AD Boivin
Manufacturing Fun

2002-03

Set-up, service and repair Manual

Snow Hawk™

FOREWORD

Congratulations, and thank you for buying an *A.D. Boivin design inc.* Snow Hawk™ vehicle. We appreciate the confidence in our product that you have demonstrated by making this purchase.

Several years of design, tests and improvements were necessary to produce this vehicle which combines performance, driving pleasure and safety.

Proper maintenance on a regularly-scheduled basis is essential in order to obtain the performance you have the right to expect from your machine. In this manual, you will find all the information needed for adjustments to and the maintenance of this vehicle.

We sincerely hope that you will have many years of enjoyment with your Snow Hawk™.

A D Boivin design inc.

All the information, illustrations, photographs and specifications found in this manual are based on the latest available data at the time of publication. Due to improvements or other changes, it is possible that you will note a few differences. *A D Boivin design* reserves the right to make changes at any time.

WARNING /CAUTION / NOTICE

Please read this manual and follow the instructions carefully. Pay particular attention to the boxes entitled WARNING and CAUTION as well as to the paragraphs preceded by the word *NOTICE*.

WARNING

This symbol is designed to call attention to particular instructions and procedures, which, if not followed to the letter, could cause injury and even fatal accidents.

▼ CAUTION

This symbol is designed to call attention to particular instructions and procedures, which, if not followed to the letter, could cause damage to or even destruction of the vehicle.

● *NOTICE:*

The information in the NOTICES is designed to explain maintenance procedures and to ensure the best possible use of the vehicle.

IMPORTANT REMARKS

Using this vehicle can be a very pleasurable experience and we wish you all the enjoyment that it can bring you. However, if certain rules are not respected, this sport can become a source of environmental problems and of interpersonal conflicts.

Adopting a responsible attitude and behaving in a responsible manner at all times will help avoid such problems and conflicts.

PROTECT THE FUTURE OF YOUR SPORT. BE SURE TO RESPECT THE RULES AT ALL TIMES. DEMONSTRATE AN AWARENESS OF THE IMPORTANCE OF THE ENVIRONMENT AND RESPECT THE RIGHTS OF OTHERS.

WARRANTY

1. All the parts of this vehicle are covered by the warranty for a period of one winter season against any problem related to its assembly or construction.

2. The labour costs of repairs covered by the warranty are the responsibility of the vehicle owner.

3. The company reserves the right to require that the dealer carrying out the repairs send back any parts declared defective.

LOCATION OF THE V.I.N.

Warnings concerning maintenance

◆ WARNING

Never have the motor running inside a building. The exhaust fumes contain carbon monoxide, a colourless, odourless gas which can cause death or severe injuries.

Allow the motor to run only in a well-ventilated area.

◆ WARNING

When hot, a motor, an exhaust system or a drive system can cause burns.

Wait until they have cooled before carrying out maintenance.

◆ WARNING

The gas tank can catch fire if it is not handled correctly. Gas vapours can burst into flames easily.

Do not smoke while carrying out vehicle maintenance.

Do not carry out maintenance anywhere near exposed flames or sparks.

◆ WARNING

Brake fluid can be dangerous for people and animals. These fluids are harmful or fatal if swallowed and must not come into contact with the skin or eyes.

◆ WARNING

Carrying out maintenance of this vehicle while the motor is running can be dangerous. Injuries could result from contact with moving parts.

Make sure you turn off the motor before working on the vehicle.

◆ WARNING

Working on this vehicle without wearing the appropriate clothing can be dangerous. Injuries could result if you are not adequately protected.

Always wear the necessary equipment when working on the vehicle: shoes, goggles, gloves and/or mask if necessary.

Important information concerning maintenance

- Replace the joints, brake shoes and pins by new ones.
- Use special tools when so indicated.
- Use original parts as well as recommended products.
- After reassembling the vehicle, inspect the parts and verify the torque on the nuts and bolts.

Replacement parts

Use only *A D Boivin* parts or their equivalent. *A D Boivin's* original high-quality parts are designed and manufactured especially for your vehicle.

●*NOTICE:*

Using replacement parts that are not equivalent or are of inferior quality could mean your vehicle will not be able to perform as it should and could damage your machine.

PICTOGRAMS AND THEIR MEANINGS

 515	 LocTite #515, Flange Sealant
 Ultra	 LocTite Ultra Copper, High Temperature Sealant
 243	 Non-permanent threadlocker (blue)
 262	 Permanent threadlocker (red)
	Brake fluid, DOT 4
	Fork oil, S.A.E. 10W
	Rear suspension shock oil, Kayaba
	Silicone grease (P/N 420 8970 61)
	Molybdenum Grease (88162-74 / Dow corning)
	Tighten a bolt or nut to a specified torque
	Replace a part by a new one when re-assembling

TABLE OF CONTENTS

FIRST CONTACT

The SNOW HAWK™ is a brand new type of vehicle. Technically speaking, it is a cross between a snowmobile and a motorcycle. However, its behaviour depends on the conditions in which it is used. Sometimes, it will react more like a bike while at other times, it will react more like a snowmobile or a jetski.

Describing exactly how the SNOW HAWK™ behaves is difficult. This is why we recommend that you take the time to become acquainted with your machine in an area free of any obstacle. This first contact should take place at low speed, with a series of basic manoeuvres that will allow you to learn about the reactions of the vehicle.

A good exercise is to follow a "figure 8" trajectory because this will allow you to experiment with right- and left-hand turns followed by accelerating and braking.

Turning can be done by steering right or left, keeping in mind the speed of the vehicle, the snow conditions and how quickly you want to change direction.

◆WARNING

Some people enter a turn by stretching out a leg on the inside of the turn and letting the foot slide over the ground (a technique used in motocross). We advise against this practice which could cause severe injuries if your foot should sink into the snow. We rather suggest keeping both feet on the footpegs as much as possible.

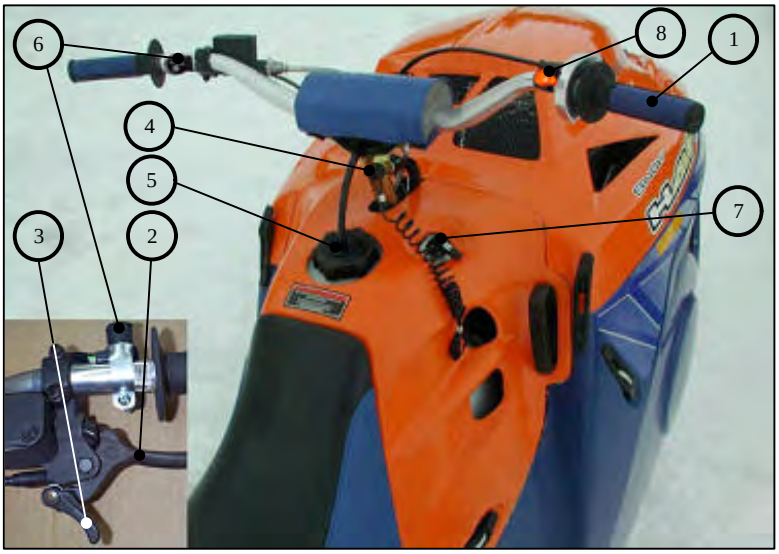
An upright position, with the knees clutching the gas tank and the elbows pointing away from the vehicle, will give a sense of security and provide greater freedom of movement while accelerating or slowing down.

◆ WARNING

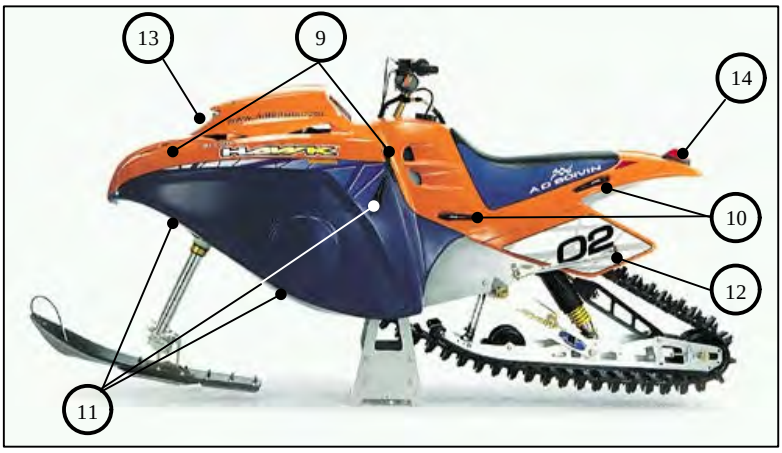
The greatest danger in using this vehicle is the perception you may have of how competent you are. Overestimating how competent you are can result in hazardous situations both for yourself and for other trail users.

Do not forget to take all the time that is necessary for you to practice and feel comfortable at low speeds before attempting high-speed manoeuvres. You will then be able to fully appreciate the joy of driving.

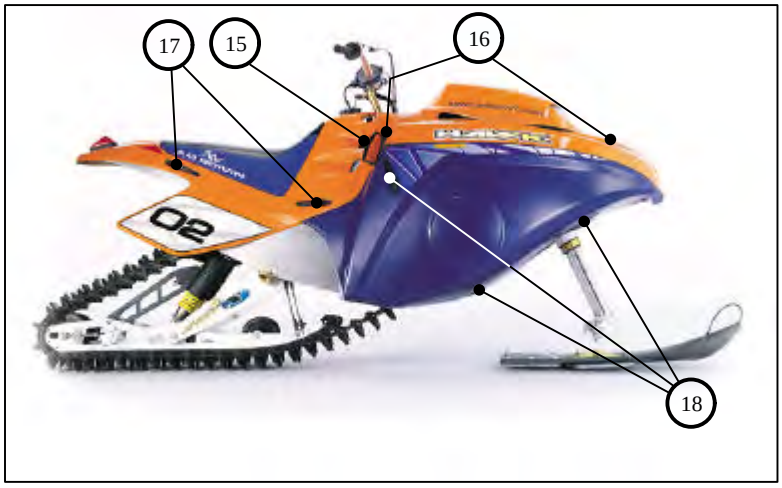
LOCATION OF MECHANISMS AND CONTROLS



1. Throttle control
2. Brake lever
3. Parking brake lever
4. Engine-cutoff (tether)
5. Gas tank cap
6. Dimmer switch
7. Choke control
8. Emergency-stop button



9. Hood latches (4)
10. Rear module latches (4)
11. Bellypan latches (6)
12. Kick stand
13. Headlight
14. Stop and tail light



15. Recoil starter handle
16. Hood latches (4)
17. Rear module latches (4)
18. Bellypan latches (6)

FUEL

This vehicle is powered by a two-stroke engine that uses a pre-mixed gasoline and oil mixture.

Gasoline: Regular unleaded gas with a minimum octane rating of **87** (R+M)/2

Motor oil: Bombardier / ROTAX Pre-mixture oil

Mixture ratio: 40 :1

Gas tank capacity: 17.5 litres

Gasoline (L)	Oil (ml)
5	125
10	250
15	375
20	500
25	625

▼ CAUTION

A mixture in which the proportion of oil is too low will cause piston failure. On the other hand, a mixture in which the proportion of oil is too high will cause excessive carbon deposits that will result in fouled spark plugs and will affect performance.

Always mix in a proportion of 40 parts of gasoline for each part of oil.

● *NOTICE:*

- o *The use of gas-line antifreeze is recommended in a ratio of 150 mL per fuel tank in very cold temperatures.*
- o *Avoid mixing oils of different brands.*

OPERATING INSTRUCTIONS

Pre-driving inspection

◆ WARNING

A pre-driving inspection is of the utmost importance before using the vehicle. Do not start the machine until you are sure all mechanisms and controls are functioning properly. Failing to proceed in the prescribed manner may result in severe injuries or even death.

- o Make sure the track and the idler wheels are not frozen and that they move freely.

- o Depress the brake lever and make sure the brake is fully engaged before the end of the lever touches the handlebar. The lever must return to its original position as soon as it is released.

- o Turn the twist throttle control a few times to make sure it functions properly. The control must return automatically to the idle position as soon as it is released.

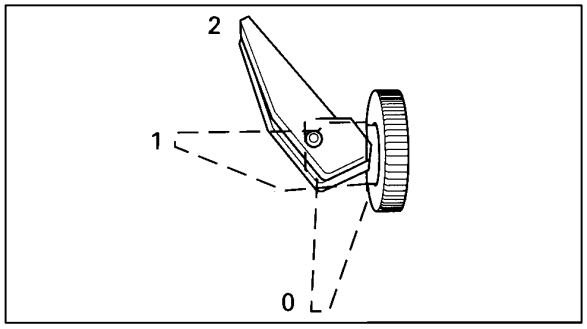
- o Make sure the engine cutoff switch, the stop light, the headlight (high and low beams) and the tail light are in good working order.

Starting the engine

- o Put the cap of the engine cutoff (tether) in place. The other end of the cord must be attached to the driver.

- o If the engine is cold, use the choke control.

  0. Normal position (not activated)
  1. Intermediate choke position
  2. Full choke position



- o Start the engine by firmly pulling the handle of the rewind starter.

◆ WARNING

Do not touch the throttle control while starting the engine.

Stopping the engine

o While the engine is idling, remove the engine cutoff cap (tether) or press the emergency-stop button.

BREAK-IN PERIOD

Engine

▼ CAUTION

A break-in period of 10 to 15 hours is essential before using the vehicle at full power.

During the break-in period, the throttle control should not be turned more than ¾ of its range. However, occasional periods of brief, brisk acceleration and frequent speed variations contribute to a good break-in. On the other hand, periods of long, high acceleration, sustained high speed and engine overheating are harmful during the break-in period.

Belt

A new drive belt must be submitted to a 5-hour break-in period. Avoid high-speed driving and brisk accelerations during this period.

Inspection – 10 hours

A general inspection is recommended after the first 10 hours of use. This inspection must be carried out by an authorized SNOW HAWK ™ dealer.

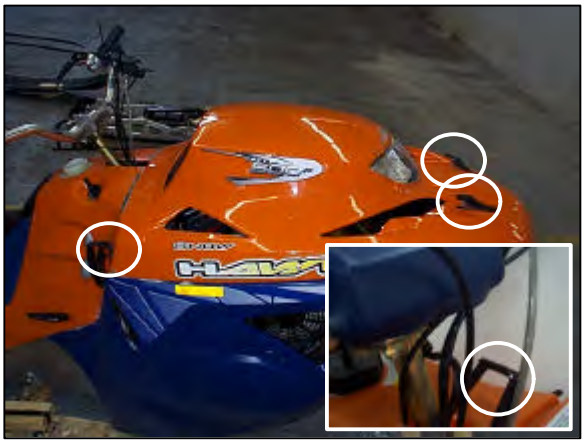
● *NOTICE:*

o *Most of the wear in this product occurs during the break-in period.*

o *Bolts and nuts can easily become loose in a new machine. Make sure you check them regularly during this period.*

REMOVAL OF THE SHELL (HOOD, REAR MODULE AND BELLY PAN)

In order to work on the vehicle more easily and to access the anchor ties, we suggest that you remove the rear module from the vehicle. To do so, you must first remove the hood. Proceed as follows:

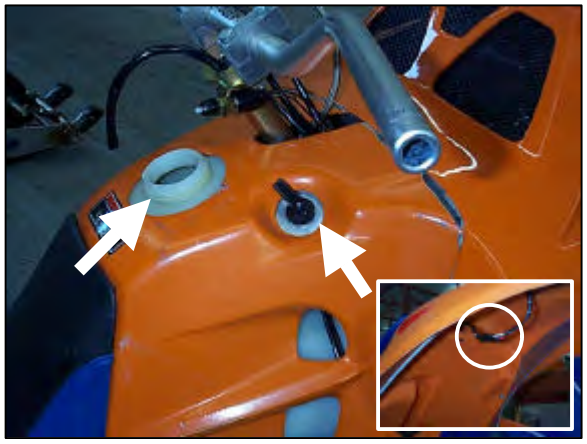


o Disconnect the front headlight.

o Unhook the 4 rubber latches (2 / side).

o Remove the hood.

- Take off the fuel tank cap.
- Set the choke to the full position.
- Unplug the tail light connector located under the light itself, underneath the rear fender.



- Release the rear module from its four rubber latches, slip the rewind starter handle through the space provided and remove the rear module.

- Roll the two O-rings down and pull the two white plastic collars down over the fork legs. To ensure that they will not interfere, let them hang loose at the base of the fork leg.
- Remove the circular fork disc
- De-latch the two rubber latches on the sides of the belly pan (towards the rear of the vehicle)

- De-latch the four rubber latches on the bottom of the belly pan.
- Descend the belly pan to floor level; most maintenance can be performed with the belly pan in this position. However, if it is required to completely remove the belly pan, remove the single bolt attaching the ski to the fork. At this point, a second person can lift the front of the vehicle slightly and the belly pan can be slid out from underneath.

● *NOTICE:*

Regular inspection and maintenance of the machine is of prime importance. Follow the guidelines in the following table. Suggested times must be reduced if the vehicle is subjected to severe usage conditions.

