and / or cylinder head, the cylinder aligning tool must be used to ensure sealing of intake manifold and exhaust. (See Tool Section).

Install muffler on exhaust socket then install aligning bar.

Cross torque cylinder head nuts to 2.1 kg-m (15 ft-lbs).

 **NOTE:** Torque each cylinder head individually.



⑨⑩ Torque cylinder head nuts to 2.1 kg-m (15 ft-lbs).

⑱⑲⑳ Torque to 2.1 kg-m (15 ft-lbs).

③①③③④ Place a clean cloth over crankcase to prevent circlip from falling into crankcase. Use a pointed tool to remove circlips from piston.

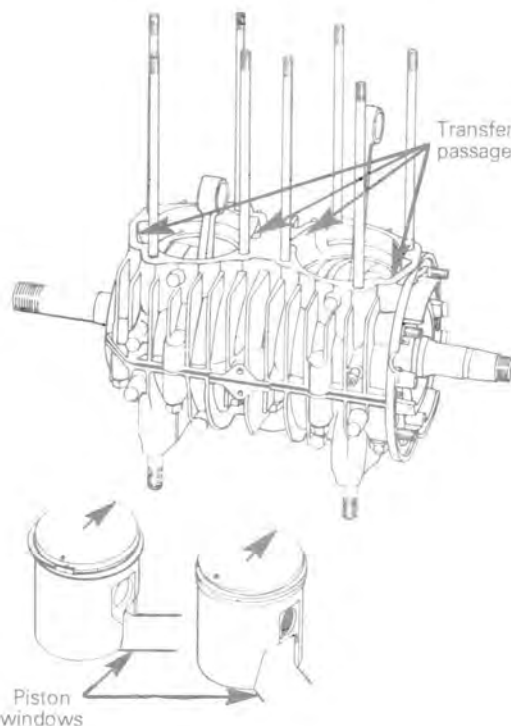
 **CAUTION:** When tapping out gudgeon pins, hold piston firmly in place to eliminate the possibilities of transmitting shock and pressure to the connecting rod.


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

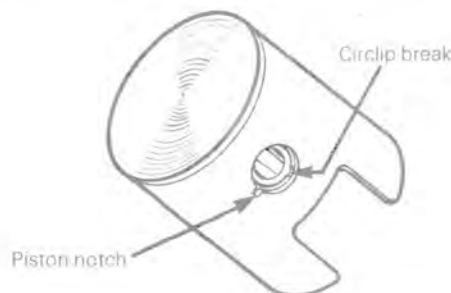
EXHAUST



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

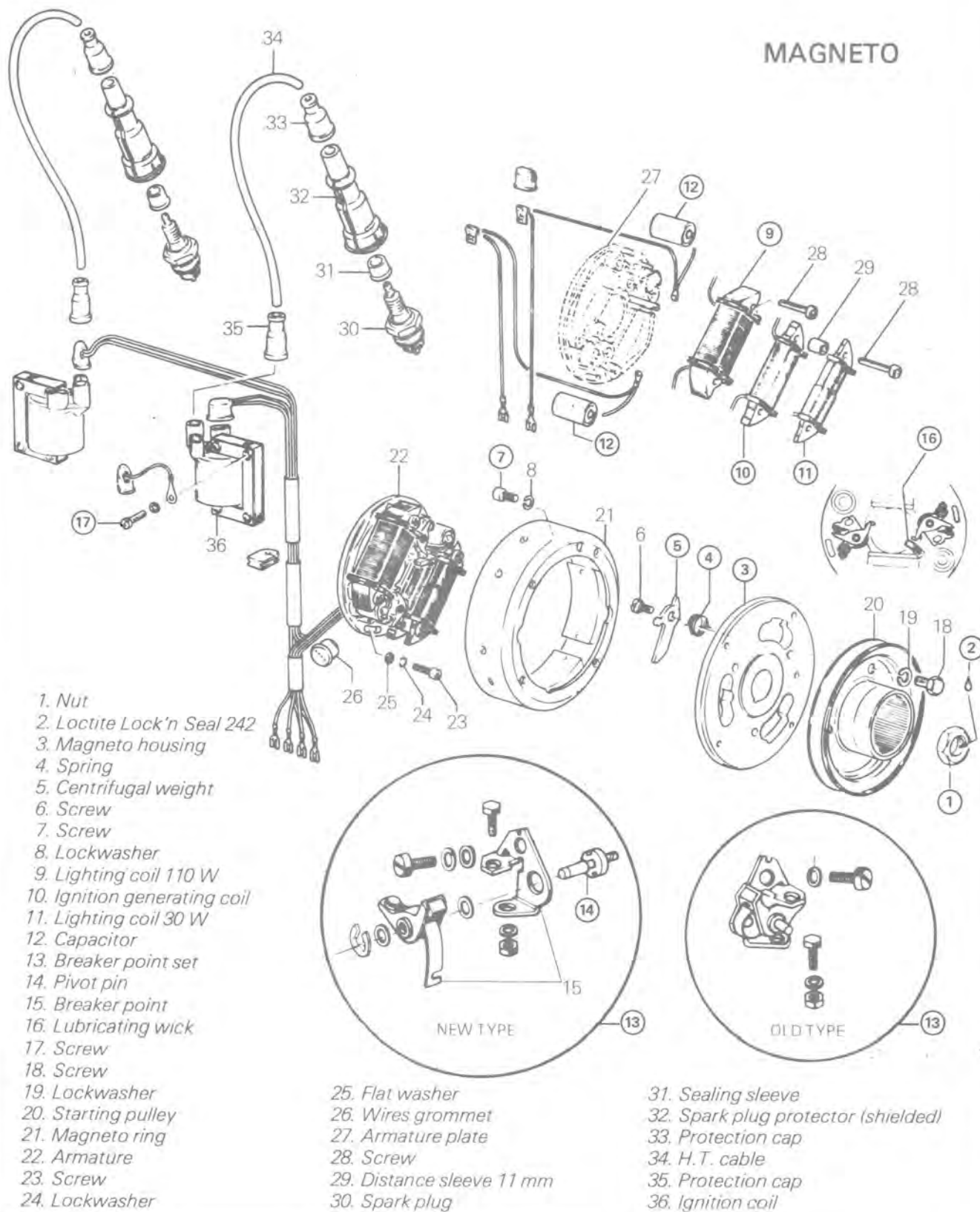


 **NOTE:** Once the circlips are installed turn each circlip so the circlip break is not directly on piston notch. Remove any burrs from piston caused through circlip installation using very fine emery cloth.



SECTION 04
SUB-SECTION 02 (TWO CYLINDER ENGINE)

MAGNETO



1. Nut
2. Loctite Lock'n Seal 242
3. Magneto housing
4. Spring
5. Centrifugal weight
6. Screw
7. Screw
8. Lockwasher
9. Lighting coil 110 W
10. Ignition generating coil
11. Lighting coil 30 W
12. Capacitor
13. Breaker point set
14. Pivot pin
15. Breaker point
16. Lubricating wick
17. Screw
18. Screw
19. Lockwasher
20. Starting pulley
21. Magneto ring
22. Armature
23. Screw
24. Lockwasher
25. Flat washer
26. Wires grommet
27. Armature plate
28. Screw
29. Distance sleeve 11 mm
30. Spark plug
31. Sealing sleeve
32. Spark plug protector (shielded)
33. Protection cap
34. H.T. cable
35. Protection cap
36. Ignition coil

NEW TYPE

OLD TYPE

MAGNETO

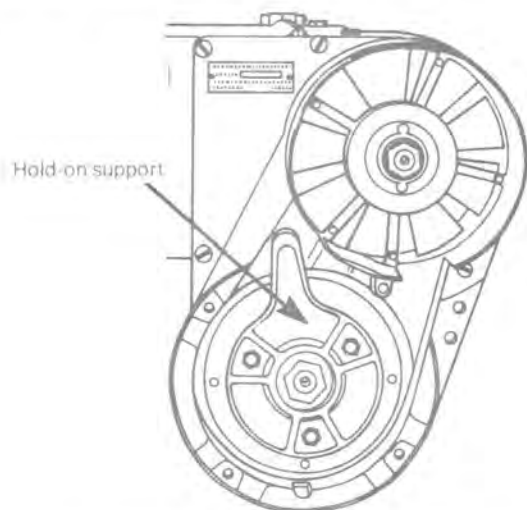
CLEANING

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

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

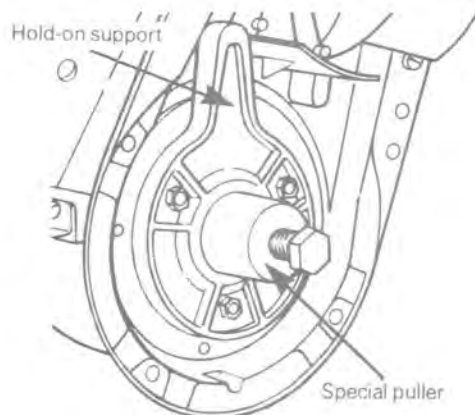
DISASSEMBLY & ASSEMBLY

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



①②③ With magneto retaining nut removed and hold-on support in place, install special puller onto hub.

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



At assembly, clean crankshaft extension (taper) then apply Loctite Lock'n Seal 242 or equivalent.



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

④⑤ At assembly, apply a small amount of low temperature grease into spring seating.

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

⑨⑩⑪ Whenever a coil is replaced, the air gap (distance between coil end and magnet) must be adjusted.

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



⑫ To replace a capacitor, it is first necessary to unsolder the two (2) black leads. The capacitor can then be driven out of the armature plate using a suitable drift and hammer. To reinstall, inverse procedure.

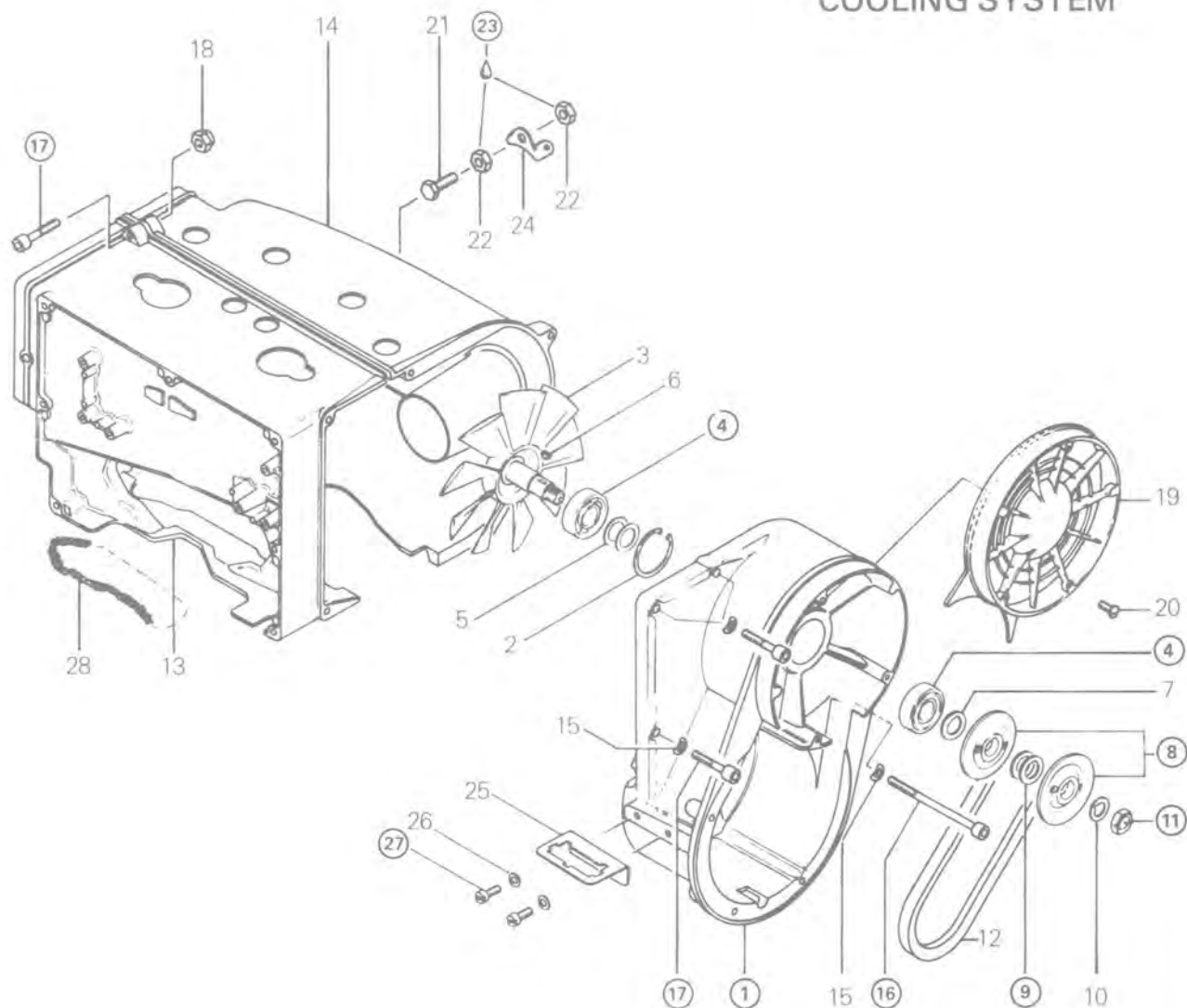
⑬⑭ Do not remove pivot pin unless replacement is needed, if removed reinstall with Loctite Lock'n Seal on threads.

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

⑮ When replacing breaker point set, apply a light coat of grease on lubricating wick.

⑰ Apply Loctite Lock'n Seal 242 on threads.

COOLING SYSTEM



1. Fan housing
2. Locking ring
3. Fan
4. Bearing
5. Washer
6. Woodruff key
7. Washer
8. Pulley (halves)
9. Shim
10. Lockwasher
11. Nut
12. Belt
13. Cylinder cowl (intake)
14. Cylinder cowl (exhaust)

15. Spring washer
16. Screw
17. Screw
18. Nut
19. Fan cover
20. Screw
21. Bolt
22. Nut
23. Loctite Lock'n Seal 242
24. Spring bracket
25. Junction block bracket
26. Lockwasher
27. Screw
28. Sealer (intake / cowl)

COOLING SYSTEM

CLEANING

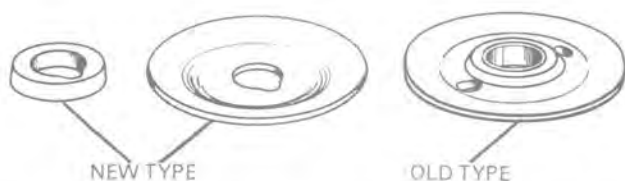
Clean all metal components in a non-ferrous metal cleaner.

DISASSEMBLY & ASSEMBLY

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

⑤ Newer pulley half does not have a shoulder on its inner face so it is installed with a 6 mm (.236") spacer.

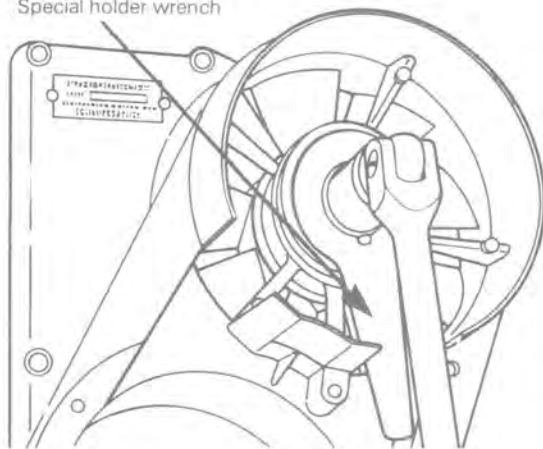
Pulley half



⑨ Shim(s) located between pulley halves are used to adjust fan belt free-play. Correct free-play is 6 mm (1/4"). If necessary to adjust, install or remove shim(s) between pulley halves. Install excess shim(s) between outer pulley half and washer.

⑪ Lock fan pulley with special holder wrench to remove or install pulley retaining nut. (See Tool Section).

Special holder wrench

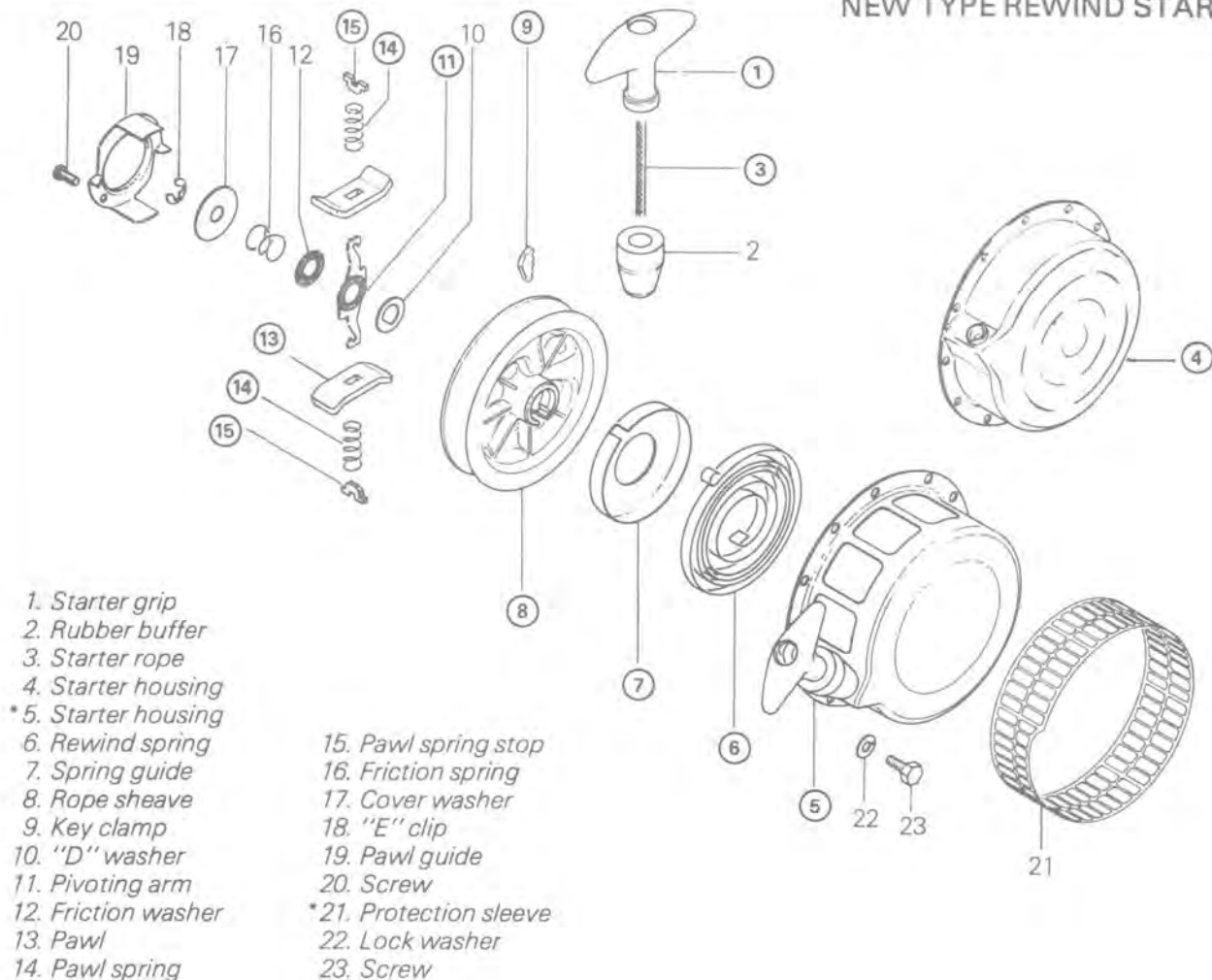


At assembly torque nut to 6.4 kg-m (46 ft-lbs).

⑩⑪⑫⑬⑭⑮⑯⑰⑱⑲⑳㉑㉒㉓㉔㉕㉖㉗㉘㉙㉚㉛㉜㉝㉞㉟㊱㊲㊳㊴㊵㊶㊷㊸㊹㊺㊻㊼㊽㊾㊿㋀㋁㋂㋃㋄㋅㋆㋇㋈㋉㋊㋋㋌㋍㋎㋏㋐㋑㋒㋓㋔㋕㋖㋗㋘㋙㋚㋛㋜㋝㋞㋟㋠㋡㋢㋣㋤㋥㋦㋧㋨㋩㋪㋫㋬㋭㋮㋯㋰㋱㋲㋳㋴㋵㋶㋷㋸㋹㋺㋻㋼㋽㋾㋿㌀㌁㌂㌃㌄㌅㌆㌇㌈㌉㌊㌋㌌㌍㌎㌏㌐㌑㌒㌓㌔㌕㌖㌗㌘㌙㌚㌛㌜㌝㌞㌟㌠㌡㌢㌣㌤㌥㌦㌧㌨㌩㌪㌫㌬㌭㌮㌯㌰㌱㌲㌳㌴㌵㌶㌷㌸㌹㌺㌻㌼㌽㌾㌿㍀㍁㍂㍃㍄㍅㍆㍇㍈㍉㍊㍋㍌㍍㍎㍏㍐㍑㍒㍓㍔㍕㍖㍗㍘㍙㍚㍛㍜㍝㍞㍟㍠㍡㍢㍣㍤㍥㍦㍧㍨㍩㍪㍫㍬㍭㍮㍯㍰㍱㍲㍳㍴㍵㍶㍷㍸㍹㍺㍻㍼㍽㍾㍿㏀㏁㏂㏃㏄㏅㏆㏇㏈㏉㏊㏋㏌㏍㏎㏏㏐㏑㏒㏓㏔㏕㏖㏗㏘㏙㏚㏛㏜㏝㏞㏟㏠㏡㏢㏣㏤㏥㏦㏧㏨㏩㏪㏫㏬㏭㏮㏯㏰㏱㏲㏳㏴㏵㏶㏷㏸㏹㏺㏻㏼㏽㏾㏿㐀㐁㐂㐃㐄㐅㐆㐇㐈㐉㐊㐋㐌㐍㐎㐏㐐㐑㐒㐓㐔㐕㐖㐗㐘㐙㐚㐛㐜㐝㐞㐟㐠㐡㐢㐣㐤㐥㐦㐧㐨㐩㐪㐫㐬㐭㐮㐯㐰㐱㐲㐳㐴㐵㐶㐷㐸㐹㐺㐻㐼㐽㐾㐿㑀㑁㑂㑃㑄㑅㑆㑇㑈㑉㑊㑋㑌㑍㑎㑏㑐㑑㑒㑓㑔㑕㑖㑗㑘㑙㑚㑛㑜㑝㑞㑟㑠㑡㑢㑣㑤㑥㑦㑧㑨㑩㑪㑫㑬㑭㑮㑯㑰㑱㑲㑳㑴㑵㑶㑷㑸㑹㑺㑻㑼㑽㑾㑿㒀㒁㒂㒃㒄㒅㒆㒇㒈㒉㒊㒋㒌㒍㒎㒏㒐㒑㒒㒓㒔㒕㒖㒗㒘㒙㒚㒛㒜㒝㒞㒟㒠㒡㒢㒣㒤㒥㒦㒧㒨㒩㒪㒫㒬㒭㒮㒯㒰㒱㒲㒳㒴㒵㒶㒷㒸㒹㒺㒻㒼㒽㒾㒿㓀㓁㓂㓃㓄㓅㓆㓇㓈㓉㓊㓋㓌㓍㓎㓏㓐㓑㓒㓓㓔㓕㓖㓗㓘㓙㓚㓛㓜㓝㓞㓟㓠㓡㓢㓣㓤㓥㓦㓧㓨㓩㓪㓫㓬㓭㓮㓯㓰㓱㓲㓳㓴㓵㓶㓷㓸㓹㓺㓻㓼㓽㓾㓿㔀㔁㔂㔃㔄㔅㔆㔇㔈㔉㔊㔋㔌㔍㔎㔏㔐㔑㔒㔓㔔㔕㔖㔗㔘㔙㔚㔛㔜㔝㔞㔟㔠㔡㔢㔣㔤㔥㔦㔧㔨㔩㔪㔫㔬㔭㔮㔯㔰㔱㔲㔳㔴㔵㔶㔷㔸㔹㔺㔻㔼㔽㔾㔿㕀㕁㕂㕃㕄㕅㕆㕇㕈㕉㕊㕋㕌㕍㕎㕏㕐㕑㕒㕓㕔㕕㕖㕗㕘㕙㕚㕛㕜㕝㕞㕟㕠㕡㕢㕣㕤㕥㕦㕧㕨㕩㕪㕫㕬㕭㕮㕯㕰㕱㕲㕳㕴㕵㕶㕷㕸㕹㕺㕻㕼㕽㕾㕿㖀㖁㖂㖃㖄㖅㖆㖇㖈㖉㖊㖋㖌㖍㖎㖏㖐㖑㖒㖓㖔㖕㖖㖗㖘㖙㖚㖛㖜㖝㖞㖟㖠㖡㖢㖣㖤㖥㖦㖧㖨㖩㖪㖫㖬㖭㖮㖯㖰㖱㖲㖳㖴㖵㖶㖷㖸㖹㖺㖻㖼㖽㖾㖿㗀㗁㗂㗃㗄㗅㗆㗇㗈㗉㗊㗋㗌㗍㗎㗏㗐㗑㗒㗓㗔㗕㗖㗗㗘㗙㗚㗛㗜㗝㗞㗟㗠㗡㗢㗣㗤㗥㗦㗧㗨㗩㗪㗫㗬㗭㗮㗯㗰㗱㗲㗳㗴㗵㗶㗷㗸㗹㗺㗻㗼㗽㗾㗿㘀㘁㘂㘃㘄㘅㘆㘇㘈㘉㘊㘋㘌㘍㘎㘏㘐㘑㘒㘓㘔㘕㘖㘗㘘㘙㘚㘛㘜㘝㘞㘟㘠㘡㘢㘣㘤㘥㘦㘧㘨㘩㘪㘫㘬㘭㘮㘯㘰㘱㘲㘳㘴㘵㘶㘷㘸㘹㘺㘻㘼㘽㘾㘿㙀㙁㙂㙃㙄㙅㙆㙇㙈㙉㙊㙋㙌㙍㙎㙏㙐㙑㙒㙓㙔㙕㙖㙗㙘㙙㙚㙛㙜㙝㙞㙟㙠㙡㙢㙣㙤㙥㙦㙧㙨㙩㙪㙫㙬㙭㙮㙯㙰㙱㙲㙳㙴㙵㙶㙷㙸㙹㙺㙻㙼㙽㙾㙿㚀㚁㚂㚃㚄㚅㚆㚇㚈㚉㚊㚋㚌㚍㚎㚏㚐㚑㚒㚓㚔㚕㚖㚗㚘㚙㚚㚛㚜㚝㚞㚟㚠㚡㚢㚣㚤㚥㚦㚧㚨㚩㚪㚫㚬㚭㚮㚯㚰㚱㚲㚳㚴㚵㚶㚷㚸㚹㚺㚻㚼㚽㚾㚿㜀㜁㜂㜃㜄㜅㜆㜇㜈㜉㜊㜋㜌㜍㜎㜏㜐㜑㜒㜓㜔㜕㜖㜗㜘㜙㜚㜛㜜㜝㜞㜟㜠㜡㜢㜣㜤㜥㜦㜧㜨㜩㜪㜫㜬㜭㜮㜯㜰㜱㜲㜳㜴㜵㜶㜷㜸㜹㜺㜻㜼㜽㜾㜿㝀㝁㝂㝃㝄㝅㝆㝇㝈㝉㝊㝋㝌㝍㝎㝏㝐㝑㝒㝓㝔㝕㝖㝗㝘㝙㝚㝛㝜㝝㝞㝟㝠㝡㝢㝣㝤㝥㝦㝧㝨㝩㝪㝫㝬㝭㝮㝯㝰㝱㝲㝳㝴㝵㝶㝷㝸㝹㝺㝻㝼㝽㝾㝿㞀㞁㞂㞃㞄㞅㞆㞇㞈㞉㞊㞋㞌㞍㞎㞏㞐㞑㞒㞓㞔㞕㞖㞗㞘㞙㞚㞛㞜㞝㞞㞟㞠㞡㞢㞣㞤㞥㞦㞧㞨㞩㞪㞫㞬㞭㞮㞯㞰㞱㞲㞳㞴㞵㞶㞷㞸㞹㞺㞻㞼㞽㞾㞿㟀㟁㟂㟃㟄㟅㟆㟇㟈㟉㟊㟋㟌㟍㟎㟏㟐㟑㟒㟓㟔㟕㟖㟗㟘㟙㟚㟛㟜㟝㟞㟟㟠㟡㟢㟣㟤㟥㟦㟧㟨㟩㟪㟫㟬㟭㟮㟯㟰㟱㟲㟳㟴㟵㟶㟷㟸㟹㟺㟻㟼㟽㟾㟿㠀㠁㠂㠃㠄㠅㠆㠇㠈㠉㠊㠋㠌㠍㠎㠏㠐㠑㠒㠓㠔㠕㠖㠗㠘㠙㠚㠛㠜㠝㠞㠟㠠㠡㠢㠣㠤㠥㠦㠧㠨㠩㠪㠫㠬㠭㠮㠯㠰㠱㠲㠳㠴㠵㠶㠷㠸㠹㠺㠻㠼㠽㠾㠿㡀㡁㡂㡃㡄㡅㡆㡇㡈㡉㡊㡋㡌㡍㡎㡏㡐㡑㡒㡓㡔㡕㡖㡗㡘㡙㡚㡛㡜㡝㡞㡟㡠㡡㡢㡣㡤㡥㡦㡧㡨㡩㡪㡫㡬㡭㡮㡯㡰㡱㡲㡳㡴㡵㡶㡷㡸㡹㡺㡻㡼㡽㡾㡿㢀㢁㢂㢃㢄㢅㢆㢇㢈㢉㢊㢋㢌㢍㢎㢏㢐㢑㢒㢓㢔㢕㢖㢗㢘㢙㢚㢛㢜㢝㢞㢟㢠㢡㢢㢣㢤㢥㢦㢧㢨㢩㢪㢫㢬㢭㢮㢯㢰㢱㢲㢳㢴㢵㢶㢷㢸㢹㢺㢻㢼㢽㢾㢿㣀㣁㣂㣃㣄㣅㣆㣇㣈㣉㣊㣋㣌㣍㣎㣏㣐㣑㣒㣓㣔㣕㣖㣗㣘㣙㣚㣛㣜㣝㣞㣟㣠㣡㣢㣣㣤㣥㣦㣧㣨㣩㣪㣫㣬㣭㣮㣯㣰㣱㣲㣳㣴㣵㣶㣷㣸㣹㣺㣻㣼㣽㣾㣿㤀㤁㤂㤃㤄㤅㤆㤇㤈㤉㤊㤋㤌㤍㤎㤏㤐㤑㤒㤓㤔㤕㤖㤗㤘㤙㤚㤛㤜㤝㤞㤟㤠㤡㤢㤣㤤㤥㤦㤧㤨㤩㤪㤫㤬㤭㤮㤯㤰㤱㤲㤳㤴㤵㤶㤷㤸㤹㤺㤻㤼㤽㤾㤿㥀㥁㥂㥃㥄㥅㥆㥇㥈㥉㥊㥋㥌㥍㥎㥏㥐㥑㥒㥓㥔㥕㥖㥗㥘㥙㥚㥛㥜㥝㥞㥟㥠㥡㥢㥣㥤㥥㥦㥧㥨㥩㥪㥫㥬㥭㥮㥯㥰㥱㥲㥳㥴㥵㥶㥷㥸㥹㥺㥻㥼㥽㥾㥿㦀㦁㦂㦃㦄㦅㦆㦇㦈㦉㦊㦋㦌㦍㦎㦏㦐㦑㦒㦓㦔㦕㦖㦗㦘㦙㦚㦛㦜㦝㦞㦟㦠㦡㦢㦣㦤㦥㦦㦧㦨㦩㦪㦫㦬㦭㦮㦯㦰㦱㦲㦳㦴㦵㦶㦷㦸㦹㦺㦻㦼㦽㦾㦿㧀㧁㧂㧃㧄㧅㧆㧇㧈㧉㧊㧋㧌㧍㧎㧏㧐㧑㧒㧓㧔㧕㧖㧗㧘㧙㧚㧛㧜㧝㧞㧟㧠㧡㧢㧣㧤㧥㧦㧧㧨㧩㧪㧫㧬㧭㧮㧯㧰㧱㧲㧳㧴㧵㧶㧷㧸㧹㧺㧻㧼㧽㧾㧿㨀㨁㨂㨃㨄㨅㨆㨇㨈㨉㨊㨋㨌㨍㨎㨏㨐㨑㨒㨓㨔㨕㨖㨗㨘㨙㨚㨛㨜㨝㨞㨟㨠㨡㨢㨣㨤㨥㨦㨧㨨㨩㨪㨫㨬㨭㨮㨯㨰㨱㨲㨳㨴㨵㨶㨷㨸㨹㨺㨻㨼㨽㨾㨿㩀㩁㩂㩃㩄㩅㩆㩇㩈㩉㩊㩋㩌㩍㩎㩏㩐㩑㩒㩓㩔㩕㩖㩗㩘㩙㩚㩛㩜㩝㩞㩟㩠㩡㩢㩣㩤㩥㩦㩧㩨㩩㩪㩫㩬㩭㩮㩯㩰㩱㩲㩳㩴㩵㩶㩷㩸㩹㩺㩻㩼㩽㩾㩿㪀㪁㪂㪃㪄㪅㪆㪇㪈㪉㪊㪋㪌㪍㪎㪏㪐㪑㪒㪓㪔㪕㪖㪗㪘㪙㪚㪛㪜㪝㪞㪟㪠㪡㪢㪣㪤㪥㪦㪧㪨㪩㪪㪫㪬㪭㪮㪯㪰㪱㪲㪳㪴㪵㪶㪷㪸㪹㪺㪻㪼㪽㪾㪿㫀㫁㫂㫃㫄㫅㫆㫇㫈㫉㫊㫋㫌㫍㫎㫏㫐㫑㫒㫓㫔㫕㫖㫗㫘㫙㫚㫛㫜㫝㫞㫟㫠㫡㫢㫣㫤㫥㫦㫧㫨㫩㫪㫫㫬㫭㫮㫯㫰㫱㫲㫳㫴㫵㫶㫷㫸㫹㫺㫻㫼㫽㫾㫿㬀㬁㬂㬃㬄㬅㬆㬇㬈㬉㬊㬋㬌㬍㬎㬏㬐㬑㬒㬓㬔㬕㬖㬗㬘㬙㬚㬛㬜㬝㬞㬟㬠㬡㬢㬣㬤㬥㬦㬧㬨㬩㬪㬫㬬㬭㬮㬯㬰㬱㬲㬳㬴㬵㬶㬷㬸㬹㬺㬻㬼㬽㬾㬿㭀㭁㭂㭃㭄㭅㭆㭇㭈㭉㭊㭋㭌㭍㭎㭏㭐㭑㭒㭓㭔㭕㭖㭗㭘㭙㭚㭛㭜㭝㭞㭟㭠㭡㭢㭣㭤㭥㭦㭧㭨㭩㭪㭫㭬㭭㭮㭯㭰㭱㭲㭳㭴㭵㭶㭷㭸㭹㭺㭻㭼㭽㭾㭿㮀㮁㮂㮃㮄㮅㮆㮇㮈㮉㮊㮋㮌㮍㮎㮏㮐㮑㮒㮓㮔㮕㮖㮗㮘㮙㮚㮛㮜㮝㮞㮟㮠㮡㮢㮣㮤㮥㮦㮧㮨㮩㮪㮫㮬㮭㮮㮯㮰㮱㮲㮳㮴㮵㮶㮷㮸㮹㮺㮻㮼㮽㮾㮿㯀㯁㯂㯃㯄㯅㯆㯇㯈㯉㯊㯋㯌㯍㯎㯏㯐㯑㯒㯓㯔㯕㯖㯗㯘㯙㯚㯛㯜㯝㯞㯟㯠㯡㯢㯣㯤㯥㯦㯧㯨㯩㯪㯫㯬㯭㯮㯯㯰㯱㯲㯳㯴㯵㯶㯷㯸㯹㯺㯻㯼㯽㯾㯿㰀㰁㰂㰃㰄㰅㰆㰇㰈㰉㰊㰋㰌㰍㰎㰏㰐㰑㰒㰓㰔㰕㰖㰗㰘㰙㰚㰛㰜㰝㰞㰟㰠㰡㰢㰣㰤㰥㰦㰧㰨㰩㰪㰫㰬㰭㰮㰯㰰㰱㰲㰳㰴㰵㰶㰷㰸㰹㰺㰻㰼㰽㰾㰿㱀㱁㱂㱃㱄㱅㱆㱇㱈㱉㱊㱋㱌㱍㱎㱏㱐㱑㱒㱓㱔㱕㱖㱗㱘㱙㱚㱛㱜㱝㱞㱟㱠㱡㱢㱣㱤㱥㱦㱧㱨㱩㱪㱫㱬㱭㱮㱯㱰㱱㱲㱳㱴㱵㱶㱷㱸㱹㱺㱻㱼㱽㱾㱿㲀㲁㲂㲃㲄㲅㲆㲇㲈㲉㲊㲋㲌㲍㲎㲏㲐㲑㲒㲓㲔㲕㲖㲗㲘㲙㲚㲛㲜㲝㲞㲟㲠㲡㲢㲣㲤㲥㲦㲧㲨㲩㲪㲫㲬㲭㲮㲯㲰㲱㲲㲳㲴㲵㲶㲷㲸㲹㲺㲻㲼㲽㲾㲿㳀㳁㳂㳃㳄㳅㳆㳇㳈㳉㳊㳋㳌㳍㳎㳏㳐㳑㳒㳓㳔㳕㳖㳗㳘㳙㳚㳛㳜㳝㳞㳟㳠㳡㳢㳣㳤㳥㳦㳧㳨㳩㳪㳫㳬㳭㳮㳯㳰㳱㳲㳳㳴㳵㳶㳷㳸㳹㳺㳻㳼㳽㳾㳿㴀㴁㴂㴃㴄㴅㴆㴇㴈㴉㴊㴋㴌㴍㴎㴏㴐㴑㴒㴓㴔㴕㴖㴗㴘㴙㴚㴛㴜㴝㴞㴟㴠㴡㴢㴣㴤㴥㴦㴧㴨㴩㴪㴫㴬㴭㴮㴯㴰㴱㴲㴳㴴㴵㴶㴷㴸㴹㴺㴻㴼㴽㴾㴿㵀㵁㵂㵃㵄㵅㵆㵇㵈㵉㵊㵋㵌㵍㵎㵏㵐㵑㵒㵓㵔㵕㵖㵗㵘㵙㵚㵛㵜㵝㵞㵟㵠㵡㵢㵣㵤㵥㵦㵧㵨㵩㵪㵫㵬㵭㵮㵯㵰㵱㵲㵳㵴㵵㵶㵷㵸㵹㵺㵻㵼㵽㵾㵿㶀㶁㶂㶃㶄㶅㶆㶇㶈㶉㶊㶋㶌㶍㶎㶏㶐㶑㶒㶓㶔㶕㶖㶗㶘㶙㶚㶛㶜㶝㶞㶟㶠㶡㶢㶣㶤㶥㶦㶧㶨㶩㶪㶫㶬㶭㶮㶯㶰㶱㶲㶳㶴㶵㶶㶷㶸㶹㶺㶻㶼㶽㶾㶿㷀㷁㷂㷃㷄㷅㷆㷇㷈㷉㷊㷋㷌㷍㷎㷏㷐㷑㷒㷓㷔㷕㷖㷗㷘㷙㷚㷛㷜㷝㷞㷟㷠㷡㷢㷣㷤㷥㷦㷧㷨㷩㷪㷫㷬㷭㷮㷯㷰㷱㷲㷳㷴㷵㷶㷷㷸㷹㷺㷻㷼㷽㷾㷿㸀㸁㸂㸃㸄㸅㸆㸇㸈㸉㸊㸋㸌㸍㸎㸏㸐㸑㸒㸓㸔㸕㸖㸗㸘㸙㸚㸛㸜㸝㸞㸟㸠㸡㸢㸣㸤㸥㸦㸧㸨㸩㸪㸫㸬㸭㸮㸯㸰㸱㸲㸳㸴㸵㸶㸷㸸㸹㸺㸻㸼㸽㸾㸿㹀㹁㹂㹃㹄㹅㹆㹇㹈㹉㹊㹋㹌㹍㹎㹏㹐㹑㹒㹓㹔㹕㹖㹗㹘㹙㹚㹛㹜㹝㹞㹟㹠㹡㹢㹣㹤㹥㹦㹧㹨㹩㹪㹫㹬㹭㹮㹯㹰㹱㹲㹳㹴㹵㹶㹷㹸㹹㹺㹻㹼㹽㹾㹿㺀㺁㺂㺃㺄㺅㺆㺇㺈㺉㺊㺋㺌㺍㺎㺏㺐㺑㺒㺓㺔㺕㺖㺗㺘㺙㺚㺛㺜㺝㺞㺟㺠㺡㺢㺣㺤㺥㺦㺧㺨㺩㺪㺫㺬㺭㺮㺯㺰㺱㺲㺳㺴㺵㺶㺷㺸㺹㺺㺻㺼㺽㺾㺿㻀㻁㻂㻃㻄㻅㻆㻇㻈㻉㻊㻋㻌㻍㻎㻏㻐㻑㻒㻓㻔㻕㻖㻗㻘㻙㻚㻛㻜㻝㻞㻟㻠㻡㻢㻣㻤㻥㻦㻧㻨㻩㻪㻫㻬㻭㻮㻯㻰㻱㻲㻳㻴㻵㻶㻷㻸㻹㻺㻻㻼㻽㻾㻿㼀㼁㼂㼃㼄㼅㼆㼇㼈㼉㼊㼋㼌㼍㼎㼏㼐㼑㼒㼓㼔㼕㼖㼗㼘㼙㼚㼛㼜㼝㼞㼟㼠㼡㼢㼣㼤㼥㼦㼧㼨㼩㼪㼫㼬㼭㼮㼯㼰㼱㼲㼳㼴㼵㼶㼷㼸㼹㼺㼻㼼㼽㼾㼿㽀㽁㽂㽃㽄㽅㽆㽇㽈㽉㽊㽋㽌㽍㽎㽏㽐㽑㽒㽓㽔㽕㽖㽗㽘㽙㽚㽛㽜㽝㽞㽟㽠㽡㽢㽣㽤㽥㽦㽧㽨㽩㽪㽫㽬㽭㽮㽯㽰㽱㽲㽳㽴㽵㽶㽷㽸㽹㽺㽻㽼㽽㽾㽿㿀㿁㿂㿃㿄㿅㿆㿇㿈㿉㿊㿋㿌㿍㿎㿏㿐㿑㿒㿓㿔㿕㿖㿗㿘㿙㿚㿛㿜㿝㿞㿟㿠㿡㿢㿣㿤㿥㿦㿧㿨㿩㿪㿫㿬㿭㿮㿯㿰㿱㿲㿳㿴㿵㿶㿷㿸㿹㿺㿻㿼㿽㿾㿿



NEW TYPE REWIND STARTER



* Applicable to one (1) cylinder engine only.

REMOVAL

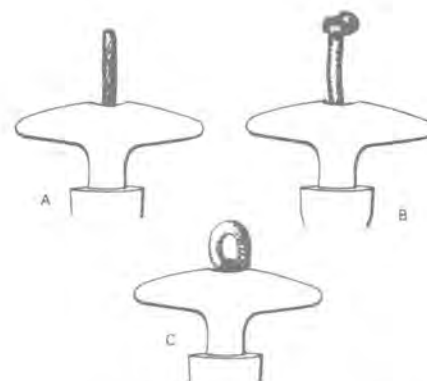
Remove the four (4) bolts and washers securing rewind starter to engine, then remove.

NOTE: On some models, the cab requires supporting before removing starter housing. The retaining cable is attached to one of the rewind starter attaching bolts.

DISASSEMBLY & ASSEMBLY

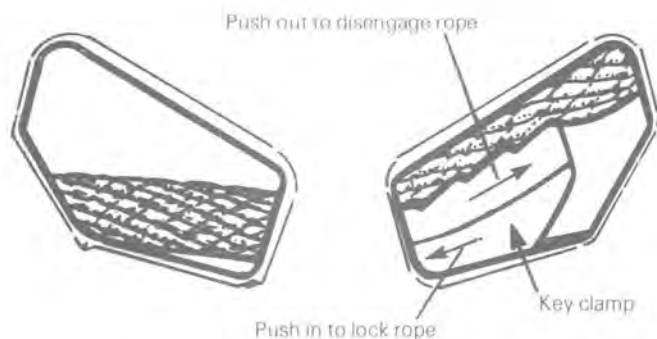
①③ Prior to installing starter grip on new rope, it is first necessary to fuse the rope end with a lite match. Pass rope through starter grip, and tie a knot in the rope end. Fuse the knot with a lite match then turn the knot down and pull the starter grip over the knot.

③⑧⑨ To remove rope from rewind starter mechanism, fully extend rope and hold rope sheave in position. Then using a pointed tool, disengage key clamp and pull rope free.



SECTION 04

SUB-SECTION 03 (REWIND STARTER)

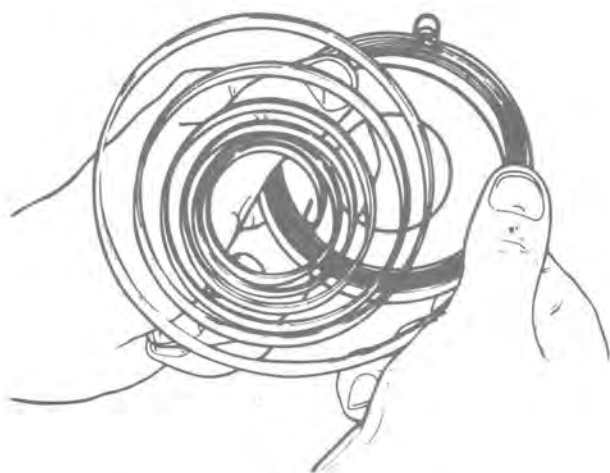


To install rope, proceed as follows:

- Rotate sheave counter-clockwise six (6) turns to achieve correct recoil tension. Hold in position.
- While holding sheave under tension, rotate sheave until the starter housing orifice and sheave orifice align.
- Insert rope through both orifices until rope is visible in the key clamp housing.
- Position the key clamp in its housing then push in to lock the rope.

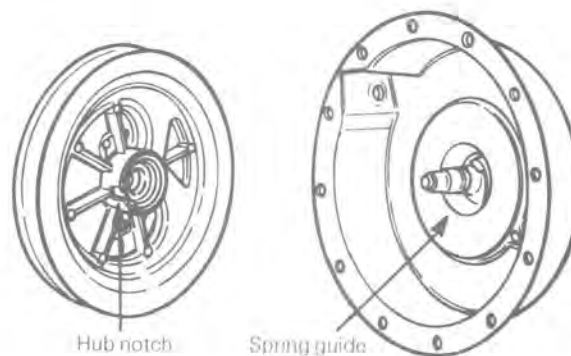
④ ⑤ ⑥ ⑦ At assembly, position spring outer end into spring guide notch then wind the spring clockwise into guide.

WARNING: Since the spring is tightly wound inside the guide it may fly out when the guide is manipulated. Always handle with care.

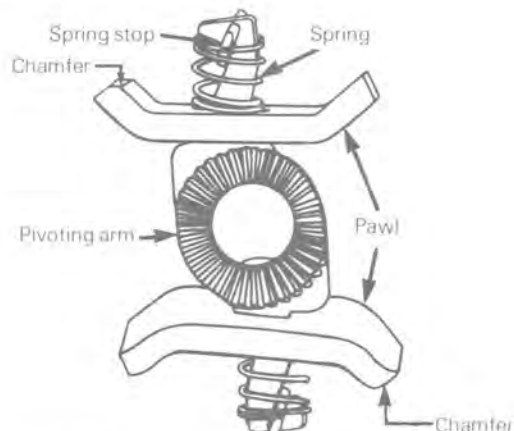


Before installing spring ass'y into starter housing, lubricate spring with light machine oil. Also apply low temperature grease on sheave bushing.

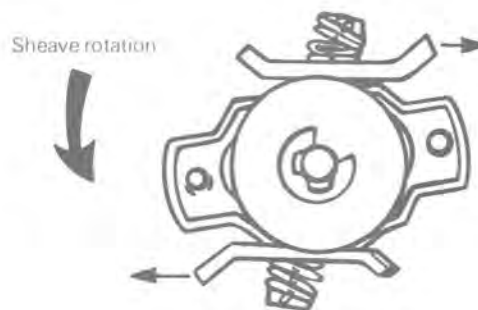
Position spring assembly into starter housing as illustrated, then place rope sheave into starter housing making sure that the sheave hub notch engages in the spring hook.



⑪ ⑬ ⑭ ⑮ Position pawls, springs and spring stops on pivoting arm as illustrated.



Install and secure pivoting arm assembly within rope sheave hub, making sure that the assembly moves clockwise when the rope sheave is turned counter-clockwise.



Reinstall pawl guide onto hub.

INSTALLATION

Reinstall rewind starter on engine and secure with previously removed bolts and washers.

NOTE: If applicable, connect cab retaining cable to one (1) of the starter housing bolts.

TWO CYLINDER ENGINE — BREAKER POINTS TYPE

FOREWORD

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

GROUP 1: engine types 248, 294

These engines do not incorporate an automatic advance mechanism. The ignition timing marks on the magneto ring are stamped at the full advance position.

GROUP 2: engine types 338, 401, 434

343 prior to serial no. 2 670 920

440 prior to serial no. 2 748 146

640 prior to serial no. 2 637 301

These engines incorporate an automatic advance mechanism. The ignition timing marks on the magneto ring are stamped at the **no advance** position.

GROUP 3: engine types 305

343 from serial no. 2 670 921

440 from serial no. 2 748 147

640 from serial no. 2 637 302

346 and 436 from 1977

These engines incorporate an automatic advance mechanism. The ignition timing marks on the magneto ring are stamped at the **full advance** position. Therefore, when setting the ignition timing **always hold the centrifugal lever at the full advance position.**

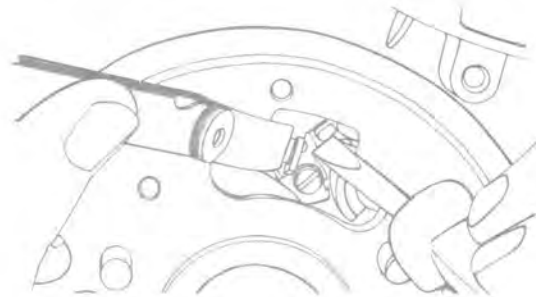
Two methods are detailed in this section; the first using the timing marks stamped on the engine, the second using a T.D.C. gauge.

TIMING MARKS PROCEDURE

1. Disconnect spark plug wires and remove spark plugs.
2. Remove rewind starter assembly from engine then remove the fan protector, starting pulley and "V" belt.

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

3. Rotate crankshaft until breaker points, visible through magneto ring opening, are fully open. Adjust points setting to 0.40 mm 0.05 (.016" .002) using a feeler gauge and screwdriver, as illustrated. Repeat procedure for other set of points. **Adjust both side equally.**

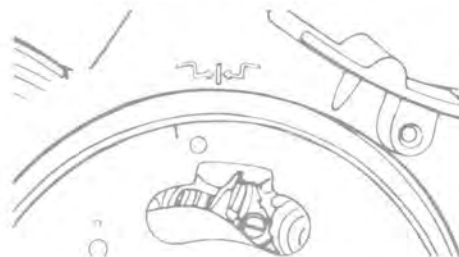


NOTE: Breaker points gap can change upon tightening. Always recheck after tightening.

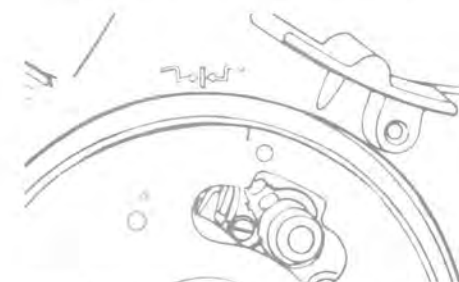
4. Disconnect junction block at engine then connect one lead of a timing light (flashlight type or of a tone timer), to the blue wire (mag. side) leading from engine. Connect other wire to fan cowl (ground).

NOTE: On group III engines, hold centrifugal lever in the open position (toward magneto rim) while performing steps 5, 6 and 7).

5. Slacken the two (2) armature plate retaining screws and turn timing instrument ON. Rotate crankshaft until mag. side piston approaches top dead center and timing marks align. Rotate armature plate until timing light fluctuates or tone signal level varies. Retighten retaining screws.
6. Ignition timing can change upon tightening therefore, rotate the magneto counter-clockwise $\frac{1}{4}$ 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



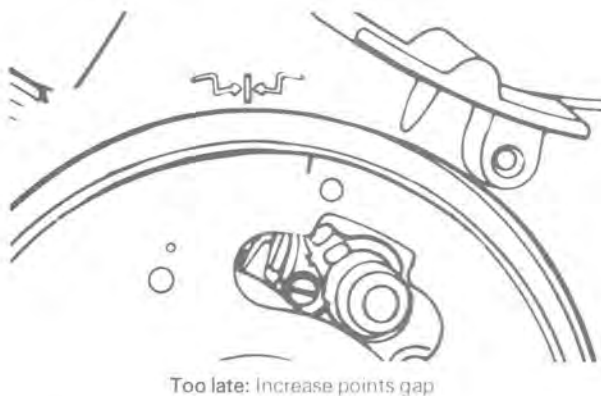
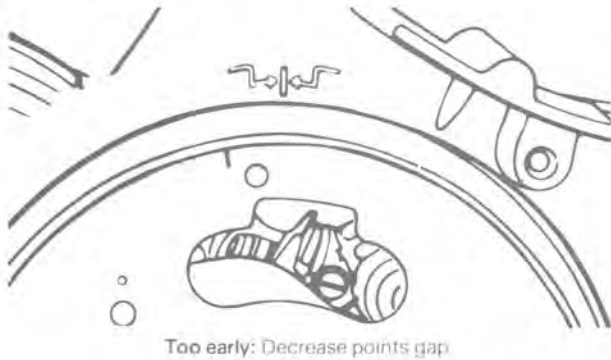
Too late: Turn armature plate counter-clockwise

SECTION 04

SUB-SECTION 04 (IGNITION TIMING)

7. Disconnect timing instrument wire from blue wire then reconnect it to the blue / red wire (P.T.O. side) leading from engine. Rotate crankshaft until P.T.O. side piston approaches top dead center. As soon as timing marks align timing light should fluctuate, or tone signal sound level should vary. If necessary to adjust proceed as follows:

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



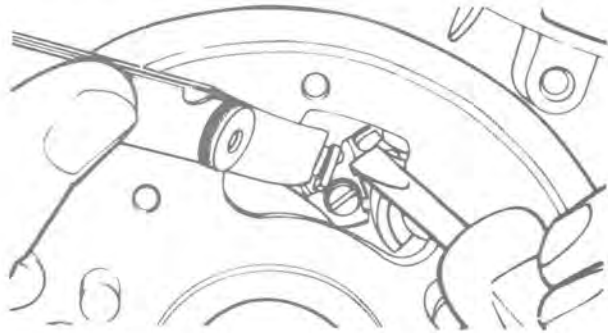
TDC GAUGE PROCEDURE

1. Disconnect spark plug wires and remove spark plugs.
2. Remove rewind starter assembly from engine then remove the fan protector, starting pulley and "V" belt.

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

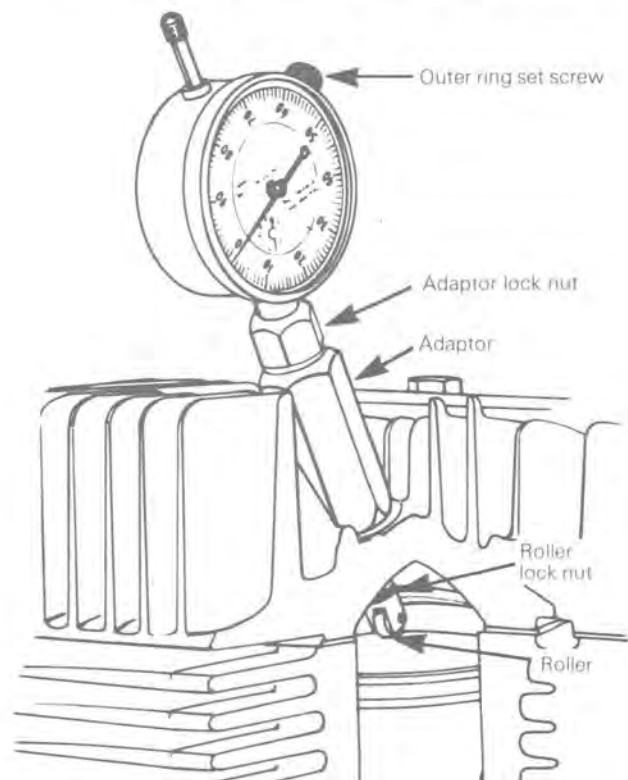
3. Rotate crankshaft until breaker points, visible through magneto ring opening are fully open. Adjust points setting to $0.40 \text{ mm} \pm 0.05$ (.016" \pm .002) using a feeler gauge and screwdriver, as illustrated.

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



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

4. Disconnect junction block at engine then connect one lead of a timing light (flashlight type or a tone timer), to the blue wire (mag. side) leading from engine. Connect other wire to fan cowl (ground).
5. Install and adjust T.D.C. gauge on engine as follows.
 - Rotate magneto until mag. side piston is just before top dead center.
 - With gauge in adaptor, adjust roller so that it is parallel with dial face. Tighten roller lock nut.



- Loosen adaptor lock nut then holding gauge with dial face toward magneto, screw adaptor in mag. side spark plug hole.
 - Slide gauge far enough into adaptor to obtain a reading then finger tighten adaptor lock nut.
 - Rotate magneto until mag. side piston is at Top Dead Center.
 - Unlock outer ring of dial and turn it until "0" on dial aligns with pointer.
 - Lock outer ring in position.
6. Slacken the two (2) armature plate retaining screws and turn timing instrument ON.

Rotate magneto counter-clockwise until specified piston position before top dead center is reached. (Refer to Technical Data Section). Hold advance mechanism centrifugal lever in full advance position (toward magneto ring) then slowly rotate armature plate until timing light fluctuates or until tone signal sound level varies. Retighten retaining screws.

- **NOTE:** Ignition timing can change upon tightening. Always recheck after tightening.
7. Disconnect timing instrument wire from blue wire then reconnect it to the blue / red wire leading from engine. Remove T.D.C. gauge from mag. side and reinstall it on P.T.O. side, as previously detailed.

8. Hold centrifugal lever in full advance position (toward magneto rim) and rotate crankshaft until P.T.O. piston approaches T.D.C. As soon as **same** specified piston position before top dead center as on mag. side is reached the timing light should fluctuate or tone signal level vary. If necessary to adjust proceed as follows:

With centrifugal lever in full advance position and piston at specified position, slacken lower breaker points set retaining screw then readjust breaker points gap until light fluctuates or tone signal level varies.

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

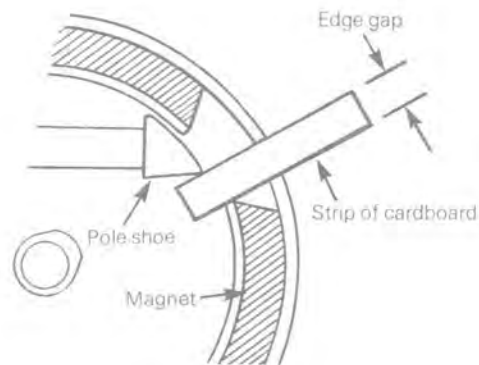
- **NOTE:** Breaker points gap can change upon tightening. Always recheck after tightening.

EDGE GAP VERIFICATION

By following either of the procedures mentioned herein the edge gap will automatically be adjusted, however, if the edge gap is to be verified, proceed as follows:

- From timing marks, rotate magneto clockwise ¼ of a turn. Hold advance mechanism centrifugal weight in the open position (toward magneto rim) then slowly turn magneto back counter-clockwise until timing light fluctuates or until tone signal sound level varies.

At this point check the distance between pole shoe trailing edge and magnet (edge gap), with a strip of cardboard of appropriate width (Refer to Technical Data Section).



- **NOTE:** Repeat same operation for second cylinder.

If edge gap is more or less than specified the problem lies within engine internal components (crankshaft out of alignment, broken woodruff key, loose breaker cam, etc.). Corrective measures should be applied.



C.D. IGNITION

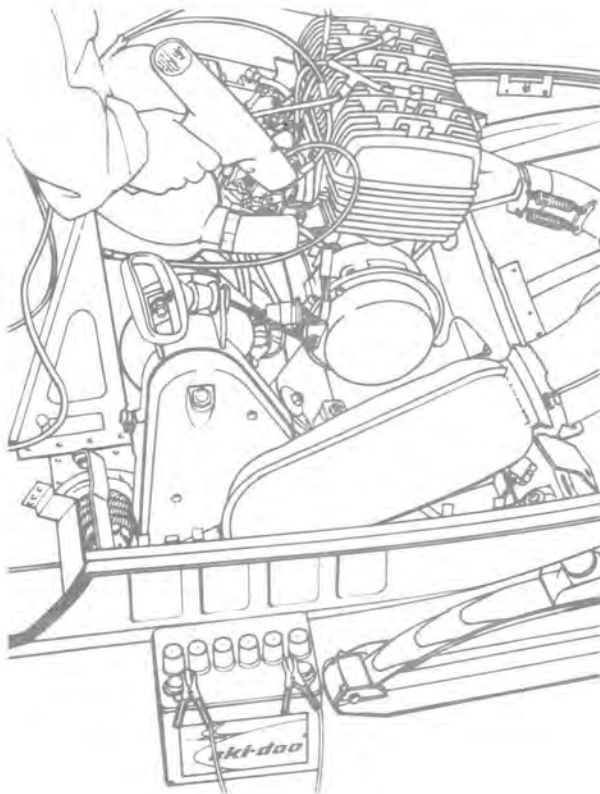
FOREWORD

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

A stroboscopic timing light such as Sun PTL 45, Snap-On MT215B, Bosch EFAW 169A, or a suitable equivalent, plus a 12 volt battery are needed.

PROCEDURE

Place skis tips against a wall. Use a support incorporating protective guard to block vehicle off the ground. (Approx. 15 cm (6") between track and floor). Remove rubber plug from upper crankcase half. Connect an operating timing light to magneto side spark plug wire.

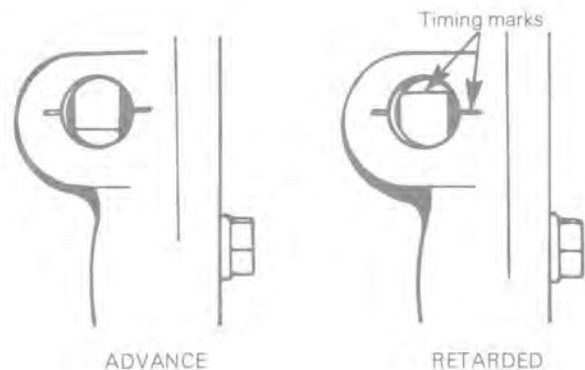


WARNING: Ensure that no one will pass behind the vehicle, even momentarily, while timing engine. Also, make sure that pulley guard is in position and that track is clear of tools, clothes, etc.

Start engine. The magneto ring / crankcase timing marks should coincide when full advance is obtained. Full advance is at 6,000 RPM.

CAUTION: Running the engine unnecessarily will cause premature slider shoe wear.

If the timing marks do not coincide, remove rewind starter and starting pulley. Slacken off the two (2) Allen capscrews securing the armature plate. Rotate plate clockwise if timing is advanced, counter-clockwise if timing is retarded.



Once timing is correct on Mag. side, release throttle, apply the brake and turn off the ignition. Connect timing light to P.T.O. side spark plug wire. Start engine and check if P.T.O. timing coincides with Mag. side timing.

If timing does not coincide, install a T.D.C. gauge into P.T.O. spark plug hole. Scribe true marks on magneto rings at lower and upper timing limits B.T.D.C. (Refer to Technical Data). Repeat for other cylinder.

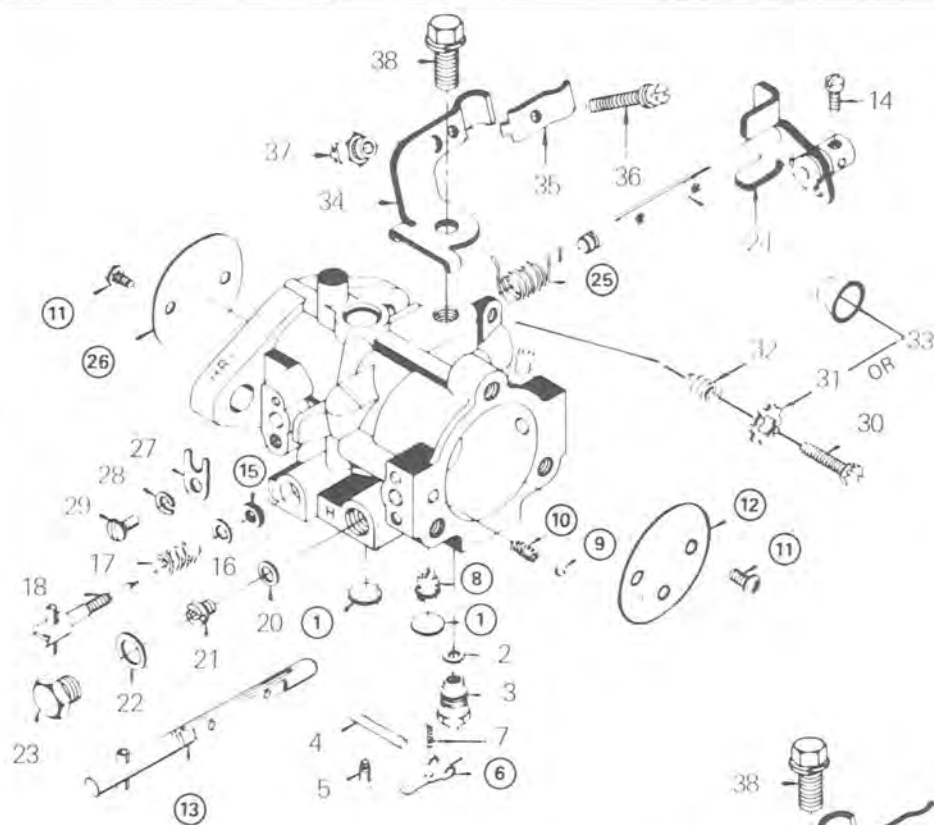
Position armature plate so that both cylinders fire within specified tolerance.



Page 1 of 1



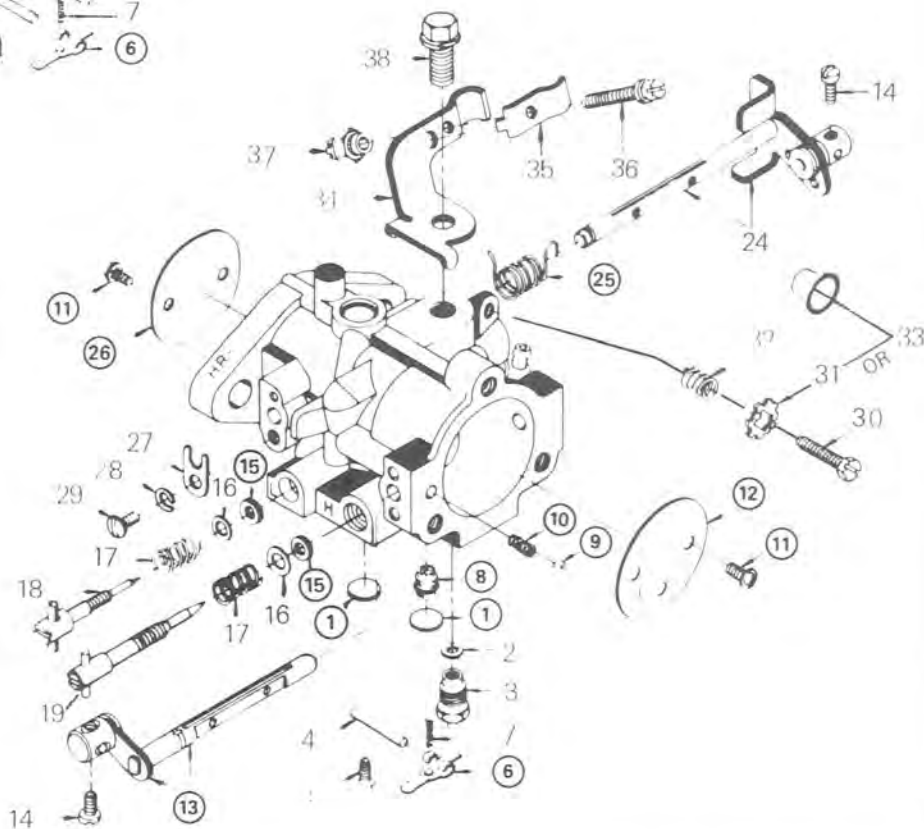
TILLOTSON HR TYPE



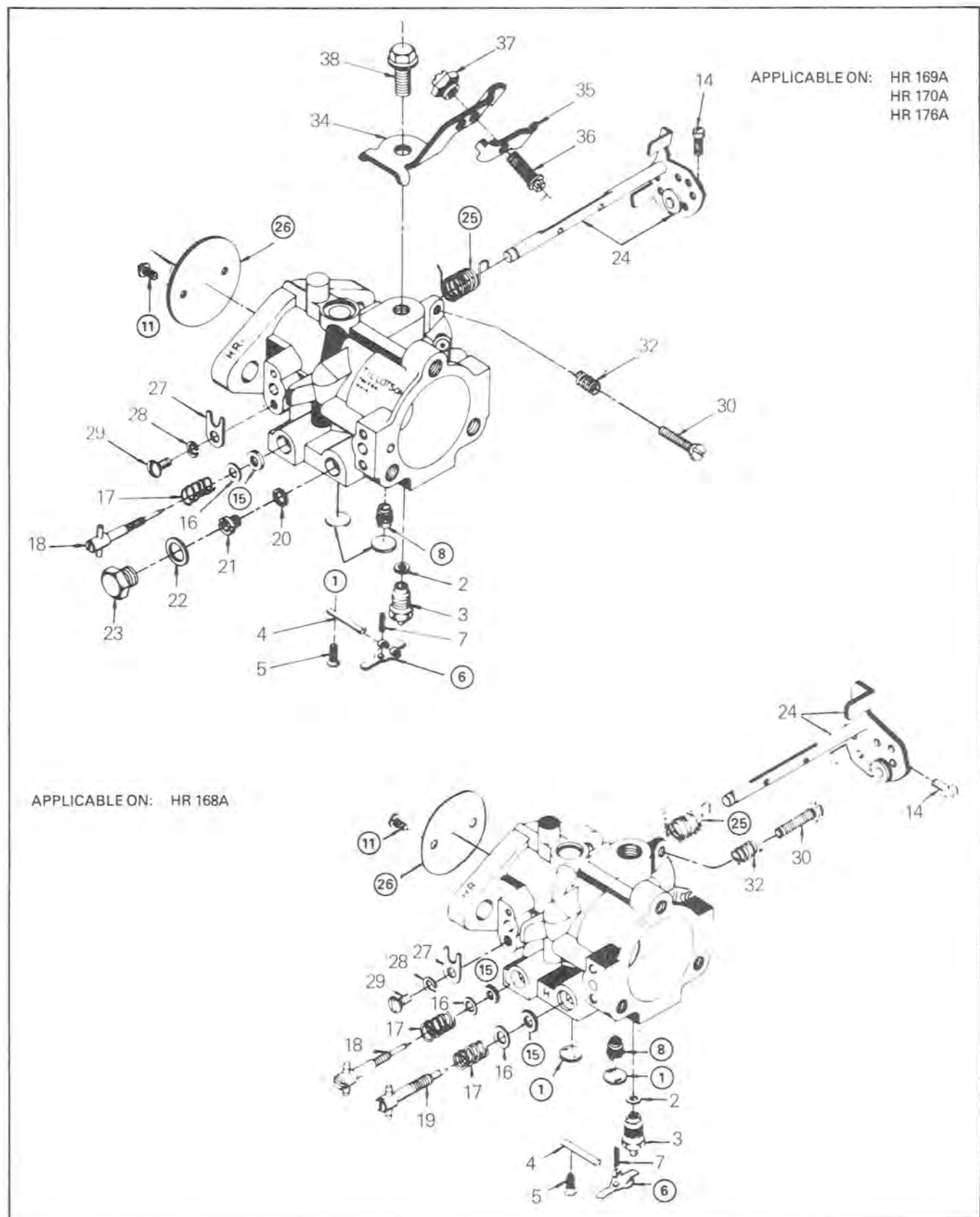
APPLICABLE ON: HR 131A
HR 133A
HR 134A
HR 135A
HR 155A
HR 161A
HR 165A
HR 166A
HR 172A
HR 173A
*HR 174A