Item \ Interval (Hrs)		Break-in (~ 10 Hrs.)	5 Hrs	15 Hrs	65 Hrs (yearlyl)
2.1 Carburetion	Fuel lines and connections	**V**	**-**	**-**	**V**
	Carburetor adjustment	**V**	**-**	**-**	**V**
	Throttle cable	**V - A**	**-**	**-**	**V - A**
	Air Filters	**V**	**-**	**-**	**V - C**
2.2 Motor	Starter cord	**V**	**-**	**-**	**V**
	Cylinder head bolts	**V**	**-**	**-**	**V**
	Engine support bolts	**V**	**-**	**-**	**V**
	Exhaust system	**V**	**-**	**V**	**V**
	Cooling System	**V**	**-**	**-**	**V**
2.3 Primary transmission system	Primary drive belt	**V**	**V**	**-**	**V - R**
	Primary and secondary clutch	**V**	**-**	**V**	**V - C**
	Primary clutch bolt	**V**	**-**	**-**	**V**
	Secondary clutch pre-tension	**V - A**	**-**	**-**	**V - A**
2.4 Secondary transmission system	Secondary drive belt (cog belt)	**V**	**-**	**-**	**V**
	Cog sprockets	**V**	**-**	**-**	**V**
	Taper Locks	**V**			**V**
2.5 Brake system	Brake fluid	**V**	**-**	**-**	**F**
	Brake pads	**V**	**-**	**V - R**	**V - R**
2.6 Front suspension and ski	Front Fork	**F**	**-**	**F**	**F**
	Fork cushion	**V**	**-**	**R**	**R**
	Ski and runners	**V**	**V - R as needed**		**V - R**
2.7 Rear suspension and track	Suspension	**V**	**-**	**V**	**-**
	Shocks	**V**	**-**	**V**	**F**
	Track	**V & A**	**-**	**V - A**	**V - A**
2.8 Chassis	Handlebar bolts	**V**	**-**	**-**	**V**
	Steering components	**V**	**-**	**V**	**V**
	Assembly	**V**	**-**	**-**	**V - C**
2.9 Electrical system	Spark plugs	**V - A - R**	**-**	**V - A - R**	**V - A - R**
	Spark plug gap	**V & A**	**-**	**-**	**V & A**
	Headlight projection/aim	**-**	**-**	**-**	**V & A**
	Lighting system, stop lamp and emergency stop switch	**V**	**V**	**-**	**V**

● *NOTICE:*

V = Verify, A = Adjust, C = Clean, R = Replace one or several part(s) and F = Replace fluid

2.1. CARBURETION

Fuel lines and connections

Check all hoses and connections in order to find and fix leaks or to prevent them.

Carburetor adjustment

For carburetor adjustment, refer to the "**Fuel system**" section.

Throttle cable

The throttle cable can be adjusted by setting the adjustment mechanism on the throttle control case.

For adjustment of the throttle cables at the carburetor end, refer to the "**Fuel system**" section.

Air filters

Air filters must be cleaned at least once a year, or more often under severe usage conditions. Clean the filters in a solution containing a non-flammable cleaning solvant (such as hot soapy water). Once they have dried, apply engine oil to the filters to prevent the infiltration of water and dust.

2.2. ENGINE

Recoil starter cord

Pull gently on the handle to unwind the full length of the cable. Inspect the cable visually to detect any wear or other damage that could eventually cause the cord to break.

Cylinder head bolts

Refer to the appropriate procedure in the "**Engine**" section.

Engine support bolts

To carry out this operation, refer to the appropriate procedure in the "**Engine**" section.

Exhaust system

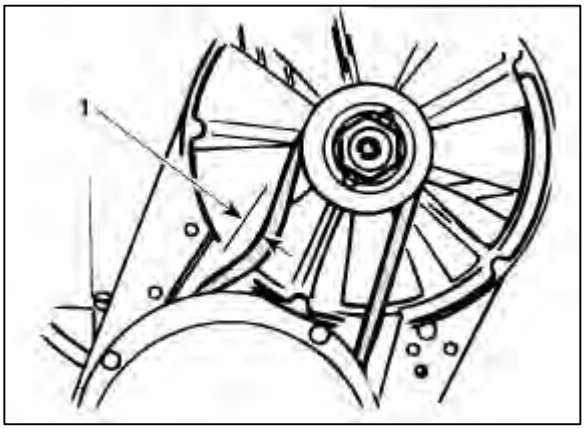
Using a torque wrench, check the torque of the retaining bolts of the exhaust manifold. Apply a torque of **22 N-m (2.2 kg-m, 16.2 lbf-ft)**.

Then, proceed to a visual inspection of the system to detect any leak or abnormality.

Cooling system

Remove the fan cover and check the condition and tension of the fan belt. Check the general condition of the belt, especially the presence of cuts or tears. If in doubt as to the condition of the belt, replace with a new one. The belt must show a deflection of **9.5 mm (3/8 in)** when a **5 Kg (11 lb)** perpendicular force is applied.

1. Deflection

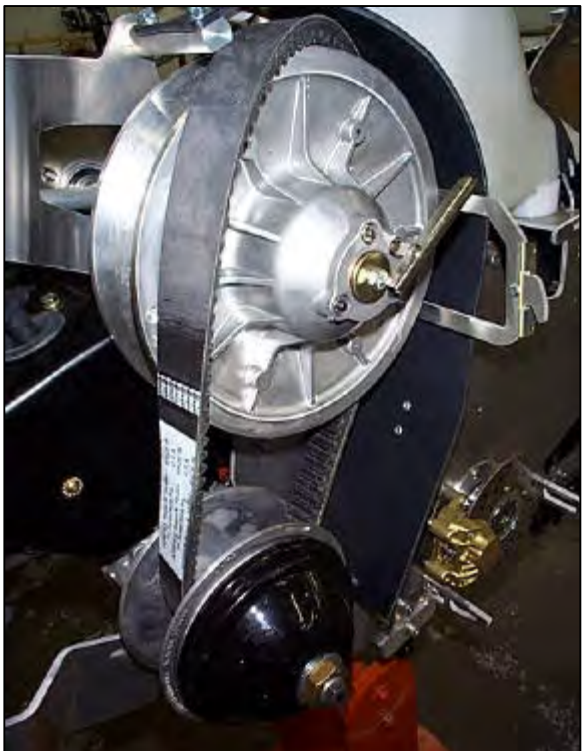


2.3. PRIMARY TRANSMISSION

Primary and secondary clutches

Remove the belt and verify that the sliding half-pulleys of the two pulleys are in good working condition.

To take the belt off, first use the special tool provided to open the secondary clutch. Then, slip the belt over the pulley from front to rear as illustrated. To reinstall the belt, proceed in the reverse order.



Primary clutch bolt

Check the torque on the primary clutch retaining bolt. **Recommended torque: 90 - 100 N-m (9–10 kg-m, 66.4 lbf-ft).**

For more information, refer to the "**Primary transmission**" section.

Pre-tension of the secondary clutch spring

For more information, refer to the "**Primary transmission**" section.

Primary transmission belt

Examine the belt. Make sure it is not cracked, frayed or worn in an abnormal way (uneven wear, wear on one side only, missing cogs, or cracked material). Abnormal wear of the belt is often due to mis-alignment of the pulleys, excessive speed when the track is frozen, quick acceleration without preliminary warming up, a scratched or rusted pulley, oil on the belt, or a twisted replacement belt. If need be, ask an authorized SNOW HAWK™ dealer for advice.

Measure the width of the belt. Replace if it is less than **31.6 mm (1.245 in) wide**.

For more information, refer to the "**Primary transmission**" section.

2.4. SECONDARY TRANSMISSION

Secondary transmission cog belt

Examine the belt. Make sure it is not cracked, frayed or worn in an abnormal way. If in doubt as to the condition of the belt, replace it with a new one.

Verify the tension of the secondary transmission belt according to the instructions found in the "**Secondary transmission**" section.

Cog Sprockets

Check the appearance of the cog sprockets. Make sure all the sprockets are there and are free of any accumulated dirt. Clean if necessary.

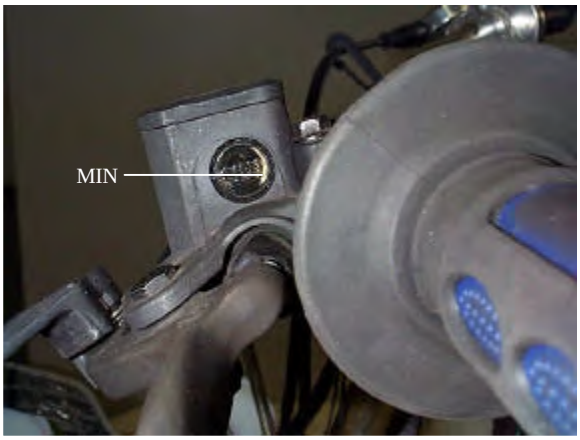
Taper-locks

Refer to the "**Secondary transmission**" section.

2.5. BRAKE SYSTEM

Brake fluid

Check to see if the brake fluid level is above the "mimimum" mark (see illustration). If not, add fluid.

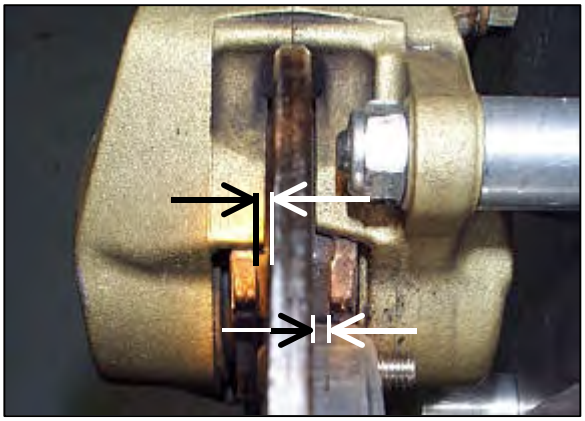


▼ CAUTION

Use only DOT 4 brake fluid from a sealed container. Do not use any other type of brake fluid.

Brake pads

Verify the thickness of the brake pad linings as illustrated. Brake pads must both be replaced if either one of them shows a clearance of less than 1 mm (1/32 in.).



● *NOTICE:*

For the replacement of brake fluid, refer to the "**Brake system**" section.

2.6. FRONT SUSPENSION AND SKI

Front fork

The air pressure inside the fork legs must be as close as possible to atmospheric pressure. Therefore, it is advisable to remove the bleeder screws from time to time to re-establish the pressure. It should be done more frequently when temperature variations are greater and more frequent.

A visual inspection of the fork legs can reveal oil leaks that might indicate broken main seals.

It is recommended to replace the fork oil after the break-in period and, from then on, after every 15 hours of use. For details, refer to the "**Front suspension and ski**" section.

▼ CAUTION

It is advisable to change the fork fluid when preparing the vehicle for storage. The presence of condensation in the suspension fluid could cause rusting to occur during the storage period.

Ski and runners

Verify the torque of all the bolts holding the ski, as well as all the steds and nuts retaining the runners. Also inspect the appearance of the runners to detect any wear, distortion, or broken studs.

2.7. REAR SUSPENSION AND TRACK

Suspension

Verify that all suspension bolts and nuts are well tightened. Verify that none of the parts are damaged or missing.

Verify that the suspension wheel bearings are in good working order.

Verify the condition of the suspension limiter straps.

Verify the condition of the slides.

For more information, refer to the "**Rear suspension and track**" section.

Shock absorbers

Check around the shock guards for the presence of oil leaks.

Shock oil must be replaced once a year. Refer to the "**Rear suspension and track**" section.

▼ CAUTION

It is advisable to change the shock fluid when preparing the vehicle for storage. The presence of condensation in the suspension fluid could cause rusting to occur during the storage period.

Track

Check the condition, alignment and tension of the track.

With the engine turned off and the rear end of the machine raised from the ground, rotate the track manually and inspect it to make sure it is in good working condition. It must not be cracked and all the lugs must be intact.

● *NOTICE:*

For track alignment and tension, refer to the "**Rear suspension and track**" section.

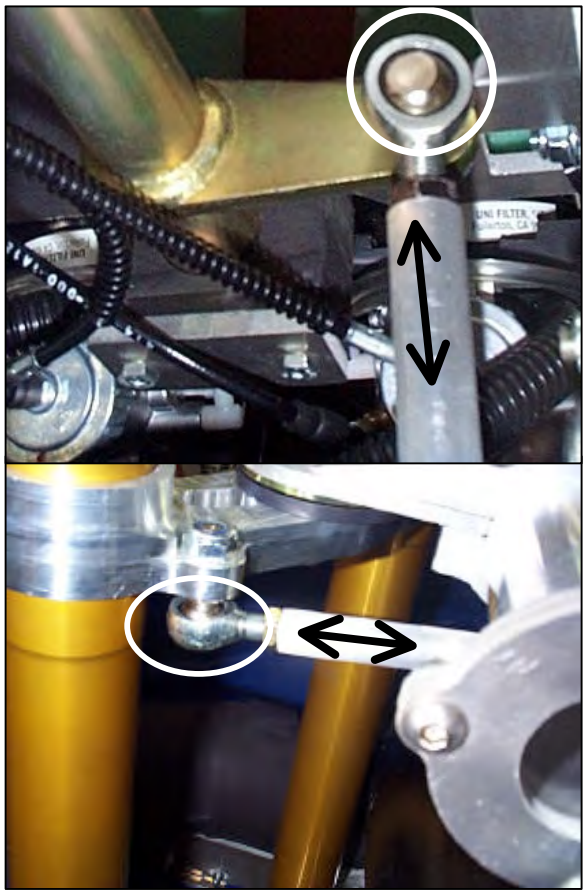
2.8. CHASSIS AND STEERING

Handlebar mounting bolts

Verify and adjust the torque to 36.5 N-m (3.7 kg-m, 27 lbf-ft), following a criss-cross order.

Steering mechanism

Verify the condition of the ball joints and check for excessive play in the pivots of the steering system. For alignment, refer to the "**Chassis and steering**" section.



Assembly

The chassis of the SNOW HAWK is different in that most of the assembly is done by bolting components rather than welding them. Therefore, bolts must be checked and tightened as need be. When doing this, refer to the table entitled "**TORQUES**" at the end of this section.

2.9. ELECTRICAL SYSTEM

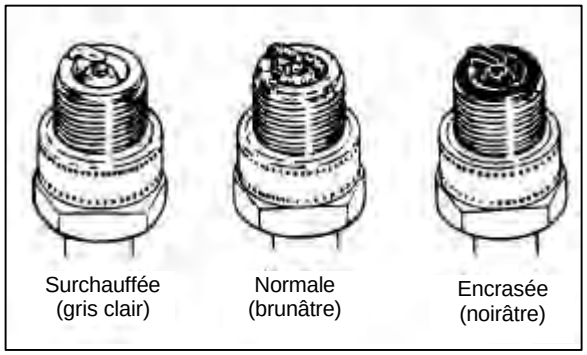
Spark plug

Check the general condition of the plug, the colour of its electrodes, carbon deposits, plug gap and possible damages to the gasket

A **NGK BR9ES** spark plug is recommended.

Check the spark plug gap. **The suggested gap is 0.45 mm (0.018").**

When tightening the spark plug, the torque must be between **25 and 30 N-m** (18 and 21.5 lbf-ft; 2.5 and 3.0 kg-m).



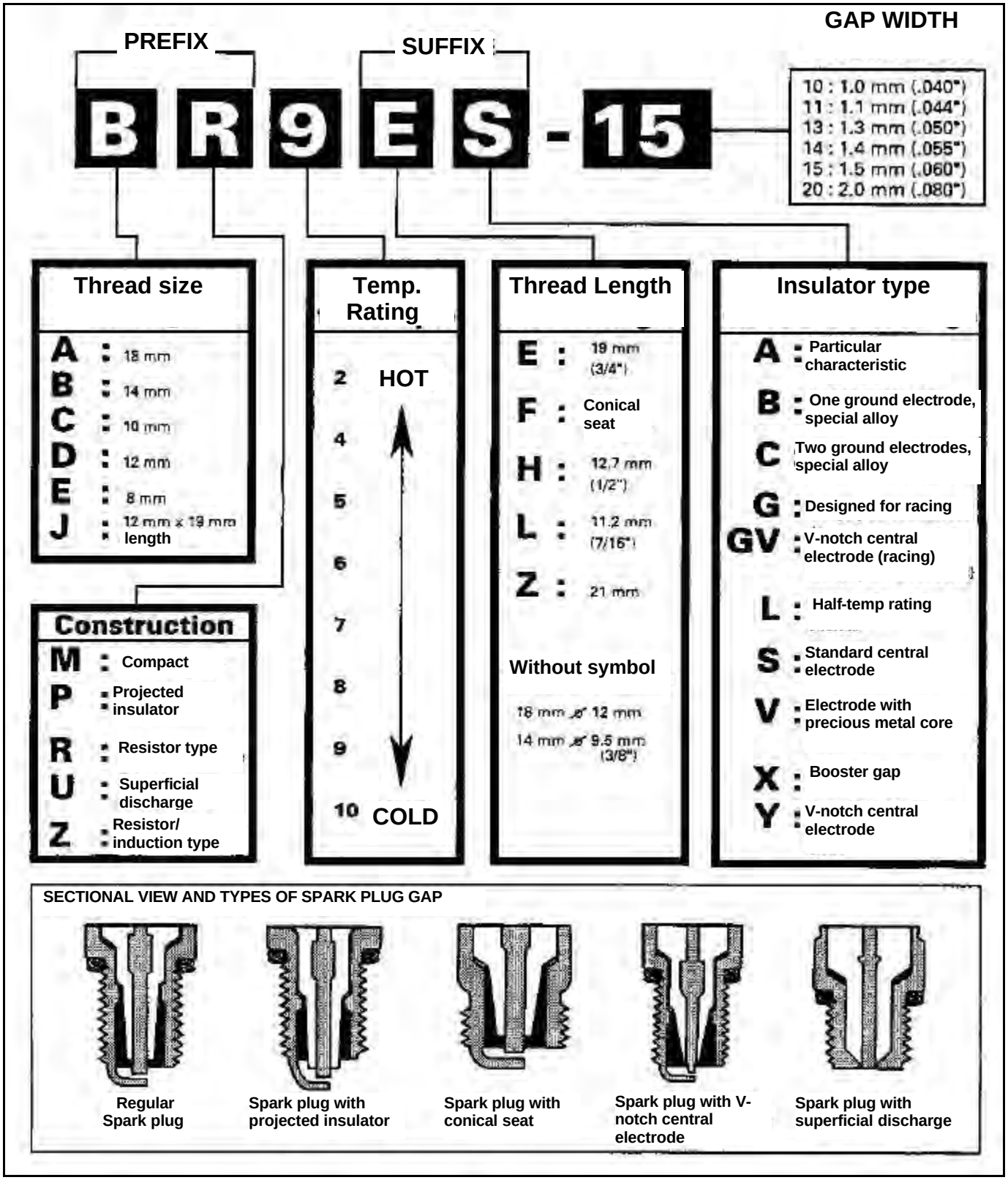
Porcelain colour	Probable cause
Light Grey (Overheated)	- Plug temperature rating too high (No. is too small) - Plug gap too wide - Air / fuel mixture too lean - Stale gasoline
Blackish (fouled)	- Plug temperature rating too low (No. is too big) - Plug gap too close - Air / fuel mixture too rich - Oil / fuel mixture too rich

▼ CAUTION

The engine may be seriously damaged if the temperature rating of the spark plug is inadequate.