* except no. 9, 10, 11, 12, 13

APPLICABLE ON: HR 132A
HR 149A
HR 164A



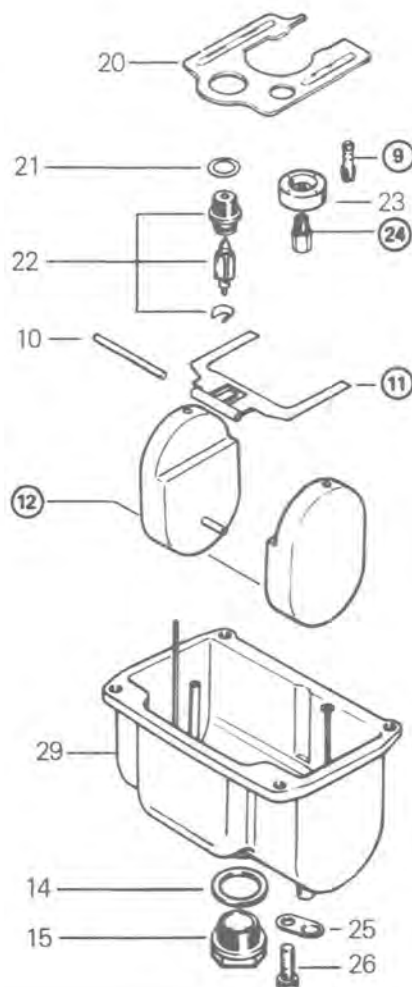
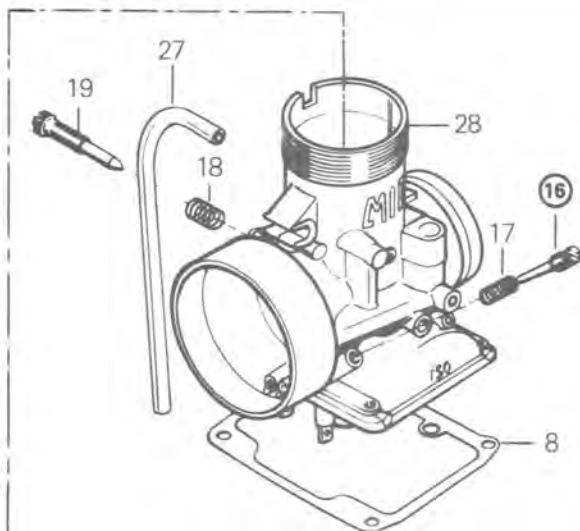
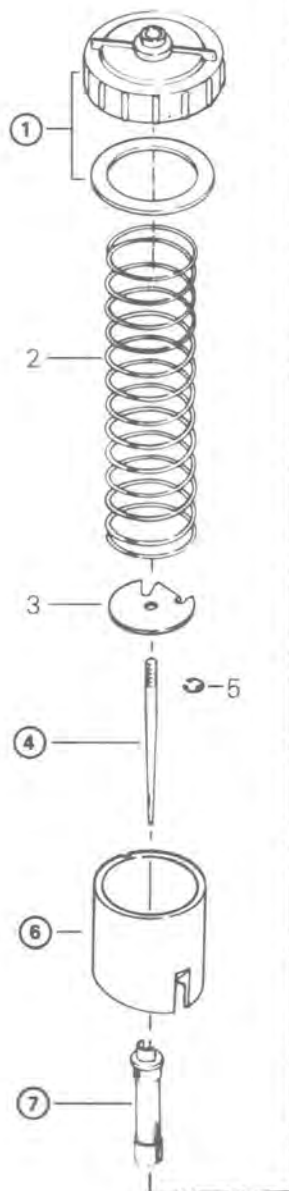
SECTION 04
SUB-SECTION 05 (CARBURETOR)



MIKUNI CARBURETOR

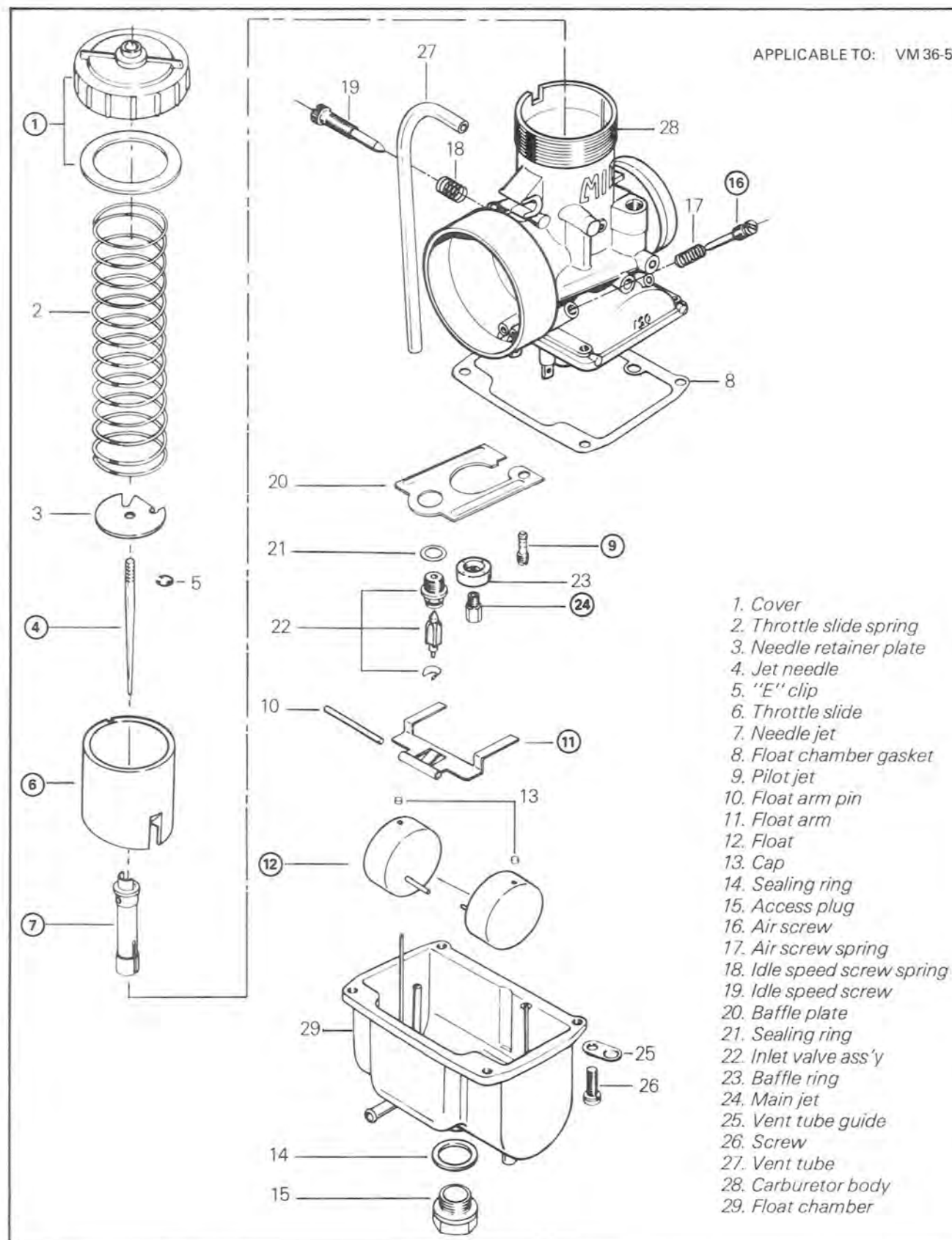
APPLICABLE TO: VM 30-90
VM 30-91
VM 32-113
VM 34-110
VM 34-118

1. Cover
2. Throttle slide spring
3. Needle retainer plate
4. Jet needle
5. "E" clip
6. Throttle slide
7. Needle jet
8. Float chamber gasket
9. Pilot jet
10. Float arm pin
11. Float arm
12. Float
13. Cap
14. Sealing ring
15. Access plug
16. Air screw
17. Air screw spring
18. Idle speed screw spring
19. Idle speed screw
20. Baffle plate
21. Sealing ring
22. Inlet valve ass'y
23. Baffle ring
24. Main jet
25. Vent tube guide
26. Screw
27. Vent tube
28. Carburetor body
29. Float chamber

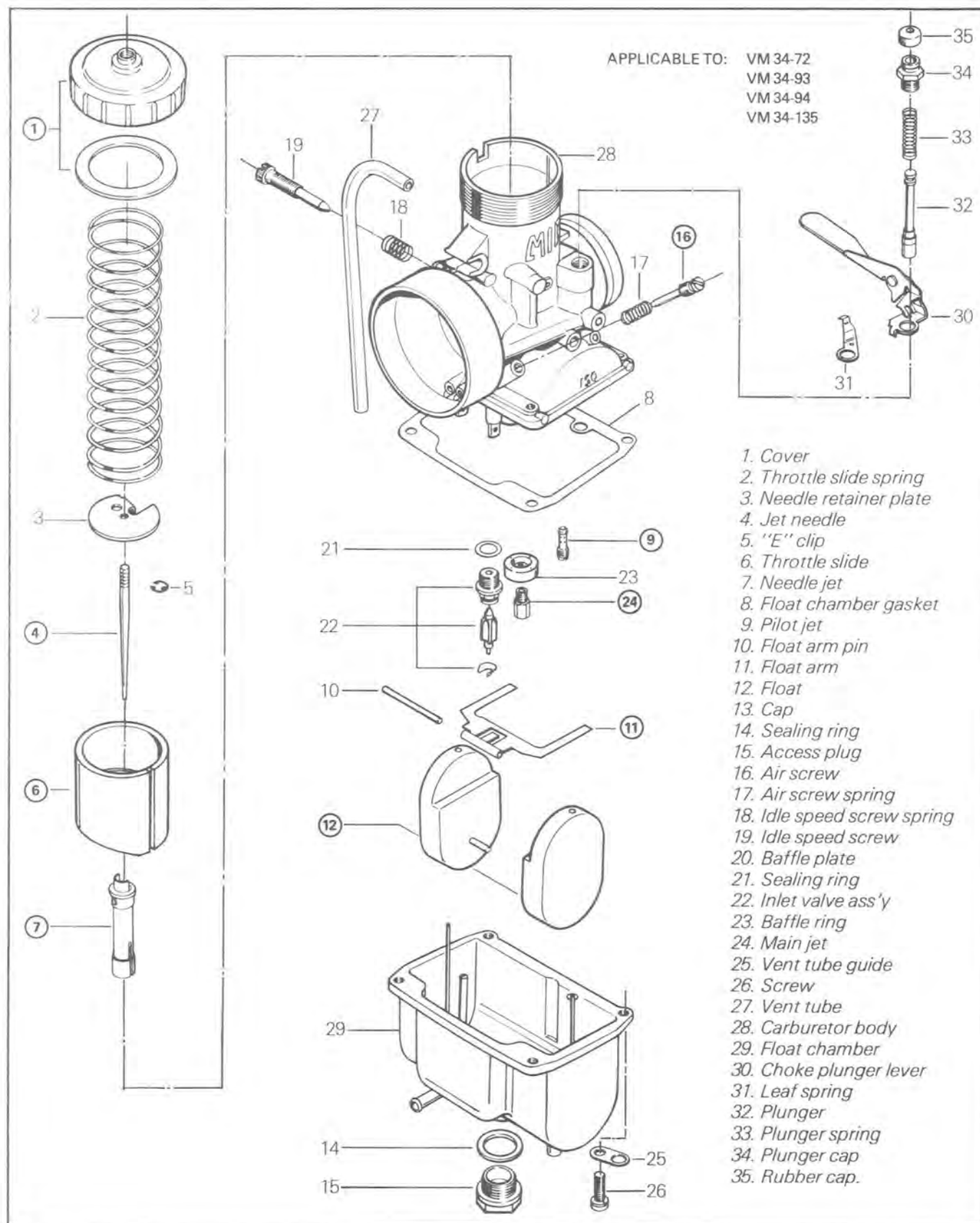


SECTION 04
SUB-SECTION 05 (CARBURETOR)

APPLICABLE TO: VM36-53



SECTION 04
SUB-SECTION 05 (CARBURETOR)



REMOVAL

Remove air silencer box, fuel line and primer line.

Unscrew carburetor cover then pull out throttle slide ass'y from carburetor.

CAUTION: Exercise care when handling throttle slide. Scratches incurred may cause throttle slide to stick open in operation.

Untighten rubber flange clamp then remove carburetor from engine.

CLEANING & INSPECTION

The entire carburetor should be cleaned with a general solvent and dried with compressed air before disassembly.

Carburetor body and jets should be cleaned in a carburetor cleaner following manufacturer's instructions.

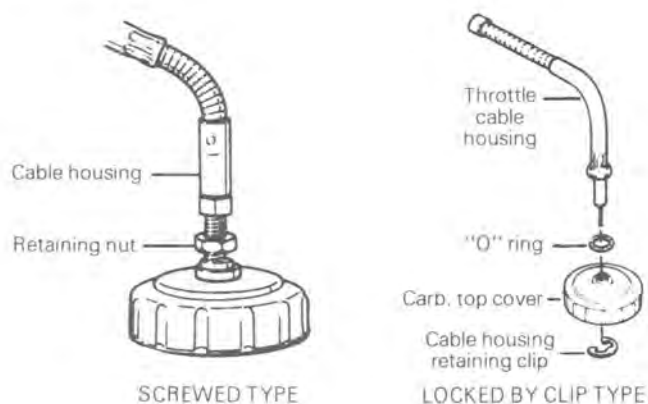
WARNING: Solvent with a low flash point such as gasoline, naphtha, benzol, etc., should not be used as they are flammable and explosive.

Check inlet needle tip condition. If worn, the inlet needle and seat must be replaced as a matched set.

Check throttle slide for wear. Replace as necessary.

DISASSEMBLY & ASSEMBLY

① Two types of carburetor cover and throttle cable are used.



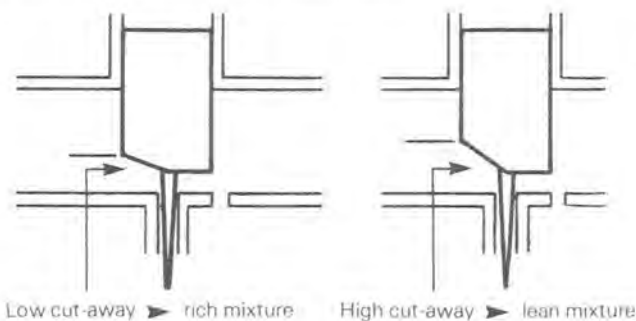
④ ⑥ ⑦ ⑨ ⑫ ⑮ ⑲ Refer to Technical Data (08, 04-05) for exact calibration of carburetor.

④ The position of the needle in the throttle slide is adjustable by means of an "E" clip inserted into one of 5 grooves located on the upper part of the needle. Position 1 is the leanest, 5 the richest.

Example:

6DH4 - 2
needle ——— ↑ ↑ ↑ Position of the "E" clip identification from top.

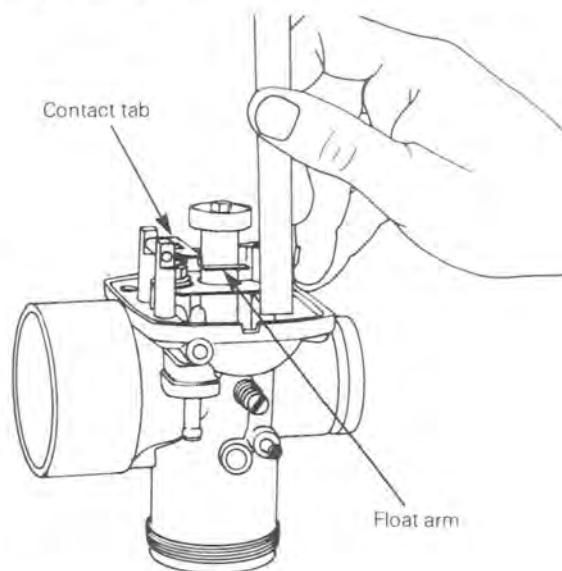
⑥ The size of the throttle slide cut-away affects the fuel mixture between 0 to $\frac{3}{4}$ throttle opening. A certain amount of richness is needed for that particular range because this is where the transition from the low speed to the high speed circuit takes place.



⑳ The Main Jet installed in the carburetor is suitable for a wide range of temperature (-30° to 5° C) (-20° to 40° F) at sea level. However, different jetting is available. Always check spark plug tip color to find out correct jetting.

⑪ ⑫ Correct fuel level in float chamber is vital toward maximum engine efficiency. To check for correct level, proceed as follows:

- Remove float chamber and gasket from carburetor.
- With carburetor upside-down, measure height between float chamber flange rib and top edge of float arm.
- To adjust bend contact tab of float arm until specified height is reached.



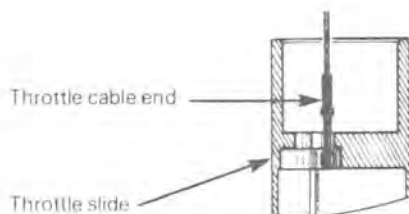
CARBURETOR	FLOAT HEIGHT ± 0.1 mm (.004")
VM 30-32-34	23.6 mm (.930")
VM 36-38	17.8 mm (.700")

INSTALLATION

To install carburetor(s) on engine, inverse removal procedure.

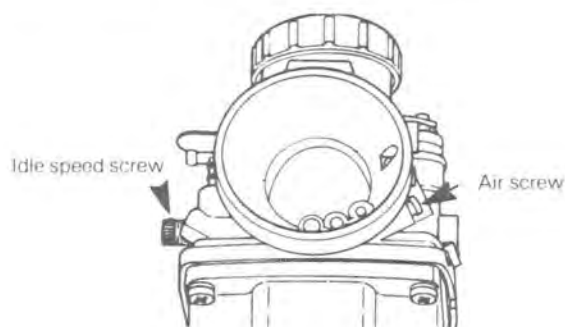
However, pay attention to the following:

- Apply a thin layer of silicone sealant between carburetor rubber flange and intake cover on engine.
- Apply Loctite Lock'n Seal 242 on bolts retaining rubber flange to intake cover.
- When installing throttle cable end in throttle slide, hook-up cable by using the stopper at the extremity of the cable.



CARBURETOR ADJUSTMENT

Refer to Technical Data (08, 04-05) for specifications.



Air Screw Adjustment

Completely close the air screw until a slight seating resistance is felt then back off to specifications.

Throttle Slide Adjustment

Completely open (counter-clockwise) the idle speed screw, unlock cable adjuster lock nut then adjust the throttle cable to remove all slack when operating throttle control lever. Lock cable adjuster in position by tightening the adjuster lock nut.

Idle Speed Adjustment

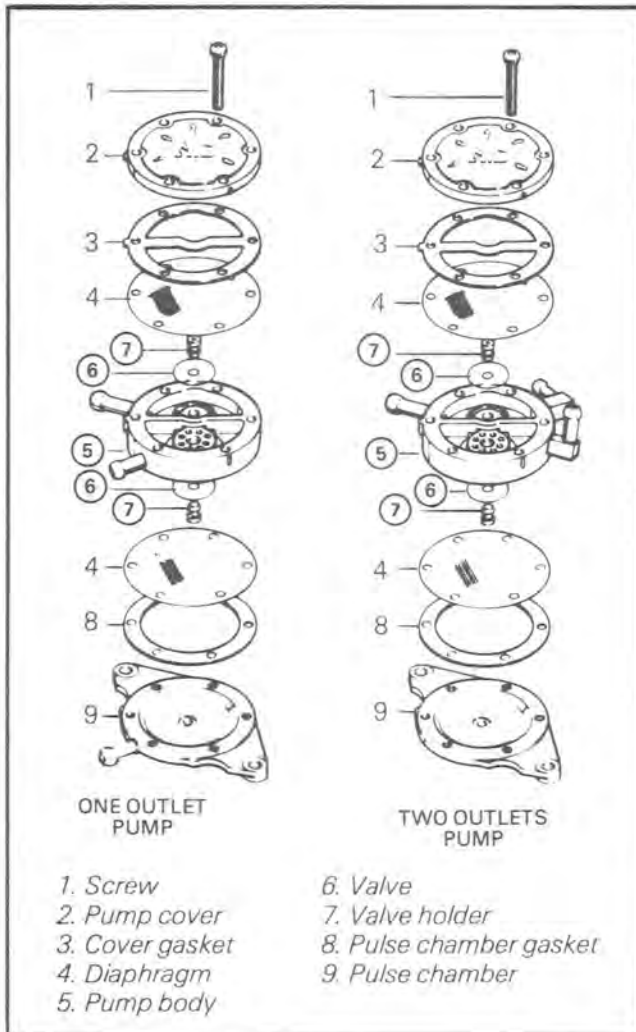
Turn idle speed screw clockwise until it contacts the throttle slide then continue turning two (2) additional turns. This will provide a preliminary idle speed setting. Start engine and allow it to warm then adjust idle speed to specifications by turning idle speed screw clockwise or counter-clockwise.

CAUTION: Do not attempt to set the idle speed by using the air screw. Severe engine damage can occur.

NOTE: The high speed jet installed in the carburetor is suitable for a wide range of temperatures (-30 to 5° C) (-20 to 40° F) at sea level. However, different jetting is available. Always check spark plug tip color to find out correct jetting.



INDEPENDENT FUEL PUMP MIKUNI TYPE



REMOVAL

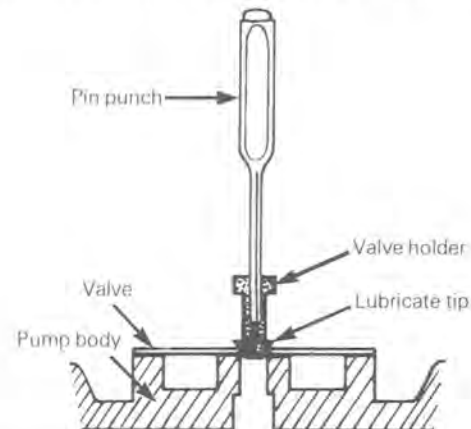
- Disconnect fuel inlet line at fuel pump then secure fuel line to steering support so that the open end is located higher than the fuel tank.
- Disconnect fuel outlet line(s).
- Disconnect pulsation line.
- Remove nuts and bolts securing fuel pump.

DISASSEMBLY & ASSEMBLY

⑤⑥⑦ Do not disassemble valve unless replacement is indicated.

To install a new valve, proceed as follows:

- Place new valve flat on its seat.
- Insert a $\frac{3}{32}$ " pin punch inside valve holder and lubricate tip of holder with a drop of oil.
- Push holder into carburetor body as illustrated.



CLEANING & INSPECTION

The entire pump should be cleaned with general purpose solvent before disassembly.

Fuel pump components should be cleaned in general purpose solvent and dried with compressed air.

WARNING: Solvent with a low flash point such as gasoline, naphta, benzol, etc., should not be used as each is flammable and explosive.

Inspect diaphragm. The pumping area should be free of holes or imperfections. Replace as needed.

Check fuel pump valves operation as follows:

Connect a length of clean plastic tubing to the inlet nipple and alternately apply pressure and vacuum with the mouth. The inlet valve should release with pressure and hold under vacuum.

Repeat the same procedure at the outlet nipple. This time the outlet valve should hold with pressure and release under vacuum.

○ **NOTE:** On model fitted with two outlets, plug one outlet with finger while checking outlet valve.

INSTALLATION

To install, inverse removal procedure.



ELECTRICAL CHARTS INDEX

Year	Model	Chart No.	Headlamp Watt	Tail Light Watt
1974	Elan 250	1	60 / 60	8 / 23
1974	Elan 250E	3	35 / 35	8 / 23
1974	Elan 250 Deluxe, 294 SS	4	35 / 35	5 / 18
1974	Olympique 300	2	60 / 60	8 / 23
1974	Olympique 340, 400, 440	5	60 / 60	8 / 23
1974	Olympique 340E, 440E	6	35 / 35	8 / 23
1974	T'NT 300 SM	4	35 / 35	5 / 18
1974	T'NT 340SM, 440SM, Everest	7	60 / 60	5 / 18
1974	T'NT 340SE, 440SE	8	60 / 60	5 / 18
1974	T'NT F / A 340, 400, 440	9	60 / 60	5 / 18
1974	Nordic 640 ER	10	60 / 60	8 / 23
1974	Alpine 440 ER	11	35 / 35	8 / 23
1974	Alpine 640 ER	12	35 / 35	8 / 23
1974	Elite 440 ER	13	35 / 35	5 / 18
1975	Elan 250	3	60 / 60*	8 / 23
1975	Elan 250 Deluxe, 300 SS	20	35 / 35	5 / 18
1975	Olympique 300-340	15	60 / 60	5 / 18
1975	Olympique 300E - 340E	16	60 / 60	5 / 18
1975	T'NT 340-440	23	60 / 60	5 / 18
1975	T'NT 340E - 440E	22	60 / 60	5 / 18
1975	T'NT Everest 440	17	60 / 60	5 / 18
1975	T'NT Everest 440E	18	60 / 60	5 / 18
1975	T'NT F / A 340 - 440	19	60 / 60	5 / 18
1975	T'NT R / V 245	21	60 / 60	5 / 18
1975	Alpine 640 ER	14	60 / 60	8 / 23
1975	Elite 440 ER	13	35 / 35	5 / 18
1976	Elan 250 (up to se. no. 3013 0399 in).	3	60 / 60*	8 / 23
1976	Elan 250 (from se. no 3013 03999)	24	60 / 60	8 / 23
1976	Elan 250 Deluxe	20	45 / 45	5 / 18
1976	Olympique 300 single	25	60 / 60	5 / 18
1976	Olympique 300 - 340	15	60 / 60	5 / 18
1976	Olympique 300E - 340E	16	60 / 60	5 / 18
1976	Olympique Plus 440	26	60 / 60	5 / 18
1976	T'NT 340	23	60 / 60	5 / 18
1976	T'NT 340E	22	60 / 60	5 / 18
1976	Everest 440	23	60 / 60	5 / 18
1976	Everest 440E	22	60 / 60	5 / 18
1976	T'NT R / V 250-340	28	60 / 60	5 / 18
1976	Alpine 640 ER	27	60 / 60	5 / 18
1977	Elan 250	29	60 / 60	5 / 18
1977	Elan 250 Deluxe	30	45 / 45	5 / 18
1977	Olympique 300 Mono	25	60 / 60	5 / 18
1977	Olympique 300 Twin, 340, 440	31	60 / 60	5 / 18

SECTION 05
SUB-SECTION 01 (ELECTRICAL CHARTS)

Year	Model	Chart No.	Headlamp Watt	Tail Light Watt
1977	Olympique 340 E	32	60 / 60	5 / 18
1977	Everest 340	23	60 / 60	5 / 18
1977	Everest 340 E	33	60 / 60	5 / 18
1977	Everest 440	34	60 / 60	5 / 18
1977	Everest 440 E	35	60 / 60	5 / 18
1977	T'NT 340 & 440 F / A, 440 F / C	36	60 / 60	5 / 18
1977	RV 340	37	60 / 60	5 / 18
1977	Alpine 640 ER	38	60 / 60	5 / 18

* 35 / 35 W with electric start option

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

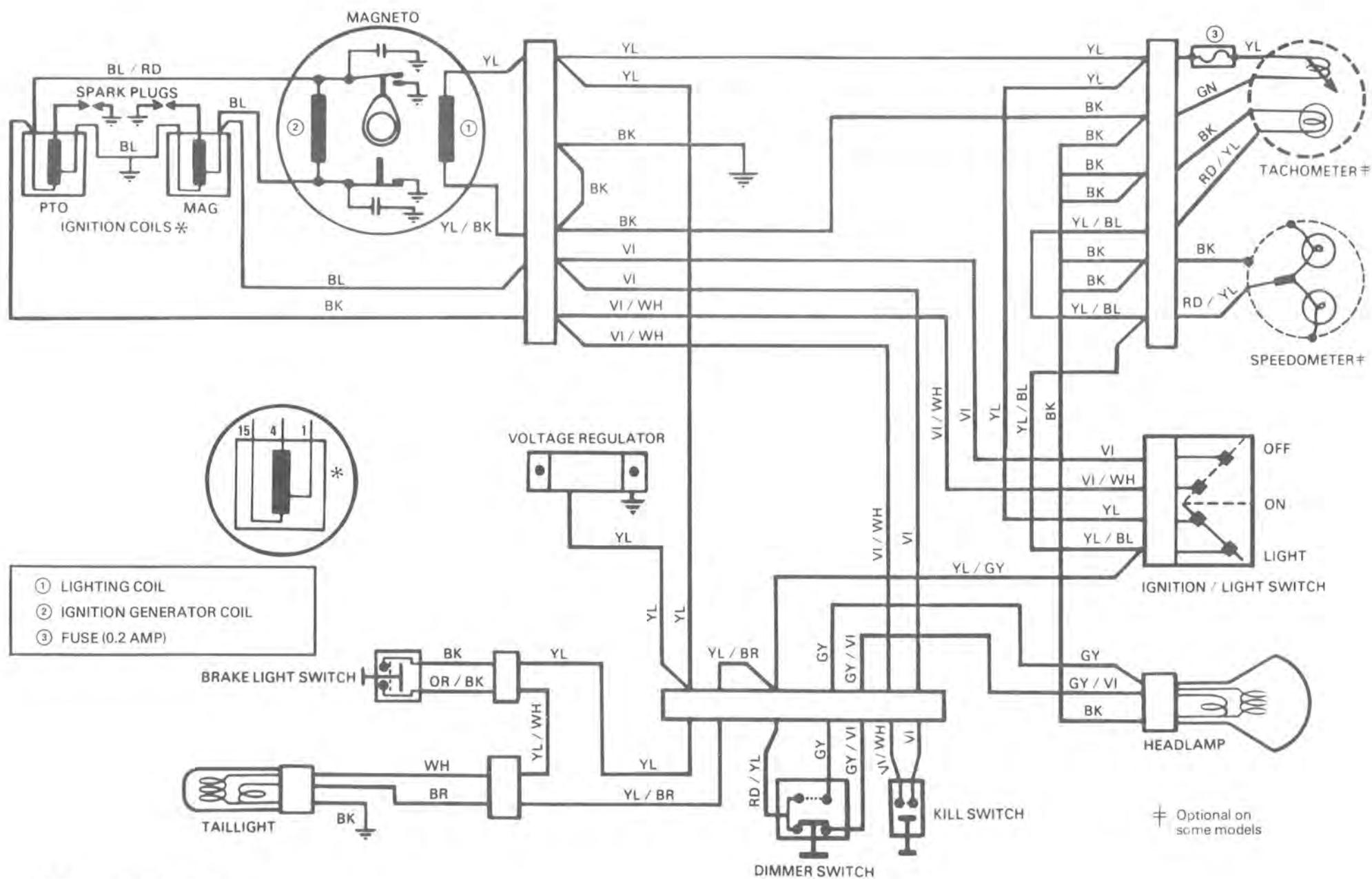


Chart 23

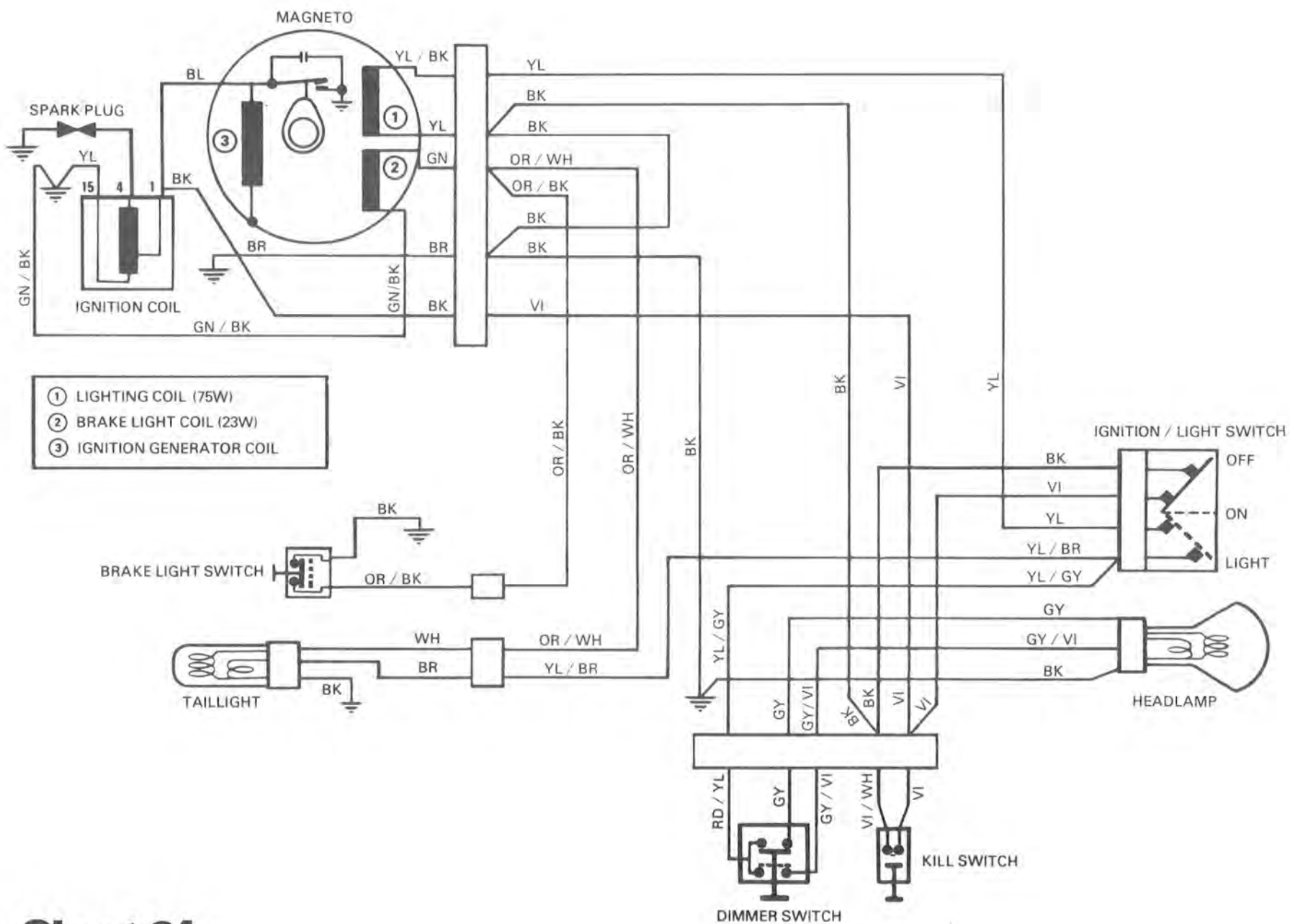


Chart 24

(1977 Supplement)