Refer to the NGK codification on the next page.

Symbols used on the NGK spark plugs



Spark plug gap

Refer to the "**Electrical system**" section.

Bundle of wires and connections

Electrical wires and connections should be inspected visually to quickly locate broken wires or faulty connections.

Lighting system, stop light and engine cut-off switch

Before each ride or excursion, it is recommended to verify that the lighting system, the stop/tail light and the engine cut-off switch are in good working order.

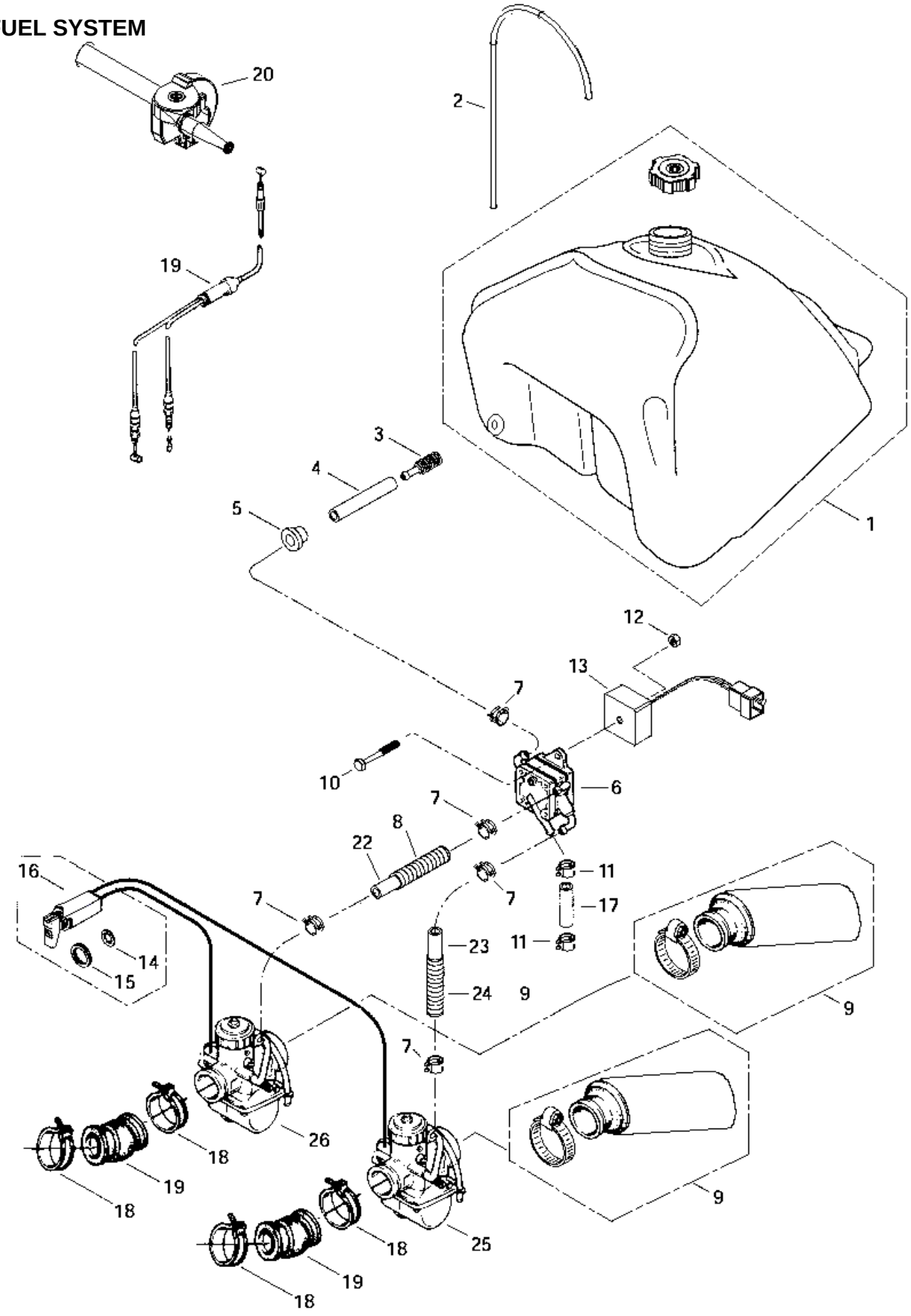
TORQUES

ITEM	N-m	kg-m	lbf-ft	lbf-in
Cylinder head bolts	22	2.2	16	192
Intake bolts	22	2.2	16	192
Crankcase bolts	22	2.2	16	192
Magneto nut	105	10.5	77	924
Axial fan nut	65	6.5	48	576
Recoil starter housing bolt	10	1	7	84
Primary clutch bolt	90	9	66	792
Secondary clutch bolt	31.7	3.17	23	276
Taper-Lock installation setscrews	17	1.7	13	156
Spark plugs	25	2.5	18	216
Handlebar mounting bolts	36.5	3.65	27	324
Front fork bolts	6.8	0.68	5	60
Fork pivot bolts	45	4.5	33	396
Ski and center runner nuts	19	1.9	14	168
Lower clamp nuts	23	2.3	17	204
Ski saddle/fork adaptor nuts	85	8.5	63	756

For any other bolt or screw that is not mentioned in the list, please refer to the following table.

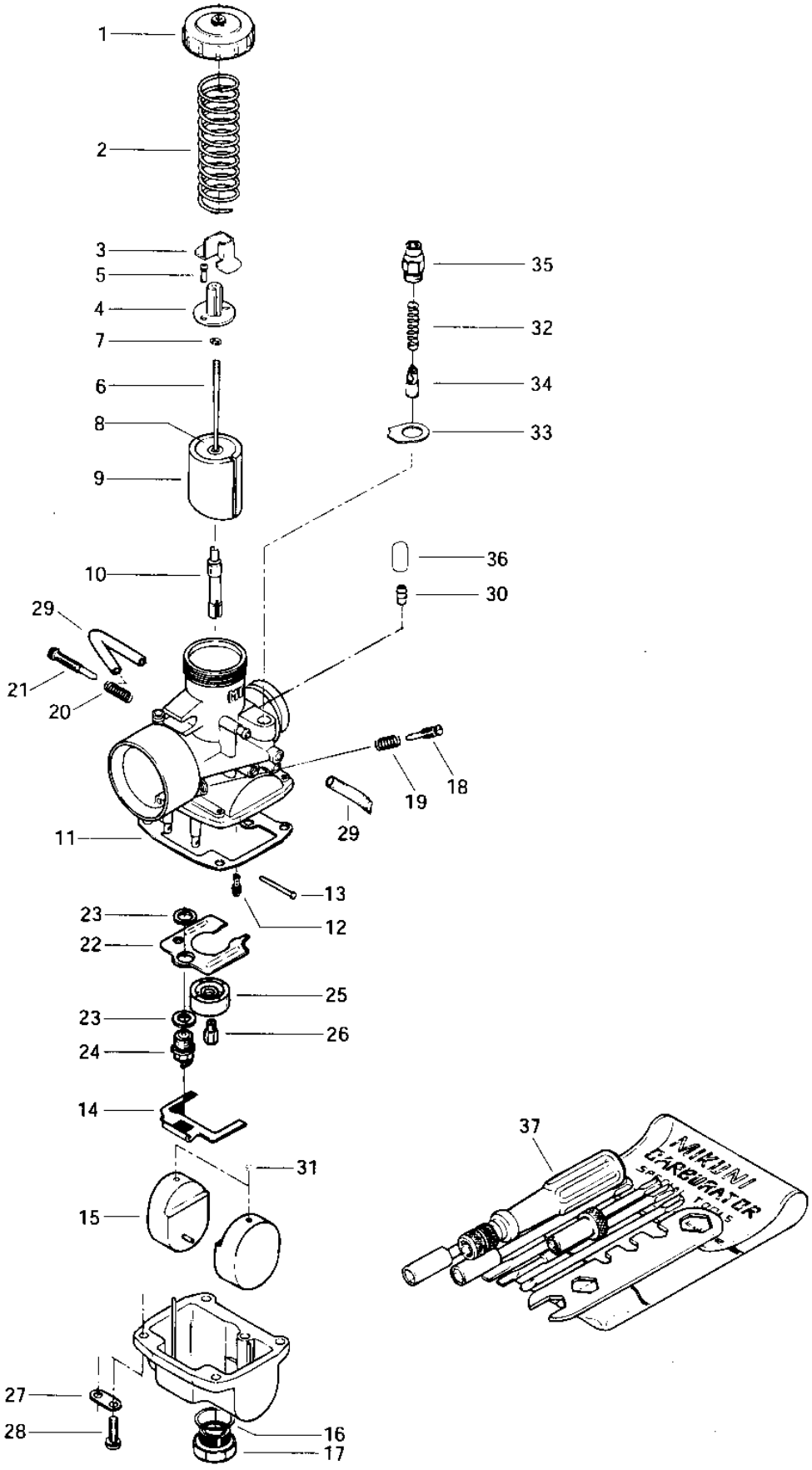
BOLT DIAMETER (MM)	GRADE " 8.8 "				GRADE " 10.9 "			
	N-m	kg-m	lbf-ft	lbf-in	N-m	kg-m	lbf-ft	lbf-in
6	10	1	7	84	15	1.5	11	132
8	25	2.5	18	216	36	3.6	27	324
10	49	4.9	36	432	72	7.2	53	636
12	85	8.5	63	756	125	12.5	92	1104

FUEL SYSTEM



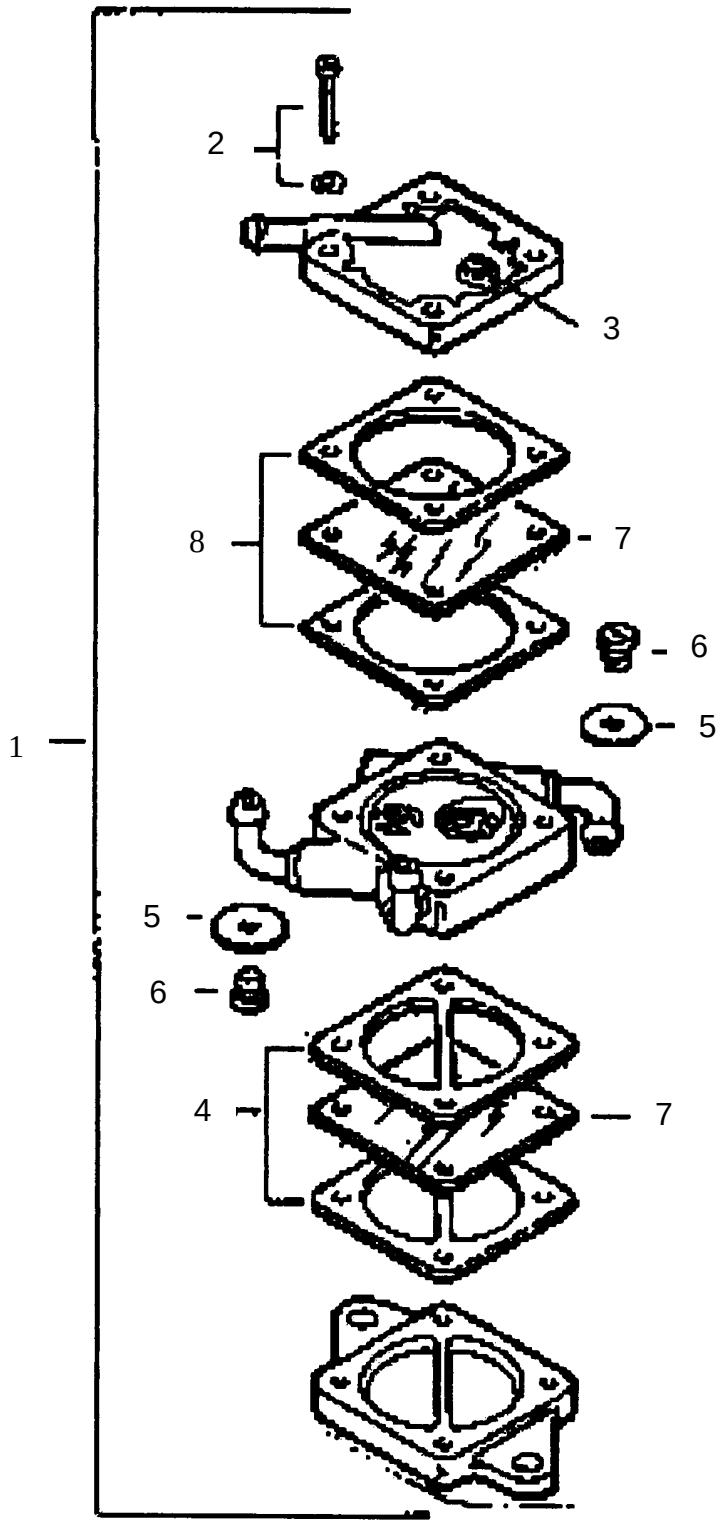
Ref.	P/N	Qty	Fuel System / 503 Rotax Part Descriptions
1	122226-N1	1	Fuel tank assembly
2	5231K82	1	3/16" PVC overflow hose
3	07-241	1	Fuel filter
4	415 080 200-1	1	Fuel line (tank to pump)
5	570 135 100	1	Grommet
6	403 801 100	1	Fuel pump
7	414 554 800	5	Spring clamp
8	14-349-1	1	Guard (MAG carburetor)
9	07-297	2	UNI filter assembly
10	20165P	1	Hex head cap screw M6x45
11	414 415 200	2	Spring clamp
12	23162	1	M6 nylon locknut
13	515 163 800	1	Voltage regulator/rectifier
14	394 103 300	1	Lock washer
15	414 977 200	1	Plastic nut
16	414 967 000	1	Choke cable
17	415 079 800	1	Impulse hose
18	408 801 900	4	Hose clamp
19	570 045 000	2	Rubber intake boot
20	01-0057	1	Twist throttle
21	X-540	1	Throttle cable
22	415 080 200-3	1	Fuel line (pump to MAG carburetor)
23	415 080 200-2	1	Fuel line (pump to PTO carburetor)
24	14-349-2	1	Guard (PTO side carburetor)
25	403 123 600	1	VM 34 Carburetor (PTO)
26	403 123 700	1	VM 34 Carburetor (MAG)

FUEL SYSTEM / CARBURETOR (VM34)



Ref.	P/N	QTY	Carburetor / Rotax 503 Part Descriptions
-	403 123 600	1	VM 34 Carburetor (PTO)
-	403 123 700	1	VM 34 Carburetor (MAG)
1	404 103 700	2	Cap
2	404 154 800	2	Throttle slide spring
3	404 122 100	2	Cap
4	404 122 900	2	Retainer
5	404 121 300	4	Screw and lock washer
6	404 110 400	2	Needle #6DH2-3
7	404 152 400	2	E-CLIP
8	404 117 000	2	washer
9	404 128 400	2	Throttle slide #2.5
10	404 107 000	2	Needle Jet #159-P-0
11	404 104 200	2	Float bowl gasket
12	404 121 000	2	Pilot Jet #60
13	404 103 300	2	Float lever pin
14	404 107 600	2	Float lever
15	404 107 100	4	Float
16	404 107 300	2	Washer
17	404 107 400	2	Drain plug
18	404 102 300	2	Idle mixture adjustment screw
19	404 101 800	2	Idle mixture adjustment screw spring
20	404 101 700	2	Idle speed adjustment screw spring
21	404 125 200	2	Idle speed adjustment screw
22	404 109 600	2	Baffle plate
23	404 101 600	2	Gasket
24	404 103 200	2	Inlet valve
25	404 110 900	2	Baffle ring
26	404 111 200	1	Main Jet #220 (PTO)
26	404 159 200	1	Main Jet #205 (MAG)
27	404 103 000	4	Tube retainer plate
28	404 102 000	8	Screw and lock washer
29	415 080 100-1	2	Vent tube (MAG)
29	415 080 100-2	1	Vent tube (PTO - left side)
29	415 080 100-3	1	Vent tube (PTO - right side)
30	404 153 400	2	Nipple
31	404 105 800	2	Cap
32	404 127 400	2	Spring
33	404 156 400	2	Plate
34	404 127 500	2	Plunger
35	404 127 200	2	Support guide
36	404 156 600	2	Cap
37	404 112 000	opt	Mikuni tool kit

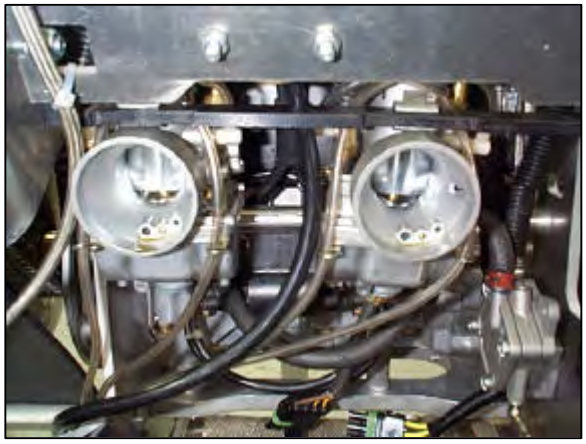
FUEL SYSTEM / FUEL PUMP



Ref.	P/N	QTY	Fuel pump/ Rotax 503 Part Descriptions
1	403 801 100	1	Fuel pump assembly
2	404 131 600	4	Screw
3	404 903 000	1	Filter
4	404 902 300	2	Gasket
5	404 902 100	2	Rubber washer
6	275 500 042	2	Valve
7	404 902 200	2	Diaphragm
8	404 902 400	2	Gasket

CARBURETORS

Removal



- Remove the air filters.
- Disconnect the inlet fuel lines and the choke cables.
- Unscrew the carburetor top caps and pull out the throttle slides.