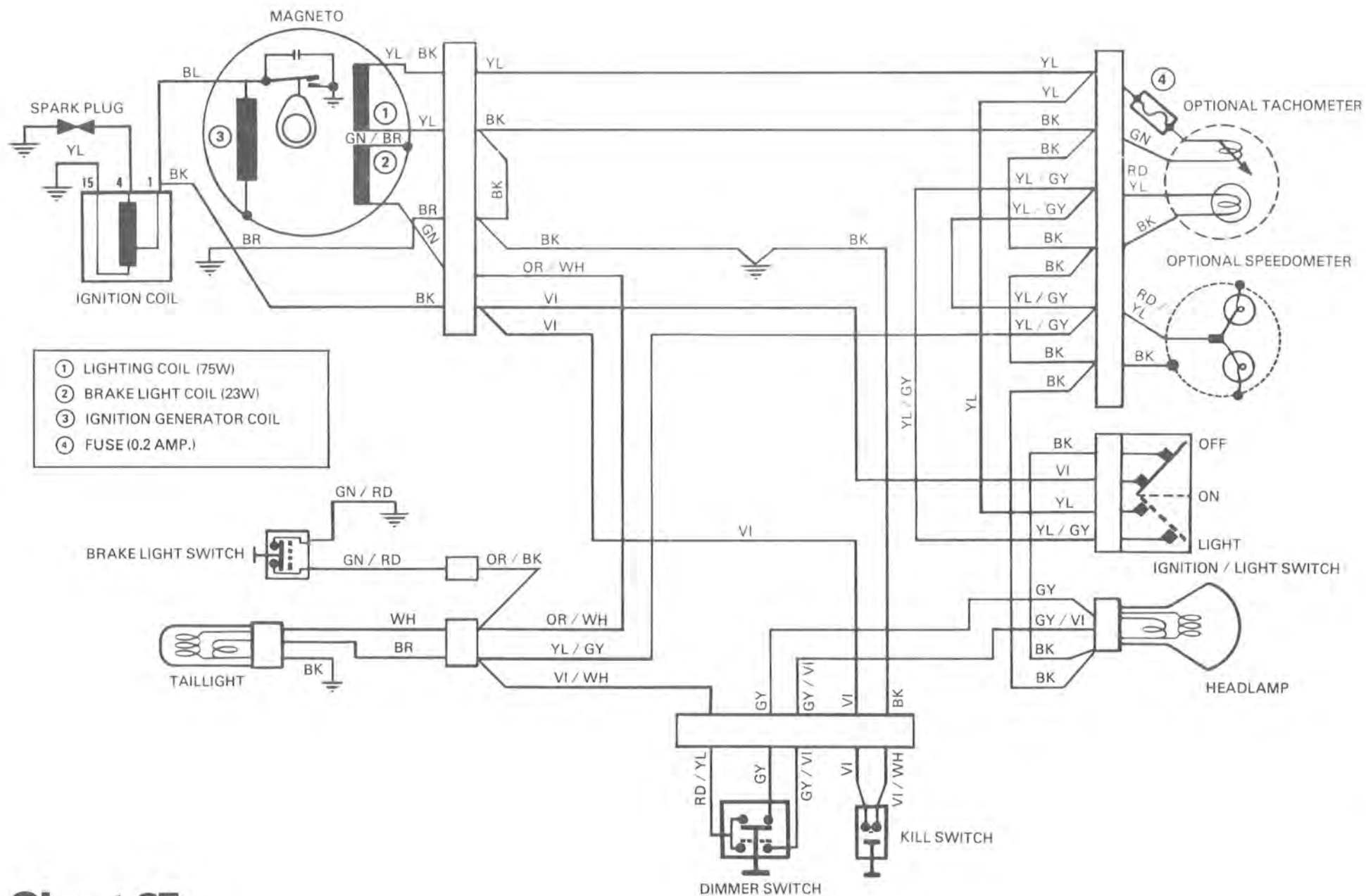


Chart 25

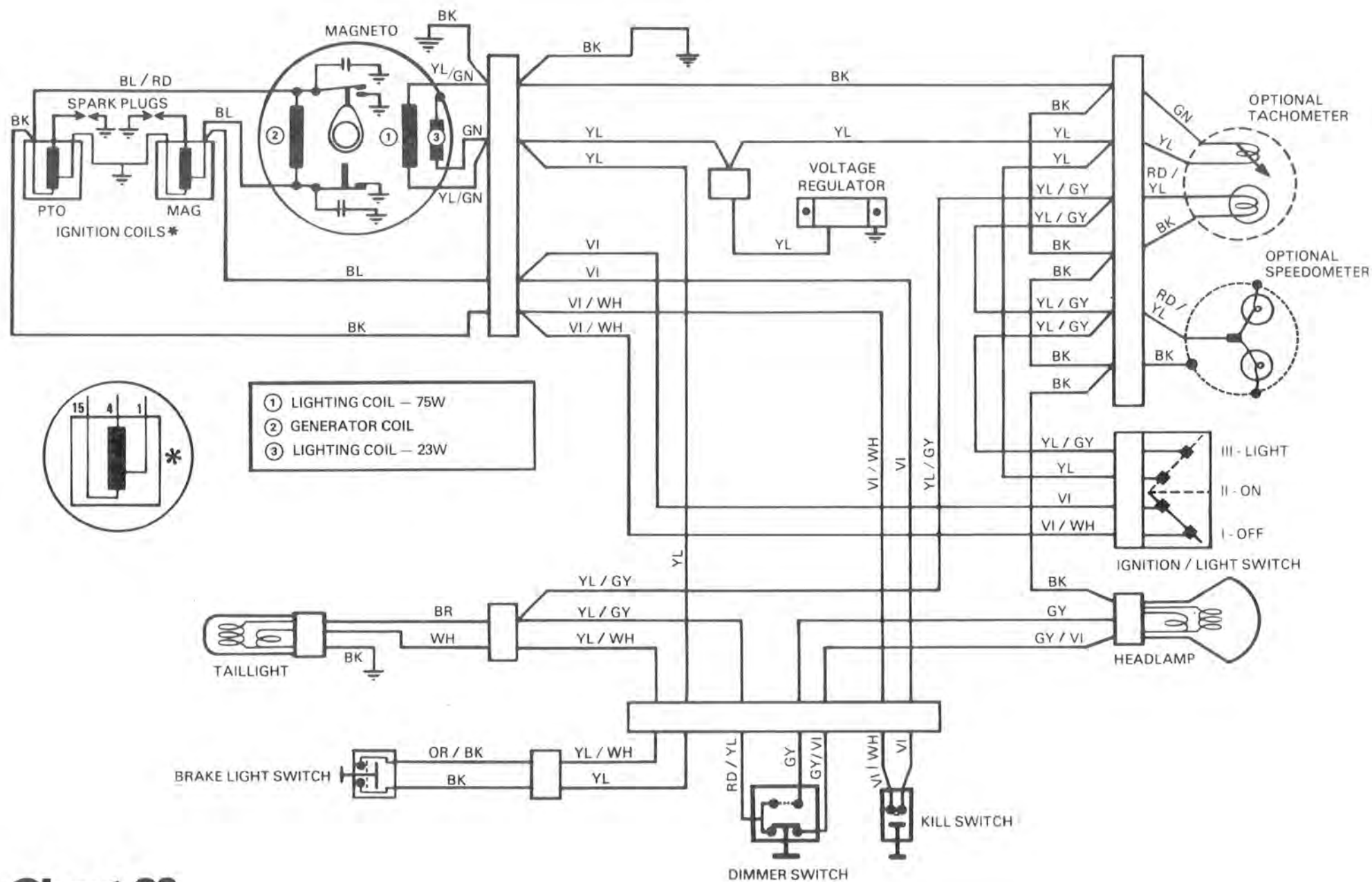


Chart 26

(1977 Supplement)

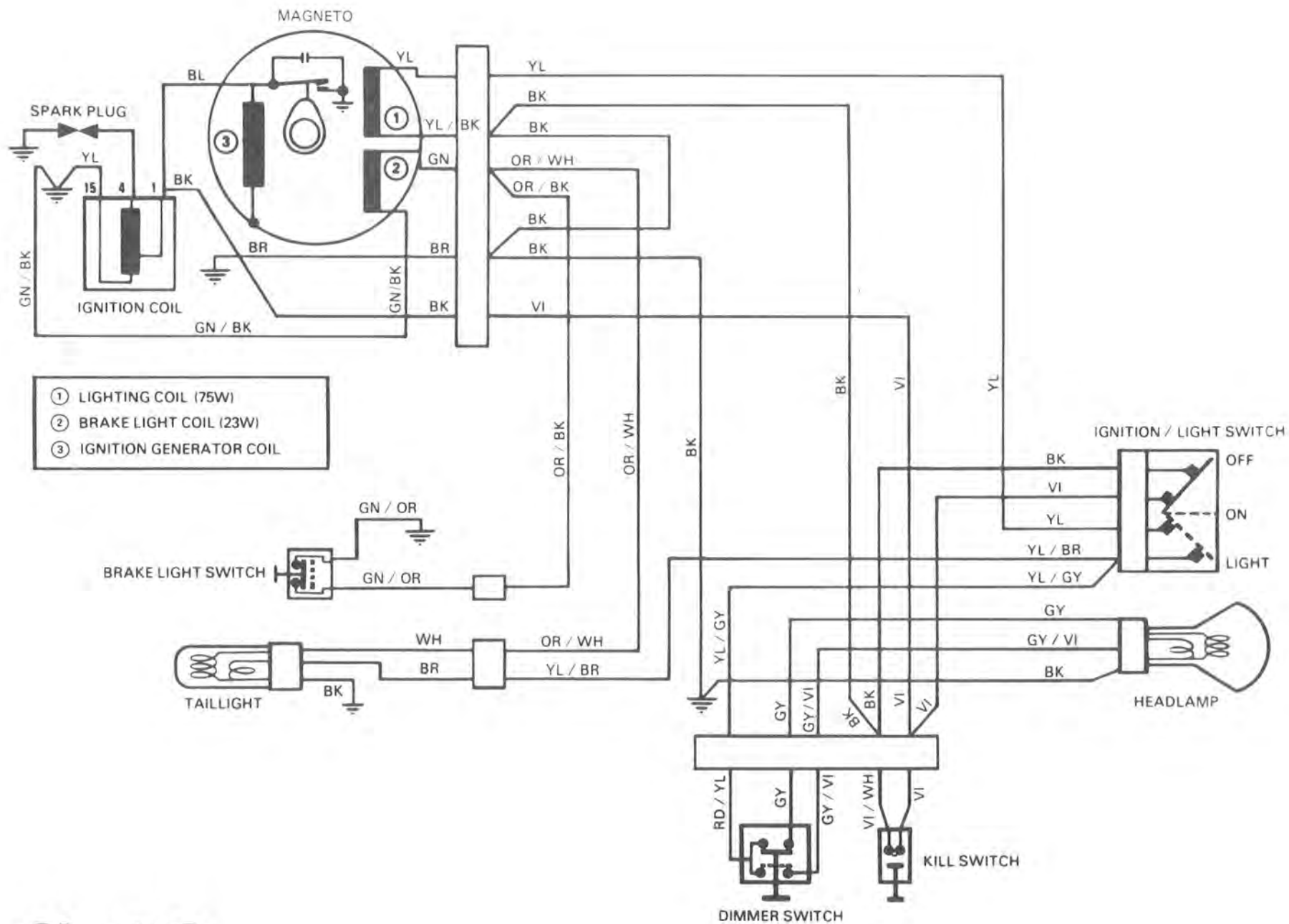


Chart 29

(1977 Supplement)

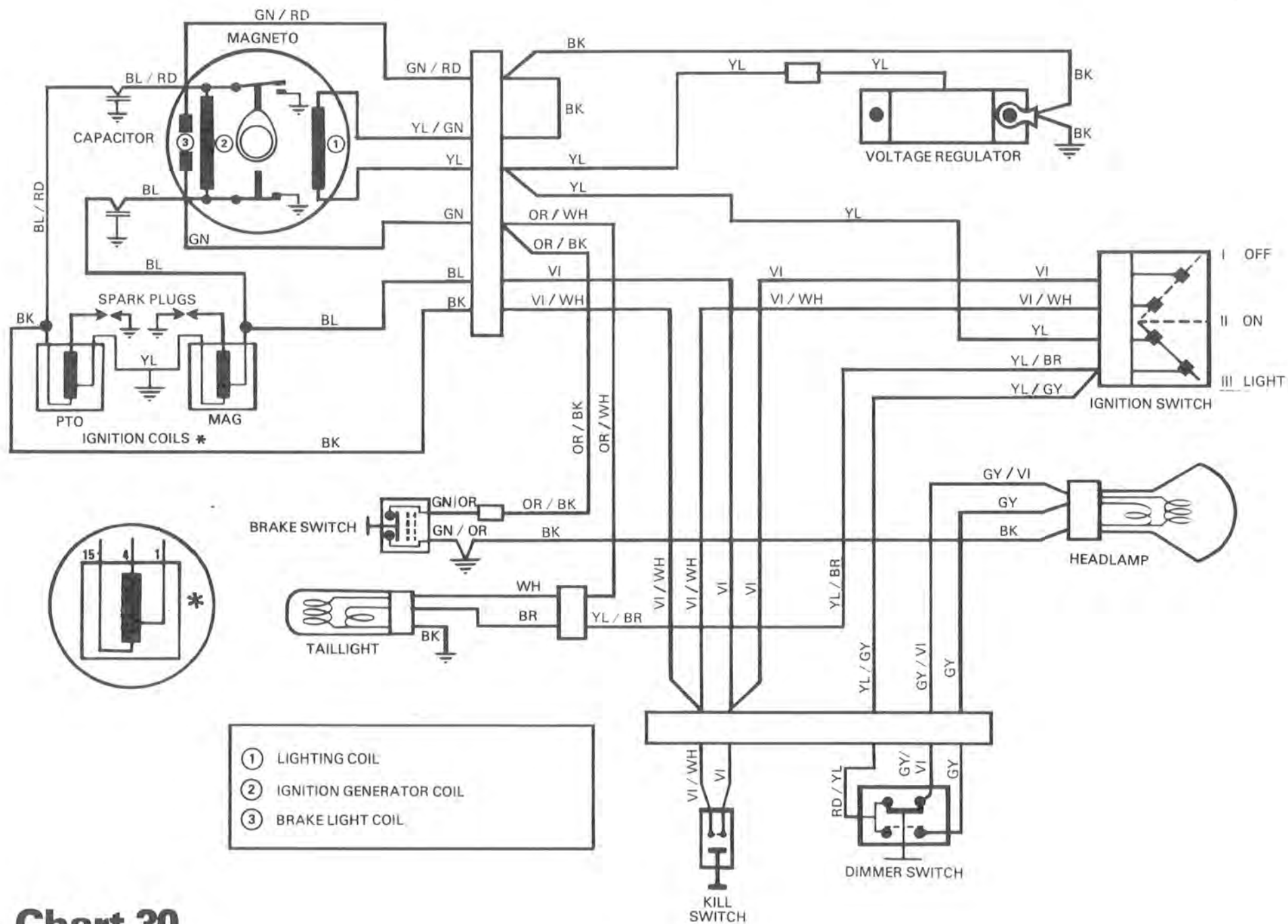


Chart 30

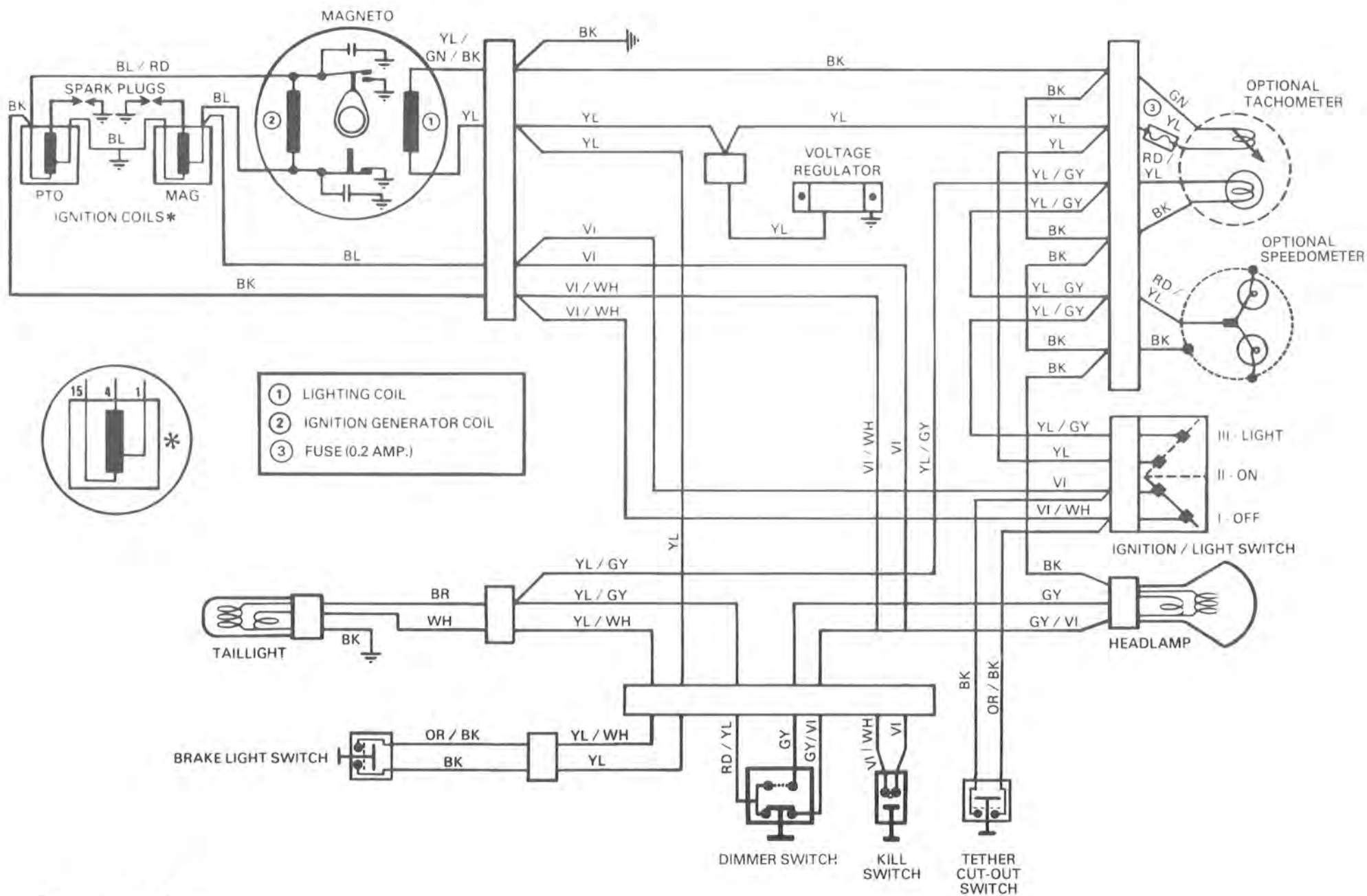
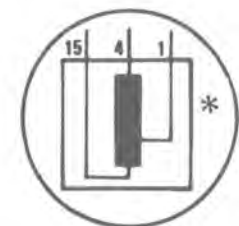


Chart 31

(1977 Supplement)



(1977 Supplement)

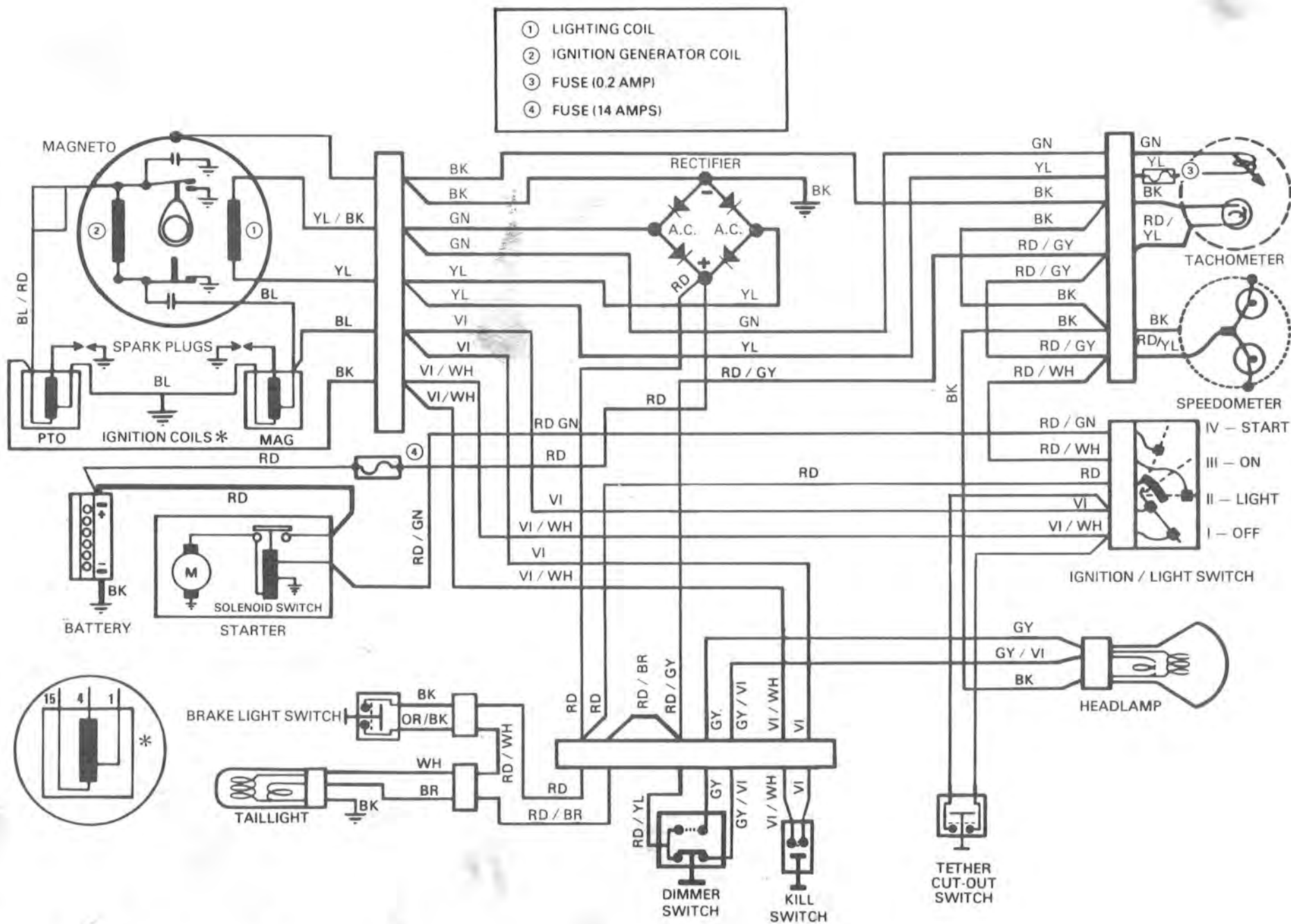


Chart 35

(1977 Supplement)

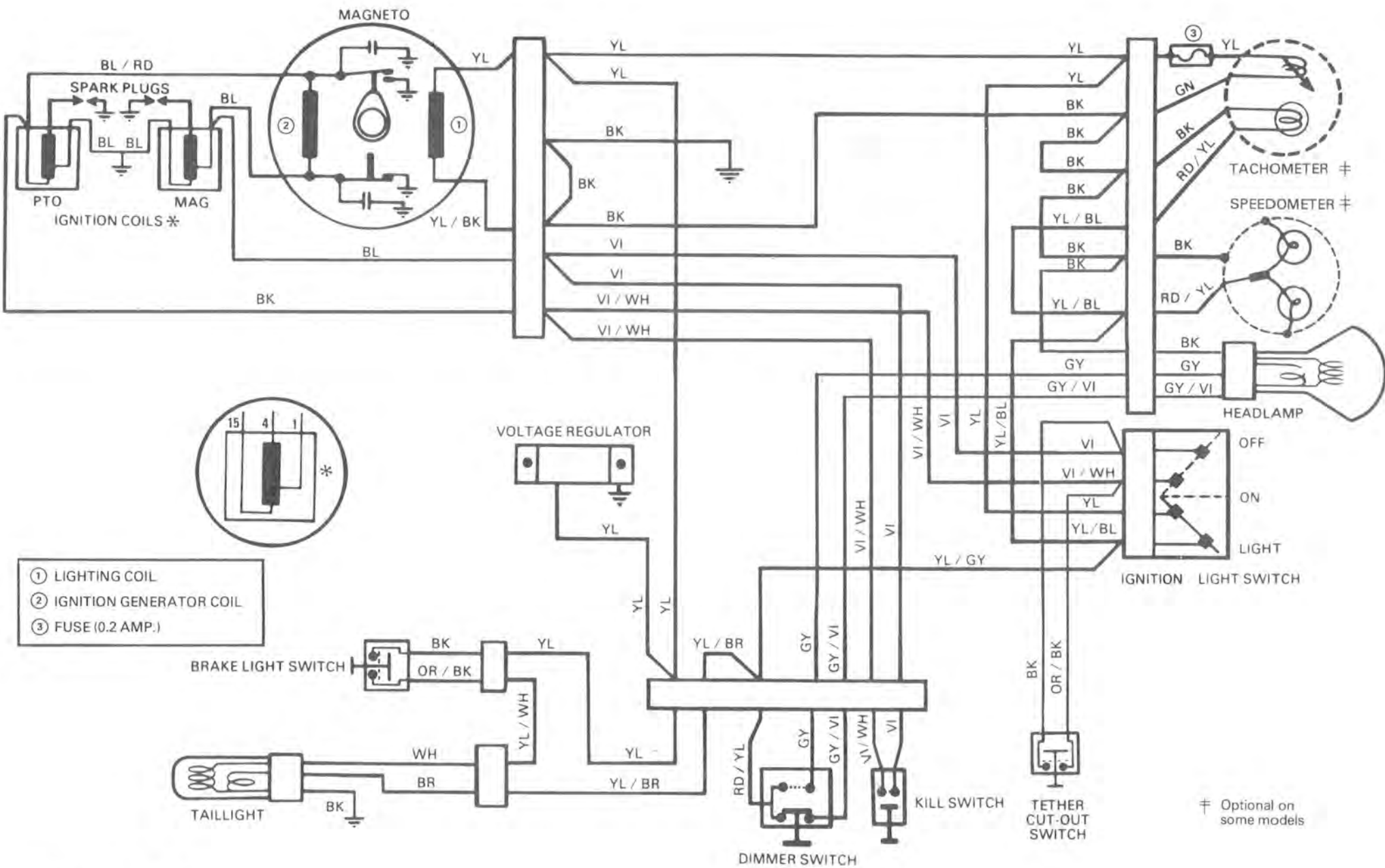


Chart 36

(1977 Supplement)

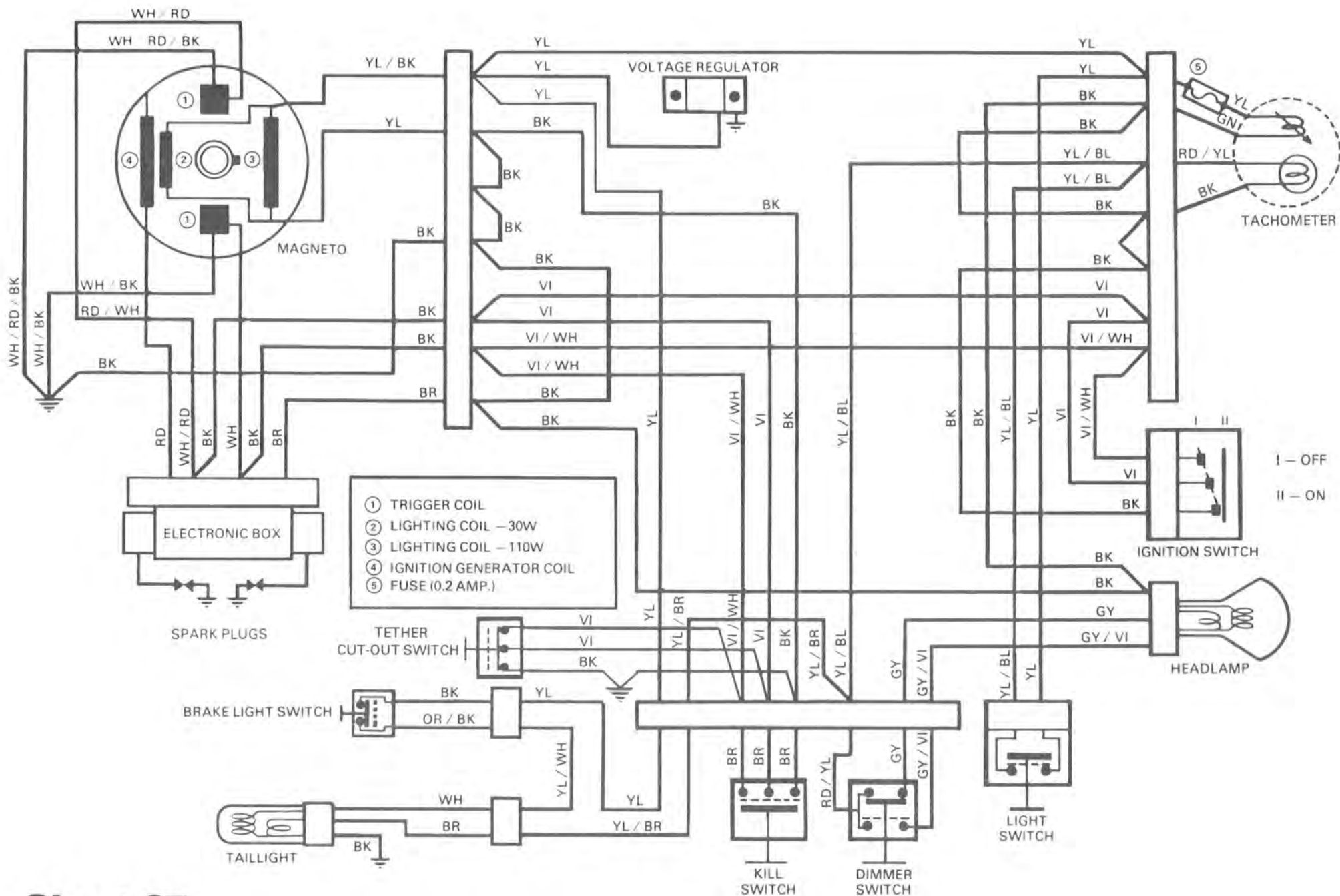


Chart 37

(1977 Supplement)

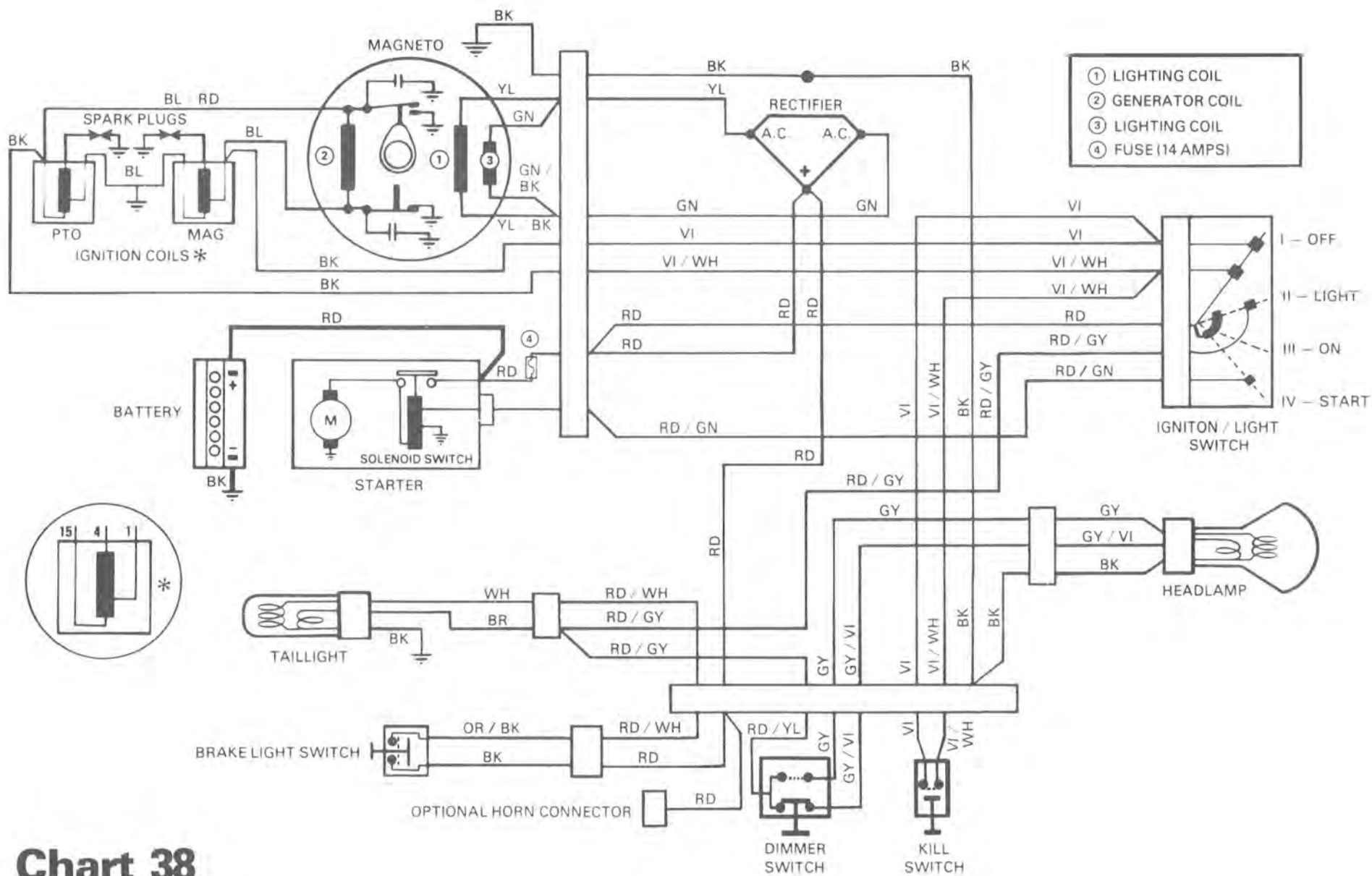
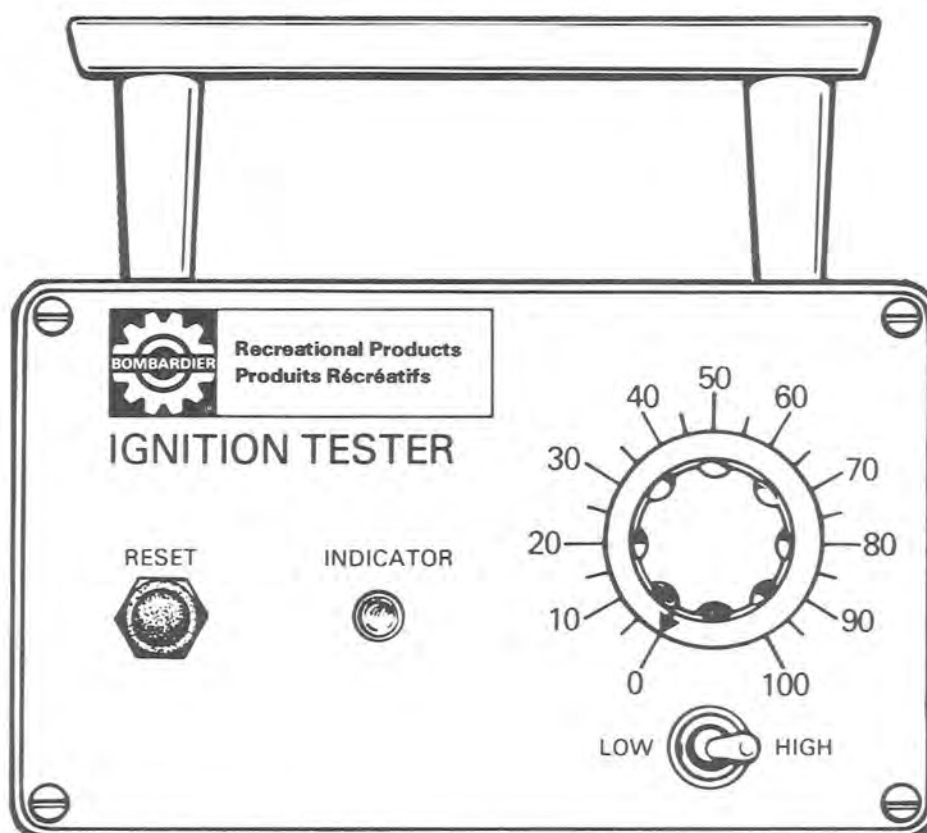


Chart 38

BOMBARDIER IGNITION TESTER



GENERAL

The Bombardier ignition tester is an electrical energy measuring device capable of measuring the peak energy output of a coil.

The tester is of solid state construction and performs as a comparator. The correct value of energy output is indicated in each test and is then compared with the value taken from the engine being tested.

The energy output is verified by means of a 0-100 scale on the tester. The greater the energy output, the greater value indication on the scale. The indication is in the form of an incandescent lamp that lights when the scale knob is set at the position corresponding to the energy output.

The tester has two input ranges selected by a toggle switch. The LOW range is sensitive to AC or DC voltages from 0.5 to 27 volts. The HIGH range is sensitive to AC or DC voltages of from approximately 75 to 500 volts.

TEST CONDITION

All tests are performed on the vehicle at cranking speed. It would seem logical that removal of spark plugs would allow the engine to turn over faster, therefore raising the output level of the ignition system. It was found that vigorous cranking against compression causes the flywheel to snap over, raising the output higher than by cranking without compression. If output results are marginal, output can be measured with and without compression. **Test values listed are taken against compression.**

Always crank vigorously as in actual starting.

Read all instructions **thoroughly** and as you become familiar with this test instrument it will be possible to test a complete ignition system in a matter of minutes. Always proceed in the following order:

1. Connect tester **P** and **N** clip leads as illustrated.
2. Follow test procedure sequence.
3. After every test that lights the indicator lamp, **reset** the indicator circuit by depressing the reset button.

ANALYSIS OF TEST RESULTS

Indicator lamp lights at specific setting.

Output is as specified. Test results should repeat three times. If readings do not repeat, output is erratic and cause should be investigated (loose connections or components, etc.).

Indicator lamp lights at a lower setting.

This indicates that the output is less than that designed to operate the engine in a satisfactory manner. The engine may run at a lower setting, but be the subject to hard starting and misfire. Be certain that correct engine cranking conditions were met before condemning the ignition.

Indicator lamp does not light.

One component is defective. Proceed as instructed to find defective component.

Intermittent ignition problems

In dealing with intermittent problems there is no easy diagnosis. For example, problems that occur only at normal engine operating temperature have to be tested under similar conditions.

In most cases of temperature and / or vibration failure, only parts replacement can solve the problem as most of these failures return to normal when engine is not running.

Double trouble


There is always the possibility of more than one defective parts. If after a component has been replaced, the problem still persists, carefully repeat the complete test procedure to find the other defective part.

ANALYSER TEST AND MAINTENANCE


A test simulator is provided with each tester as a means to test the lamp, detector circuit, and batteries.

High scale test

- 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.

- 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.
- 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

- Place switch in LOW position.
- Set tester dial to 50, or below.
- 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


- Remove the four (4) screws securing cover to case.
- Carefully lift cover.
- Replace batteries with size "C" Alkaline batteries. Be sure to observe polarity markings on battery holder or lamp will not light.
- Install cover on case carefully being certain that no wires are pinched between cover and case. Secure cover.

 **NOTE:** Weak batteries will not impair tester operation or calibration. The light will grow dim.

The ignition tester may give false readings if the rivets on the back cover come in contact with metal.

Indicator knob alignment

Check indicator knob alignment by turning knob fully clockwise. The white mark on the knob must align with no. 100 on the scale. If the marks does not line up with the no. 100, loosen the knob set screw, line the mark on the knob with no. 100, and tighten the set screw. 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.

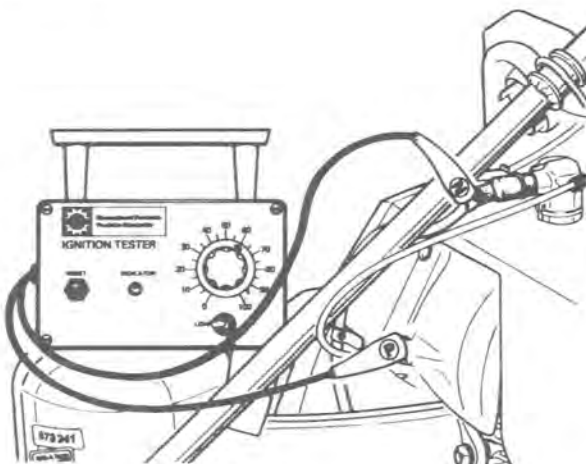
TESTS INDEX

ROTAX ONE CYLINDER ENGINE BREAKER POINTS IGNITION	Test no. 1:	Ignition coil output to spark plug	p. 3
	Test no. 2:	Ignition generator coil output	p. 4
	Test no. 3:	Lighting coil output	p. 4
	Test no. 4:	Brake light coil output	p. 4
ROTAX TWO CYLINDER ENGINE BREAKER POINTS IGNITION	Test no. 5:	Ignition coil output to spark plug	p. 5
	Test no. 6:	Ignition generator coil output	p. 5
	Test no. 7:	Lighting coil output	p. 6
	Test no. 8:	Brake light coil output	p. 6
ROTAX TWO CYLINDER ENGINE CD IGNITION	Test no. 9:	C.D. box output to spark plug	p. 6
	Test no. 10:	Ignition generator coil output	p. 7
	Test no. 11:	Trigger coil output (all engine types except 640)	p. 7
	Test no. 12:	Trigger coil output (640 engine types)	p. 8
	Test no. 13:	Lighting coil output	p. 10

Test no. 1: Ignition coil output to spark plug

NOTE: To obtain accurate readings it is necessary to install a new correctly gapped spark plug. However, if test is performed on engine before spark plug is changed, a low or no tester reading could indicate a fouled or faulty spark plug. Replace spark plug by a new one and recheck.

1. Attach tester **N** lead over spark plug wire directly behind spark plug cap. Connect **P** lead to a good engine ground.



CAUTION: Never connect the tester lead directly to the inner metallic spark plug wire.

2. Set tester dial and switch as follows:

Engine type	Switch position	Dial	
		With suppressor cap	Without suppressor cap
247,302	LOW	60	45

3. Turn ignition key to ON, disable kill button circuit, then crank engine.

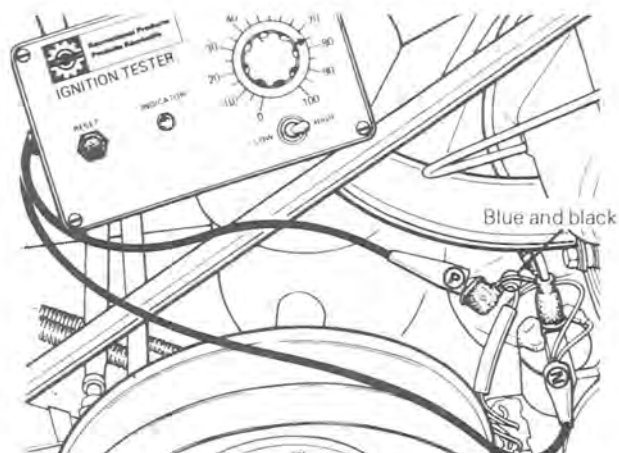
A. Indicator lamp lights: Ignition output is up to specifications. Repeat test at least three (3) times to verify reading and check for consistent output.

B. Indicator lamp does not light: Ignition coil output is low or spark plug is faulty if test no. 2 is positive.

WARNING: Lift rear of vehicle off the ground while performing this test as the engine may start.

Test no. 2: Ignition generator coil output

1. Disconnect blue and black wires from terminal (15) of ignition coil.
2. Attach tester P lead to **blue** and **black** wires previously disconnected. Connect tester N lead to a good engine ground.



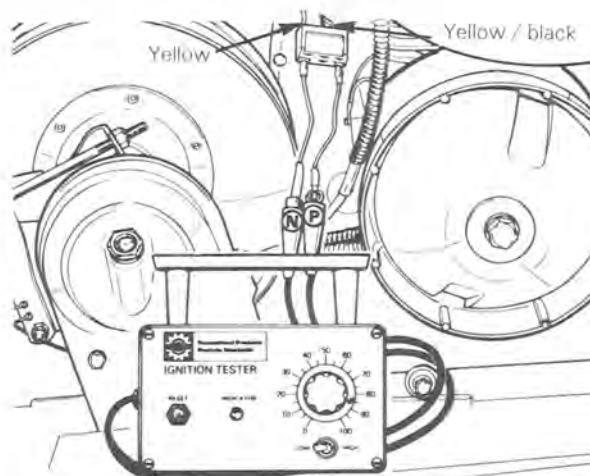
3. Set tester dial and switch as follows:

Engine type	Switch position	Dial
247, 302	HIGH	75

4. Turn ignition key to ON position, disable kill button circuit then crank engine.
 - Indicator lamp lights:** Coil output is up to specifications. Repeat test at least three (3) times to verify reading and check for consistency.
 - Indicator lamp does not light:** Coil output is below specifications. This could be caused by a faulty coil or breaker points. Check breaker points condition and adjustment, and correct as necessary. Repeat test. If lamp still does not light the coil is defective and should be replaced.

Test no. 3: Lighting coil output

1. Disconnect wiring harness junction block at engine.
2. Connect tester leads as illustrated using two (2) harness adaptors.



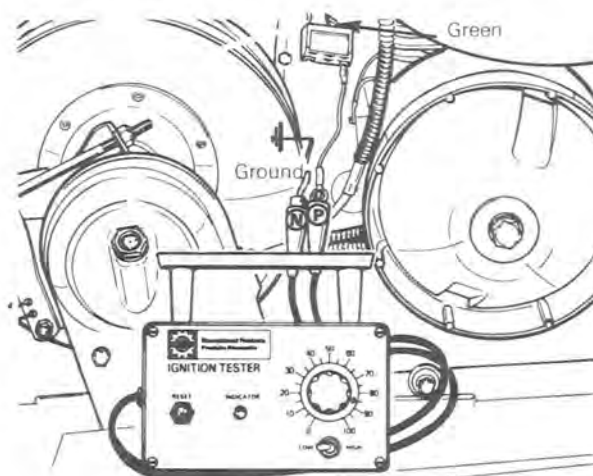
3. Set tester dial and switch as follows:

Engine type	Switch position	Dial
247, 302	LOW	85

4. With ignition key to OFF position, crank engine.
 - 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 defective.

Test no. 4: Brake light coil output

1. Disconnect wiring harness junction block at engine.
2. Connect tester leads as illustrated using two (2) harness adaptors.



3. Set tester dial and switch as follows:

Engine type	Switch position	Dial
247, 302	LOW	85

4. With ignition key to OFF position, crank engine.

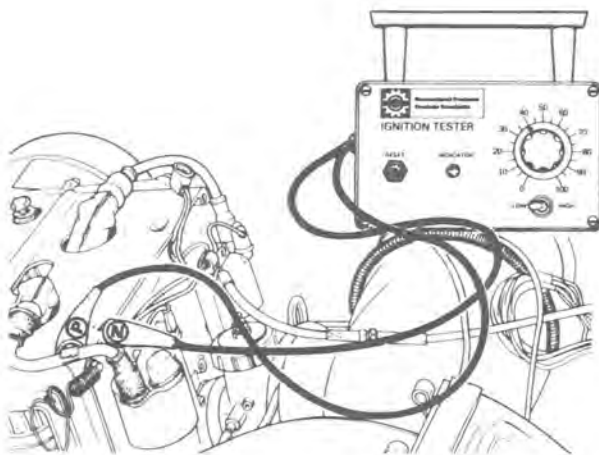
A. Indicator lamp lights: Brake light coil output is up to specifications. Repeat test at least three (3) times to verify reading and consistency.

B. Indicator lamp does not light: Brake light coil is defective.

Test no. 5: Ignition coil output to spark plug

NOTE: To obtain accurate readings it is necessary to install new, correctly gapped spark plugs. However, if test is performed on engine before spark plugs are changed, a low or no reading could indicate fouled or faulty spark plugs. Replace them by new ones and re-check.

1. Attach tester **P** lead over P.T.O. spark plug wire directly behind spark plug cap. Connect **N** lead to a good engine ground.



CAUTION: Never connect the tester lead directly to the inner metallic spark plug wire.

2. Set tester dial and switch as follows:

Engine type	Switch position	Dial	
		Without suppressor cap	With suppressor cap
248, 294, 305, 338, 343, 401, 402, 434, 440, 640, 346, 436	LOW	40	50

3. Turn ignition switch key to ON position, disable kill button circuit then crank engine.

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

B. Indicator lamp does not light: Coil output is low or spark plug is faulty if test no. 6 is positive.

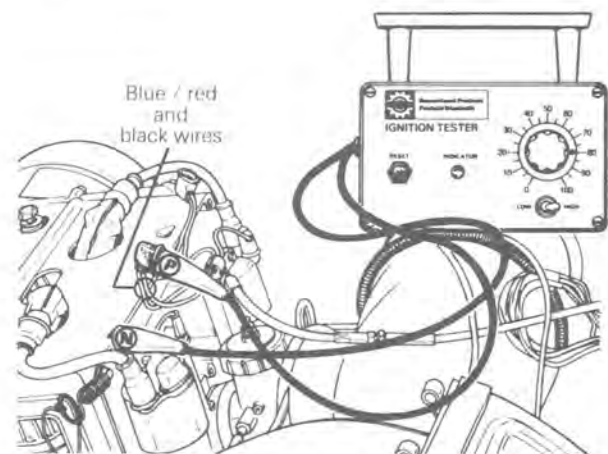
4. Repeat above procedure on other side.

WARNING: Lift rear of vehicle off the ground while performing this test as the engine may start.

Test no. 6: Ignition generator coil output

1. Disconnect blue / red and black wires from terminal (15) of P.T.O. side ignition coil. Disconnect the two blue wires from terminal (1) of magneto side ignition coil. Make sure that both connectors do not touch the engine (ground).

2. Connect tester **P** lead to blue / red and black wires previously disconnected. Connect **N** lead to a good engine ground.



3. Set tester switch and dial as follows:

Engine type	Year	Switch position	Dial
248, 294		HIGH	75
305, 343, 346, 436, 402, 440, 640	1975,76,77	HIGH	80
338, 401, 434		HIGH	70

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

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

SECTION 05

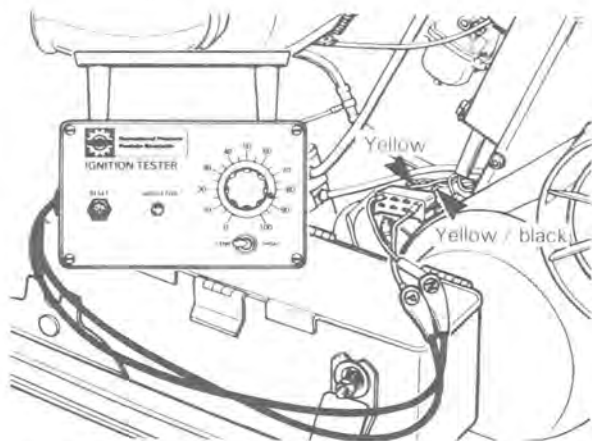
SUB-SECTION 03 (ELECTRICAL TESTS)

- B. Indicator lamp does not light:** Generator coil output is below specifications. This could be caused either by a faulty coil or breaker points.
5. Repeat test with other side (**blue** wires). If test indicates good on magneto side wire, but not on the other, suspect faulty breaker points. If test indicates no output on either side, suspect either faulty generator coil or breaker points.

Test no. 7: Lighting coil output

NOTE: In some engine types covered by this test an additional lighting coil is connected in parallel with the main lighting coil, in this case, the test will determine if the whole assembly is working right or not. If test result appears to be negative, the electrical resistance of each component must be checked separately. (Refer to Technical Data 08, 05-03).

1. Disconnect wiring harness junction block at engine.
2. Connect tester leads as illustrated using two (2) harness adaptors.



3. Set tester dial and switch as follows:

Engine type	Year	Switch position	Dial
248, 294		LOW	80
305, 343, 402, 440, 640, 346, 436	1975-76-77	LOW	85

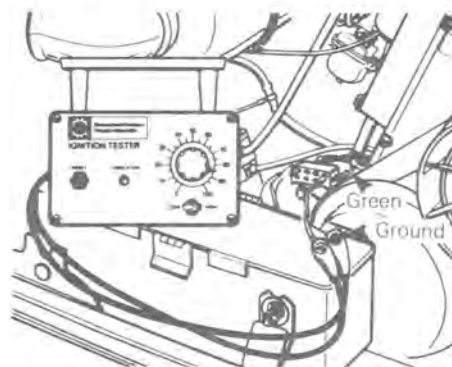
4. With ignition key to OFF position crank engine.

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

Test no. 8: Brake light coil output

NOTE: This test is applicable to engine types 338 & 401 (1974) and 434 (1974-75).

1. Disconnect wiring harness junction block at engine.
2. Connect tester leads as illustrated using two (2) harness adaptors.



3. Set tester dial and switch as follows:

Engine type	Year	Switch position	Dial
338, 401	1974	LOW	85
434	1974-75	LOW	85

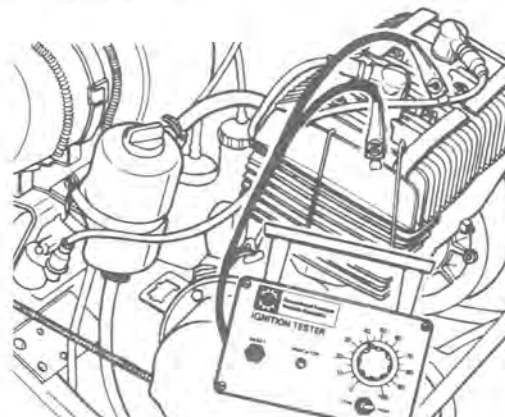
4. With ignition key to OFF position crank engine.

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

Test no. 9: CD box output to spark plug

NOTE: To obtain accurate readings it is necessary to install new, correctly gapped spark plugs. However, if test is performed on engine before spark plugs are changed, a low or no reading could indicate fouled or faulty spark plugs. Replace them by new ones and re-check.

1. Attach tester P lead over P.T.O. spark plug wire directly behind spark plug cap. Connect N lead to a good engine ground.



CAUTION: Never connect the tester lead directly to the inner metallic spark plug wire.

2. Set tester switch and dial as follows:

Engine type	Switch position	Dial	
		With suppressor cap	Without suppressor cap
245, 345, 346, 396, 436, 440, 640	LOW	40	20

3. Turn ignition switch key to **ON** position, disable kill button circuit then crank engine.

A. Indicator lamp lights: CD box output is up to specifications. Repeat test at least three (3) times to verify reading and check for consistency.

B. Indicator lamp does not light: If ignition generator coil and trigger coil test (no. 10, 11, 12) are positive, CD box output is low or spark plug is faulty.

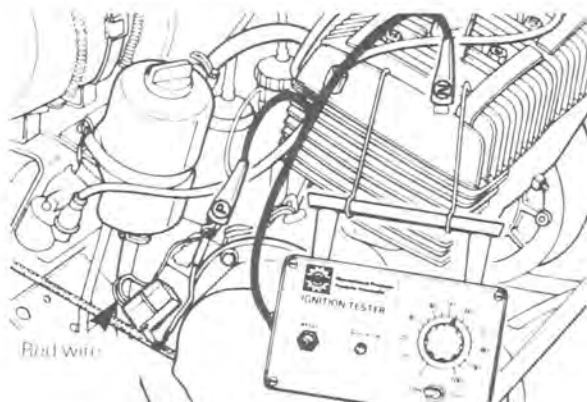
WARNING: Lift rear of vehicle off the ground while performing this test as the engine may start.

4. Repeat above procedure on other side.

Test no. 10: Ignition generator coil output

1. Disconnect wire connector from C.D.I. electronic box.

2. Using one (1) harness adaptor, connect tester **P** test lead to **red** wire of connector removed from C.D.I. electronic box. Connect **N** test lead to ground (engine); do not use brown wire as ground.



3. Set tester switch and dial as follows:

Engine type	Switch position	Dial
2435, 345, 346, 396, 436, 440, 640	HIGH	55

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

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

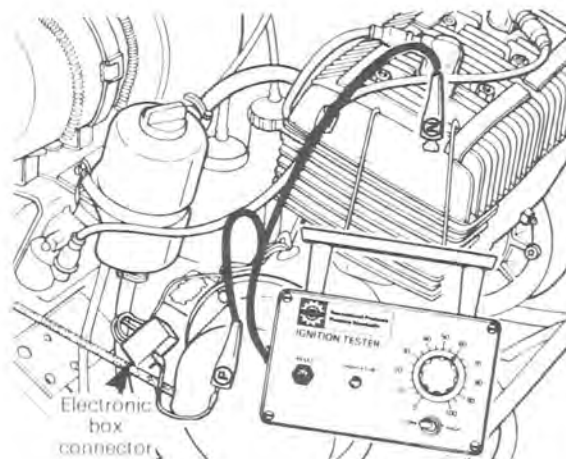
B. Indicator lamp does not light: If trigger coil test (no. 11 or 12) is positive, the problem is a faulty ignition generator coil.

WARNING: Do not touch tester **P** lead clip while cranking the engine. Also make sure that tester **P** lead clip does not contact any metallic object.

Test no. 11: Trigger coil output (all engine types except 640)

1. Connect tester leads as follows:

- Connect tester **P** lead, as illustrated, to wire coming from P.T.O. side trigger at connector removed from C.D.I. electronic box. Use one (1) harness adaptor.
- Connect tester **N** lead to a good engine ground.



2. Set tester switch and dial as follows:

Engine type	Switch position	Dial
245, 345, 346, 396, 436, 440	LOW	60

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

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

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

SECTION 05

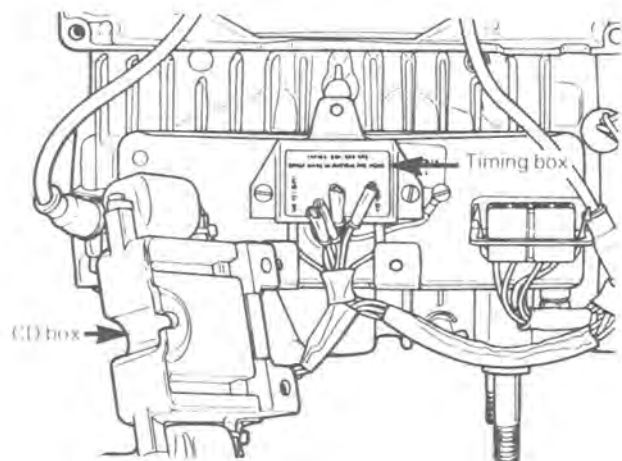
SUB-SECTION 03 (ELECTRICAL TESTS)

○ **NOTE:** If not output is indicated on trigger coil, carefully inspect the trigger ground connection wire connected to C.D.I. electronic box retaining screw. Clean and tighten connection then repeat test.

4. Connect tester leads to opposite trigger as follows:
 - Connect tester **P** lead to wire leading from mag side trigger.
 - Leave tester **N** lead connected to a good engine ground.

Test no. 12: Trigger coil output (640 engine type)

1. Disconnect wire connector from C.D.I. electronic box, remove the C.D.I. electronic box from its bracket then disconnect the four (4) wires (violet, black / violet, black / yellow, violet / yellow) fitted with clear insulating sleeve from the timing box.

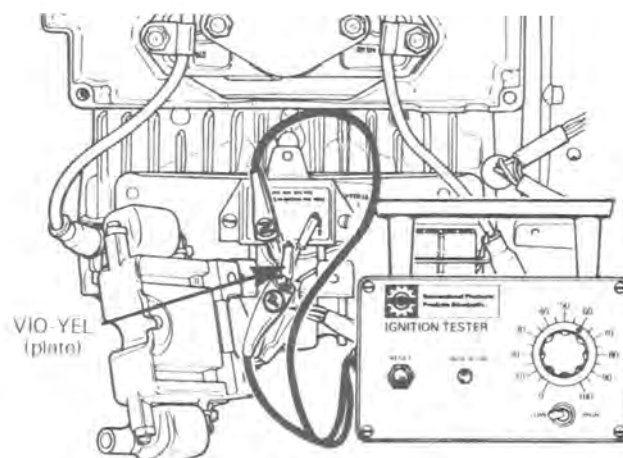


Connect tester leads as follows:

Connect tester **P** lead, as illustrated, to **violet / yellow** wire removed from timing box terminal marked **Vio-Yel (plate)**.

○ **NOTE:** There are two (2) violet / yellow wires connected to the timing box; use the one with a clear plastic insulator.

Connect tester **N** lead to **black / yellow** wire removed from timing box.



2. Set tester switch and dial as follows:

Engine type	Switch position	Dial
640	LOW	60

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

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

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

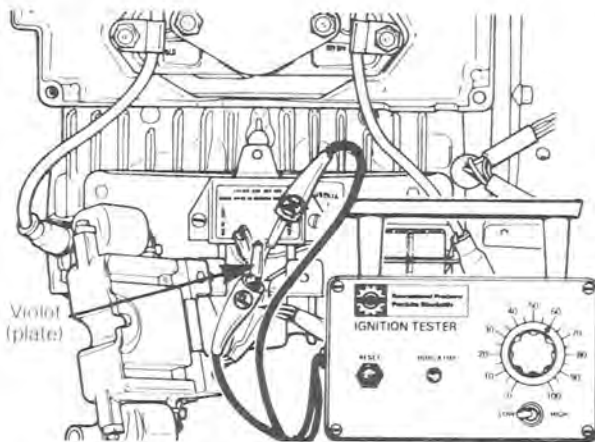
If above test indicates correct trigger coils output and ignition is unsatisfactory test timing box.

Timing box test

1. Connect tester **P** lead, as illustrated, to **violet** wire removed from timing box terminal marked **Vio (plate)**.

○ **NOTE:** There are two violet wires connected to the timing box; use the one with a clear plastic insulator.

- Connect **N** lead to **black / violet** wire removed from timing box.

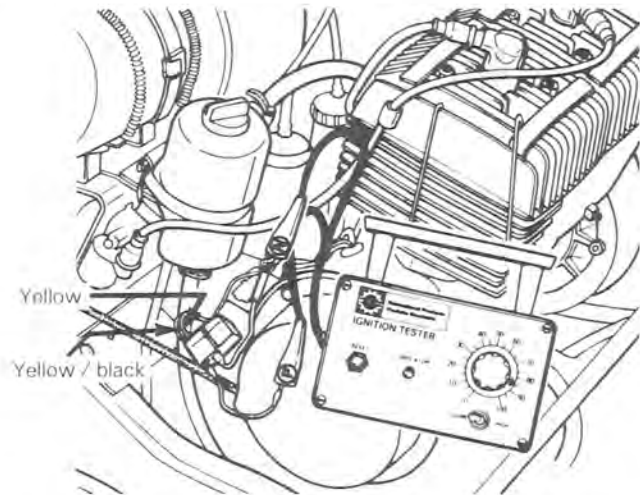


2. Turn ignition key to **ON** position, disable cut-out button circuit then crank engine.
 - A. Indicator lamp lights:** Timing box is up to specifications. Repeat test at least three (3) times to verify reading and check for consistency.
 - B. Indicator lamp does not light:** The problem is a faulty timing box.

Test no. 13: Lighting oil output

- **NOTE:** In some engine types covered by this test an additional lighting coil is connected in parallel with the main lighting coil, in this case the test will determine if the whole assembly is working right or not. If test result appears to be negative, the electrical resistance of each component must be checked separately. (Refer to Technical Data 08, 05-02).

1. Disconnected wiring harness junction block at engine.
2. Connect tester leads as illustrated using two (2) harness adaptors.



3. Set tester dial and switch as follows:

Engine type	Switch position	Dial
245, 345, 346, 396, 436, 440, 640	LOW	85

4. With ignition key to **OFF** position, crank engine.
 - A. Indicator lamp lights:** Lighting coil output is up to specifications. Repeat test at least three (3) times to verify reading and consistency.
 - B. Indicator lamp does not light:** Lighting coil is defective.



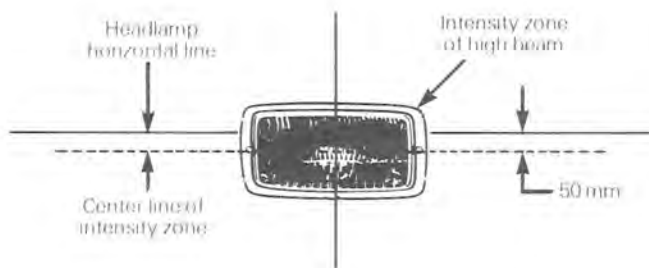
BODY

BEAM AIMING

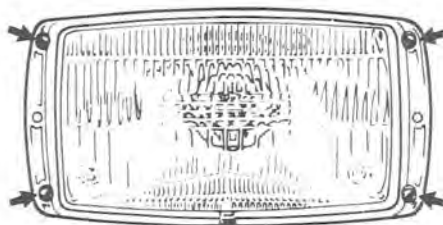
Beam aiming is correct when center of high intensity zone of high beam is 50 mm (2") below horizontal headlamp center line.

REQUIRED CONDITIONS

- Place a vehicle on a flat surface 7.6 m (25') from a wall or screen.
- Suspension adjusted to obtain 14-16 cm (5.5-6.5") between rear of footrest and ground (rider seated on vehicle).
- Turn High Beam ON.



To adjust, remove headlamp chrome ring and turn upper or lower adjustment screws to obtain specified beam position.



DECALS

remove decal, pull.

Clean surface.

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

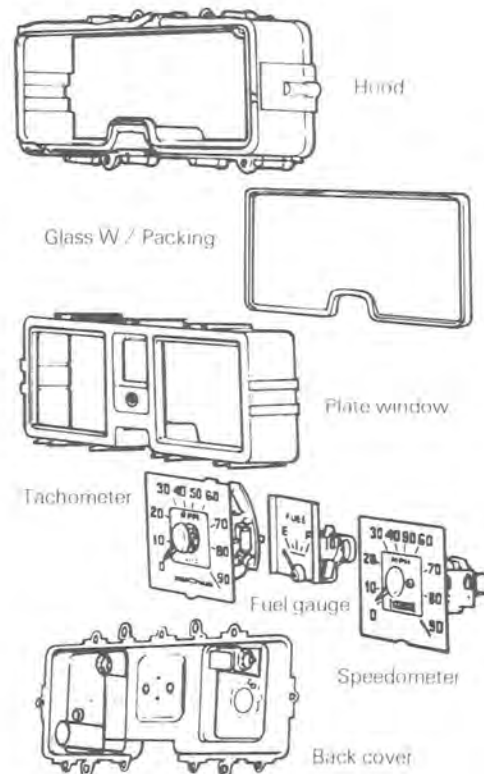
SHEET MOLDED COMPOUND

To repair sheet molded cabs, use appropriate resin compound.

WINDSHIELD (ELITE)

Position windshield and insert screws. Using a soft face hammer, gently tap on screw heads until square section of screw bites into the windshield. Install washers and nuts. Work from center, outward.

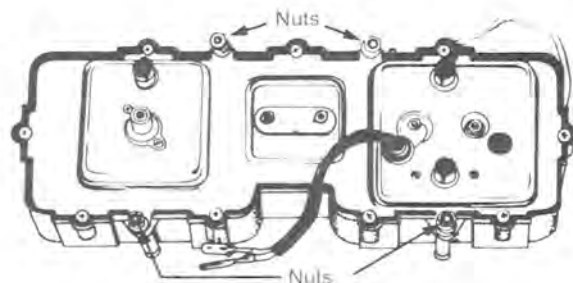
DASHBOARD (NORDIC & ELITE)



SECTION 06

SUB-SECTION 01 (BODY)

Disconnect electrical connections and speedometer cable. Remove the four (4) nuts and spacers securing dash to console. (Lower fasteners must be held for removal, however, the dashpanel decal must first be removed). Remove dash, two (2) long spacers and two (2) hooks.



When installing dash make sure new gaskets are used. The back cover must be sealed with windshield sealant. Install dash and new decal.

FUEL TANK CONNECTOR

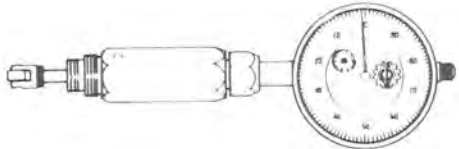
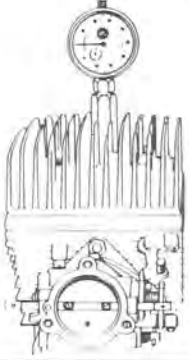

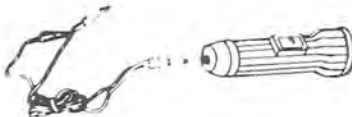
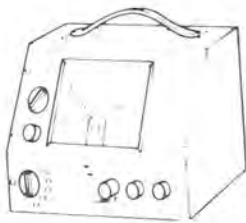
Remove gear clamp. Disconnect fuel lines and unscrew male connector.

Install new fuel lines on connector. One (1) of the fuel lines must be two (2) inches shorter than the other.

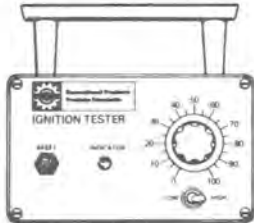

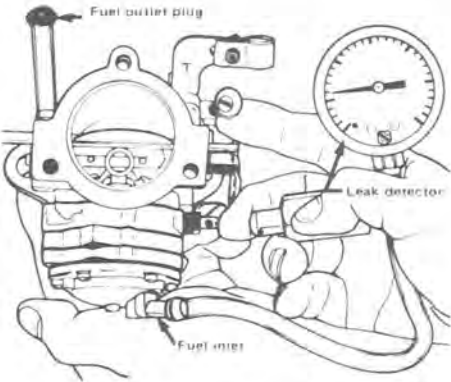
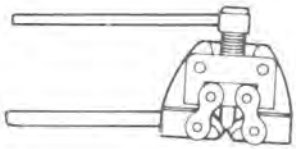
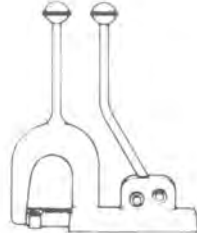
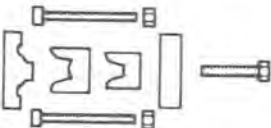

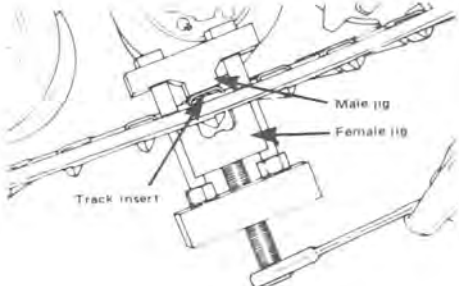
Apply pipe thread compound on connector threads and screw the connector into gas tank. Install gear clamp and connect fuel lines.

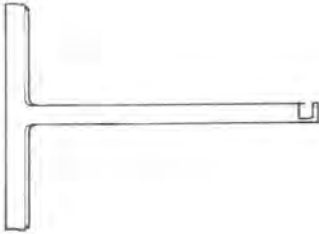
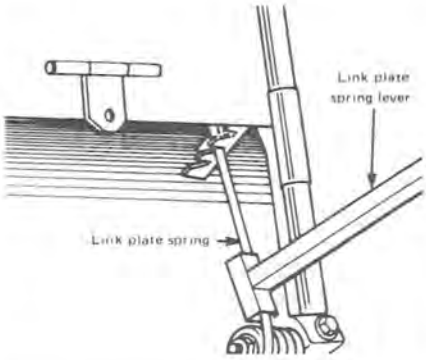

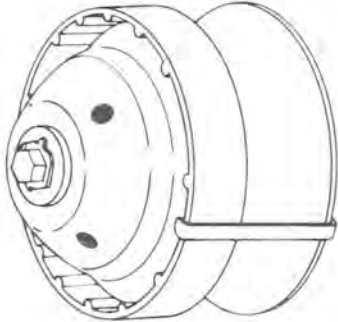

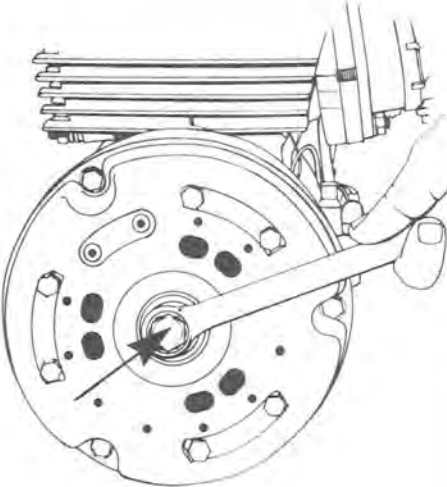



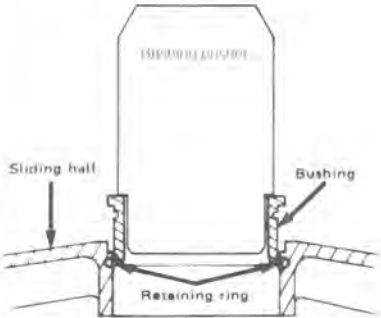

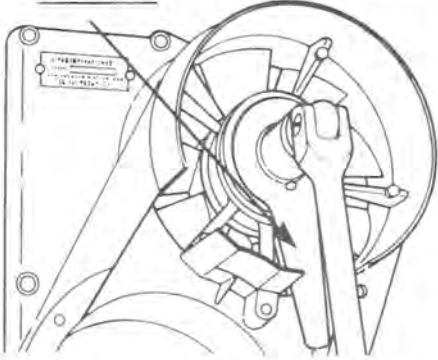

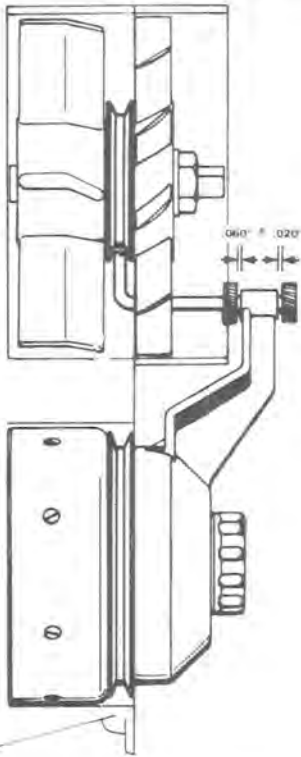
○ **NOTE:** The carburetor return fuel line should be connected to the adaptor of the shorter fuel line.

ITEM	USE	APPLICABLE TO
<p>Dial Indicator (T.D.C. gauge)</p> 	<p>Engine timing, to determine T.D.C.</p> 	<p>All Engine types.</p>
<p>Tone Timer</p> 	<p>Engine timing (static)</p>	<p>All Engine types.</p>
<p>Circuit Tester (continuity light)</p> 	<p>Engine timing (static). Continuity tests.</p>	<p>All Engine types.</p>
<p>Magneto Ignition Analyser (Metcall brand)</p> 	<p>Engine electrical components tests.</p>	<p>All Engine types.</p>

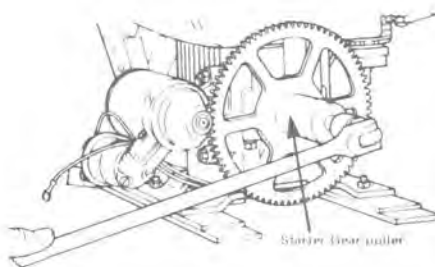
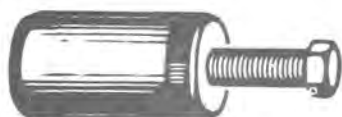
SECTION 07
(TOOLS)

<p>Bombardier Ignition Tester</p> 	<p>Engine electrical components tests.</p>	<p>All engine types.</p>
<p>Carburetor Leak Detector</p> 		<p>All Tillotson carburetors.</p>
<p>Chain Breaking Tool</p> 		<p>All types of chain.</p>
<p>Track Insert Installer</p>  <p>Heavy Duty</p>  <p>Insert Block</p> 		<p>All types of track.</p>

<p>Link Plate Spring Lever</p> 		<p>All models with link plate springs.</p>
<p>Drive Pulley Retainer</p> 	<p>For indexation of governor cup.</p> 	<p>Square shaft drive pulley.</p>
<p>Drive Pulley Puller</p> 	<p>To remove drive pulley from crankshaft.</p> 	<p>Taper shaft engines.</p>

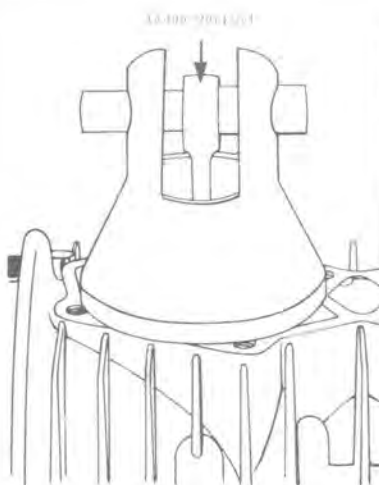
<p>Bushing Pusher</p> 	<p>To install bushing in sliding half.</p> 	<p>High performance drive pulley.</p>
<p>Fan Holder</p> 		<p>Twin cylinders.</p>
<p>Fan Pulley Aligning Tool</p> 		<p>248-249-294 engine types.</p>

Starter Gear Puller



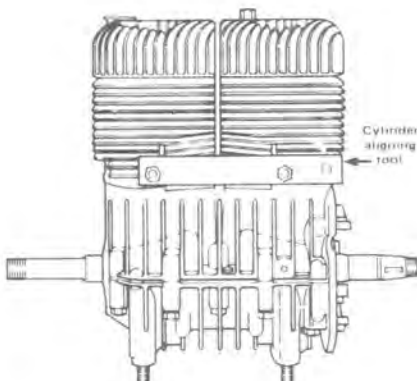
Twin cylinders
electric start engines.