◆ WARNING

Be careful not to scratch the slides; otherwise, they could get stuck in an open position while the engine is running.

- Disconnect the throttle cables from the slides.

- Loosen the hose clamps holding the fuel inlet lines, and then remove the carburetors from the engine.

● *NOTICE:*

An opening in the chassis, through which a screwdriver can be inserted, is provided to give easier access to the hose clamps.

Cleaning and inspection

Prior to dismantling, the carburetor should be cleaned thoroughly, using an all purpose solvent and then dried with compressed air.

▼ CAUTION

Concentrated carburetor cleaner product can damage the float, rubber parts, O-rings, etc. Consequently, it is recommended that these parts be removed before cleaning.

◆ WARNING

The use of highly volatile solvents such as gasoline, naphtha, benzol, etc., is prohibited since these products are flammable and explosive.

- Verify the condition of the tip of the fuel inlet valve. If the tip is worn, replace both the valve and its seat.

● *NOTICE:*

Install only a snowmobile carburetor inlet valve as it is designed to function with a fuel pump.

- Check to see if the throttle slide is worn and replace it if need be.

- Check for the presence of fuel in the float.

- If there is fuel inside the float, inspect it for possible fissures or other damage that would indicate it is no longer hermetically sealed. Replace the float if necessary.

Dismantling and assembling

● *NOTICE:*

To facilitate the dismantling and re-assembling of the carburetor, it is recommended to use a tool kit (P/N 404 1120 00).

Calibration

Initial settings

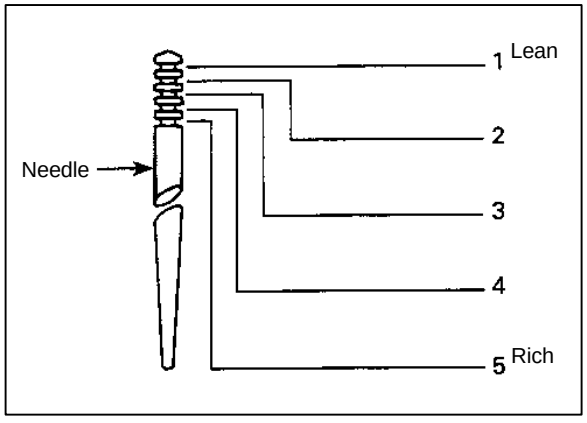
SNOW HAWK™ carburetors must be adjusted as follows:

Mikuni VM34	Settings	
	MAG	PTO
Pilot jet	60	60
Air screw	1.5 Tours	1.5 Tours
Slide cutaway	2.5	2.5
Needle jet	P-0 (#159)	P-0 (#159)
Needle	6DH2-3	6DH2-3
Main jet	205	220
Fuel level	23.9mm	23.9mm

Needle

Remove the screws from the needle retaining plate in order to be able to pull the needle out.

The position of the needle inside the accelerator slide is adjusted by inserting an E-clip into one of the 5 notches at the top part of the needle. Position 1 (the highest) gives the leanest mixture, while position 5 (the lowest) gives the richest mixture



● *NOTICE:*

The last digit in the identification number of the needle indicates the recommended position of the E-clip from the top of the needle.

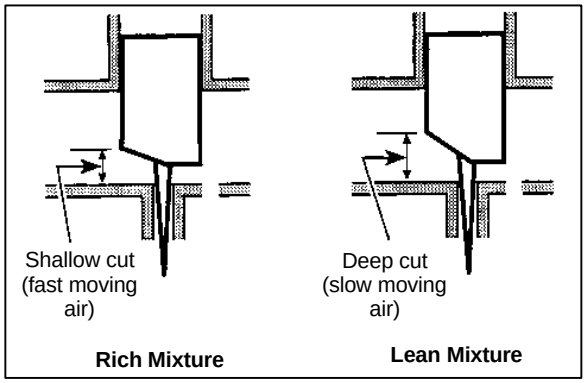
Example: 6DH2-3

Needle identification number

Recommended position of the E-CLIP from the top

Throttle slide

With an opening of the throttle slide between 1/8 and 1/2, the dimension on the projection of the slide influences the mixture which, during this transition period from low to high speed, must be relatively rich.



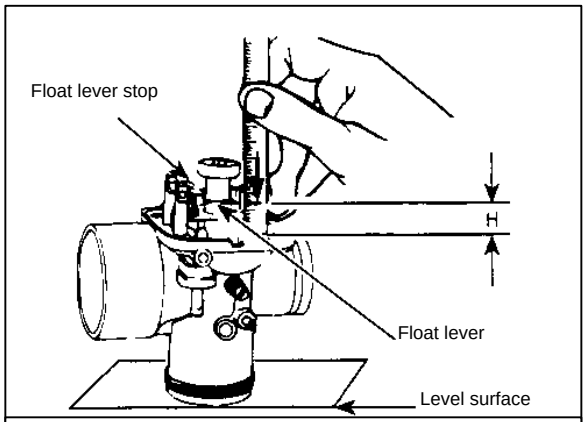
Main jet

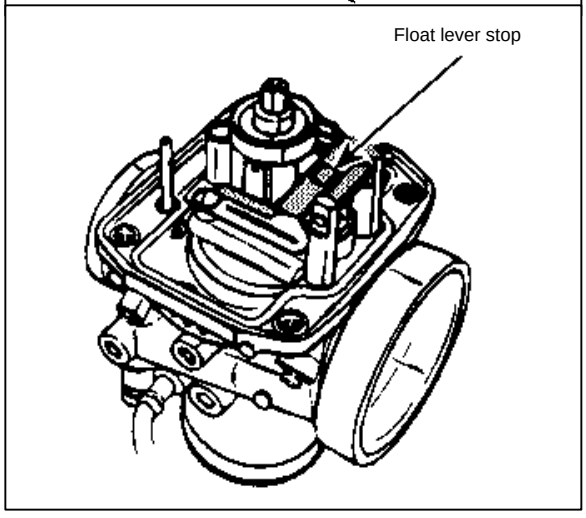
The main jet of the carburetor has been selected for a temperature of -20°C (O°F), at sea level. Other main jets can be installed depending on temperature and/or altitude differences. Always refer to spark plug electrode colour and/or the piston crown to determine the appropriate jet size to be used.

Adjustment of float level

In order for the engine to deliver its full power, it is essential that the level of the fuel in the carburetor bowl remain at a pre-determined level. To verify the proper float level, proceed as follows:

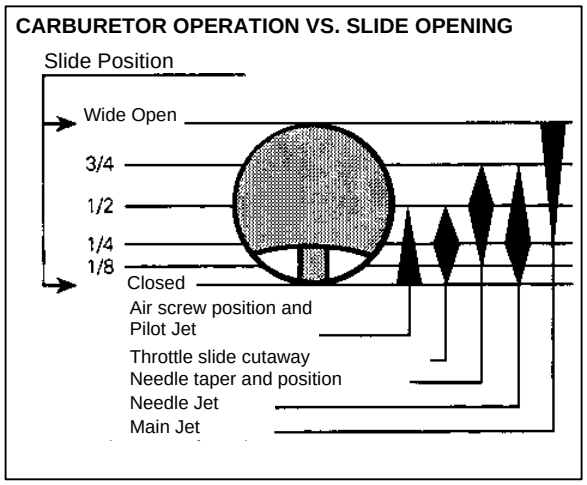
- Remove the carburetor bowl and gasket.
- Turn the carburetor upside down, and measure the height H between the seat of the bowl and the upper end of the float lever.
- Bend the stop flap of the float lever until the recommended height has been reached.
- The measured height H must be 23.9 mm ± 1 mm (0.941" ± 0.040").





The illustration on the right shows which parts of the carburetor start or stop functioning depending on the position of the throttle slide.

Please note that the widest part of each symbol corresponds to the slide opening for which the influence of a particular component is the greatest. For example, the throttle slide projection starts working at the closed position, reaches its maximum influence when the opening is 1/4, and stops when the opening is 1/2.



● *NOTICE:*

For high altitude conditions, refer to the appendix “Technical Information for use at High Altitude”. This appendix provides information concerning calibration depending on altitude and temperature.

Installation

▼ CAUTION

Never allow throttle slides to close abruptly.

To re-install the carburetors, carry out the removal operations in reverse order, inspecting first the accelerator cable and housing.

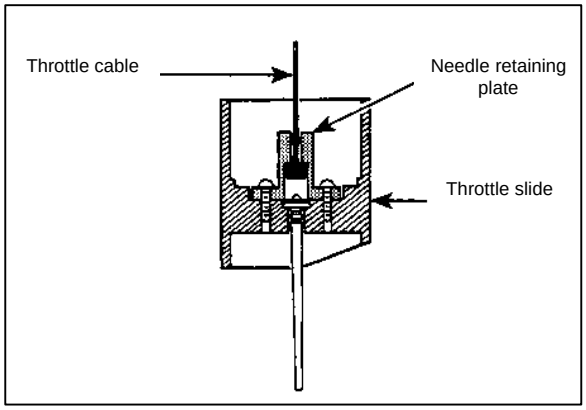
● *NOTICE:*

Be sure to re-install the carburetor with the red dot on the MAG side and the carburetor with the blue dot on the PTO side.

▼ CAUTION

Verify to see if either of the rubber intake boots are fissured or damaged. When installing, make sure these boots are securely fastened to the intake manifold. Otherwise, the engine will be severely damaged.

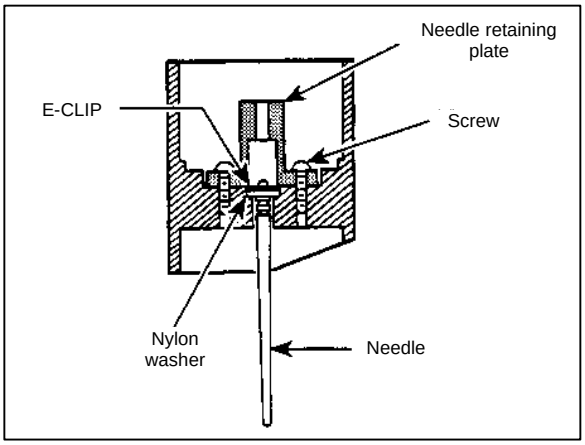
Attach the accelerator cable to the needle retaining plate.



▼ CAUTION

Make sure the nylon washer is correctly installed under the E-clip of the needle.

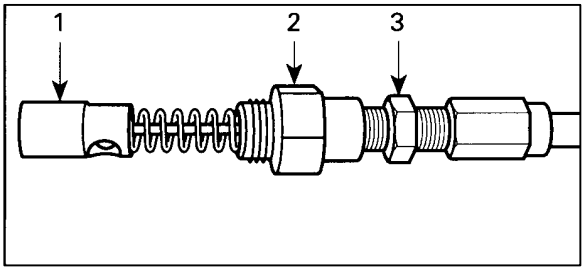
The engine may be severely damaged if this precaution is not taken.



Verification of the choke cables

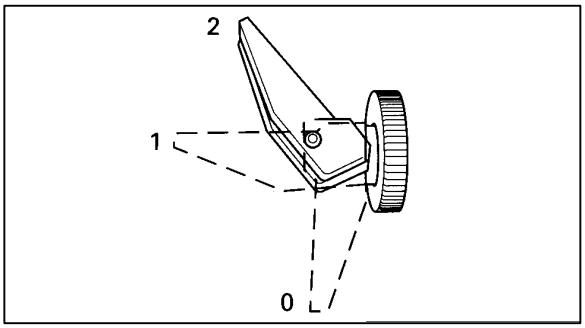
Chokes are adjusted individually, using a device similar to the one used to synchronize the carburetors. The cables must be adjusted so that both plungers start moving at the same time.

1. Plunger
2. Adaptor
3. Lock nut



The plungers must come into contact with the adaptors when fully engaged, but they must have sufficient free play to allow them to rest firmly against their seat when the choke is not operating.

0. Normal position (not activated)
1. Intermediate choke position
2. Full choke position

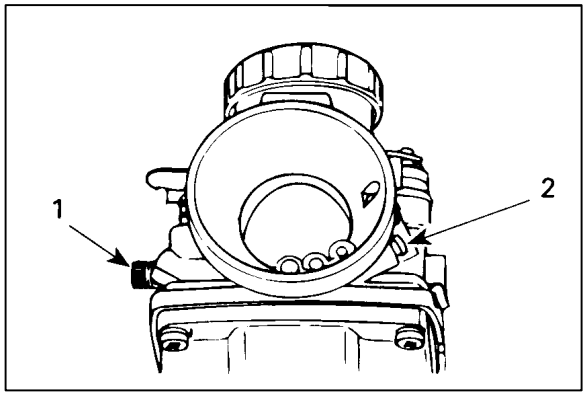


Carburetor synchronization

Both carburetor slides must start opening simultaneously.

Completely unscrew the idling speed adjustment screw from the two carburetors.

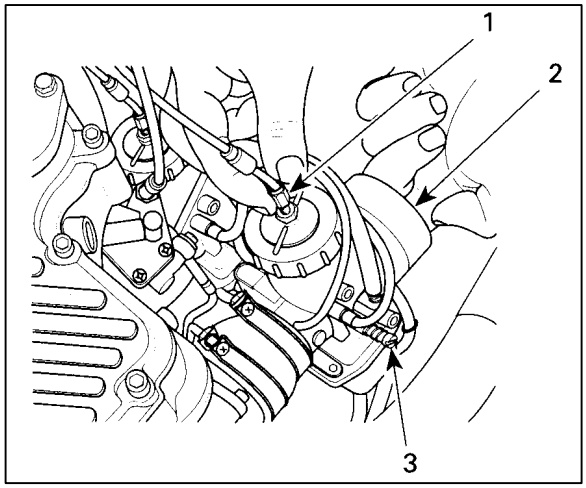
1. Idling speed adjustment screw
2. Idling mixture adjustment screw



Loosen the lock nut of the throttle cable adjustment mechanism, and screw in the adjustment mechanism until the slide touches the bottom of the carburetor. Proceed in this way for both carburetors.

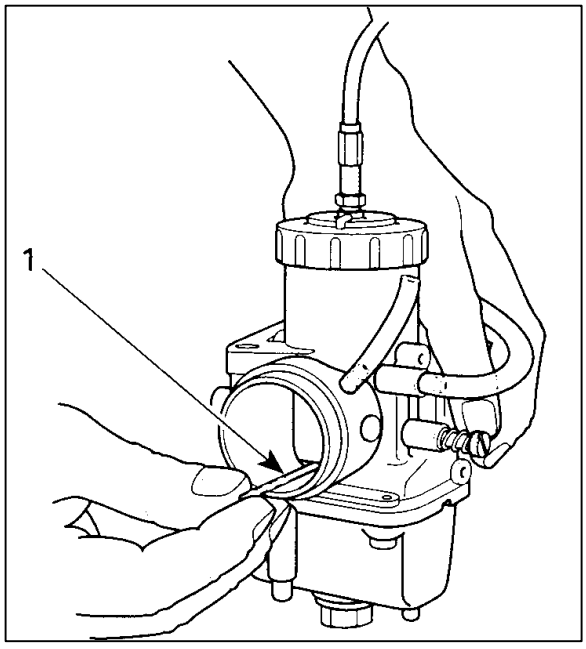
Loosen the lock screw on the cable adjustment mechanism, but without lifting the slide. Proceed carefully with both carburetors, and then tighten the lock nuts. Both carburetor slides must start opening simultaneously. Turn the accelerator handle to make sure it is functioning properly and if need be, turn the cable adjustment mechanism to eliminate any excessive play.

1. Screw up or down until there is no play in the cable.
2. Make sure the slide stays absolutely still.
3. Idling speed adjustment screw completely unscrewed.



Adjust the height of the slide, raising it by 1.8 mm by turning the idling screw.

1. Gauge (1.9 mm) used to adjust the height of the accelerator slide.



▼ CAUTION

Never put anything inside the carburetor while the engine is running.

◆ WARNING

Before starting the engine to proceed with the adjustments, make sure the parking brake is securely engaged.

Start the engine and let it warm up. Set the idling speed (1650 RPM ± 200) by turning the idle screw clockwise to increase the speed, and counter-clockwise to decrease the speed.

The final idle adjustment must be the same, within ½turn of the initial position (1.9 mm).

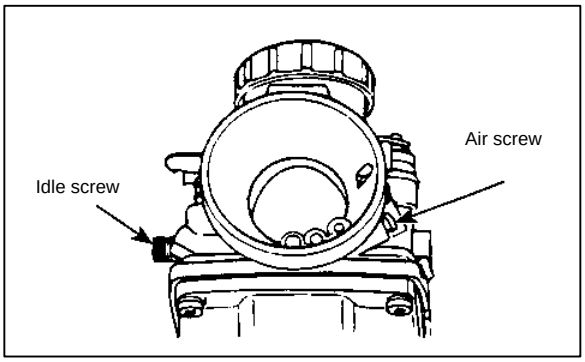
● *NOTICE:*

During this adjustment, the idle screws of both carburetors must be screwed or unscrewed the same number of turns.

Adjustment of the idle mixture screw

Turn mixture screw clockwise until it just closed, then open 1.5 turns.

Turn the mixture screw clockwise for a richer mixture, and counter-clockwise for a leaner mixture.