Connecting Rod Holder


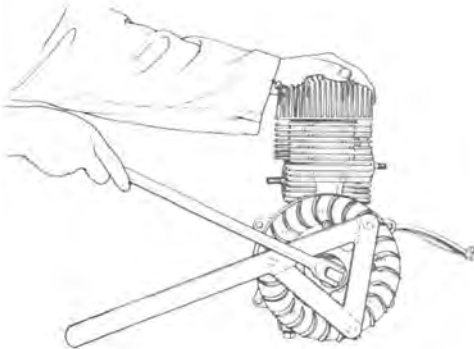

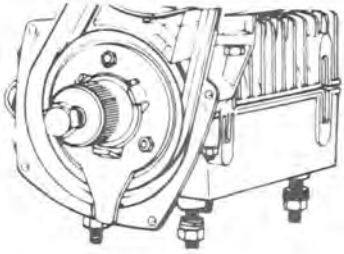

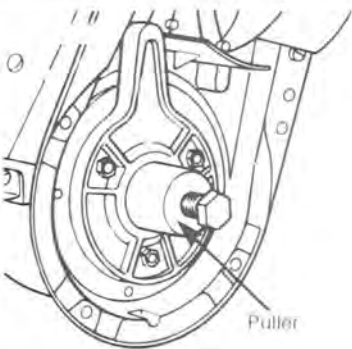



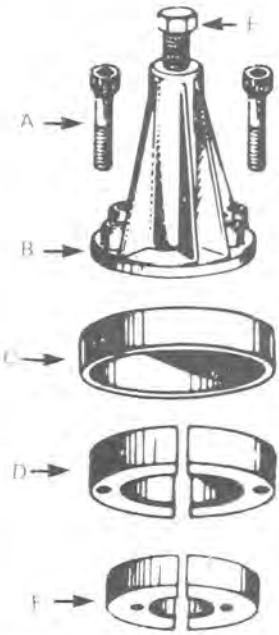
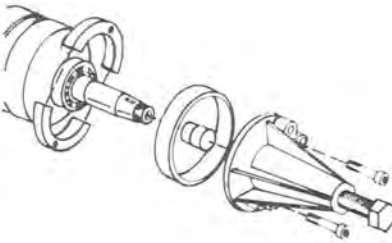
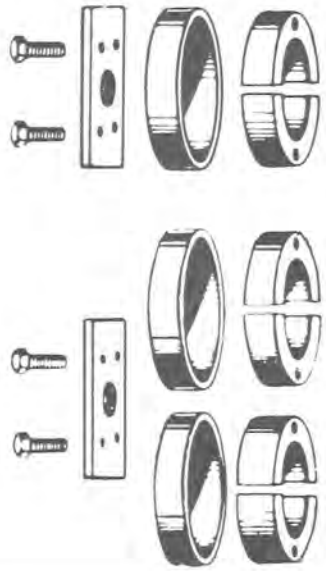
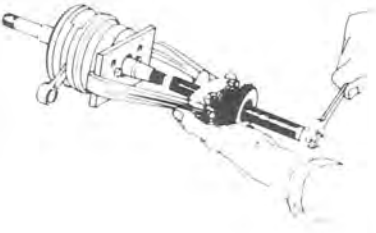
All single cylinder models,
370 engine type.

Cylinder Aligning Tool


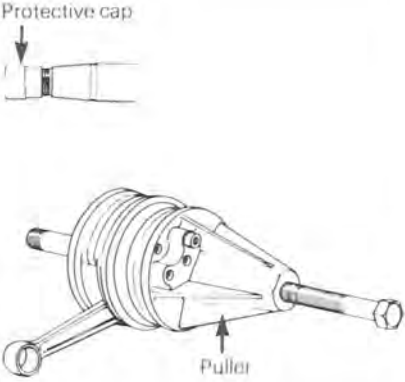

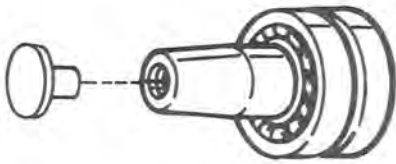




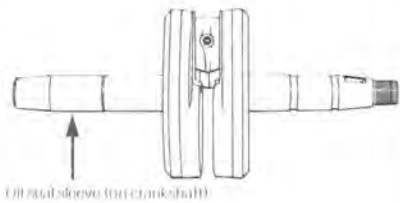
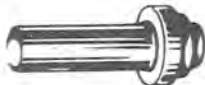
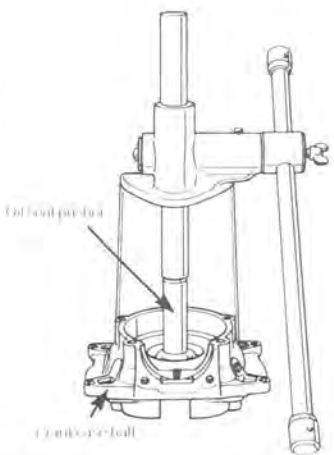
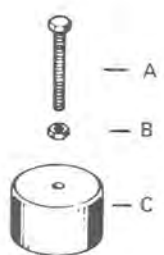
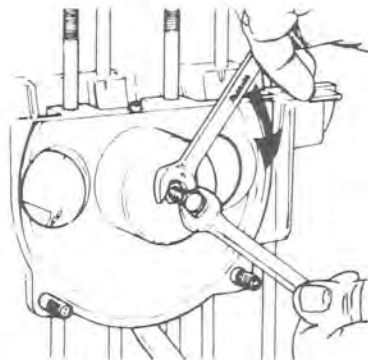
Twin cylinders engine
types.

<p>Magneto Housing Holder.</p> 		<p>Single cylinder engine types.</p>
		<p>Twin cylinders engine types.</p>
		<p>Twin cylinders engine types.</p>
<p>Bearing puller.</p> 	<p>To remove magneto ring from engine.</p>	<p>All engines.</p>

<p>Bearing Puller</p>  <p>A) Ring Screw B) Puller C) Ring for puller D) Ring half for ball bearing E) Ring half for roller bearing F) Puller Screw</p>		<p>All engine types.</p>
<p>Bearing Puller</p> 		<p>All engine types (old).</p>

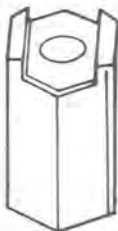
SECTION 07
(TOOLS)

<p>Protection Cap</p> 	<p>Protect crankshaft end, when using bearing puller.</p> <p>Protective cap</p>  <p>Puller</p>	<p>All engine types.</p>
<p>Protection End Cap</p> 	<p>To protect crankshaft end, when using bearing puller.</p> 	<p>All taper shaft engine type.</p>
<p>Bearing Simulator</p> 	<p>When adjusting crankshaft play.</p>	<p>All engine types.</p>

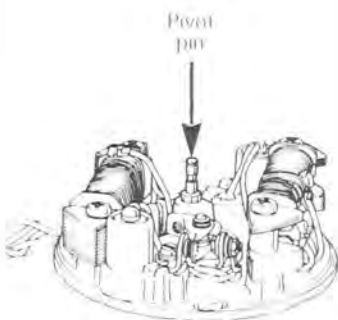
<p>Oil Seal Sleeve</p> 	<p>To avoid oil seal damage during crankshaft installation.</p> 	<p>All single cylinder engine types and 370 type.</p>
<p>Oil Seal Pusher</p> 		<p>All single cylinder engine type and 370 type.</p>
<p>Rotary valve shaft puller</p> 	<p>To remove rotary valve shaft assembly from crankcase.</p> 	<p>RV engines.</p>

SECTION 07
(TOOLS)

Armature plate contact set
pivot pin remover (socket)

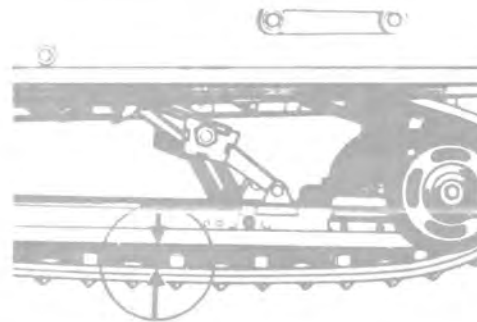


To remove contact set, pivot
pin from armature plate



All engine types using breaker
point type ignition.

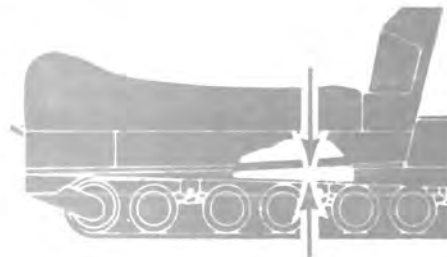
TRACK TENSION SPECIFICATIONS (TORQUE REACTION SLIDE)



		1974	1975	1976	1977
OLYMPIQUE	340, 340E Plus (440) 440	-	10-13 mm ($\frac{3}{8}$ - $\frac{1}{2}$ ")	10-13 mm ($\frac{3}{8}$ - $\frac{1}{2}$ ") 10-13 mm ($\frac{3}{8}$ - $\frac{1}{2}$ ")	10-13 mm ($\frac{3}{8}$ - $\frac{1}{2}$ ") 10-13 mm ($\frac{3}{8}$ - $\frac{1}{2}$ ")
EVEREST	340, 340E 440, 440E	19 mm ($\frac{3}{4}$ ")	19 mm ($\frac{3}{4}$ ")	19 mm ($\frac{3}{4}$ ")	19 mm ($\frac{3}{4}$ ") 19 mm ($\frac{3}{4}$ ")
T'NT F / C	340, 340E 440, 440E	19 mm ($\frac{3}{4}$ ") 19 mm ($\frac{3}{4}$ ")	19 mm ($\frac{3}{4}$ ") 19 mm ($\frac{3}{4}$ ")	19 mm ($\frac{3}{4}$ ")	
T'NT F / A	340, 440		19 mm ($\frac{3}{4}$ ")		
T'NT	340, 440				19 mm ($\frac{3}{4}$ ")
T'NT R / V	250 340		19 mm ($\frac{3}{4}$ ")	19 mm ($\frac{3}{4}$ ") 19 mm ($\frac{3}{4}$ ")	19 mm ($\frac{3}{4}$ ")

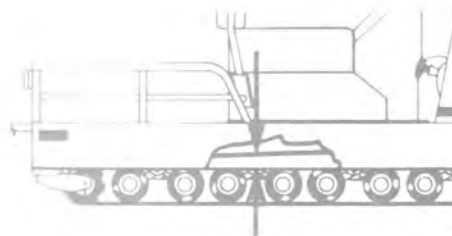


TRACK TENSION SPECIFICATIONS (BOGIE WHEEL SYSTEM)



		1974	1975	1976	1977
ELAN	250T, E	35 mm (1 3/8 ")			
	250	35 mm (1 3/8 ")	35 mm (1 3/8 ")	35 mm (1 3/8 ")	35 mm (1 3/8 ")
	250 Deluxe	35 mm (1 3/8 ")	35 mm (1 3/8 ")	35 mm (1 3/8 ")	35 mm (1 3/8 ")
OLYMPIQUE	300 Mono	57 mm (2 1/4 ")	57 mm (2 1/4 ")	57 mm (2 1/4 ")	57 mm (2 1/4 ")
	300 Twin			57 mm (2 1/4 ")	57 mm (2 1/4 ")
	340, 400, 440	57 mm (2 1/4 ")			
NORDIC	640ER	57 mm (2 1/4 ")			
ELITE	440ER	*57 mm (2 1/4 ")	*57 mm (2 1/4 ")		
ALPINE	440ER	*57 mm (2 1/4 ")			
	640ER	*57 mm (2 1/4 ")	*57 mm (2 1/4 ")	*57 mm (2 1/4 ")	*57 mm (2 1/4 ")

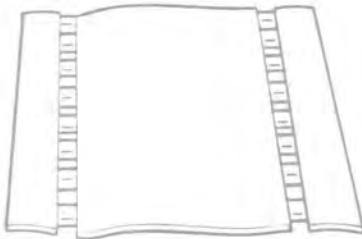
*Between top inside edge of track and center of bogie wheel set retaining bolt.



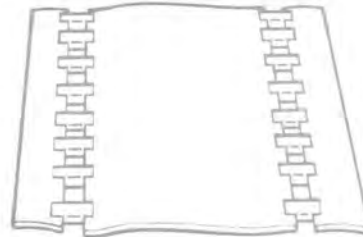


TRACK SPECIFICATIONS

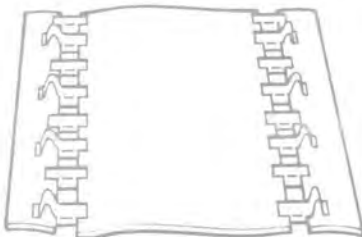
CLEAT AND GUIDE ARRANGEMENT



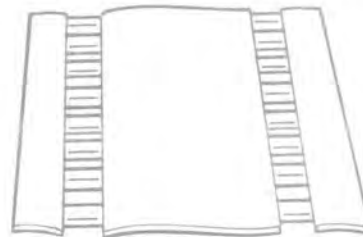
TYPE 1: Narrow insert.



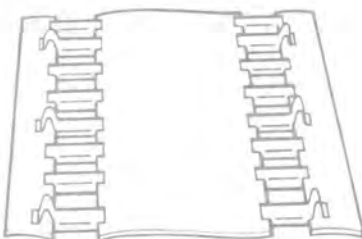
TYPE 2: Narrow insert with shoulder.



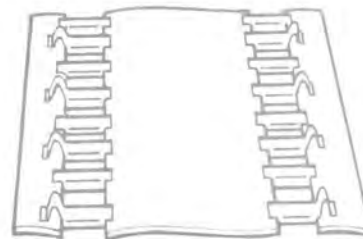
TYPE 3: Narrow guide with shoulder.



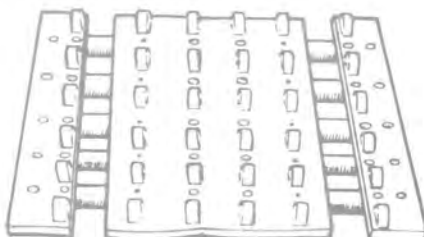
TYPE 4: Wide insert (large track hole).



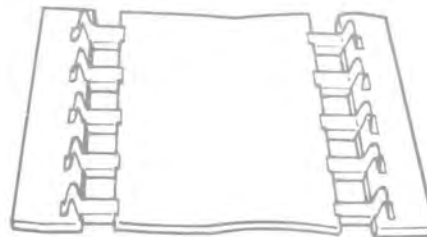
TYPE 5: Wide guide (large track hole).



TYPE 6: Wide guide (large track hole).



TYPE 7: Internal drive metal link.



TYPE 8: Narrow guide with shoulder.

1974 TRACK SPECIFICATIONS

MODEL		TYPE OF TRACK
ELAN	250, 250E, 250 Deluxe 294SS	TYPE 1: Narrow insert. TYPE 2: Narrow insert with shoulder.
OLYMPIQUE	(Bogie) (Slide)	TYPE 1: Narrow insert. TYPE 2: Narrow insert with shoulder.
NORDIC	640ER	TYPE 4: Wide insert (large track hole).
T'NT	F / C 300, 340, 440 EVEREST 440 F / A 340, 400, 440	TYPE 6: Wide guide (large track hole). TYPE 5: Wide guide (large track hole). TYPE 3: Narrow guide with shoulder.
ELITE	440ER	TYPE 1: Narrow insert.
ALPINE	440ER, 640ER	TYPE 1: Narrow insert.

1975 TRACK SPECIFICATIONS

MODEL		TYPE OF TRACK
ELAN	250, 250 Deluxe 300SS	TYPE 1: Narrow insert. TYPE 2: Narrow insert with shoulder.
OLYMPIQUE	300, 300E Twin 340, 340E	TYPE 1: Narrow insert. TYPE 5: Wide guide (large track hole).
T'NT	F / C 340, 440 EVEREST 440 F / A 340, 440 R / V 245	TYPE 6: Wide guide (large track hole). TYPE 5: Wide guide (large track hole). TYPE 3: Narrow guide with shoulder. TYPE 7: Internal drive metal link.
ALPINE	640ER	TYPE 1: Narrow insert.
ELITE	440ER	TYPE 1: Narrow insert.

1976 TRACK SPECIFICATIONS

MODEL		TYPE OF TRACK
ELAN	250, 250 Deluxe	TYPE 1: Narrow insert.
OLYMPIQUE	300 Mono, Twin 340, 440 (Plus)	TYPE 1: Narrow insert. TYPE 5: Wide guide (large track hole).
T'NT F / C	340	TYPE 5: Wide guide (large track hole).
EVEREST	440	TYPE 5: Wide guide (large track hole).
T'NT R / V	250, 340	TYPE 8: Narrow guide with shoulder.
ALPINE	640ER	TYPE 1: Narrow insert.

1977 TRACK SPECIFICATIONS

MODEL		TYPE OF TRACK
ELAN	250, 250 Deluxe	TYPE 1: Narrow insert.
OLYMPIQUE	300 Mono, Twin 340 440	TYPE 1: Narrow insert. TYPE 5: Wide guide (large track hole). TYPE 6: Wide guide (large track hole).
EVEREST	340, 440	TYPE 5: Wide guide (large track hole).
T'NT	340, 440	TYPE 3: Narrow guide with shoulder.
R / V	340	TYPE 3: Narrow guide with shoulder.
ALPINE	640ER	TYPE 1: Narrow insert.

		1974	WIDTH	1975	WIDTH	1976	WIDTH	1977	WIDTH
ELAN	250	570 0411	30 mm (1 3/16")	570 0411	30 mm (1 3/16")	570 0411	30 mm (1 3/16")	570 0411	30 mm (1 3/16")
	250, 250 Twin	570 0411	30 mm (1 3/16")						
	250 Deluxe	570 0411	30 mm (1 3/16")	570 0411	30 mm (1 3/16")	570 0411	30 mm (1 3/16")	570 0411	30 mm (1 3/16")
	294SS	570 0411	30 mm (1 3/16")						
	300SS			570 0411	30 mm (1 3/16")				
OLYMPIQUE	300 Twin	570 0411	30 mm (1 3/16")	570 0414	30 mm (1 3/16")	414 2327	33 mm (1 1/8")	414 2327	33 mm (1 1/8")
	300E Twin			570 0414	30 mm (1 3/16")	414 2327	33 mm (1 1/8")		
	300 Mono					570 0411	30 mm (1 3/16")	570 0411	30 mm (1 3/16")
	340, 340E	570 0411	30 mm (1 3/16")	570 0414	30 mm (1 3/16")	414 2327	33 mm (1 1/8")	414 2327	33 mm (1 1/8")
	400, 400E	570 0411	30 mm (1 3/16")						
	440	570 0411	30 mm (1 3/16")			414 2417	33 mm (1 5/16")	414 2327	33 mm (1 1/8")
	Plus (440)					570 0414	30 mm (1 3/16")		
T'NT	300SM	570 0411	30 mm (1 3/16")						
	340SM, SE	570 0411	30 mm (1 3/16")	570 0411	30 mm (1 3/16")				
	340, 340E					414 2327	33 mm (1 1/8")		
	440SM, SE	570 0414	30 mm (1 3/16")	570 0414	30 mm (1 3/16")				
T'NT	340 F / A							414 2327	33 mm (1 1/8")
	440 F / A							414 2417	33 mm (1 5/16")
	440 F / C							414 2417	33 mm (1 5/16")
EVEREST	340							414 2327	33 mm (1 1/8")
	440SL	570 0414	30 mm (1 3/16")	570 0414	30 mm (1 3/16")				
	440					414 2417	33 mm (1 5/16")	414 2417	33 mm (1 5/16")
	440E			570 0414	30 mm (1 3/16")	414 2417	33 mm (1 5/16")		
NORDIC	640ER	570 0414	30 mm (1 3/16")						
ALPINE	440ER	570 0411	30 mm (1 3/16")						
	640ER	570 0414	30 mm (1 3/16")	570 0414	30 mm (1 3/16")	414 2277	33 mm (1 1/8")	414 2277	33 mm (1 1/8")
ELITE	440ER	570 0414	30 mm (1 3/16")	570 0414	30 mm (1 3/16")				
T'NT F / A	340, 440	414 1884	30 mm (1 3/16")	414 1884	30 mm (1 3/16")				
	400	414 1884	30 mm (1 3/16")						
R / V	250			414 2277	33 mm (1 5/16")	414 2277	33 mm (1 5/16")		
	340					414 2277	33 mm (1 5/16")	414 2277	33 mm (1 5/16")

VEHICLE MODEL / DRIVE BELT NUMBER



1974 DRIVE PULLEY SPECIFICATIONS

		PULLEY TYPE	COUNTERWEIGHT IDENTIFICATION	SPRING NUMBER	SPRING COLOR	SPRING LENGTH mm (inch) ± 1.5 (.060")	RETAINING BOLT TORQUE kg-m (ft-lbs)
ELAN	250, 250E	R.R.S.	E-4	504 2129	Bronze	81.3 (3.200)	*5.1-7.5 (37-54)
	250 Deluxe	R.R.S.	D-4	414 1623	Blue	77.7 (3.060)	*5.1-7.5 (37-54)
	294SS	R.S.S. (L.C.)	B-1-K	414 1995	Yellow	100.1 (3.940)	*11.5-12.7 (83-92)
OLYMPIQUE	All models	P.L.	No hole	414 0013	Black	76.2 (3.0)	*5.1-7.5 (37-54)
T'NT	300SM	R.S.S. (L.C.)	B-1-K	414 1995	Yellow	100.1 (3.940)	*11.5-12.7 (83-92)
	340SM, SE	R.S.S. (L.C.)	C-3-L	414 1967	Light blue	118.9 (4.680)	*11.5-12.7 (83-92)
	440SM, SE	R.S.S. (L.C.)	C-4-L	414 1967	Light blue	118.9 (4.680)	*11.5-12.7 (83-92)
	EVEREST	R.S.S. (L.C.)	C-4-L	414 1967	Light blue	118.9 (4.680)	*11.5-12.7 (83-92)
T'NT F / A	340	H.P.	A-8	414 1572	White	101.6 (4.0)	**8-9.4 (58-68)
	400, 440	H.P.	A-9	414 1572	White	101.6 (4.0)	**8-9.4 (58-68)
NORDIC	640ER	R.S.S. (L.C.)	C-8	414 1966	Pink	122.2 (4.810)	*11.5-12.7 (83-92)
ALPINE	440ER	P.L.	1 rivet, 1 washer	414 1587	Brown	77.7 (3.060)	*5.1-7.5 (37-54)
	640ER	P.L.	1 rivet, 3 washers	414 1587	Brown	77.7 (3.060)	*5.1-7.5 (37-54)
ELITE	440ER	R.S.S. (L.C.)	C-8-M	414 1967	Light blue	118.9 (4.680)	*11.5-12.7 (83-92)

H.P.: High Performance
P.L.: Pressure Lever
R.R.S.: Roller Round Shaft
R.S.S.: Roller Square Shaft
(L.C.): Large Center

- * Torque retaining bolt to specification then loosen and retorqued to specific value.
- ** After bolt is torqued, start engine and repeatedly apply throttle and brake. Stop engine and retorqued.

1975 DRIVE PULLEY SPECIFICATIONS

		PULLEY TYPE	COUNTERWEIGHT IDENTIFICATION	SPRING NUMBER	SPRING COLOR	SPRING LENGTH mm (inch) ± 1.5 (.060")	RETAINING BOLT TORQUE kg-m (ft-lbs)
ELAN	250	R.R.S.	E-4	504 2129	Bronze	81.3 (3.200)	*5.1- 7.5 (37-54)
	250 Deluxe, 300SS	R.S.S. (L.C.)	B-1-K	414 1995	Yellow	99.8 (3.930)	*11.5-12.7 (83-92)
OLYMPIQUE	300, 340	R.S.S. (I.C.)	C-3-L	414 2239	Yellow (cut)	88.9 (3.500)	*11.5-12.7 (83-92)
T'NT F / C	340	R.S.S. (L.C.)	C-3-L	414 1967	Light blue	118.9 (4.680)	*11.5-12.7 (83-92)
T'NT F / C	340	R.S.S. (I.C.)	C-3-L	414 2239	Yellow (cut)	88.9 (3.500)	*11.5-12.7 (83-92)
T'NT F / C	440	R.S.S. (L.C.)	C-4-L	414 1967	Light blue	118.9 (4.680)	*11.5-12.7 (83-92)
T'NT F / C	440	R.S.S. (I.C.)	C-4-L	414 2235	Black (cut)	104.6 (4.120)	*11.5-12.7 (83-92)
EVEREST	440	R.S.S. (I.C.)	C-4-L	414 2235	Black (cut)	104.6 (4.120)	*11.5-12.7 (83-92)
T'NT F / A	340	H.P.	B	414 1572	White	101.6 (4.0)	**8- 9.4 (58-68)
	440	H.P.	A	414 1572	White	101.6 (4.0)	**8- 9.4 (58-68)
T'NT	245 RV	▼ R.S.S. (S.C.)	A-3	414 2328	Gold	74.4 (2.930)	**8- 9.4 (58-68)
ALPINE 640ER	Series 000 3307	R.S.S. (L.C.)	C-8	414 1967	Light blue	118.9 (4.680)	*11.5-12.7 (83-92)
	Series 000 3308	R.S.S. (I.C.)	C-8	414 2235	Black (cut)	104.6 (4.120)	*11.5-12.7 (83-92)
ELITE	440ER	R.S.S. (L.C.)	C-8-M	414 1967	Light blue	118.9 (4.680)	*11.5-12.7 (83-92)

H.P.: High Performance

R.R.S.: Roller Round Shaft

R.S.S.: Roller Square Shaft

(S.C.): Small Center

(I.C.): Intermediate Center

(L.C.): Large Center

▼: Hub Plug with Wear pads

* Torque retaining bolt to specification then loosen and retorque to specific value.

** After bolt is torqued, start engine and repeatedly apply throttle and brake. Stop engine and retorque.

		PULLEY TYPE	COUNTERWEIGHT IDENTIFICATION	SPRING NUMBER	SPRING COLOR	SPRING LENGTH mm (inch) ± 1.5 (.060")	RETAINING BOLT TORQUE kg-m (ft-lbs)
ELAN	250	R.R.S.	E-4	504 2129	Bronze	81.3 (3.200)	*5.1- 7.5 (37-54)
	250 Deluxe	R.R.S.	D-2	414 1623	Blue	77.7 (3.060)	*5.1- 7.5 (37-54)
OLYMPIQUE	300 Mono	P.L.	Full flyweight	414 1587	Brown	77.7 (3.060)	*5.1- 7.5 (37-54)
	300 Twin, 340	◆ R.S.S. (S.C.)	C-3-L	414 1967	Light blue	118.9 (4.680)	**8 - 9.4 (58-68)
	Plus (440)	R.S.S. (I.C.)	C-8-M	414 2235	Black (cut)	104.6 (4.120)	*11.5-12.7 (83-92)
T'NT	340	◆ R.S.S. (S.C.)	C-3-L	414 1967	Light blue	118.9 (4.680)	**8 - 9.4 (58-68)
EVEREST	440	◆ R.S.S. (S.C.)	C-4-L	414 1966	Pink	122.2 (4.810)	**8 - 9.4 (58-68)
T'NT R / V	250	◆ R.S.S. (S.C.)	A-2	414 2328	Gold	74.4 (2.930)	**8 - 9.4 (58-68)
	340	◆ R.S.S. (S.C.)	A-3	414 2610	Purple	73.6 (2.900)	**8 - 9.4 (58-68)
ALPINE	640ER	R.S.S. (bearing)	C-8 double	414 1966	Pink	122.2 (4.810)	*11.5-12.7 (83-92)

P.L.: Pressure Lever

R.R.S.: Roller Square Shaft

R.S.S.: Roller Square Shaft

(S.C.): Small Center

(I.C.): Intermediate Center

(Bearing): With Bearing

◆ Hub Plug with "Duralon" Bushing.

* Torque retaining bolt to specification then loosen and retorquing to specific value.

** After bolt is torqued, start engine and repeatedly apply throttle and brake. Stop engine and retorquing.

1976 DRIVE PULLEY SPECIFICATIONS

1977 DRIVE PULLEY SPECIFICATIONS

		PULLEY TYPE	COUNTERWEIGHT IDENTIFICATION	SPRING NUMBER	SPRING COLOR	SPRING LENGTH		RETAINING BOLT TORQUE	
						mm (inch)	± 1.5 (.060")	kg-m	(ft-lbs)
ELAN	250	R.R.S.	E-4	414 2580	Bronze	81.3	(3.200)	*5.1- 7.5	(37-54)
	250 Deluxe	R.R.S.	D-2	414 2581	Blue	77.7	(3.060)	*5.1- 7.5	(37-54)
OLYMPIQUE	300 Mono	R.R.S.	E-4	414 2581	Blue	77.7	(3.060)	*5.1- 7.5	(37-54)
	300 Twin, 340	◆ R.S.S.	C-3-L	414 1967	Light blue	118.9	(4.680)	**8 - 9.4	(58-68)
	440	◆ R.S.S.	C-8-M	414 1967	Light blue	118.9	(4.680)	**8 - 9.4	(58-68)
EVEREST	340	◆ R.S.S.	C-3-L	414 1967	Light blue	118.9	(4.680)	**8 - 9.4	(58-68)
	440	◆ R.S.S.	C-4-L	414 1966	Pink	122.2	(4.810)	**8 - 9.4	(58-68)
T'NT	340	◆ R.S.S.	C-4-L	414 1995	Yellow	100.1	(3.940)	**8 - 9.4	(58-68)
	440 Free Air	◆ R.S.S.	C-4-L ①	414 1967	Light blue	118.9	(4.680)	**8 - 9.4	(58-68)
	440 Fan Cooled	◆ R.S.S.	C-4-L	414 1966	Pink	122.2	(4.810)	**8 - 9.4	(58-68)
RV	340	◆ R.S.S.	A-3	414 2835	Red	88.9	(3.500)	**8 - 9.4	(58-68)
ALPINE	640ER	● R.S.S. (bearing)	C-8 double	414 1966	Pink	122.2	(4.810)	*11.5-12.7	(83-92)

R.R.S.: Roller Round Shaft

R.S.S.: Roller Square Shaft

(Bearing): With Bearing

◆ Hub Plug with "Duralon" Bushing.

● With "Duralon" Bushing.

① With 4 std. washers no. 399 901 500.

* Torque retaining bolt to specification then loosen and retorque to specific value.

** After bolt is torqued, start engine and repeatedly apply throttle and brake. Stop engine and retorque.

WEAR PADS

WEAR PAD PART NO.	APPLICATION		VEHICLE MODEL
	INNER HALF PART NO.	SHAFT CLASSIFICATION	
504 2207 00	504 2217 00	Forged	'75 Elan 250 Deluxe and 300SS
504 2207 00	504 2211 00	Forged	'75 Alpine (1st series), '74 '75 T'NT 440, '74 Everest
504 2207 00	504 2204 00	Forged	'74-'75 T'NT 340
504 2277 00	504 2233 00	Machined	'75 Alpine (2nd series), '75 T'NT 440 and Everest
504 2277 00	504 2245 00	Machined	'75 T'NT 340 '75 Olympique 300-340
504 2250 00	504 2247 00	Machined	'75 T'NT R / V 245
504 2207 00	504 2279 00		'76 Alpine
504 2207 00	504 2233 00		'76 Olympique PLUS



1. The first part of the document is a list of the names of the members of the committee.



DRIVEN PULLEY SPRING TENSION

		1974 kg ± 1 (lbs ± 2)	1975 kg ± 1 (lbs ± 2)	1976 kg ± 1 (lbs ± 2)	1977 kg ± 1 (lbs ± 2)
ELAN	All models	3.6 (8)	3.6 (8)	3.6 (8)	3.6 (8)
OLYMPIQUE	All models	3.6 (8)	3.6 (8)	3.6 (8)	3.6 (8)
NORDIC	640ER	3.6 (8)			
T'NT F / A		5.9 (13)	5.9 (13)		
T'NT F / C		3.6 (8)	5 (11)	3.6 (8)	
EVEREST		3.6 (8)	5 (11)	3.6 (8)	3.6 (8)
T'NT					3.6 (8)
RV	250		5.9 (13)	5.9 (13)	
	340			5.9 (13)	5.9 (13)
ALPINE	440ER	3.6 (8)			
	640ER	3.6 (8)	5.4 (12)	5.4 (12)	5.4 (12)
ELITE		3.6 (8)	3.6 (8)		



1974-75 PULLEY ALIGNMENT SPECIFICATIONS

		OFFSET *		DISTANCE **	
		(Simulator rod dia.)		(Between pulleys)	
		1974	1975	1974	1975
ELAN	250	14 mm (9/16")	14 mm (9/16")	47 mm (1 7/8")	47 mm (1 7/8")
	250E, 250T	14 mm (9/16")	14 mm (9/16")	47 mm (1 7/8")	
	250 Deluxe	14 mm (9/16")	14 mm (9/16")	47 mm (1 7/8")	38 mm (1 1/2")
	294SS, 300SS	13 mm (1/2")	13 mm (1/2")	38 mm (1 1/2")	
OLYMPIQUE	300 Mono, Twin 340, 400, 440	14 mm (9/16")	13 mm (1/2")	47 mm (1 7/8")	35 mm (1 3/8")
NORDIC	640ER	13 mm (1/2")		41 mm (1 5/8")	
EVEREST	440	13 mm (1/2")	13 mm (1/2")	35 mm (1 3/8")	35 mm (1 3/8")
T'NT F / C	300, 340, 440				
T'NT F / A	340, 400, 440	Self adjusting	Self adjusting	● 31 mm (1 1/4")	31 mm (1 1/4")
ALPINE	440ER	14 mm (9/16")		● 47 mm (1 7/8")	
	640ER		14 mm (9/16")		● 41 mm (1 5/8")
ELITE	440ER	14 mm (9/16")	14 mm (9/16")	● 38 mm (1 1/2")	● 38 mm (1 1/2")
RV	245		13 mm (1/2")		35 mm (1 3/8")

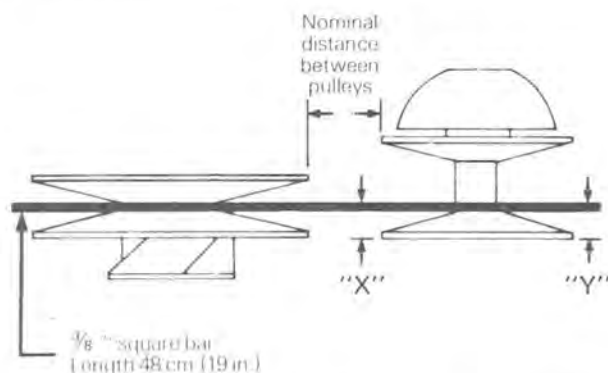
* Tolerance: $\pm .8$ mm ($\pm 1/32$ ")

** Tolerance: ± 1.6 mm ($\pm 1/16$ ")

● Non adjustable



1976 AND UP PULLEY ALIGNMENT SPECIFICATIONS



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

		DIMENSION X & Y (Offset)		NOMINAL DISTANCE (Between pulleys)	
		1976	1977	1976	1977
ELAN	250, 250 Deluxe	32-34 mm (1 ⁹ / ₃₂ - 1 ¹¹ / ₃₂ ")	33-35 mm (1 ⁵ / ₁₆ - 1 ³ / ₈ ")	43-44 mm (1 ¹ / ₁₆ - 1 ³ / ₄ ")	43-44 mm (1 ¹ / ₁₆ - 1 ³ / ₄ ")
OLYMPIQUE	300 Mono	32-34 mm (1 ⁹ / ₃₂ - 1 ¹¹ / ₃₂ ")	same	47 mm (1 ⁷ / ₈ ")	47 mm (1 ⁷ / ₈ ")
	300 Twin, 340	33-35 mm (1 ⁵ / ₁₆ - 1 ³ / ₈ ")	same	35 mm (1 ³ / ₈ ")	35 mm (1 ³ / ₈ ")
	Plus (440)	32-34 mm (1 ⁹ / ₃₂ - 1 ¹¹ / ₃₂ ")		35 mm (1 ³ / ₈ ")	
	440				35 mm (1 ³ / ₈ ")
EVEREST	340		same		35 mm (1 ³ / ₈ ")
	440	33-35 mm (1 ⁵ / ₁₆ - 1 ³ / ₈ ")	same	35 mm (1 ³ / ₈ ")	
T'NT F / C	340	33-35 mm (1 ⁵ / ₁₆ - 1 ³ / ₈ ")		35 mm (1 ³ / ₈ ")	
T'NT	340, 440		same		35 mm (1 ³ / ₈ ")
RV	250	33-35 mm (1 ⁵ / ₁₆ - 1 ³ / ₈ ")		35 mm (1 ³ / ₈ ")	
	340				35 mm (1 ³ / ₈ ")
ALPINE	640ER	32-34 mm (1 ⁹ / ₃₂ - 1 ¹¹ / ₃₂ ")	same	44 mm (1 ³ / ₄ ")	44 mm (1 ³ / ₄ ")



1974 SPROCKET AND CHAIN SPECIFICATIONS

		UPPER / LOWER	CHAIN PITCH
ELAN	250	10 / 25	1/2" single
	250E	10 / 25	1/2" single
	250T	14 / 35	3/8" double
	250 Deluxe	14 / 35	3/8" double
	294SS	15 / 34	3/8" double
OLYMPIQUE	300	15 / 35	3/8" double
	340	15 / 34	3/8" double
	340E	15 / 34	3/8" double
	400	16 / 34	3/8" double
	400E	16 / 34	3/8" double
	440	16 / 33	3/8" double
NORDIC	640ER	18 / 33	3/8" triple
T'NT	300SM	14 / 34	3/8" double
	340SM	15 / 34	3/8" double
	340SE	15 / 34	3/8" double
	440SM	19 / 38	3/8" triple
	440SE	19 / 38	3/8" triple
EVEREST	440SL	19 / 38	3/8" triple
T'NT F / A	340	*14-15-16 / 44	3/8" triple
	400	*15-16-17 / 44	3/8" triple
	440	*15-16-17 / 44	3/8" triple
ALPINE	440ER	17 / 46	3/8" triple
	640ER	17 / 38	3/8" triple
ELITE	440ER	17 / 46	3/8" triple

* Maximum engine revolutions 8300 RPM.