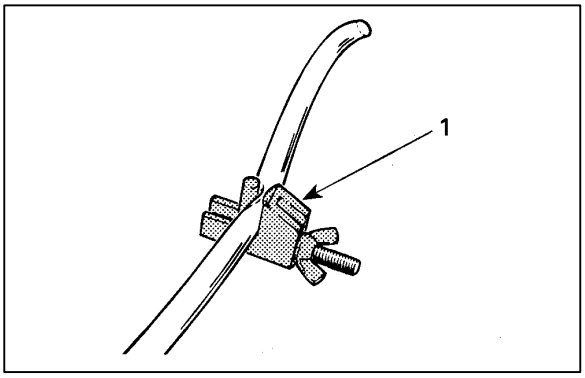


FUEL PUMP

REMOVAL

Install a hose pinch clamp (P/N 529 0099 00) on the fuel feeding line near the pump inlet

1. Hose pinch clamp (P/N 529 0099 00)

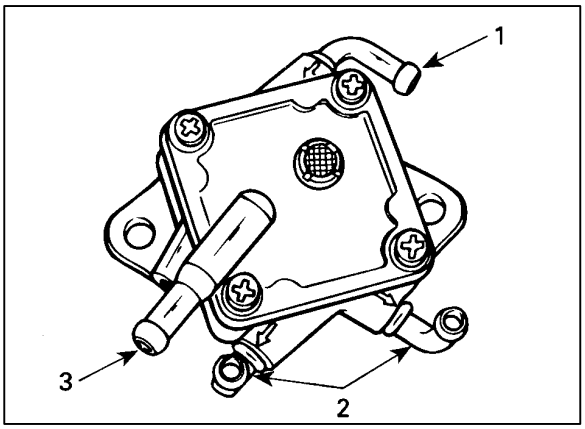


Disconnect the fuel outlet hose(s).

1. Intake
2. Outlets
3. Vacuum

Disconnect the vacuum hose.

Remove the screws and nuts holding the pump.



PUMP VERIFICATION

Verify that the fuel pump is in good working order. To do this, hook a clean plastic tube to the inlet connector. Blow air in and out of the tube with your mouth. The valve should open when air is drawn out, and close when air is blown in.

Proceed in the same way with the outlet valve. This valve should close when air is drawn out, and open when air is blown in.

● *NOTICE:*

Plug one of the outlet connections with a finger during the verification of the outlet valve.

To check the vacuum diaphragm and the pump gasket, proceed in the following way:

Hook a clean plastic tube to the vacuum connector and plug the aeration hole on the top cover. Blow air in and out of the tube with your mouth to make sure there are no leaks either in the diaphragm or in the gasket.

DISMANTLING

Do not dismantle the valves, unless it is necessary to replace them.

CLEANING AND INSPECTION

Prior to dismantling, the pump should be cleaned thoroughly, using an all-purpose solvent. The components of the pump should also be cleaned with an all-purpose solvent and then dried with compressed air.

◆ WARNING

The use of highly volatile solvents such as gasoline, naphtha, benzol, etc., is prohibited since these products are flammable and explosive.

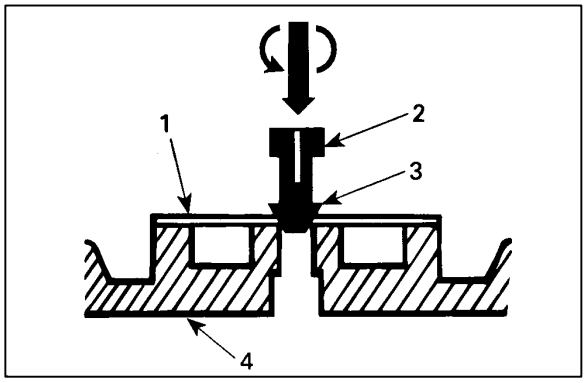
Verify the condition of the diaphragm. Its surface must not be punctured or torn, or show any other imperfection. Replace it if need be.

Clean the top cover filter thoroughly. Replace the filter if necessary.

RE-ASSEMBLY

To install a new valve, proceed as follows:

- Place the new valve flat on its seat.
- Lightly oil the conical tip of the retaining rod.
- Push the retaining rod down with a rotating motion until it reaches its seating position.



1. Valve
2. Lubricate the tip
3. Pump body

When re-assembling the pump, make sure the components are installed in the initial order. Refer to preceding illustrations if necessary.

INSTALLATION

To install the pump, follow the removal procedure in reverse order.

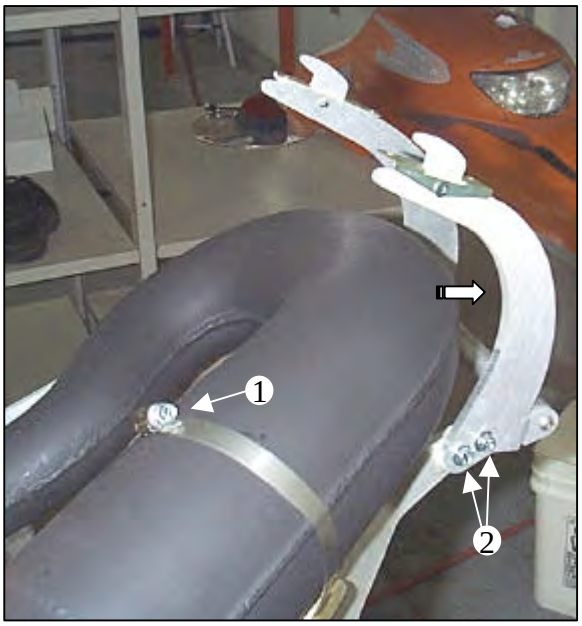
◆ WARNING

Pressurize the fuel system to insure that there are no leaks.

ENGINE REMOVAL

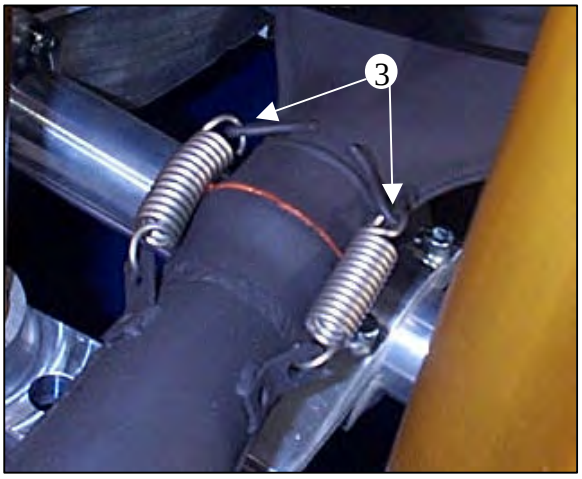
Unfasten or remove the following parts of the vehicle:

Remove the all bodywork from the vehicle.

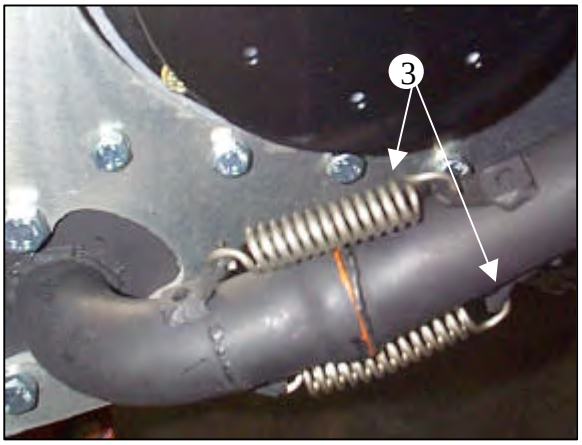


Exhaust pipe

- Remove the fixation clamp of the exhaust pipe. (No. 1)
- Loosen the four bolts (No. 2) securing the hood supports and pull the supports towards the nose of the vehicle to increase the space between the exhaust pipe and these parts.



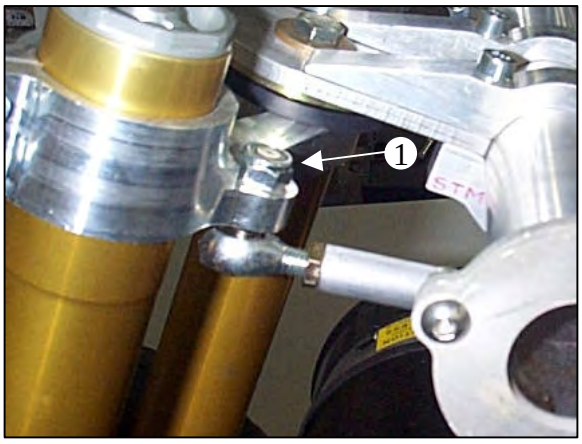
- Remove the two springs at the outlet of the engine and the two springs at the outlet of the exhaust pipe. (No.3)



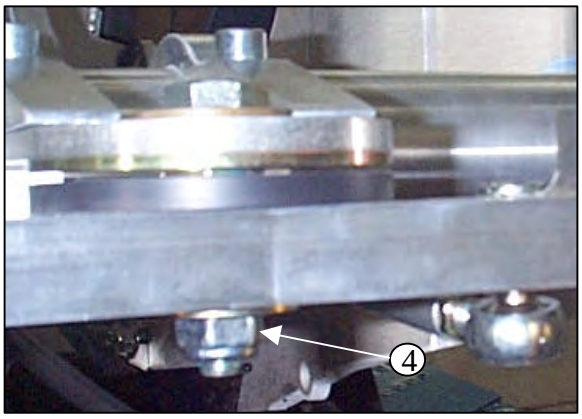
- Pull gently towards the nose of the vehicle to get the exhaust pipe out of the two flanges.
- Plug the exhaust manifold outlet with a clean cloth.

Front fork

- Remove the nut retaining the forward tie-rod end of the steering shaft to the upper triple clamp. (No. 1)



- Then, remove the two fork pivot bolts and nuts (No. 4) that secure the front fork and remove it from the vehicle.

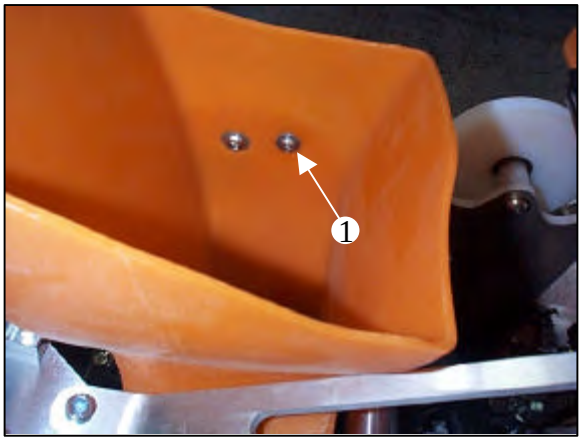


Recoil starter

- With a small screwdriver, push the knot out of the recess in the starter handle. Since it is often easier, cut the cord just before the knot while holding the cord securely so that it does not slip from your hands and go into the recoil housing. Make a new knot in the cord once the starter handle has been removed to keep it from doing this.

Air exhaust duct

- Remove the mounting screw (No. 1) from the duct and remove it from the vehicle (be careful not to drop the screw).

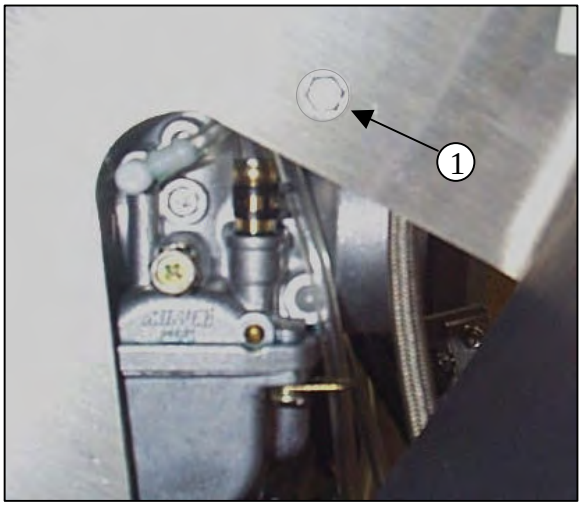


Secondary Clutch

- Remove the secondary clutch via the one bolt retaining it. (See the **Secondary Transmission System** section to remove the secondary clutch.)

Carburetor supports

- Remove the plastic carburetor support by removing the two mounting screws (No. 1). There is one on each side of the chassis.



Carburetors

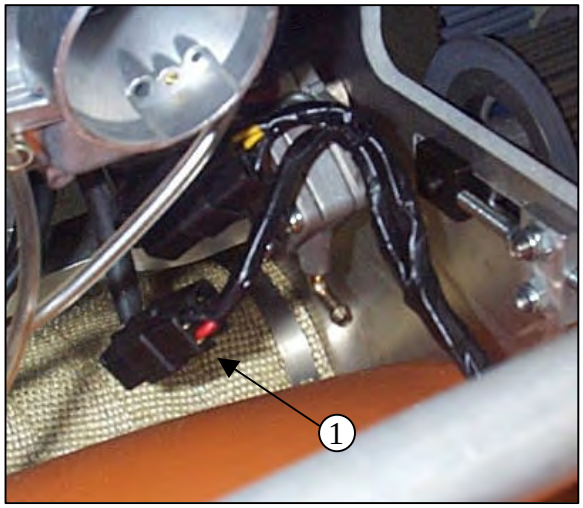
- Remove the air filters.
- Insert a screwdriver into the slots on each side of the chassis to unscrew the hose clamps retaining the carburetors to the engine intake boots. (See right)
- Remove the two carburetors from the intake boots.
- Using clean cloths, plug the engine intake boots and the carburetor inlet/outlets..

Vacuum hose

- Disconnect the vacuum hose from the engine.

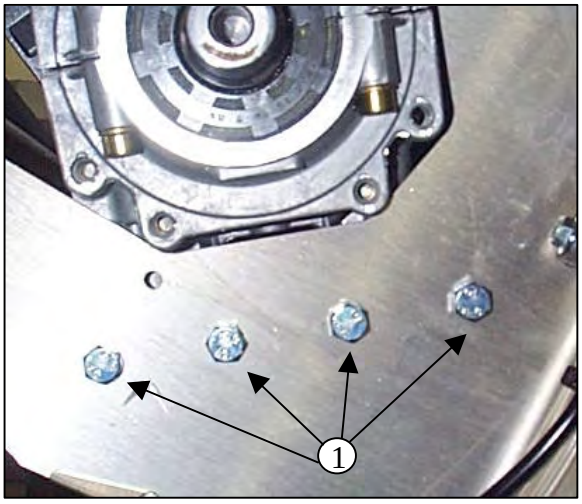
Electrical connections

- Disconnect the wiring harness from the magneto via the four-wire connector coming from the MAG side of the engine. (Connector No.1 at right)



Engine mounting bolts

- Remove the four bolts (No.1) on each side of the engine and then remove the engine (complete with the engine mounting plate) from the chassis.



ENGINE INSTALLATION

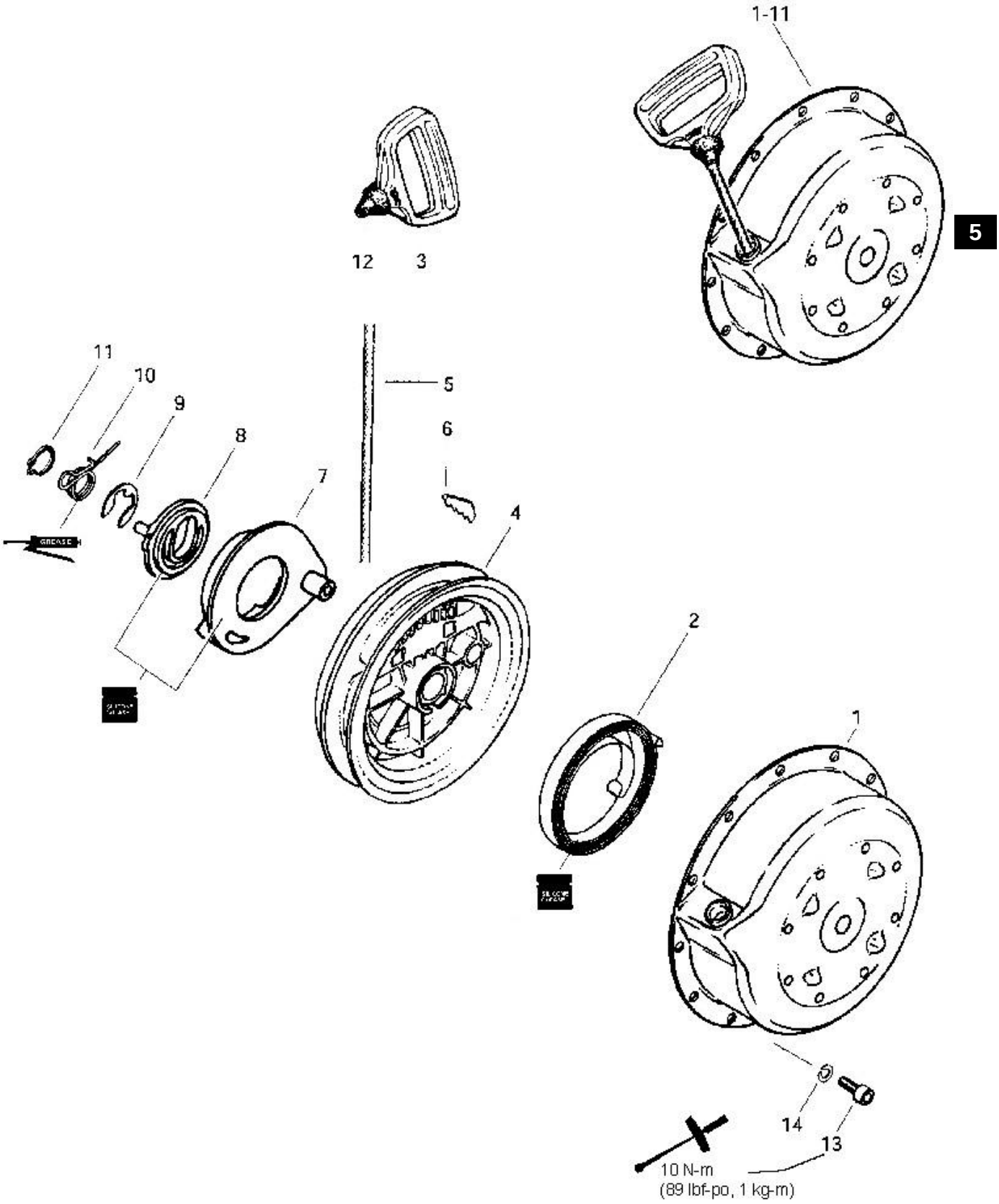
To re-install the engine, proceed using the instructions above, in the reverse order. However, pay particular attention to the following points:

- Ensure that all engine mount bolts are securely tightened. (325 lbf-in, 27 lbf-ft)
- After installation of the throttle cable, verify the maximum opening of the carburetor slide.
- Check the alignment of the clutches and the tension of the drive belt.