1975-76 SPROCKET AND CHAIN SPECIFICATIONS

		UPPER / LOWER		CHAIN PITCH	
		1975	1976	1975	1976
ELAN	250	10 / 25	10 / 25	1/2" single	1/2" single
	250 Deluxe	14 / 35	14 / 35	3/8" double	3/8" double
	300SS	15 / 34		3/8" double	
OLYMPIQUE	300 Mono		15 / 35		3/8" double
	300 Twin	14 / 35	16 / 35	3/8" double	3/8" double
	300E Twin	14 / 35	16 / 35	3/8" double	3/8" double
	340	15 / 34	17 / 34	3/8" double	3/8" double
	340E	15 / 34	17 / 34	3/8" double	3/8" double
	440 Plus		17 / 34		3/8" double
T'NT	340	15 / 34	16 / 34	3/8" double	3/8" double
	340E	15 / 34	16 / 34	3/8" double	3/8" double
	440	19 / 38		3/8" triple	
	440E	19 / 38		3/8" triple	
EVEREST	440	19 / 38	21 / 38	3/8" triple	3/8" triple
	440E	19 / 38	21 / 38	3/8" triple	3/8" triple
T'NT F / A	340	15 / 44		3/8" triple	
	440	16 / 44		3/8" triple	
T'NT R / V	250	16 / 40	15 / 38	3/8" double	3/8" double
	340		18 / 38		3/8" triple
ALPINE	640ER	17 / 38	17 / 34	3/8" triple	3/8" triple
ELITE	440ER	17 / 46		3/8" triple	

1977 SPROCKET AND CHAIN SPECIFICATIONS

		UPPER / LOWER	CHAIN PITCH
ELAN	250	10 / 25	$\frac{1}{2}$ " single
	250 Deluxe	14 / 35	$\frac{3}{8}$ " double
OLYMPIQUE	300 Mono	15 / 35	$\frac{3}{8}$ " double
	300 Twin	16 / 35	$\frac{3}{8}$ " double
	340	17 / 34	$\frac{3}{8}$ " double
	440	20 / 34	$\frac{3}{8}$ " triple
EVEREST	340	16 / 34	$\frac{3}{8}$ " double
	440	21 / 38	$\frac{3}{8}$ " triple
T'NT	340	15 / 34	$\frac{3}{8}$ " double
	440 Free Air	18 / 38	$\frac{3}{8}$ " triple
	440 Fan cooled	18 / 38	$\frac{3}{8}$ " triple
RV	340	18 / 38	$\frac{3}{8}$ " triple
ALPINE	640ER	17 / 38	$\frac{3}{8}$ " triple



1974 STEERING SYSTEM TORQUE SPECIFICATIONS

	STEERING SYSTEM TYPE	HANDLE BAR RETAINING BOLT kg-m (ft-lbs)	STEERING ARM TO SKI LEG		TIE ROD END TO STEERING ARM	
			kg-m	(ft-lbs)	kg-m	(ft-lbs)
ELAN (All models)	1	Welded	2.5-3.2	(18-23)	2.5-3.2	(18-23)
OLYMPIQUE (All except 300 Mono) 300 Mono	2	3.8-4.8 (28-35)	2.5-3.2	(18-23)	2.5-3.2	(18-23)
	2	3.8-4.8 (28-35)	6 7.6	(44-55)	2.5-3.2	(18-23)
NORDIC 640ER	3	3.8-4.8 (28-35)	2.5-3.2	(18-23)	2.5-3.2	(18-23)
T'NT F / C	4	3.8-4.8 (28-35)	2.5-3.2	(18-23)	2.5-3.2	(18-23)
EVEREST	5	3.8-4.8 (28-35)	2.5-3.2	(18-23)	2.5-3.2	(18-23)
T'NT F / A						
ALPINE	6	3.8-4.8 (28-35)	2.5-3.2	(18-23)	*5.5-6.9	(40-50)
ELITE	7	3.8-4.8 (28-35)	2.5-3.2	(18-23)	2.5-3.2	(18-23)

1975-1976 STEERING SYSTEM TORQUE SPECIFICATIONS

	STEERING SYSTEM TYPE	HANDLE BAR RETAINING BOLT kg-m (ft-lbs)	STEERING ARM TO SKI LEG		TIE ROD END TO STEERING ARM	
			kg-m	(ft-lbs)	kg-m	(ft-lbs)
ELAN (All models)	1	Welded	2.5-3.2	(18-23)	2.5-3.2	(18-23)
OLYMPIQUE (All models)	10	Welded	2.5-3.2	(18-23)	2.5-3.2	(18-23)
T'NT F / C	4	3.8-4.8 (28-35)	2.5-3.2	(18-23)	2.5-3.2	(18-23)
EVEREST	9	Welded	2.5-3.2	(18-23)	2.5-3.2	(18-23)
F / A	8	Welded	2.5-3.2	(18-23)	2.5-3.2	(18-23)
RV						
ALPINE	6	3.8-4.8 (28-35)	2.5-3.2	(18-23)	*5.5-6.9	(40-50)

* Steering arm ball bushing torque value.

1977 STEERING SYSTEM TORQUE SPECIFICATIONS

	STEERING SYSTEM TYPE	HANDLE BAR RETAINING BOLT	STEERING ARM TO SKI LEG		TIE ROD END TO STEERING ARM	
		kg-m (ft-lbs)	kg-m	(ft-lbs)	kg-m	(ft-lbs)
ELAN	1	Welded	2.5-3.2	(18-23)	2.5-3.2	(18-23)
OLYMPIQUE T'NT EVEREST	10	Welded	2.5-3.2	(18-23)	2.5-3.2	(18-23)
RV	12	Welded	2.5-3.2	(18-23)	2.5-3.2	(18-23)
ALPINE	11	3.8-4.8 (28-35)	2.5-3.2	(18-23)	*5.5-6.9	(40-50)

* Steering arm ball bushing torque value.

1974 SKI SYSTEM TORQUE SPECIFICATIONS

	SKI SYSTEM TYPE	LEAF SPRING / SPRING COUPLER RETAINING BOLT kg-m (ft-lbs)	RUNNER SHOE kg-m (ft-lbs)	SPRING COUPLER TO SKI LEG
ELAN (All models except 294SS) 294SS	1 1	4.8-5.5 (35-40)	0.5-0.7 (4-5) 1.2-1.6 (9-12)	Tighten bolt, move ski by hand to check that it pivotes easily on ski-leg. Then tighten locking nut to 6-7.6 kg-m (44-55 ft-lbs).
OLYMPIQUE	2	4.8-5.5 (35-40)	1.2-1.6 (9-12)	
NORDIC	5	4.8-5.5 (35-40)	1.2-1.6 (9-12)	
T'NT F / C EVEREST F / A	3	4.8-5.5 (35-40)	1.2-1.6 (9-12)	
ALPINE	4	4.8-5.5 (35-40)	1.2-1.6 (9-12)	
ELITE	6	4.8-5.5 (35-40)	1.2-1.6 (9-12)	

1975-1976-1977 SKI SYSTEM TORQUE SPECIFICATIONS

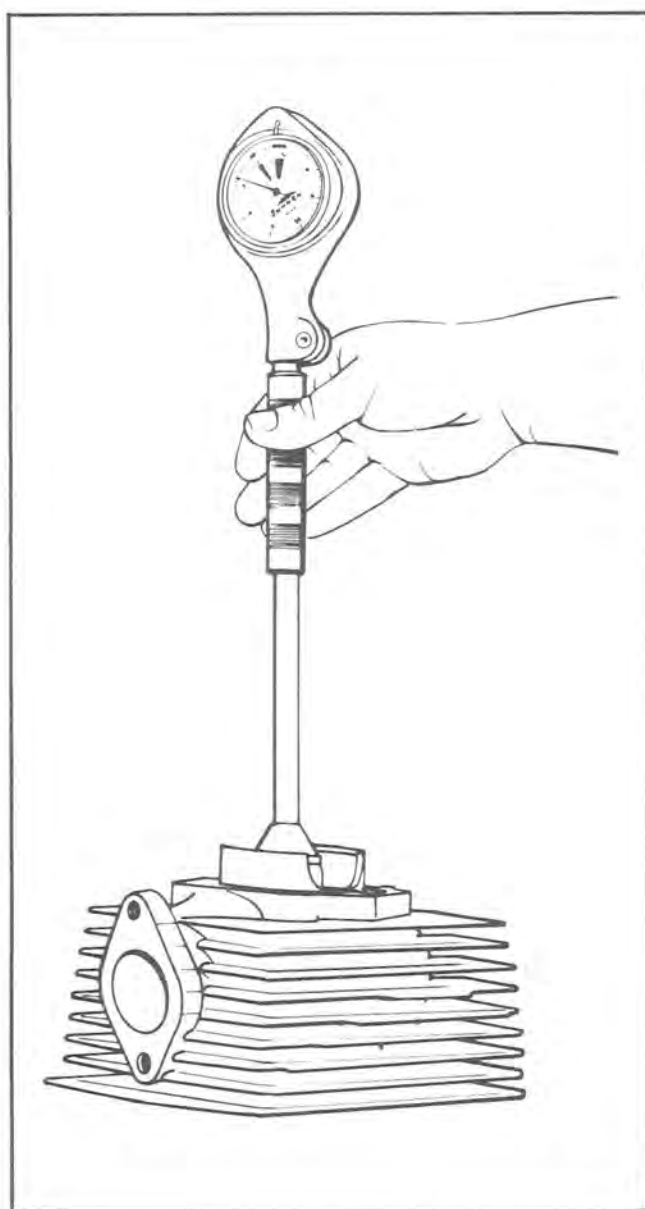
	SKI SYSTEM TYPE	LEAF SPRING / SPRING COUPLER RETAINING BOLT kg-m (ft-lbs)	RUNNER SHOE kg-m (ft-lbs)	SPRING COUPLER TO SKI LEG
ELAN (All models except 300SS) 300SS 1975	7 7	4.8-5.5 (35-40)	0.5-0.7 (4-5) 1.2-1.6 (9-12)	Tighten bolt, move ski by hand to check that it pivotes easily on ski-leg. Then tighten locking nut to 6-7.6 kg-m (45-55 ft-lbs).
OLYMPIQUE	8	4.8-5.5 (35-40)	1.2-1.6 (9-12)	
T'NT F / C EVEREST 1975-76 T'NT & EVEREST 1977	9	4.8-5.5 (35-40)	1.2-1.6 (9-12)	
T'NT F / A 1975	10	4.8-5.5 (35-40)	1.2-1.6 (9-12)	
T'NT RV	11	4.8-5.5 (35-40)	1.2-1.6 (9-12)	
ELITE 1975	6	4.8-5.5 (35-40)	1.2-1.6 (9-12)	
ALPINE 1975-76 1977	12 13	4.8-5.5 (35-40) 4.8-5.5 (35-40)	1.2-1.6 (9-12) 1.2-1.6 (9-12)	



ONE CYLINDER ENGINE TECHNICAL DATA

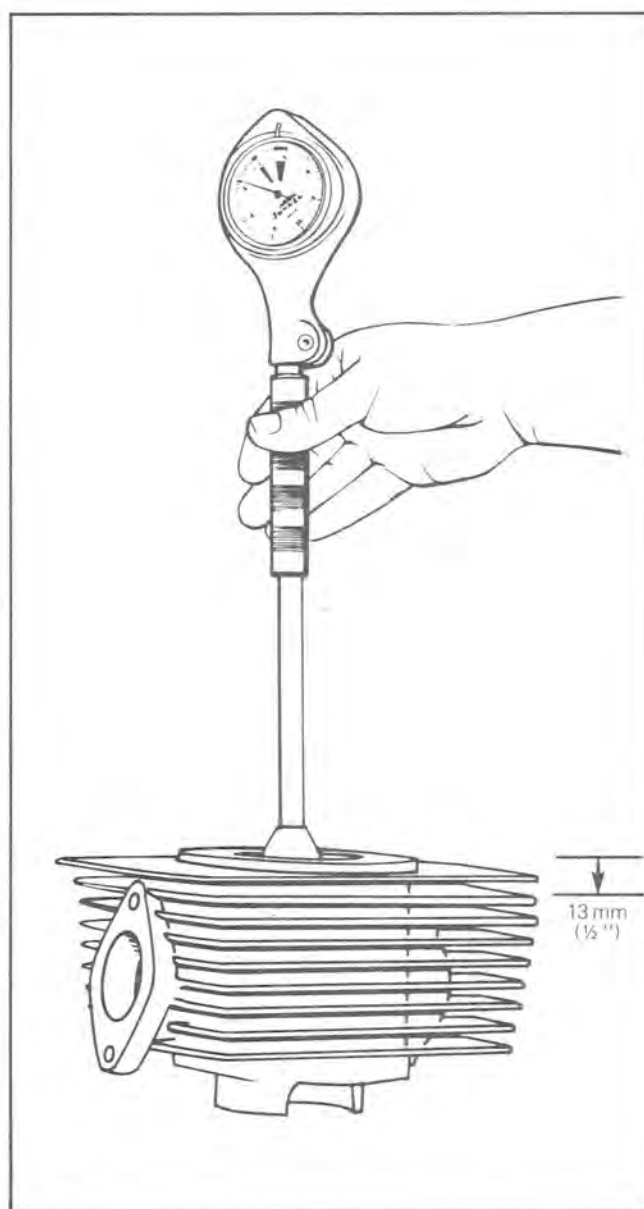
Cylinder taper

Measure cylinder diameter 16 mm ($\frac{5}{8}$ "') from top of cylinder and down to just below the intake port. If the difference between each measurement exceed 0.08 mm (.003'') the cylinder should be rebored and honed or should be replaced.



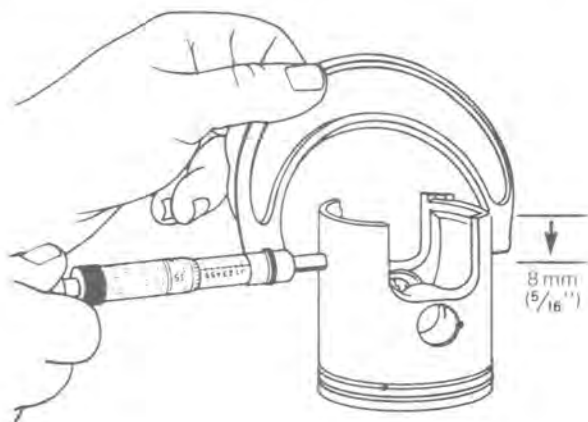
Cylinder out of round

Measuring 13 mm ($\frac{1}{2}$ "') 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 cylinder wall clearance

To determine this clearance, the piston should be measured 8 mm ($\frac{5}{16}$ "') above its bottom edge and the cylinder should be measured 13 mm ($\frac{1}{2}$ "') below its top edge.

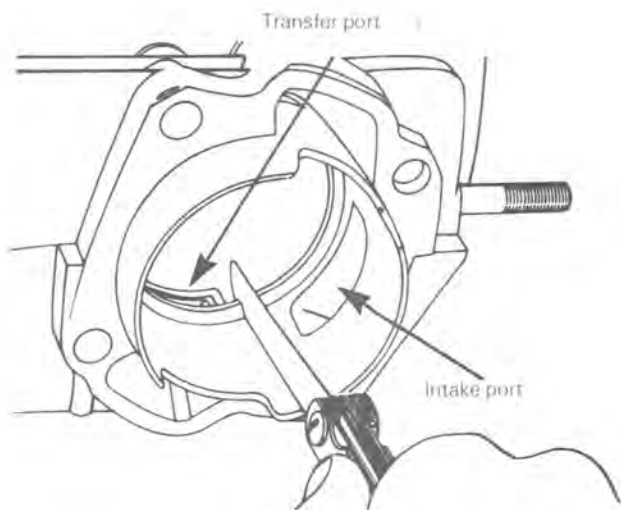


The difference between these two measurements should be within specified tolerance.

○ **NOTE:** If cylinder diameter is 0.1 mm (.004"') larger than nominal, the cylinder should be rebored.

Ring end gap

Position ring half way between transfer port and intake port. Using a feeler gauge, check ring end gap. If gap exceed specified tolerance the ring should be replaced.



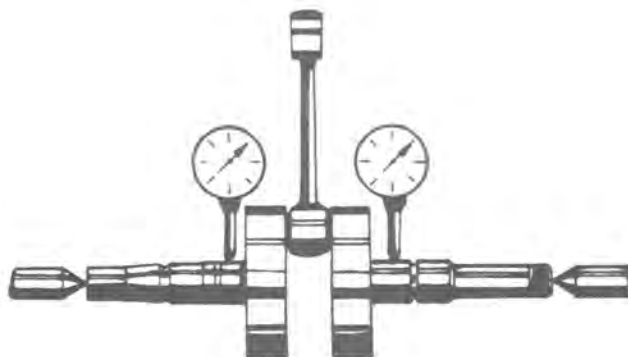
Piston ring / groove clearance

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



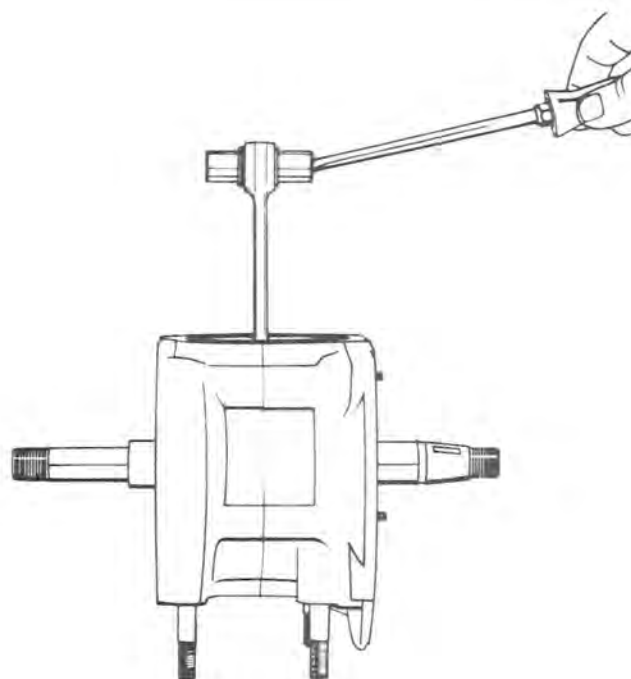
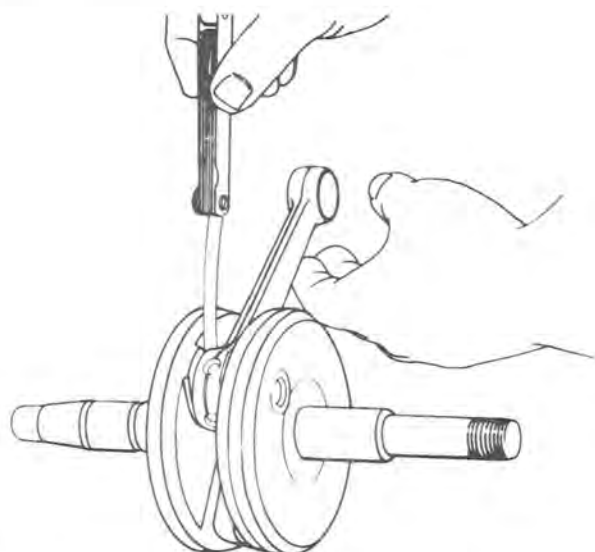
Crankshaft deflection

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 exceed 0.08 mm (.003"') the crankshaft should be repaired by a specialized shop or it should be replaced.



Connecting rod big end axial play

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



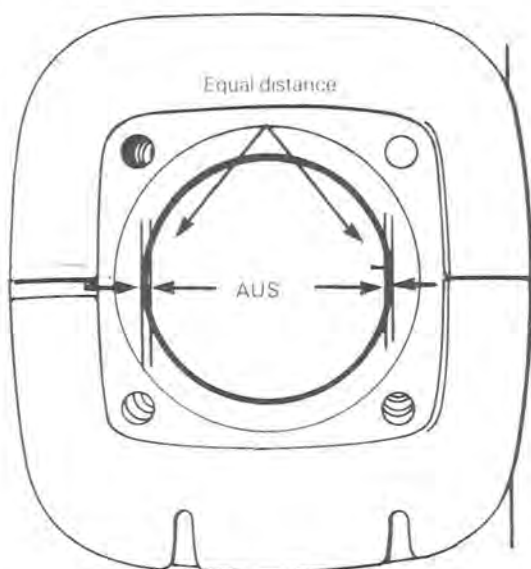
Connecting rod alignment

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.

TOLERANCE AND WEAR LIMIT (ONE CYLINDER ENGINE)

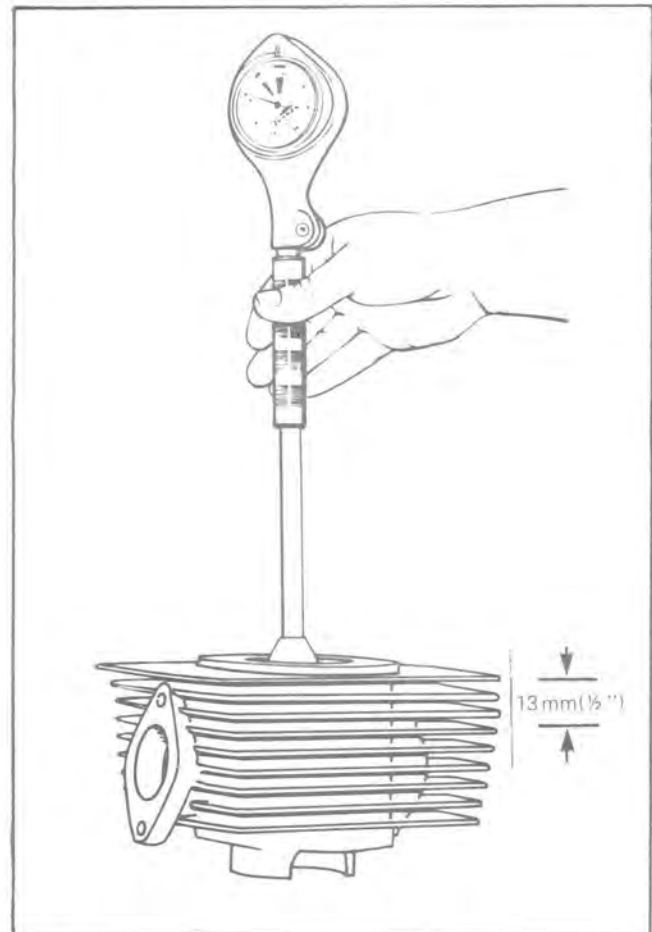
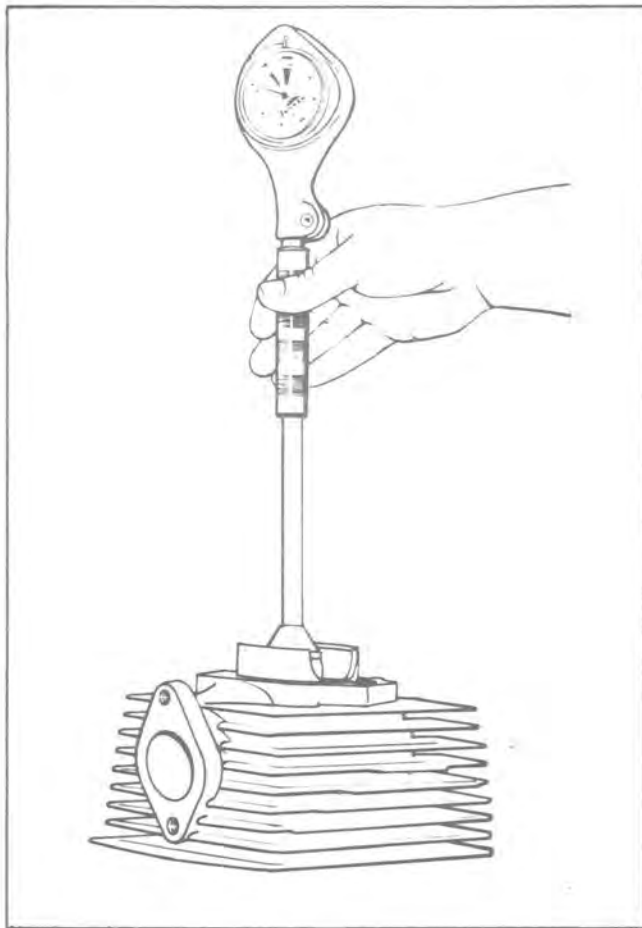
Year	Engine Type	Cylinder bore (nominal)			Piston to wall clearance		Ring End gap	Crankshaft End play
		std.	1st o.s.	2nd o.s.	Fitted tolerance	Wear limit		
1974	247	69.0 mm (2.7165")	69.5 mm (2.7362")	N.A.	0.065-0.100 mm (.0026-.0039")	0.165 mm (.0065")	0.25-1.60 mm (.010-.063")	0.10-0.40 mm (.004-.016")
1974	302	76.0 mm (2.9921")	76.5 mm (3.0118")	77 mm (3.0315")	0.080-0.115 mm (.0031-.0045")	0.195 mm (.0076")	0.30-1.60 mm (.012-.063")	0.10-0.40 mm (.004-.016")
1975	247	69.0 mm (2.7165")	69.5 mm (2.7362")	N.A.	0.065-0.100 mm (.0026-.0039")	0.165 mm (.0065")	0.25-1.60 mm (.010-.063")	0.10-0.40 mm (.004-.016")
1976	247	69.0 mm (2.7165")	69.5 mm (2.7362")	N.A.	0.065-0.100 mm (.0026-.0039")	0.165 mm (.0065")	0.25-1.60 mm (.010-.063")	0.10-0.40 mm (.004-.016")
1976	302	76.0 mm (2.9921")	76.5 mm (3.0118")	77.0 mm (3.0315")	0.080-0.115 mm (.0031-.0045")	0.195 mm (.0076")	0.30-1.60 mm (.012-.063")	0.10-0.40 mm (.004-.016")
1977	247	69.0 mm (2.7165")	69.5 mm (2.7362")	N.A.	0.063-0.099 mm (.0025-.0039")	0.162 mm (.0064")	0.25-1.60 mm (.010-.063")	0.10-0.40 mm (.004-.016")
1977	302	76.0 mm (2.9921")	76.5 mm (3.0118")	77.0 mm (3.0315")	0.078-0.114 mm (.0031-.0045")	0.198 mm (.0078")	0.25-1.60 mm (.010-.063")	0.10-0.40 mm (.004-.016")

N.A. Not applicable

TWO CYLINDER ENGINE TECHNICAL DATA

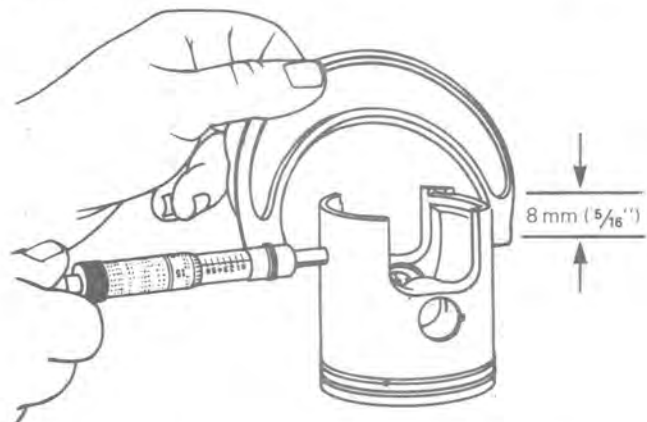
Cylinder taper

Measure cylinder diameter 16 mm ($\frac{5}{8}$ "') from top of cylinder and down to just below the intake port. If the difference between each measurement exceed 0.08 mm (.003"') the cylinder should be rebored and honed or should be replaced.



Piston to cylinder wall clearance

To determine this clearance, the piston should be measured 8 mm ($\frac{5}{16}$ "') above its bottom edge and the cylinder should be measured 13 mm ($\frac{1}{2}$ "') below its top edge.



Cylinder out of round

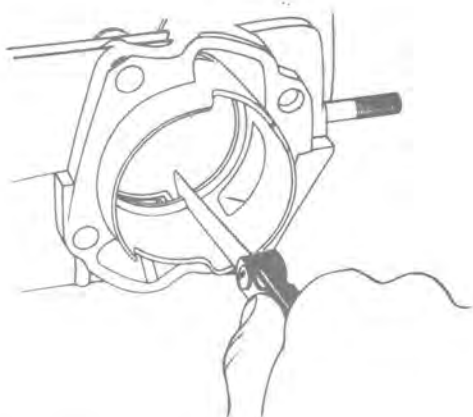
Measuring 13 mm ($\frac{1}{2}$ "') from top of cylinder with a cylinder gauge, check if the cylinder out of round is more than 0.05 mm (.002"'). If larger, cylinder should be rebored and honed or should be replaced.

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

○ **NOTE:** If cylinder diameter is 0.1 mm (.004") larger than nominal, the cylinder should be rebored.

Ring end gap

Position ring half way between transfer port and intake port. Using a feeler gauge, check ring end gap. If gap exceed specified tolerance the ring should be replaced.



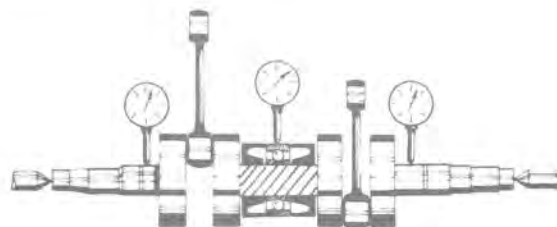
Piston ring / groove clearance

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



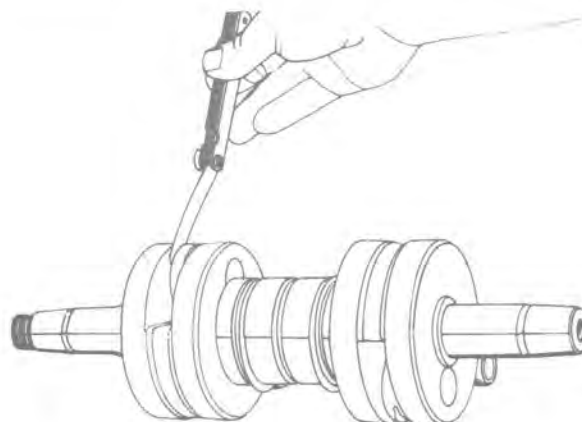
Crankshaft deflection

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 exceed 0.08 mm (.003") the crankshaft should be repaired by a specialized shop or it should be replaced.



Connecting rod big end axial play

Using a feeler gauge measure distance between connecting rod and thrust washer. If axial play exceeds 0.50 mm (.020") the crankshaft should be replaced.



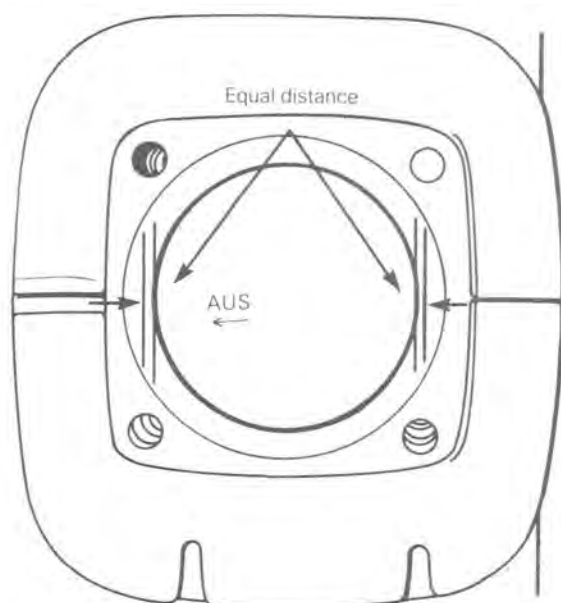
Connecting rod alignment

Check if connecting rod is bent as follows:

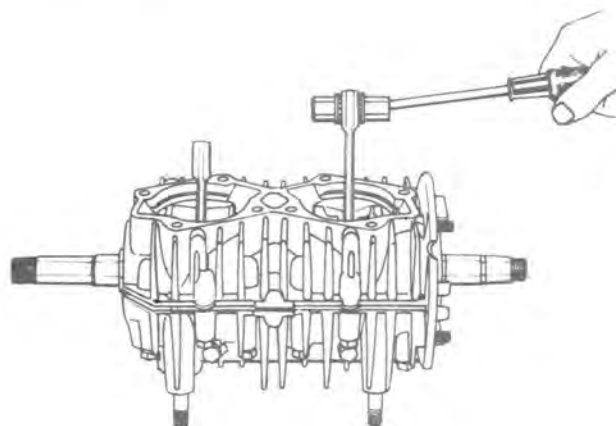
- Once engine crankcase is assembled with the piston mounted on connecting rod without its piston rings, position cylinder on piston.

○ **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.