▼ CAUTION

There is a red dot on the MAG side carburetor and one on the engine housing to match. Be sure to pair the dot on the carburetor with the dot on the housing when re-installing them since the PTO and MAG side carburetors each have a unique calibration.

RECOIL STARTER



Ref.	P/N	QTY	Recoil Starter / Rotax 503 Part Descriptions
1	420 9100 68	1	Recoil starter housing
2	420 9391 15	1	Rewind spring
3	420 8521 76	1	Starter handle
4	420 8522 83	1	Starter pulley
5	412 5001 00	1	Starter cord, 2200 mm
6	420 8520 70	1	Key clamp
7	420 8522 90	1	Pawl
8	420 8523 01	1	Pawl lock
9	420 8453 00	1	E-clip
10	420 9389 85	1	Locking spring
11	420 9457 70	1	C-clip
12	420 9604 15	1	Rubber stopper
13	420 2412 36	4	Hex head cap screw M6 x 16
14	420 9457 51	4	M6 Lock washer
1-11	420 9969 39	1	Rewind starter Assy.

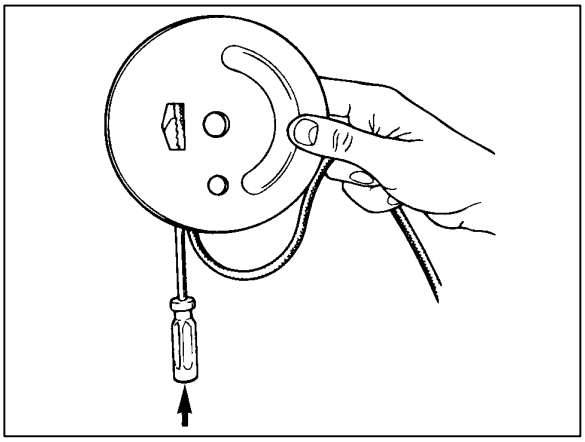
Removal

Remove the screws and the washers that attach the recoil starter to the engine, then remove the recoil starter.

Dismantling

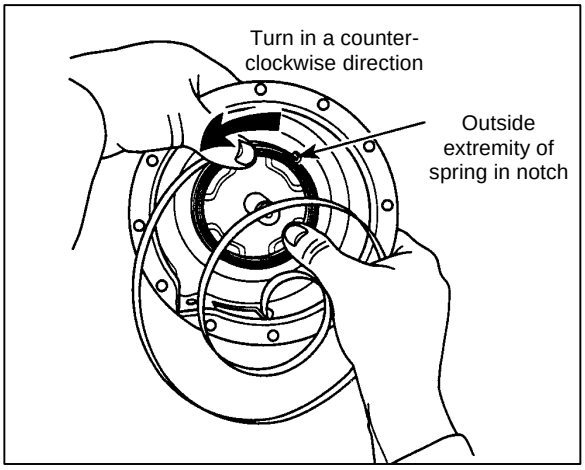
To free the cord from the recoil starter mechanism :

- Remove the retaining ring, the snap spring, the E-clip and the pawl.
- Lift the pulley out of the starter housing.
- Release the wedge and withdraw the cord.



Re-assembling

When reassembling, insert the outside end of the spring in the notch of the guide then roll the spring into the guide turning it counter-clockwise.



◆ WARNING

Because it is so tightly rolled inside the guide, it is possible that the spring will pop out when it is being manipulated. Always handle it with care.

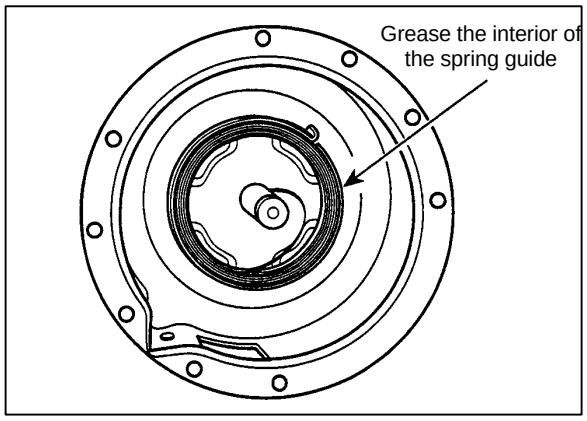
● *NOTICE:*

Periodically, it is necessary to clean, inspect and lubricate the recoil starter because of the dust that collects in it.

▼ CAUTION

It is of the greatest importance that the starter spring be lubricated on a regular basis using the specified lubricants. If this is not done, the parts of the starter will not last as long as they could and / or the recoil starter could perform poorly at very cold temperatures.

Lubricate the spring with silicone compound and place it in the starter housing, as illustrated.



▼ CAUTION

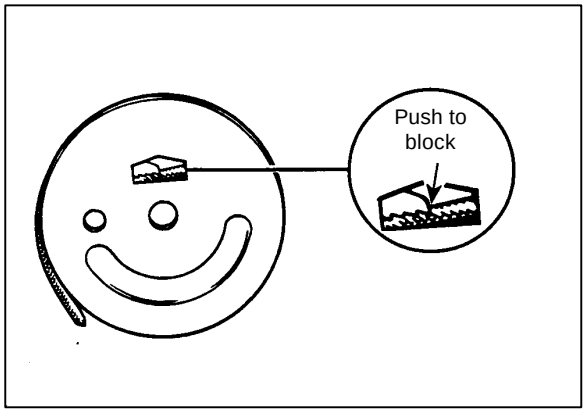
Do NOT use this lubricant (silicone compound) on the snap spring of the starter because the spring does not stay in place when submitted to vibrations.

▼ CAUTION

Using standard all-purpose grease can cause the recoil starter to function badly.

Installing a new

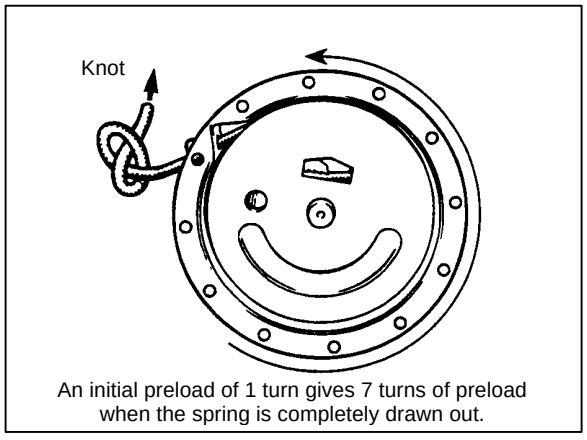
To install a new cord, insert the cord into the pulley opening and block it with the wedge as illustrated.



To adjust cord tension:

Wind the cable around the pulley and place it in the starter housing making sure that the notch on the hub of the pulley is fitted into the hook of the return spring.

- Turn the pulley counter-clockwise until the end of the cable is accessible through the opening in the starter housing.
- Pull the cable out of the starter housing and make a temporary knot to keep it in place.

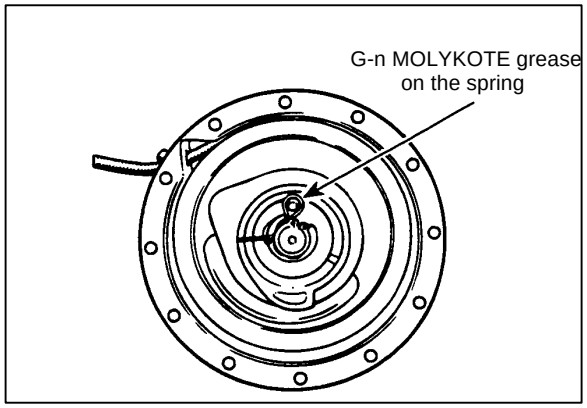


An initial preload of 1 turn gives 7 turns of preload when the spring is completely drawn out.

Install the pawl, the pawl lock and the E-clip.

Install the snap spring, and lubricate it with the G-n MOLYKOTE paste from Dow Corning or equivalent.

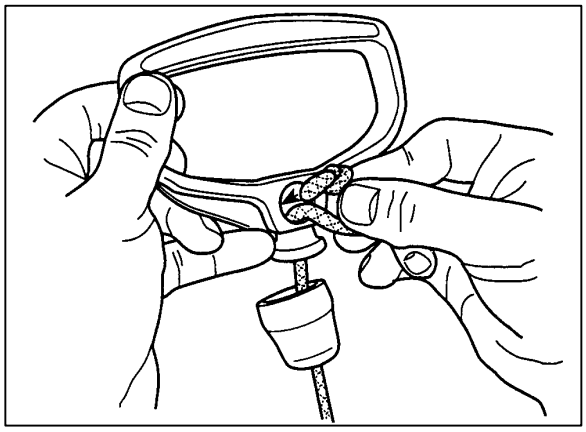
Install the retaining ring.



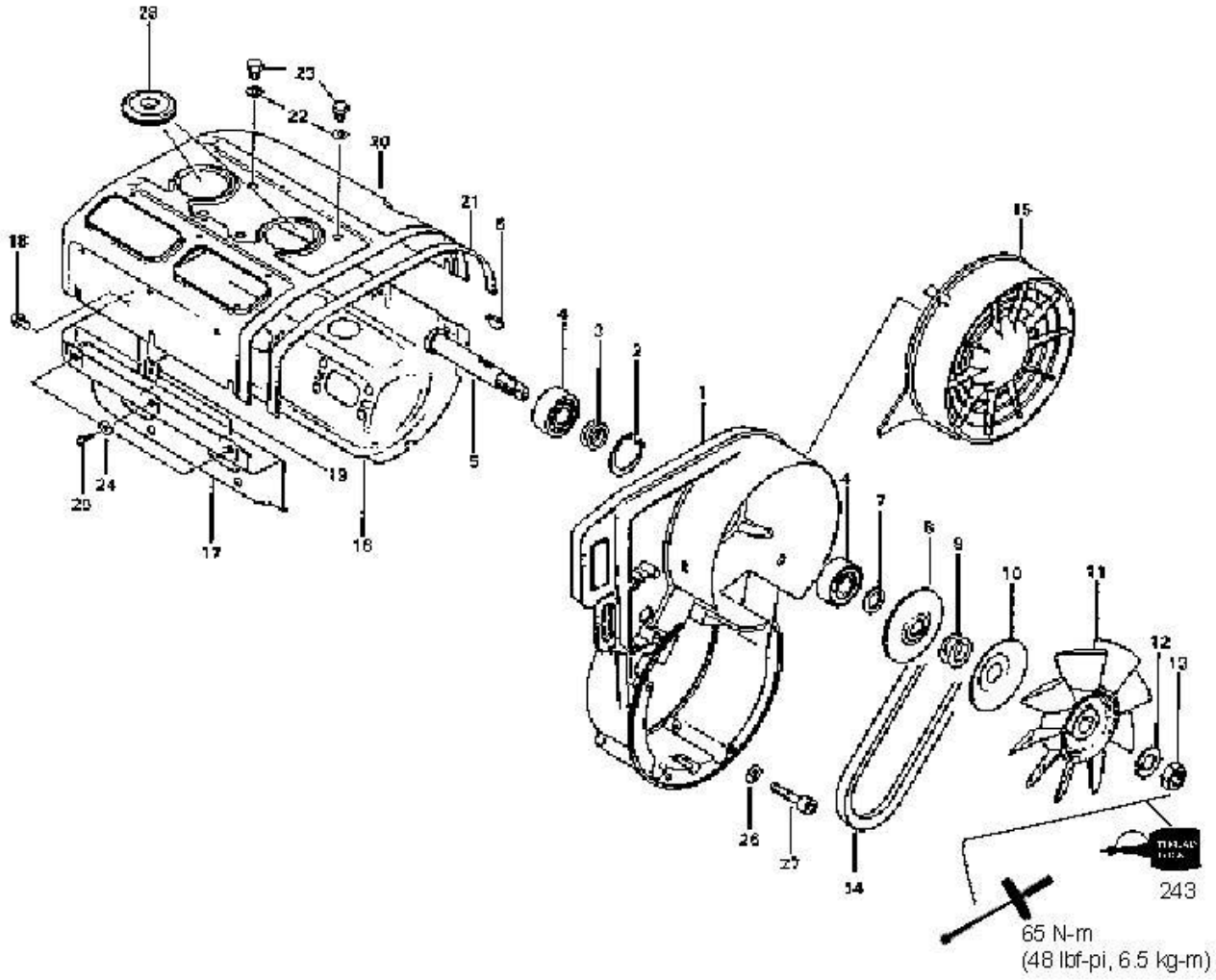
▼ CAUTION

Do not use this lubricant on the return spring because it does not adhere when it is dry.

Before installing the starter handle on the new cord, fuse the strands of the cable together by burning the end with a match. Pass the cord through the rubber stop and through the handle then tie a knot in it at the end. Fuse the knot with a match. Push the knot into the recess on the starter handle and draw tight.



COOLING SYSTEM



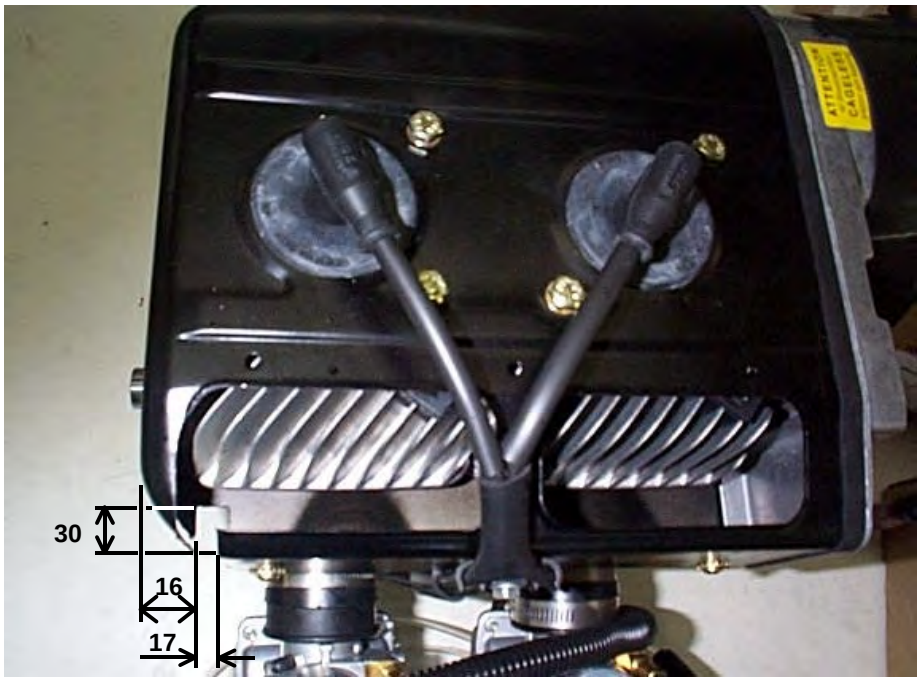
COOLING SYSTEM 6 - 2

Ref.	P/N	QTY	Cooling System / Rotax 503 Part Descriptions
1	420 9115 40	1	Fan housing
2	420 9458 80	1	Retaining ring
3	420 2445 85	2	1mm Shim
4	405 4061 00	2	6203 Roller Bearing
5	420 9379 40	1	Fan shaft
6	420 2460 15	1	Woodruff key
7	420 8276 50	1	Spacer
8	420 9804 96	1	Sheave (inside)
9	420 8270 80		Spacer 0.5 mm
10	420 9805 20	1	Sheave (outside)
11	420 8662 92	1	Fan
12	420 9457 56	1	16 mm Lock washer
13	420 9422 85	1	M16 x 1.5 Hex nut
14	414 6308 00	1	V-belt
15	420 9756 95	1	Fan guard
16	420 9110 66	1	Cylinder housing, Exhaust side
17	420 9110 67	1	* Cylinder housing, Intake side
18	420 2403 85	1	M6 x 12 screw
19	417 3000 05	8	Spring nut
20	420 9128 22	1	* Cylinder housing, Upper portion
21	420 9609 61	1	Sealing strip 440 mm
22	420 9457 52	4	Lock washer 8 mm
23	420 9105 81	4	M8 x 16 Hex head cap screw
24	420 8452 70	8	Washer
25	417 3000 06	8	B4.8 x 16 screw
26	420 9457 51	4	6 mm lock washer
27	205 0630 44	4	M6 x 30 cylindrical screw
28	570 1247 00	2	Spark plug protector
-	320 5031 80	1	Motor Assembly

● *NOTICE:*

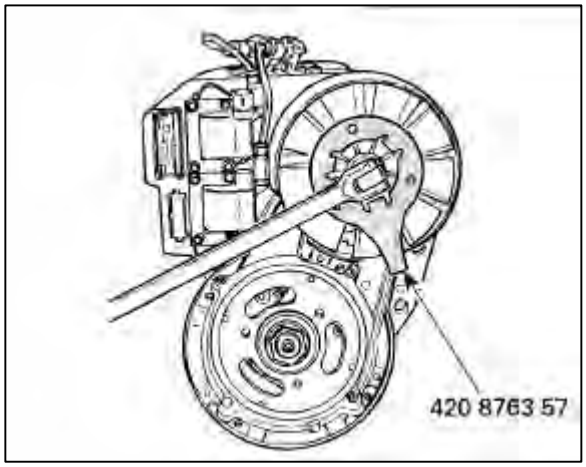
The parts identified by an * are ROTAX parts modified in the A D Boivin Design Inc factory.

Below is an illustration of these modifications. The dimensions given are in mm.

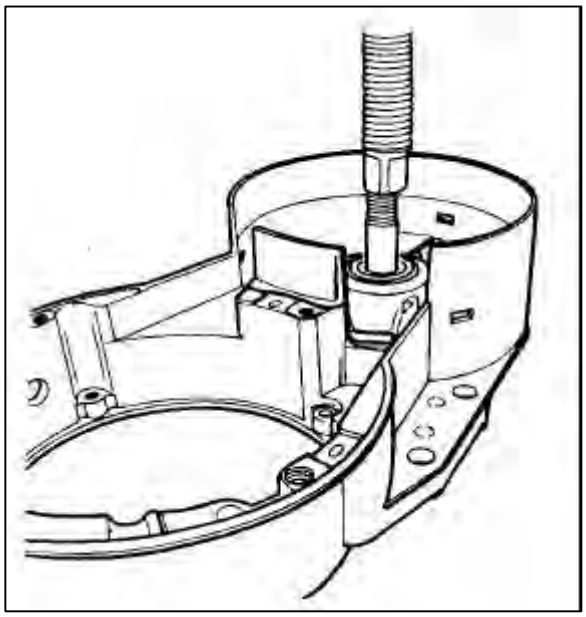


Assembly and disassembly

Remove the fan guard. To remove or install the bolt securing the fan, immobilize the pulley using the special nut removal tool. (P/N 420 8763 57). When assembling, tighten the bolt to 65 N-M (6.5 kg-m, 48 lbf-ft).

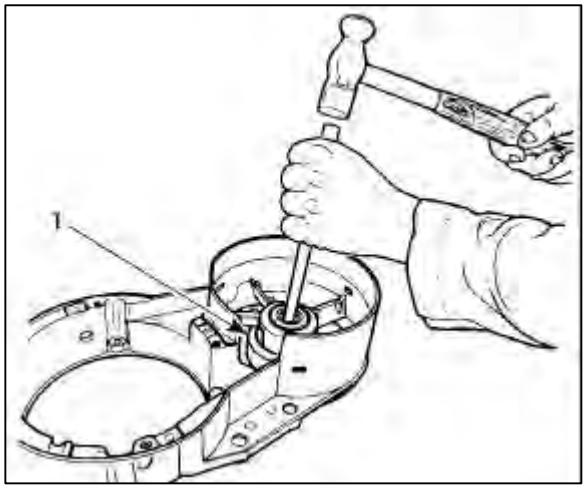


Using a press, pull out the fan shaft.



Support the fan housing using a ring. Remove the roller bearing by tapping all around the inside cage with a punch. Keep the shims.

Remove the retaining ring and take out the second roller bearing.

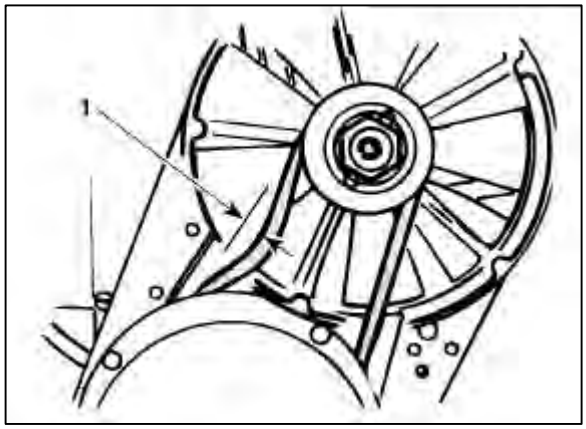


To carry out the installation, use a press and install the first roller bearing, then install the retaining ring. Next, press in the second roller bearing from the opposite side until it is level with the edge of the housing. Press in the fan from the opposite side of the fan housing. The fan shaft must turn freely.

Apply a coat of LOCTITE 243 to the threads of the fan shaft.

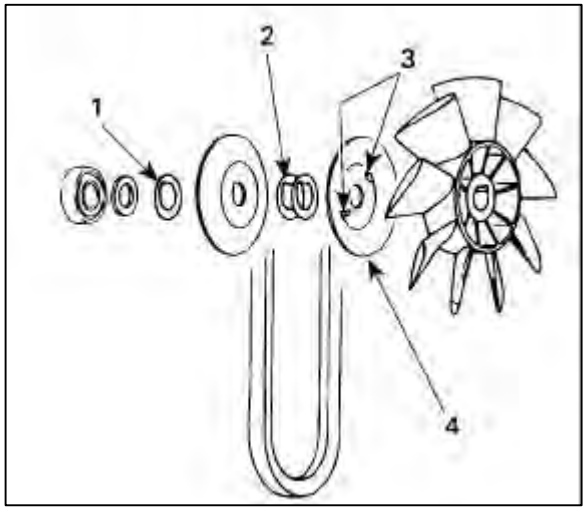
The deflection of the belt must be 9.5mm (3/8 of an inch) when a force of 5 kg (11lb) is applied).

1. Deflection



If the deflection is different, the tension must be corrected by adding or removing one or more shims between the driven half-pulleys. If the tension must be corrected, take advantage of the fact that the shaft can be turned by hand, when the half-pulleys are dismantled, to make sure that the bearing of the fan is in good working order.

1. Unused shims here
2. Adjust here
3. Locator keys
4. Flange



Position the flanges so that the one with the two locator keys is located on the side closest the fan.

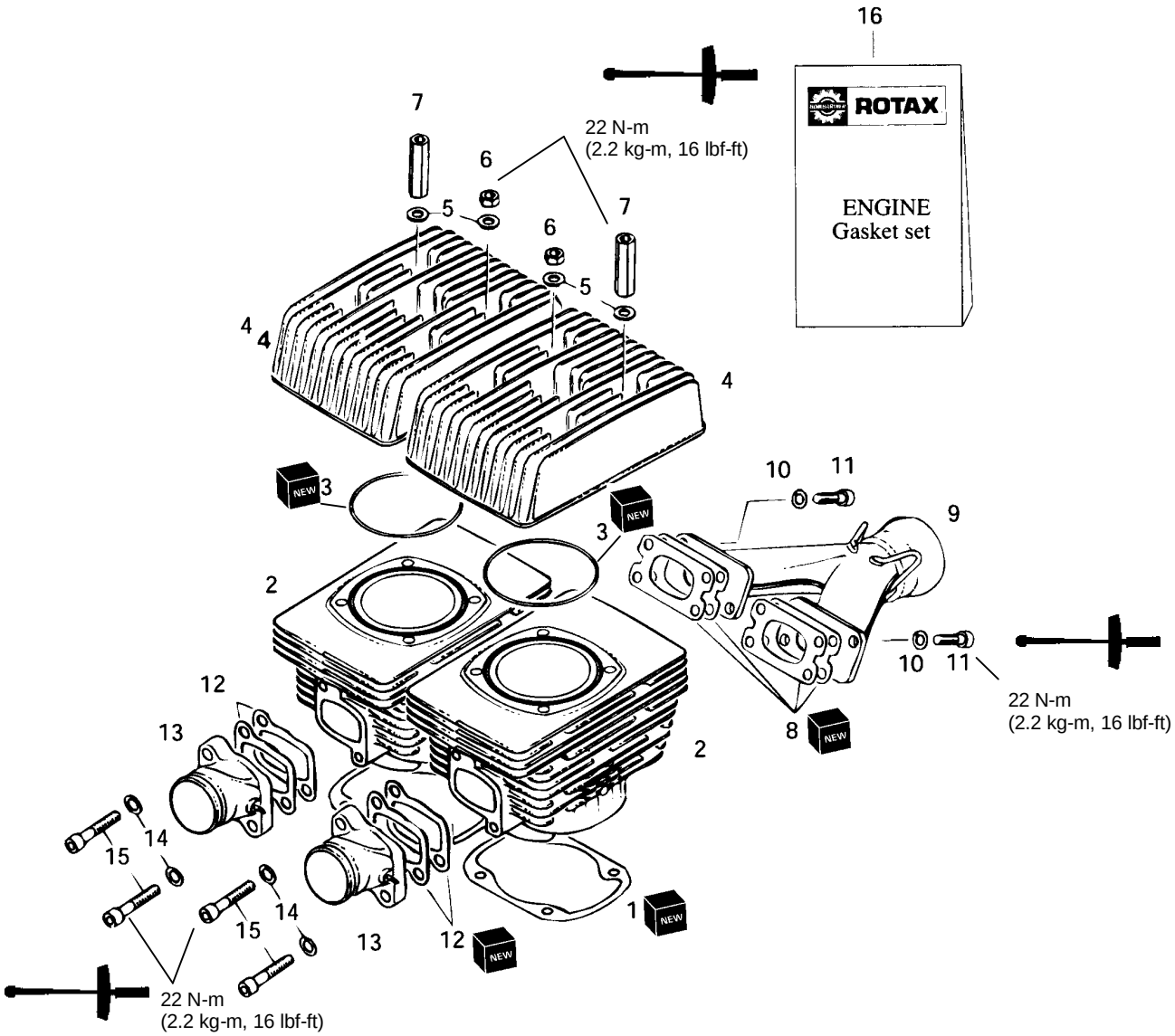
Reinstall the fan guard.

WARNING

Always reinstall the fan guard after performing a maintenance operation.

ENGINE / CYLINDERS AND CYLINDER HEADS

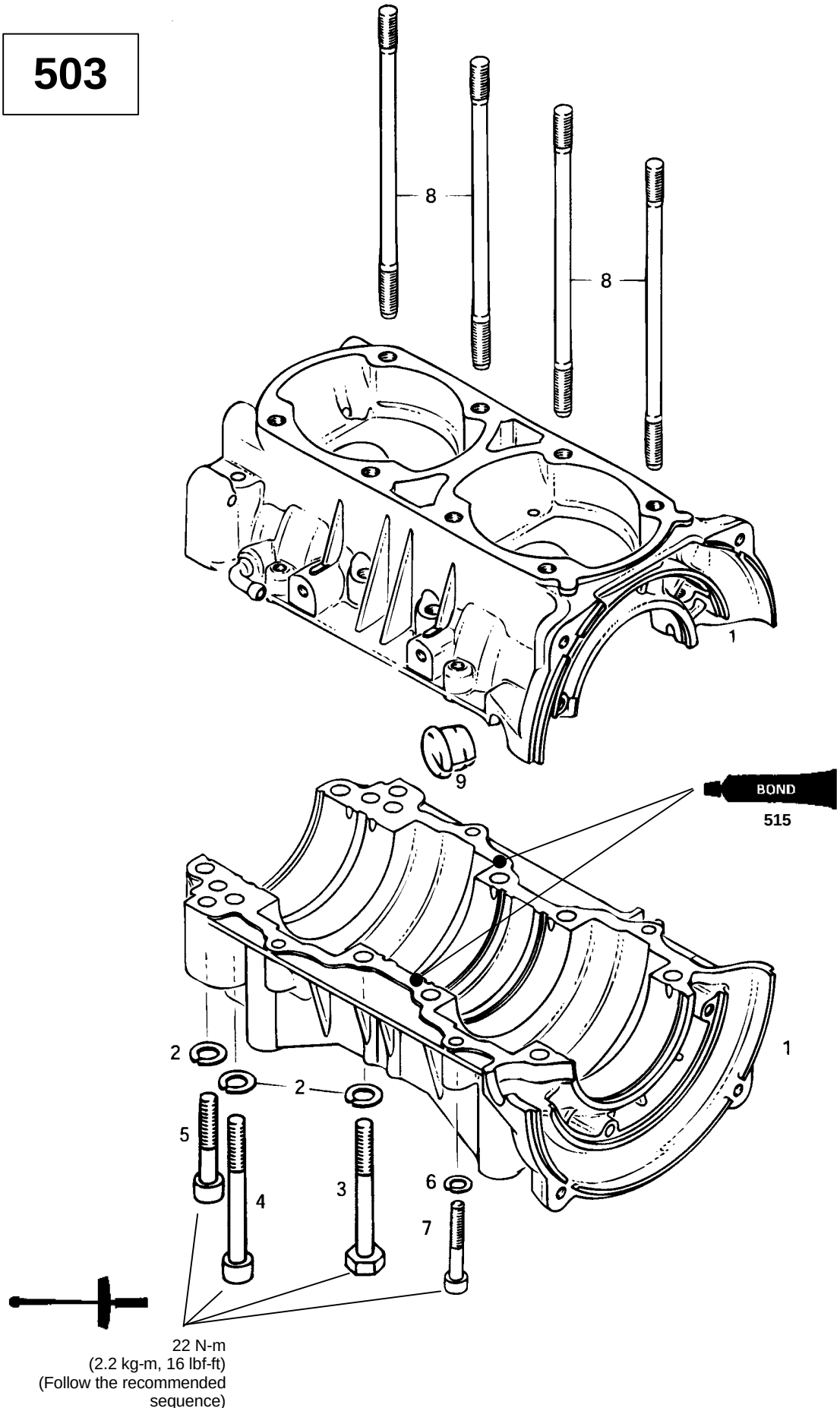
503



Ref.	P/N	Qty	Cylinders and cylinder heads / Rotax 503 Part Descriptions
1	420 8318 58	2	Gasket, 0.5mm
2	420 8236 49	2	Cylinder and cylinder sleeve
3	420 8505 40	2	O-ring
4	420 8236 64	2	Cylinder head
5	420 2503 11	8	8.4mm washer
6	228 0810 45	4	M8 Hex screw
7	420 8422 03	4	M8 X 47 distance nut
8	420 8318 49	4	Gasket, Exhaust manifold, 1mm
9	420 9731 28	1	Exhaust manifold
10	224 7811 40	4	8mm Lock washer
11	222 9830 65	4	M8 X 30 allen bolt
12	420 8318 66	4	Intake gasket, 1mm
13	420 8674 08	2	Intake socket Assy.
14	420 9457 52	4	8mm Lock washer
15	420 8406 81	4	M8 X 40 allen bolt
16	420 9942 38	1	Engine gasket set
-	420 2501 65	@	O-ring, 64mm
-	420 8319 50	@	Oil seal
-	420 8318 58	@	Gasket, 0.5mm
-	420 8505 40	@	O-ring
-	420 8318 43	@	Gasket, 1mm
-	420 8318 66	@	Gasket, Intake, 1mm
-	404 1466 00	@	Gasket

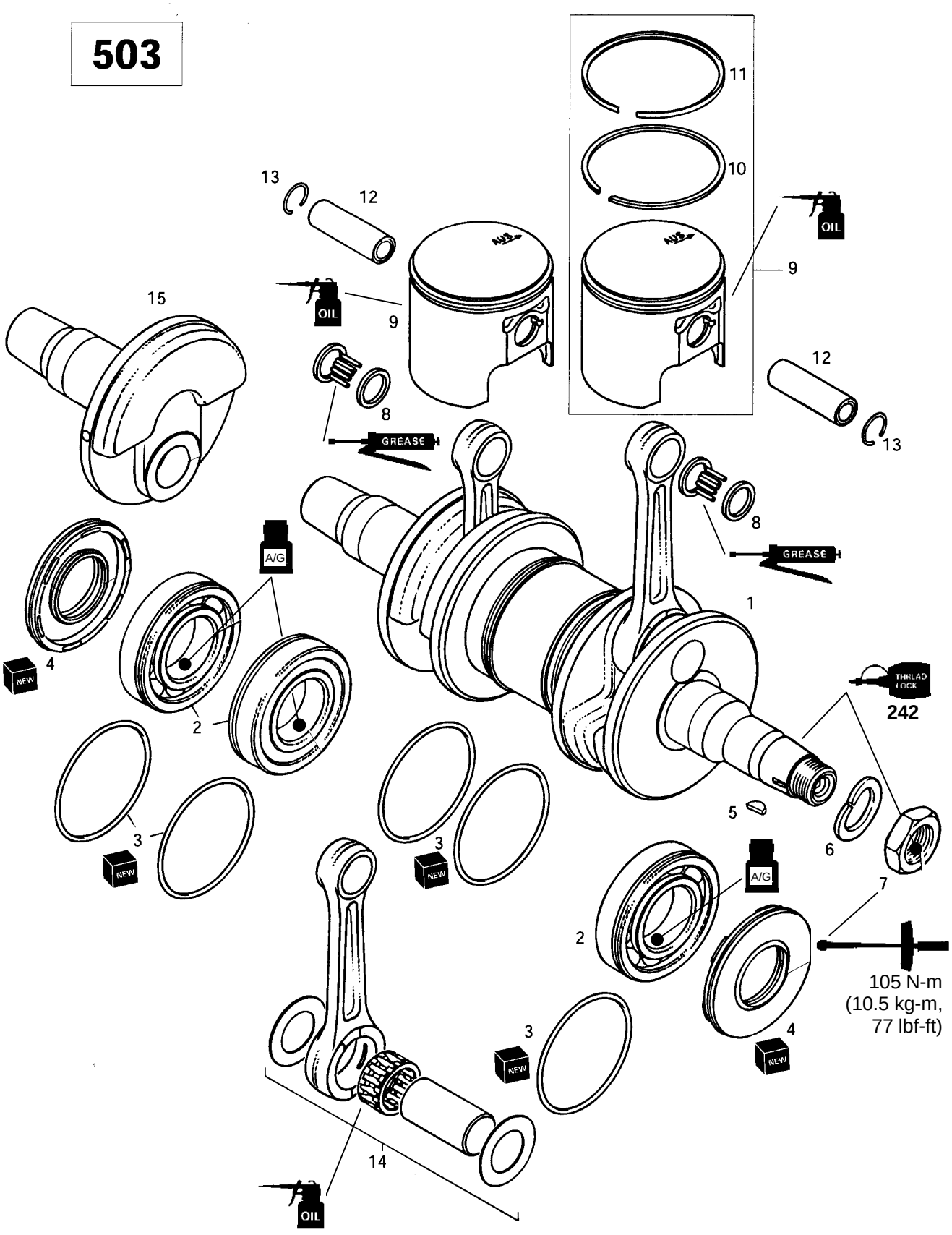
ENGINE / HOUSING

503



Ref.	P/N	Qty	Crankcase / Rotax 503 Part Descriptions
1 - 6	420 8867 13	1	Crankcase Assy.
2	420 9457 52	14	8mm Lock washer
3	420 8412 01	6	M8 X 70 Hex Bolt
4	420 8415 61	2	M8 X 45 Allen bolt
5	420 8418 41	2	M8 X 65 Allen bolt
7	222 0845 65	4	M8 X 45 Hex bolt
8	420 8405 55	8	Stud, M8 X 173.5
9	420 9602 88	1	Cable grommet

ENGINE / CRANKSHAFT AND PISTONS



Ref.	P/N	Qty	Crankshaft and pistons / Rotax 503 Part Descriptions
1	420 9964 46	1	Crankshaft Assy.
2	420 8322 31	3	Roller bearing 6207
3	420 2501 65	5	O-ring, 64 mm
4	420 8319 50	2	Oil seal
5	420 2460 55	1	Woodruff key
6	420 9457 59	1	22 mm Lock washer
7	420 8422 30	1	M22 Hex nut
8	420 8323 20	2	Cageless needle bearing
9 - 11	420 9962 45	2	Piston Assy. 72.0 mm
	420 9962 46	Opt	Oversize Piston Assy. 72.25 mm
	420 9962 47	Opt	Oversize Piston Assy. 72.50 mm
10	420 9158 50	2	Rectangular ring 72.00 mm
	420 9158 51	Opt	Rectangular ring 72.25 mm
	420 9158 52	Opt	Rectangular ring 72.50 mm
11	420 2152 35	2	Semi-trapezoidal ring 72.00 mm
	420 2152 36	Opt	Semi-trapezoidal ring 72.25 mm
	420 2152 37	Opt	Semi-trapezoidal ring 72.50 mm
12	420 9161 85	2	Piston pin
13	420 9457 35	4	Circlip
14	420 9945 64	2	Crankshaft repair kit
15	420 8182 42	1	Crankshaft PTO

TOP END

● *NOTICE:*

The engine must be removed from the chassis to carry out the following operations.