TOLERANCE AND WEAR LIMIT (TWO CYLINDER ENGINE)

Year	Engine type	Cyl. bore nominal dimension		Piston to wall clearance		Ring end-gap	Crankshaft end-play
		Standard	Oversize	Fitted tolerance	Wear limit		
1974	248	54.0 mm (2.1260")	54.5 mm (2.1457")	0.050-0.085 mm (.0020-.0034")	0.135 mm (.0054")	0.20-1.60 mm (.008-.063")	0.10-0.40 mm (.004-.016")
1974	294	57.0 mm (2.2441")	57.5 mm (2.2638")	0.050-0.085 mm (.0020-.0034")	0.135 mm (.0054")	0.20-1.60 mm (.008-.063")	0.10-0.40 mm (.004-.016")
1974	338	59.5 mm (2.3425")	60.0 mm (2.3622")	0.080-0.115 mm (.0031-.0045")	0.195 mm (.0076")	0.20-1.60 mm (.008-.063")	0.10-0.40 mm (.004-.016")
1974	343	59.5 mm (2.3425")	60.0 mm (2.3622")	0.080-0.115 mm (.0031-.0045")	0.195 mm (.0076")	0.20-1.60 mm (.008-.063")	0.10-0.40 mm (.004-.016")
1974	346	59.5 mm (2.3425")	59.75 mm (2.3524")	0.100-0.135 mm (.0039-.0053")	0.235 mm (.0092")	0.20-1.60 mm (.008-.063")	N.A.
1974	396	64.5 mm (2.5394")	64.75 mm (2.5492")	0.090-0.125 mm (.0035-.0049")	0.215 mm (.0084")	0.25-1.60 mm (.010-.063")	N.A.
1974	401	64.5 mm (2.5394")	65.0 mm (2.5591")	0.080-0.115 mm (.0031-.0045")	0.195 mm (.0076")	0.25-1.60 mm (.010-.063")	0.10-0.40 mm (.004-.016")
1974	434	67.5 mm (2.6575")	68.0 mm (2.6772")	0.080-0.115 mm (.0031-.0045")	0.195 mm (.0076")	0.25-1.60 mm (.010-.063")	N.A.
1974	436	67.5 mm (2.6575")	67.75 mm (2.6673")	0.110-0.145 mm (.0043-.0057")	0.255 mm (.010")	0.25-1.60 mm (.010-.063")	N.A.
1974	440	67.5 mm (2.6575")	N.A.	0.053-0.153 mm (.0021-.006")	0.216 mm (.0086")	0.25-1.60 mm (.010-.063")	N.A.
1974	640	76.0 mm (2.9921")	76.5 mm (3.0118")	0.090-0.125 mm (.0043-.0057")	0.215 mm (.0084")	0.30-1.60 mm (.012-.063")	0.10-0.40 mm (.004-.016")

N.A.: Not applicable

SECTION 08
SUB-SECTION 04-02

TOLERANCE AND WEAR LIMIT (TWO CYLINDER ENGINE)

Year	Engine Type	Cyl. bore nominal dimension		Piston to wall clearance		Ring end-gap	Crankshaft end-play
		Standard	Oversize	Fitted tolerance	Wear limit		
1975	245	54.0 mm (2.1260")	54.25 mm (2.1358")	0.070-0.105 mm (.0028-.0041")	0.175 mm (.0069")	0.20-0.50 mm (.008-.020")	0.10-0.40 mm (.004-.016")
1975	248	54.0 mm (2.1260")	54.5 mm (2.1457")	0.050-0.085 mm (.0020-.0033")	0.135 mm (.0053")	0.20-1.60 mm (.008-.063")	0.10-0.40 mm (.004-.016")
1975	294	57.0 mm (2.2441")	57.5 mm (2.2638")	0.050-0.085 mm (.0020-.0033")	0.135 mm (.0053")	0.20-1.60 mm (.008-.063")	0.10-0.40 mm (.004-.016")
1975	305	55.5 mm (2.1850")	56.0 mm (2.2047")	0.050-0.085 mm (.0020-.0033")	0.135 mm (.0053")	0.20-1.60 mm (.008-.063")	0.10-0.40 mm (.004-.016")
1975	343	59.5 mm (2.3425")	60.0 mm (2.3622")	0.080-.0115 mm (.0031-.0045")	0.195 mm (.0077")	0.20-1.60 mm (.008-.063")	0.10-0.40 mm (.004-.016")
1975	346	59.5 mm (2.3425")	59.75 mm (2.3524")	0.100-0.135 mm (.0039-.0053")	0.235 mm (.0093")	0.20-1.60 mm (.008-.063")	N.A.
1975	434	67.5 mm (2.6575")	68.0 mm (2.6772")	0.080-.0115 mm (.0031-.0045")	0.195 mm (.0077")	0.25-1.60 mm (.010-.063")	N.A.
1975	436	67.5 mm (2.6575")	67.75 mm (2.6673")	0.090-0.125 mm (.0035-.0049")	0.215 mm (.0085")	0.25-1.60 mm (.010-.063")	N.A.
1975	440	67.5 mm (2.6575")	N.A.	0.063-0.153 mm (.0025-.006")	0.216 mm (.0086")	0.25-1.60 mm (.010-.063")	N.A.
1975	640	76.0 mm (2.9921")	76.5 mm (3.0118")	0.090-0.110 mm (.0035-.0043")	0.215 mm (.0085")	0.30-1.60 mm (.012-.063")	0.10-0.40 mm (.004-.016")
1976	245	54.0 mm (2.1260")	54.25 mm (2.1358")	0.070-0.105 mm (.0028-.0041")	0.175 mm (.0069")	0.20-0.50 mm (.008-.020")	N.A.
1976	248	54.0 mm (2.1260")	54.5 mm (2.1457")	0.050-0.085 mm (.0020-.0033")	0.135 mm (.0053")	0.20-1.60 mm (.008-.063")	0.10-0.40 mm (.004-.016")
1976	305	55.5 mm (2.1850")	56.0 mm (2.2047")	0.070-0.105 mm (.0028-.0041")	0.175 mm (.0069")	0.20-1.60 mm (.008-.063")	0.10-0.40 mm (.004-.016")
1976	343	59.5 mm (2.3425")	60.0 mm (2.3622")	0.080-0.115 mm (.0031-.0045")	0.195 mm (.0077")	0.20-1.60 mm (.008-.063")	0.10-0.40 mm (.004-.016")
1976	345	63.0 mm (2.4803")	63.25 mm (2.4902")	0.050-0.085 mm (.0020-.0033")	0.135 mm (.0053")	0.20-0.50 mm (.008-.020")	N.A.
1976	434	67.5 mm (2.6575")	68.0 mm (2.6772")	0.080-0.115 mm (.0031-.0045")	0.195 mm (.0077")	0.25-1.60 mm (.010-.063")	N.A.
1976	440	67.5 mm (2.6575")	N.A.	0.033-0.153 mm (.0013-.006")	0.216 mm (.0086")	0.25-1.60 mm (.010-.063")	N.A.
1976	640	76.0 mm (2.9921")	76.5 mm (3.0118")	0.070-0.105 mm (.0028-.0041")	0.175 mm (.0069")	0.30-1.60 mm (.012-.063")	0.10-0.40 mm (.004-.016")

N.A.: Not applicable

TOLERANCE AND WEAR LIMIT (TWO CYLINDER ENGINE)

Year	Engine Type	Cyl. bore nominal dimension		Piston to wall clearance		Ring end-gap	Crankshaft end-play
		Standard	Oversize	Fitted tolerance	Wear limit		
1977	248	54.0 mm (2.1259")	54.5 mm (2.1456")	0.048-0.083 mm (.0019-.0033")	0.132 mm (.0052")	0.20-1.60 mm (.008-.063")	0.10-0.40 mm (.004-.016")
1977	305	55.5 mm (2.1850")	56.0 mm (2.2047")	0.068-0.104 mm (.0027-.0041")	0.173 mm (.0068")	0.20-1.60 mm (.008-.063")	0.10-0.40 mm (.004-.016")
1977	343	59.5 mm (2.3425")	60.0 mm (2.3622")	0.078-0.114 mm (.0031-.0045")	0.198 mm (.0078")	0.20-1.60 mm (.008-.063")	0.10-0.40 mm (.004-.016")
1977	345	63.0 mm (2.4803")	63.25 mm (2.4901")	0.048-0.083 mm (.0019-.0033")	0.132 mm (.0052")	0.20-0.51 mm (.008-.020")	N.A.
1977	346	59.5 mm (2.3425")	59.75 mm (2.3524")	0.099-0.134 mm (.0039-.0053")	0.233 mm (.0092")	0.20-1.60 mm (.008-.063")	N.A.
1977	436	67.5 mm (2.6574")	67.75 mm (2.6673")	0.089-0.124 mm (.0035-.0049")	0.213 mm (.0084")	0.25-1.60 mm (.010-.063")	N.A.
1977	440*	67.5 mm (2.6574")	68.0 mm (2.6771")	0.068-0.114 mm (.0027-.0045")	0.183 mm (.0072")	0.25-1.60 mm (.010-.063")	0.10-0.40 mm (.004-.016")
1977	440**	67.5 mm (2.6574")	N.A.	0.078 mm (.0031")	0.156 mm (.0062")	0.25-1.60 mm (.010-.063")	0.10-0.40 mm (.004-.016")
1977	640	76.0 mm (2.9921")	76.5 mm (3.0118")	0.068-0.104 mm (.0027-.0041")	0.173 mm (.0068")	0.30-1.60 mm (.012-.063")	0.10-0.40 mm (.004-.016")




N.A.: Not applicable

* Cast iron sleeve cylinder

** Nikasil coated cylinder






1974 IGNITION TIMING SPECIFICATIONS

Engine Type	Ignition Type	Direct measurement B.T.D.C. 	Indirect measurement B.T.D.C. 	Edge gap 
247	BK PT	3.98 mm \pm 0.25 (.157" \pm .010)	N.A.	6.5 mm \pm 1.5 (.260" \pm .060)
248	BK PT	2.22 mm \pm 0.25 (.087" \pm .010)	2.29 mm \pm 0.25 (.090" \pm .010)	9.0 mm \pm 2.0 (.354" \pm .080)
294	BK PT	2.39 mm \pm 0.25 (.094" \pm .010)	2.49 mm \pm 0.30 (.098" \pm .012)	9.0 mm \pm 2.0 (.354" \pm .080)
302	BK PT	3.98 mm \pm 0.25 (.157" \pm .010)	5.79 mm \pm 0.41 (.228" \pm .016)	6.5 mm \pm 1.5 (.260" \pm .060)
338	BK PT	3.07 mm \pm 0.25 (.121" \pm .010)	3.62 mm \pm 0.27 (.143" \pm .011)	6.5 mm \pm 1.5 (.260" \pm .060)
343	BK PT	3.07 mm \pm 0.25 (.121" \pm .010)	3.73 mm \pm 0.30 (.147" \pm .012)	6.5 mm \pm 1.5 (.260" \pm .060)
346	CD	2.07 mm \pm 0.25 (.081" \pm .010)	N.A.	N.A.
396	CD	2.07 mm \pm 0.25 (.081" \pm .010)	N.A.	N.A.
401	BK PT	3.07 mm \pm 0.25 (.121" \pm .010)	3.73 mm \pm 0.30 (.147" \pm .012)	6.5 mm \pm 1.5 (.260" \pm .060)
434	BK PT	3.07 mm \pm 0.25 (.121" \pm .010)	3.30 mm \pm 0.25 (.130" \pm .010)	6.5 mm \pm 1.5 (.260" \pm .060)
436	CD	2.07 mm \pm 0.25 (.081" \pm .010)	N.A.	N.A.
440	BK PT	3.07 mm \pm 0.25 (.121" \pm .010)	3.30 mm \pm 0.25 (.130" \pm .010)	6.5 mm \pm 1.5 (.260" \pm .060)
640	CD	3.35 mm \pm 0.25 (.132" \pm .010)	3.48 mm \pm 0.25 (.137" \pm .010)	N.A.
640	BK PT	3.95 mm \pm 0.25 (.156" \pm .010)	4.11 mm \pm 0.25 (.162" \pm .010)	6.5 mm \pm 1.5 (.260" \pm .060)




N.A.. Not applicable

1975 IGNITION TIMING SPECIFICATIONS

Engine Type	Ignition Type	Direct measurement B.T.D.C. 	Indirect measurement B.T.D.C. 	Edge gap 
245	CD	1.20 mm \pm 0.25 (.047" \pm .010)	N.A.	N.A.
247	BK PT	3.98 mm \pm 0.25 (.157" \pm .010)	N.A.	6.5 mm \pm 1.5 (.260" \pm .060)
248	BK PT	2.22 mm \pm 0.25 (.087" \pm .010)	2.29 mm \pm 0.25 (.090" \pm .010)	9.0 mm \pm 2.0 (.276" \pm .060)
294	BK PT	2.39 mm \pm 0.25 (.094" \pm .010)	2.49 mm \pm 0.30 (.098" \pm .012)	9.0 mm \pm 2.0 (.276" \pm .060)
305	BK PT	3.07 mm \pm 0.25 (.121" \pm .010)	3.73 mm \pm 0.30 (.147" \pm .012)	6.5 mm \pm 1.5 (.260" \pm .060)
343	BK PT	3.07 mm \pm 0.25 (.121" \pm .010)	3.73 mm \pm 0.30 (.147" \pm .012)	6.5 mm \pm 1.5 (.260" \pm .060)
346	CD	2.07 mm \pm 0.25 (.081" \pm .010)	N.A.	N.A.
434	BK PT	3.07 mm \pm 0.25 (.121" \pm .010)	3.30 mm \pm 0.25 (.130" \pm .010)	6.5 mm \pm 1.5 (.260" \pm .060)
436	CD	2.07 mm \pm 0.25 (.081" \pm .010)	N.A.	N.A.
440	BK PT	3.07 mm \pm 0.25 (.121" \pm .010)	3.30 mm \pm 0.25 (.130" \pm .010)	6.5 mm \pm 1.5 (.260" \pm .060)
440	CD	2.07 mm \pm 0.25 (.081" \pm .010)	2.21 mm \pm 0.25 (.087" \pm .010)	N.A.
640	BK PT	3.95 mm \pm 0.25 (.156" \pm .010)	4.11 mm \pm 0.25 (.162" \pm .010)	6.5 mm \pm 1.5 (.260" \pm .060)




N.A. Not applicable

1976 IGNITION TIMING SPECIFICATIONS

Engine Type	Ignition Type	Direct measurement B.T.D.C. 	Indirect measurement B.T.D.C. 	Edge gap 
245	CD	1.15 mm \pm 0.25 (.045" \pm .010)	N.A.	N.A.
247	BK PT	3.98 mm \pm 0.25 (.157" \pm .010)	N.A.	6.5 mm \pm 1.5 (.260" \pm .060)
248	BK PT	2.22 mm \pm 0.25 (.087" \pm .010)	2.29 mm \pm 0.25 (.090" \pm .010)	9.0 mm \pm 2.0 (0.354" \pm .079)
302	BK PT	3.98 mm \pm 0.25 (.157" \pm .010)	N.A.	6.5 mm \pm 1.5 (.260" \pm .060)
305	BK PT	3.07 mm \pm 0.25 (.121" \pm .010)	3.73 mm \pm 0.30 (.147" \pm .012)	6.5 mm \pm 1.5 (.260" \pm .060)
343	BK PT	3.07 mm \pm 0.25 (.121" \pm .010)	3.73 mm \pm 0.30 (.147" \pm .012)	6.5 mm \pm 1.5 (.260" \pm .060)
345	CD	1.0 mm \pm 0.25 (.039" \pm .010)	N.A.	N.A.
434	BK PT	3.07 mm \pm 0.25 (.121" \pm .010)	3.30 mm \pm 0.25 (.130" \pm .010)	6.5 mm \pm 1.5 (.260" \pm .060)
440	BK PT	3.07 mm \pm 0.25 (.121" \pm .010)	3.30 mm \pm 0.25 (.130" \pm .010)	6.5 mm \pm 1.5 (.260" \pm .060)
640	BK PT	3.95 mm \pm 0.25 (.156" \pm .010)	4.11 mm \pm 0.25 (.162" \pm .010)	6.5 mm \pm 1.5 (.260" \pm .060)

N.A.: Not applicable

1977 IGNITION TIMING SPECIFICATIONS

Engine Type	Ignition Type	Direct measurement B.T.D.C. 	Indirect measurement B.T.D.C. 	Edge gap 
247	BK PT	3.98 mm \pm 0.25 (.157" \pm .010)	N.A.	6.6 mm \pm 1.5 (.260" \pm .060)
248	BK PT	2.22 mm \pm 0.25 (.087" \pm .010)	2.29 mm \pm 0.25 (.090" \pm .010)	9.0 mm \pm 2.0 (0.354" \pm .079)
302	BK PT	3.98 mm \pm 0.25 (.157" \pm .010)	N.A.	6.6 mm \pm 1.5 (.260" \pm .060)
305	BK PT	① 3.07 mm \pm 0.25 (.121" \pm .010)	① 3.73 mm \pm 0.30 (.147" \pm .012)	6.6 mm \pm 1.5 (.260" \pm .060)
343	BK PT	② 3.07 mm \pm 0.25 (.121" \pm .010)	② 3.73 mm \pm 0.30 (.147" \pm .012)	6.6 mm \pm 1.5 (.260" \pm .060)
345	CD	1.0 mm \pm 0.25 (.039" \pm .010)	N.A.	N.A.
346	BK PT	2.52 mm \pm 0.25 (.100" \pm .010)	N.A.	6.6 mm \pm 1.5 (.260" \pm .060)
436	BK PT	2.52 mm \pm 0.25 (.100" \pm .010)	N.A.	6.6 mm \pm 1.5 (.260" \pm .060)
440	BK PT	3.07 mm \pm 0.25 (.121" \pm .010)	3.30 mm \pm 0.25 (.130" \pm .010)	6.6 mm \pm 1.5 (.260" \pm .060)
640	BK PT	3.95 mm \pm 0.25 (.156" \pm .010)	4.11 mm \pm 0.25 (.162" \pm .010)	6.6 mm \pm 1.5 (.260" \pm .060)

N.A. - Not applicable

- ① From engine serial No. 2 852 346 and up, use 2.11 mm (.083") for direct timing and 2.46 mm (.097") for indirect timing.
- ② From engine serial No. 2 930 685 and up, use 2.11 mm (.083") for direct timing and 2.46 mm (.097") for indirect timing.

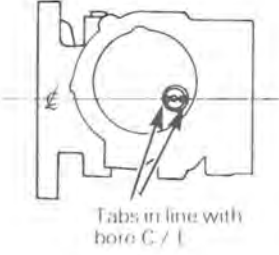
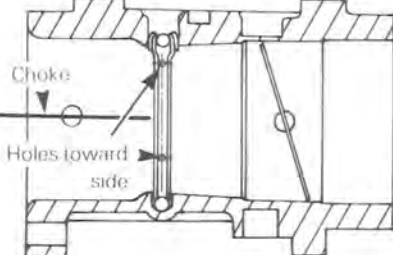
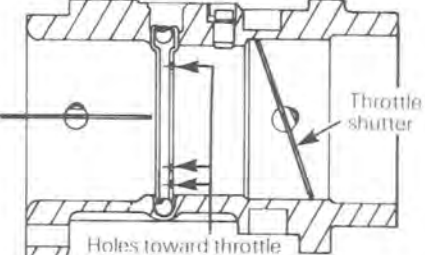
CARBURETOR SPECIFICATIONS

YEAR	MODEL	ENGINE TYPE	CARBURETOR	MAIN FUEL JET DIA.	LOW SPEED ADJ. + 1/8 - 0	HIGH SPEED ADJ. + 1/8 - 0	IDLE SPEED R.P.M.
1974	ELAN 250	247	HR-133-A	.042"	3/4	fixed	1800-2200
1974	ELAN 250 2 cyl.	248	HR-155-A	.044"	1	fixed	1800-2200
1974	ELAN 250DL	248	HR-155-A	.044"	1	fixed	1800-2200
1974	ELAN 294SS	294	HR-161-A	.051"	3/4	fixed	1800-2200
1974	OLYMPIQUE 300	302	HR-132-A	—	3/4	1	1800-2200
1974	OLYMPIQUE 340	338	HR-131-A	.050"	3/4	fixed	1800-2200
1974	OLYMPIQUE 400	401	HR-134-A	.052"	3/4	fixed	1800-2200
1974	OLYMPIQUE 440	434	HR-135-A	.045"	7/8	fixed	1800-2200
1974	T'NT 300	294	HR-164-A	—	1	1	1800-2200
1974	T'NT 340	343	HD-134-A	—	1	1	1800-2200
1974	T'NT 440	440	HD-138-A	—	1	1	1800-2200
1974	EVEREST 440	440	HD-138-A	—	1	1	1800-2200
1974	NORDIC 640	640	HD-133-A	.067"	1	fixed	1800-2200
1974	ALPINE 440	434	HD-108-A	.054"	3/4	fixed	1800-2200
1974	ALPINE 640	640	HD-124-A	.073"	3/4	fixed	1800-2200
1974	ELITE 440	434	HD-140-A	.058"	1	fixed	1800-2200
1974	T'NT 340 F / A	346	2 x HR-149-A	—	1	1 1/2	1800-2200
1974	T'NT 400 F / A	396	2 x HD-123-A	—	1	3/4	1800-2200
1974	T'NT 440 F / A	436	2 x HRM-3A	—	1	1 1/4	1800-2200
1975	ELAN 250	247	HR-133-A	.042"	3/4	fixed	1800-2000
1975	ELAN 250 Deluxe	248	HR-165-A	.044"	1	fixed	1800-2000
1975	ELAN 300SS	294	HR-166-A	.051"	3/4	fixed	1800-2000
1975	OLYMPIQUE 300, 300E	305	HR-169-A	.051"	1	fixed	1500-1800
1975	OLYMPIQUE 340, 340E	343	HR-170-A	.054"	1	fixed	1500-1800
1975	T'NT 340, 340E	343	HD-134-A	—	1	1	1800-2200
1975	T'NT 440, 440E	440	HD-138-A	—	1	1	1800-2200
1975	EVEREST 440, 440E	440	HD-138-A	—	1	1	1800-2200
1975	T'NT F / A 340	346	2 x HR-168-A	—	1	1 1/2	1800-2000
1975	T'NT F / A 440	436	2 x HRM-5-A	—	1	1	1800-2000
1975	T'NT F / A 245 R / V	245	2 x VM-34-72	.260	1	fixed	3000
1975	ALPINE 640ER	640	HD-142-A	.060"	1	fixed or 1	1500-1800
1975	ELITE 440ER	434	HD-140-A	.058"	1	fixed	1800-2200

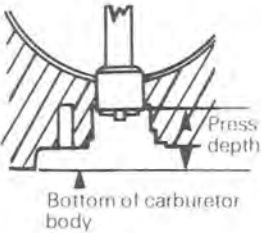
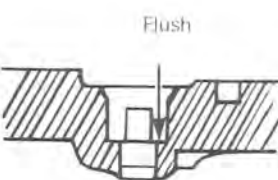
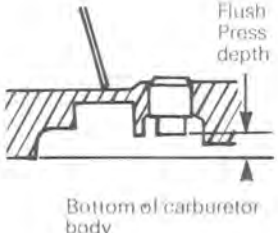
CARBURETOR SPECIFICATIONS

YEAR	MODEL	ENGINE TYPE	CARBURETOR	MAIN FUEL JET DIA.	LOW SPEED ADJ. + ¼ - 0	HIGH SPEED ADJ. + ¼ - 0	IDLE SPEED R.P.M.
1976	ELAN 250	247	HR-173-A	.046"	1	fixed	1500-1800
1976	ELAN 250SS	248	HR-172-A	.042"	1	fixed	1800-2200
1976	OLYMPIQUE 300 Mono	302	HR-174-A	.045"	1	fixed	1200-1500
1976	OLYMPIQUE 300 300E, Twin	305	HR-169-A	.051"	1	fixed	1500-1800
1976	OLYMPIQUE 340, 340E	343	HR-170-B	.054"	1	fixed	1500-1800
1976	OLYMPIQUE Plus 440	434	HR-176-A	.049"	1	fixed	1500-1800
1976	T'NT 340, 340E	343	HD-148-A	—	1	1	1500-1800
1976	T'NT EVEREST 440, 440E	440	HD-147-A	—	1	1	1500-1800
1976	T'NT R / V 250	245	2 x VM 34-93	no. 300	1	fixed	3000
1976	T'NT R / V 340	345	2 x VM 34-94	no. 320	1	fixed	2500
1976	ALPINE 640ER	640	HRM-7-A	—	1 ¼	1	1500-1800
1977	ELAN 250	247	HR-173-A	.046"	1	fixed	1500-1800
1977	ELAN 250 Deluxe	248	HR-172-A	.042"	1	fixed	1800-2200
1977	OLYMPIQUE 300 Mono	302	HR-174-A	.045"	1	fixed	1200-1500
1977	OLYMPIQUE 300 Twin	305	VM 30-90	no. 260	1 ½ ± 0	fixed	1500-1800
1977	OLYMPIQUE 340	343	VM 30-91	no. 260	1 ½ ± 0	fixed	1500-1800
1977	OLYMPIQUE 440	440	VM 32-113	no. 290	1 ½ ± 0	fixed	1500-1800
1977	EVEREST 340	343	HD-148-A	—	1	1	1500-1800
			OPTIONAL VM 30-98	no. 250	1 ½ ± 0	fixed	1500-1800
1977	EVEREST 440	440	VM 34-110	no. 340	1 ½ ± 0	fixed	1500-1800
1977	T'NT 340	346	VM 34-118	no. 300	1 ± 0	fixed	1800-2000
1977	T'NT 440	436	VM 36-53	no. 350	1 ± 0	fixed	1800-2000
1977	T'NT 440	440	VM 34-110	no. 340	1 ½ ± 0	fixed	1500-1800
1977	RV 340	345	2 x VM 34-135	no. 320	1 ± 0	fixed	3000-3200
1977	ALPINE 640ER	640	HRM-7-A	—	1 ¼	1	1500-1800

NOZZLE CHECK VALVE INSTALLATION POSITION

 <p>Applicable on: HD-124-A HD-133-A HD-138-A HD-147-A</p>	 <p>Applicable on: HD-124-A HD-133-A</p>	 <p>Applicable on: HD-138-A HD-147-A</p>
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NOZZLE CHECK VALVE PRESS DEPTH SPECIFICATIONS

			
MODEL	Main Nozzle / Discharge Tube	Main Nozzle	Intermediate Nozzle
HD-108-A HD-134-A HD-123-A HD-148-A HD-140-A HD-142-A	Not applicable	Nozzle shoulder flush with well floor	Not applicable
HD-124-A HD-133-A	.343" *	Not applicable	Not applicable
HD-138-A HD-147-A	.343" *	Not applicable	.156"

* Measurement taken between lowest point of nozzle and bottom of carburetor body.

All measurements $\pm .005''$


MIKUNI CARBURETOR SPECIFICATIONS

CARBURETOR	MAIN JET (Production)	JET NEEDLE*	NEEDLE JET	CUT AWAY	PILOT JET	AIR SCREW
VM 34-72	260	6DH4-2	P-4 (159)	2.5	35	1 turn
VM 34-93	300	6DH4-2	P-0 (159)	1.5	35	1 turn
VM 34-94	320	6DH4-2	P-2 (159)	1.5	30	1 turn
VM 30-90	260	6DH2-3	P-6 (159)	1.5	25	1½ turn
VM 30-91	260	6DH2-3	Q-0 (159)	2.0	25	1½ turn
VM 30-98	250	6F9-3	Q-2 (159)	3.5	35	1½ turn
VM 34-110	340	6F9-3	P-2 (159)	1.5	20	1½ turn
VM 34-118	300	6F9-3	Q-2 (159)	3.5	35	1 turn
VM 32-113	290	6F9-4	Q-2 (159)	3.5	35	1½ turn
VM 36-53	350	6I1-2	P-2 (159)	3.5	40	1 turn
VM 34-135	320	6DH2-4	P-0 (159)	1.5	30	1 turn

*6DH4, -3 indicates specific slot of the needle from top.

1975 RV 250 MAIN JET APPLICATION CHART

Meters (Feet) ALTITUDE	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)
0 Sea level	300	290	280	270	260	250	240	230
600 m (2,000)	290	280	270	260	250	240	230	220
1200 m (4,000)	270	260	250	240	230	220	210	200
1800 m (6,000)	260	250	240	230	220	210	200	190
2400 m (8,000)	240	230	220	210	200	190	180	170
3,000 m (10,000)	230	220	210	200	190	180	170	160

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

1976 RV 250 MAIN JET APPLICATION CHART

<div> <div>TEMPERATURE</div> <div>° C</div> <div>(° F)</div> </div> <div> <div>Meters (feet)</div> <div>ALTITUDE</div> </div>	-45° C (-50)	-35° C (-30)	-25° C (-10)	-15° C (10)	0° C (30)	10° C (50)	20° C (70)	30° C (90)
0 (sea level)	350	330	320	310	300	290	280	270
600 m (2,000)	330	320	310	300	280	270	260	250
1,200 m (4,000)	310	300	290	280	270	260	250	240
1,800 m (6,000)	300	290	270	260	250	240	230	220
2,400 m (8,000)	280	270	260	250	240	220	210	200
3,000 m (10,000)	260	250	240	230	220	210	200	190

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


1976 RV 340 MAIN JET APPLICATION CHART

<div> <div>TEMPERATURE</div> <div>° C</div> <div>(° F)</div> </div> <div> <div>Meters (feet)</div> <div>ALTITUDE</div> </div>	-45° C (-50)	-35° C (-30)	-25° C (-10)	-15° C (10)	0° C (30)	10° C (50)	20° C (70)	30° C (90)
0 Sea level	370	360	350	330	320	310	300	290
600 m (2,000)	350	340	330	320	300	290	280	270
1,200 m (4,000)	330	320	310	300	290	270	260	250
1,800 m (6,000)	320	300	290	280	270	260	240	230
2,400 m (8,000)	300	290	280	260	250	240	230	210
3,000 m (10,000)	280	270	260	250	230	220	210	200

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

1977 RV 340 MAIN JET APPLICATION CHART

Meters (feet) ALTITUDE	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)
0 Sea level			350	340	330	320	310	300	280	270
600 m (2,000)			340	330	310	300	290	280	270	250
1,200 m (4,000)			320	310	300	290	270	260	250	240
1,800 m (6,000)			310	290	280	270	260	240	230	220
2,400 m (8,000)			290	280	260	250	240	230	220	200
3,000 m (10,000)			270	260	250	240	220	210	200	190

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

Engine type			74		73		72		71	
			①	②	①	②	①	②	①	②
ELAN	250	(247)	M175T1	M145T1	M175T1	M145T1	M175T1	M145T1	M175T1	M145T1
	250E	(247)								
	250T	(248)								
	250 Deluxe	(248)	W240T1	W225T1	W240T1	W225T1				
	250SS	(249)								
	294SS	(294)	W260T1	W260T1	W260T1	W260T1				
OLYMPIQUE	300	(302)	M175T1	M145T1	M175T1	M145T1	M175T1	M145T1	M175T1	M145T1
	335	(337)								
SKANDIC	335	(337)			M225T1	M175T1	M225T1	M175T1	M225T1	M175T1 (same on 1970)
OLYMPIQUE	340	(338)	W240T1	W225T1	W240T1	W225T1				
	399	(401)	W240T1	W240T1	W240T1	W240T1	W240T1	W225T1	W240T1	W225T1
	440	(434)	M225T1	M175T1	M225T1	M175T1				
T'NT	290 1 cyl.	(292)					M280T31	M260T1	M280T31	M260T1
	300 2 cyl.	(294)	W260T1	W260T1	W260T1	W240T1				
	340 1 cyl.	(342)							M280T31	M280T31
	340 2 cyl.	(343)	W260T1	W260T1	W280M1	W260T1	W280M1	W260T1		
	440	(434)	M260T1	M260T1	M280T31	M280T31	M280T31	M280T31	M260T1	M260T1
	640	(641)					M280T31	M260T1	M280T31	M260T1
	775	(775)					M310T31S	M280T1	M310T31S	M280T1
T'NT F / A	340	(346)								
	440	(436)	W280M2	W280M2	W280M2	W280M2				
	400	(396) (398)	W280M2	W280M2	W280M2	W280M2	TYPE: 398 W280T30	W280T30		
NORDIC	399	(401)					(440)		(401)	
	440	(434)					M240T1	M225T1	W240T1	W225T1
	640	(640)	M225T1	M225T1	M225T1	M225T1	M225T1	M225T1	M225T1	M225T1
ALP. VAL.	399	(401)							(401)	
									W240T1	W225T1
	440	(434)	M225T1	M175T1	M225T1	M175T1	M240T1	M225T1		
	640	(640)	M225T1	M175T1	M225T1	M175T1	M225T1	M175T1	M225T1	M175T1
ELITE	440	(434)	M240T1	M225T1	M225T1	M175T1				

① Engine full load.

② Engine part load.

1971-72-73-74 BOSCH SPARK PLUG CHART

1975-76-77 BOSCH SPARK PLUG CHART

		Engine type	1975		1976		1977	
			①	②	①	②	①	②
ELAN	250 250 Deluxe 300SS	(247) (248) (294)	M175T1 W240T1 W260T1	M145T1 W225T1 W240T1	M175T1 W240T1	M175T1 W240T1	M175T1 W240T1	M175T1 W240T1
OLYMPIQUE	300 Mono 300 Twin 340 Plus 440 440	(302) (305) (343) (434) (440)	W240T1 W260T1	W225T1 W260T1	M225T1 W260T1 W260T1 M240T1	M175T1 W240T1 W240T1 M225T1	M175T1 W260MZ1 W260MZ1 M260T1	M175T1 W240MZ1 W240MZ1 M260T1
EVEREST	340 440	(343) (440)	M260T1	M260T1	M260T1	M260T1	W260MZ1 M260T1	W260MZ1 M260T1
T'NT F / C	340 440	(343) (440)	W260T1 M260T1	W260T1 M260T1	W260T1	W260T1		
T'NT	340 440 440	(346) (436) (440)					W260MZ2 W260MZ2 M260T1	W260MZ2 W260MZ2 M260T1
T'NT F / A	340 440	(346) (436)	W280M2 W280M2	W280M2 W280M2				
T'NT RV	250 340	(245) (345)	W280MZ2	W280MZ2	W280MZ2 W280MZ2	W280MZ2 W280MZ2	W280MZ2	W280MZ2
ELITE	440	(434)	M240T1	M225T1				
ALPINE	640	(640)	M225T1	M225T1	M225T1	M175T1	M240T1	M240T1

① Engine full load.

② Engine part load.

IGNITION GENERATING COIL, LIGHTING COIL & BRAKE LIGHT COIL RESISTANCE CHART

1974-75 MODELS		ENGINE TYPE	IGNITION GENERATING COIL		LIGHTING COIL		BRAKE LIGHT COIL	
			1974	1975	1974	1975	1974	1975
ELAN	250	247	3.4	3.4	0.45	0.45	1.85	1.85
	250T	248	1.15		0.45		1.90	
	250 Deluxe	248	1.15	1.15	0.45	0.45	1.90	1.90
	294SS,300SS	294	1.15	1.15	0.45	0.45	1.90	1.90
OLYMPIQUE	300	302	3.4		0.45		1.85	
	300	305		3.3		0.23		
	340	338	2.35		0.40		1.70	
	340	343		3.3		0.23		
	400	401	2.35		0.40		1.70	
	440	434	2.35		0.40		1.70	
EVEREST	440	440	3.4		0.40	0.23 ①		2.15 ②
T'NT F / C	300	294	1.15		0.45		1.90	
	340	343	3.4	3.3	0.40	0.23		
	440	440	3.4	3.3	0.40	0.23		
T'NT F / A	340	346			0.23	0.23		
	400	396			0.23			
	440	435			0.23	0.23		
	245 RV	245				0.23		
NORDIC	640	640			0.14			
ELITE	440	434	2.35	2.35	0.14	0.14	1.70	1.70
ALPINE	440	434	2.35		0.40		1.70	
	640	640	2.35	3.3	0.14	0.23		

All values are given in ohms, with a tolerance of $\pm 20\%$.

① $\pm .025$ ohms

② additional lighting coil 30W.

IGNITION GENERATING COIL, LIGHTING COIL & BRAKE LIGHT COIL RESISTANCE CHART

1976-77 MODELS		ENGINE TYPE	IGNITION GENERATING COIL		LIGHTING COIL		BRAKE LIGHT COIL	
			1976	1977	1976	1977	1976	1977
ELAN	250	247	3.4	3.4	0.45	0.45	1.85	1.85
	250 Deluxe	248	1.15	1.15	0.45	0.45	1.90	1.90
OLYMPIQUE	300 Mono	302	3.4	3.4	0.45	0.45	1.85	1.85
	300 Twin	305	3.3	3.3	0.23	0.23		
	340	343	3.3	3.3	0.23	0.23		
	Plus (440)	434	2.35		0.45		1.70	
	440			3.3		0.23		
EVEREST	340	343		3.3		0.23		
	440	440	3.3	3.3	0.23	0.23		
T'NT F / C	340	343	3.3					
T'NT	340	346		3.3		0.23		
	440	436		3.3		0.23		
	440	440		3.3		0.23		
T'NTR / V	250	245	① 355		② 0.23		③ 2.15	
	340	345	① 355	355 ①	② 0.23	0.23 ②	③ 2.15	2.15 ③
ALPINE	640	640	3.3	3.3	② 0.23	0.23 ②	③ 2.15	2.15 ③

All values are given in ohms, with a tolerance of $\pm 20\%$.

① ± 15 ohms

② ± 0.025 ohms

③ additional lighting coil 30W.

LIMITED WARRANTY 1977 MODEL SKI-DOO® SNOWMOBILE

Bombardier Limited (BOMBARDIER), as manufacturer,

WARRANTS

FROM THE DATE OF FIRST CONSUMER SALE every 1977 SKI-DOO® snowmobile sold as a

NEW VEHICLE by an authorized SKI-DOO dealer for a period of:

Twelve (12) consecutive months for ELAN®, OLYMPIQUE®, T'NT® and EVEREST® models;

Ninety (90) consecutive days for RV® and ALPINE® models 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 winter season, beginning the 1ST DAY OF DECEMBER.

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.

EXCLUSIONS

Items and components:

Any expendable items and / or components that are damaged or worn due to normal use or lack of proper maintenance, are excluded from this warranty.

BOMBARDIER under this warranty, will not remedy or pay for the following:

- 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 new 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.
- 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 incidental or consequential damages.

Some states 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 Warranty Registration card given by the selling dealer at time of purchase.

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 consumer guide booklet.
3. Then if your grievance still remains unsolved, you may write to us:

Bombardier Limited
Trade and Consumer Affairs
Recreational Product Group
Valcourt, Quebec, Canada, J0E 2L0

PLEASE PROVIDE ALL NECESSARY DETAILS INCLUDING:

- Model and serial number
- Date of purchase
- Name and address of your selling or servicing dealer
- Problem

This warranty gives you specific rights; and you may also have other legal rights which may vary from state to state.

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 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.