CLEANING

Throw away all the seals. Use a seal cleaning agent to clean all the contact surfaces.

Clean all the metal parts with a solvent for non-ferrous metal.

Using a wooden spatula, scrape and remove the carbon in the exhaust port, the cylinder head and on the piston cap.

● *NOTICE:*

Clean the piston cap well so that the letters "AUS" and the arrow are visible after the cleaning.

Clean the grooves of the piston rings with a special tool or with an old piece of ring.

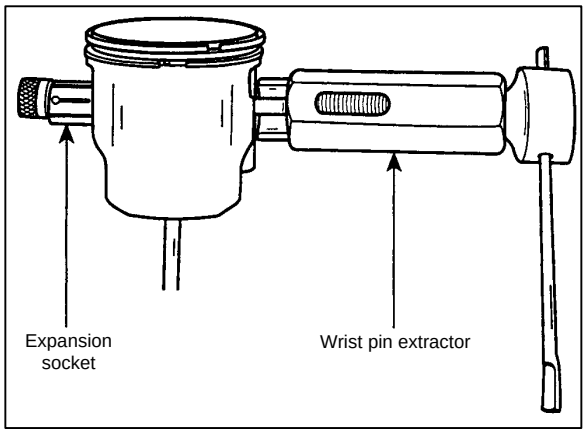
DISMANTLING

The piston pins of the SNOW HAWK™ are equipped with needle bearings without a cage.

Use a piston wrist pin extractor (P/N 529 0210 00), an expansion bushing and a positioning bushing.

- Cover the casing with a clean cloth or a rubber cushion (P/N) 529 0234 00) to prevent the circlips from falling into it. Then remove the piston circlip by inserting a pointed tool into the piston notch.

- Insert the piston wrist pin extractor (P/N 529 0210 00), then install the expansion socket over the extractor rod.

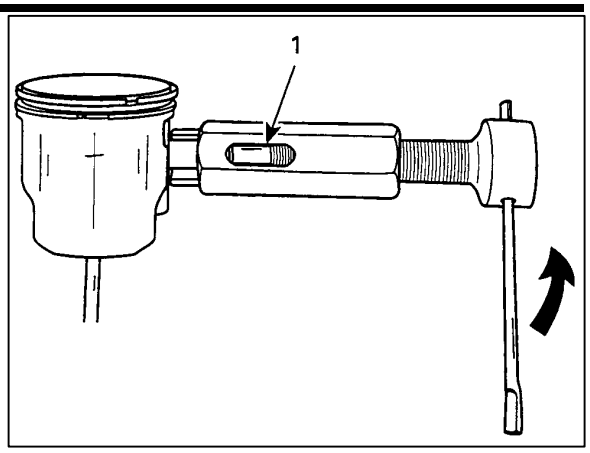


- Take the piston pin out by unscrewing the extractor until the first thread of the rod and the mark 503 are in line with one another.

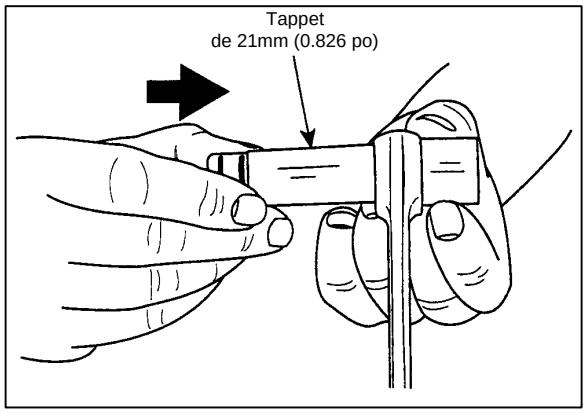
  1. Mark 503 of the extractor

- Turn the extractor as shown to take the piston out.

- Remove the piston from the connecting rod.



- Install the positioning socket, then push the needle bearings and the stop washers using a tappet 22 mm (0.826 in) in diameter.



● *NOTICE:*

Pistons and oversized segments of 0.25 mm and 0.5 mm are available if needed

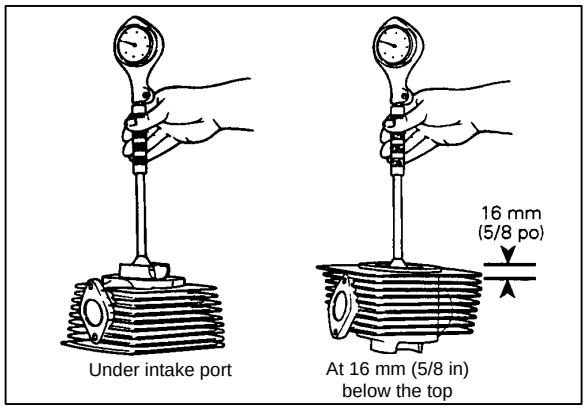
Join all the needles, the stop washers and the sockets using a lock fastener.

Inspection

Taper of the cylinder

Compare the diameter of the cylinder, 16 mm (5/8 in) from the top, to its diameter just under the intake port.

If the difference is more than 0.8 mm (.003 in), the cylinder must be reamed again or replaced.

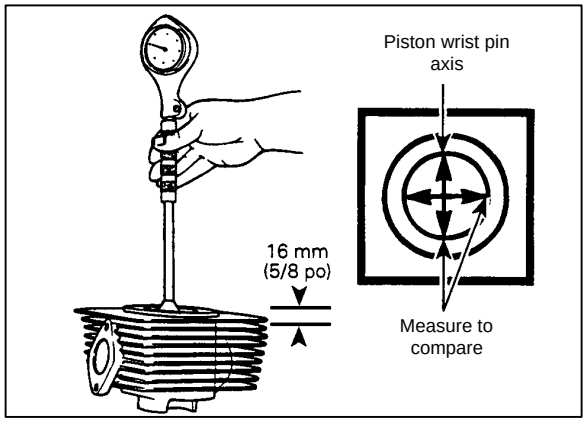


● *NOTICE:*

Make sure to resharpen the bevelled edge around the intake ports of the cylinder linings after each honing.

Ovalization of the cylinder

Using a dial gauge, measure the cylinder at 16 mm (5/8 in) from the top to see if the ovalization exceeds 0.05 mm (.002 in). If so, the cylinder must be reamed again or replaced.



● *NOTICE:*

Make sure to resharpen the bevelled edge around the intake ports of the cylinder linings after each reaming.

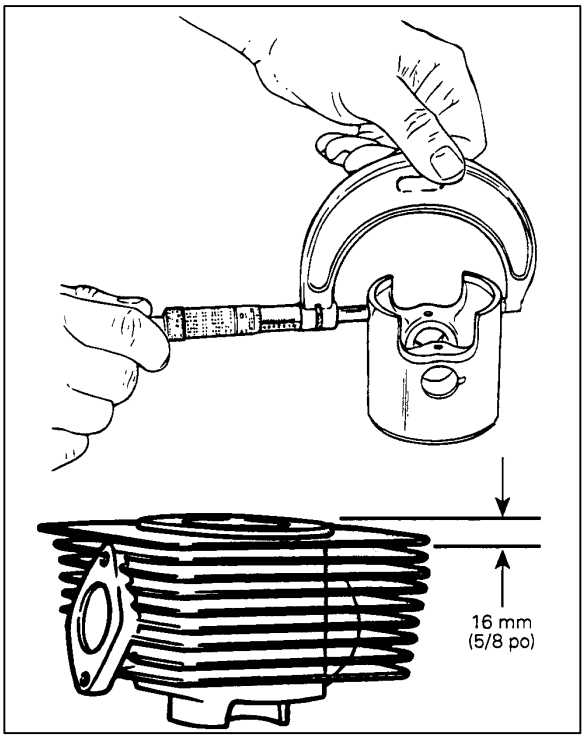
Play between the cylinder and the piston

Before measuring the play between the piston and the cylinder, verify the taper and the ovalization of the cylinder.

To determine exactly how much play there is between the piston and the cylinder, measure the piston under the pin opening and at a 90^0 angle to the piston pin. Note the larger of the two diameters.

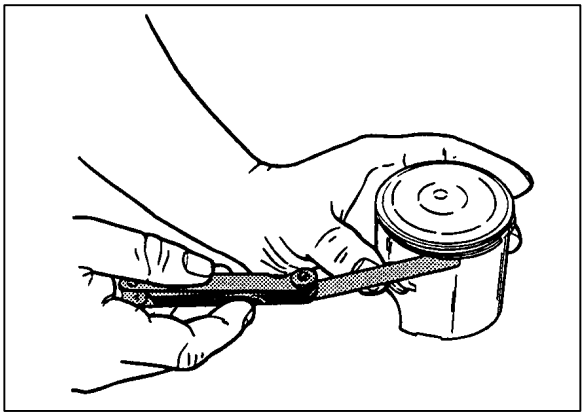
Measure the cylinder 16 mm (5/8 in) from its upper edge. Note the smaller of the two diameters.

The difference between these two measurements must be less than 0.2 mm (.008 in).



Play between the piston ring and the groove

Using a thickness gauge, measure the play between the rectangular piston ring and its groove. Replace the piston if this play exceeds 0.2 mm (.008 in).



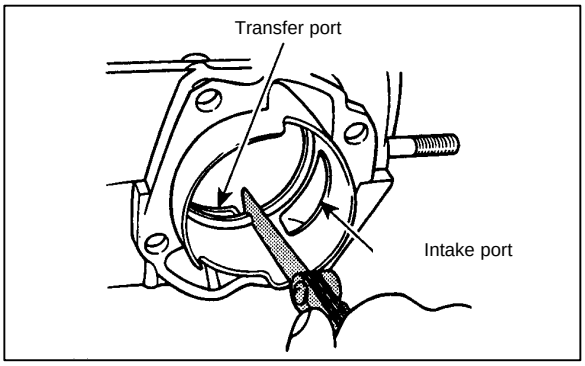
Opening of the piston ring

Place the piston ring halfway between the transfer port and the intake port.

● *NOTICE:*

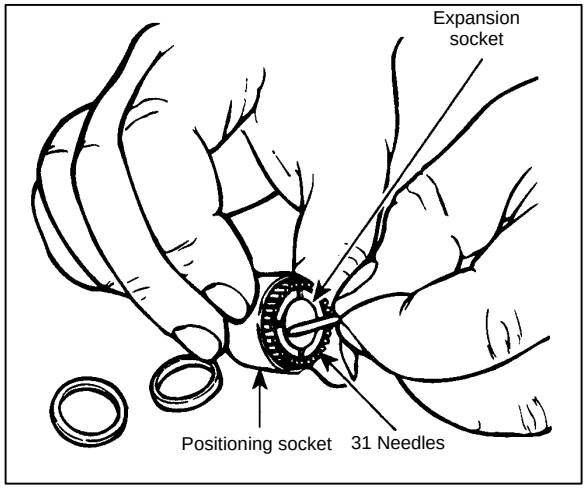
To put the ring in the cylinder correctly, use the piston to push it in.

Using the thickness gauge, check the opening of the ring. Replace the piston ring if it is more than 1 mm (0.39 in).

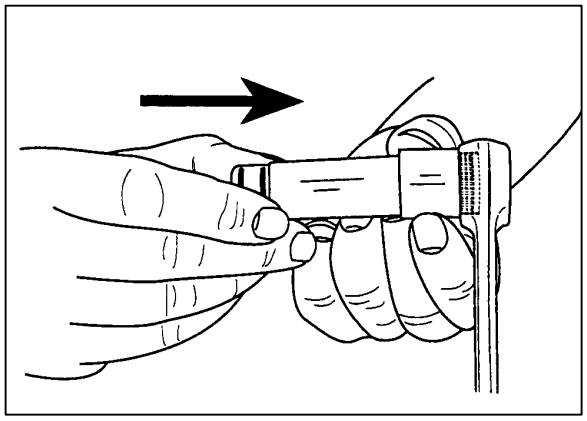


Reassembling

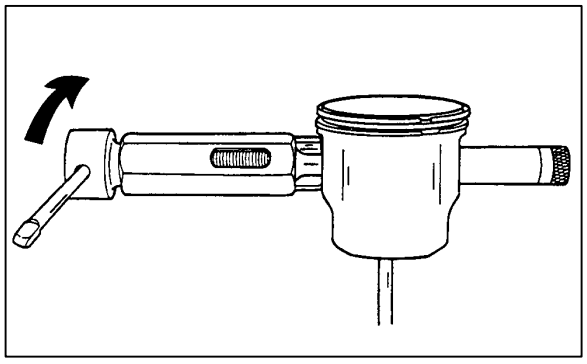
When reinstalling the needle bearings, make sure there are 31 needles between the expansion socket and the positioning socket.



- Grease the stop washers and install them at the ends of the needles.



- Insert the needles in the connecting rod using a tappet 21 mm (.836 in) in diameter.
- Install the piston on the connecting rod so that the arrow under the letters "AUS" is pointing towards the exhaust port.

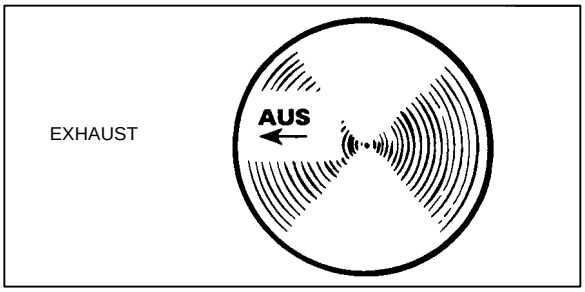


- Install the piston wrist pin extractor (P/N 529 0210 00), then turn its handle until the piston pin is in the correct position in the piston.
- Remove the piston wrist pin extractor and the expansion socket.
- Install the circlips according to the directions given below.

When installing new needle bearings, make sure to insert the needles and the stop washers. The needles are not held in place by an expansion socket, but rather by two plastic half-cages.

- Use a piston wrist pin extractor (P/N 529 0210 00) to insert the piston pin. The half-cages should come out of the piston, if not, use duck-bill pliers to take them out.
- Install the circlips according to the directions given below.

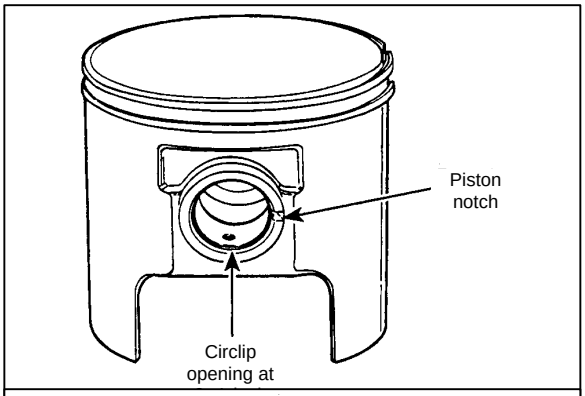
When reassembling, place the pistons over the connecting rods so that the arrow under the letters "AUS" is facing the exhaust port.



● *NOTICE:*

The pistons and the replacement cylinders have a red or green mark on them. It is very important to match a piston with a cylinder of the same colour.

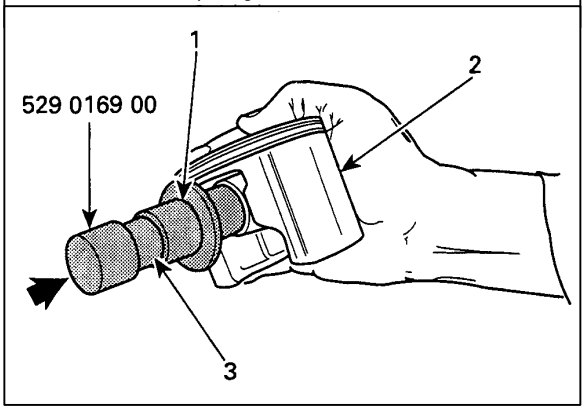
To minimize the effects of the forces of acceleration on the circlips, install them as illustrated.



▼ CAUTION

The circlips must not move freely in the groove after their installation. If they do move, replace them.

Use the piston circlip installation tool (P/N 529 0169 00).



1. *insert the circlip*
2. *Secure it*
3. *Oil it*

● *NOTICE:*

After re-reaming the cylinder lining, make sure to redo the bevelled edges all around the opening of the intake, transfer and exhaust ports.

Before inserting the piston in the cylinder, lubricate the cylinder with new injection oil or the equivalent.

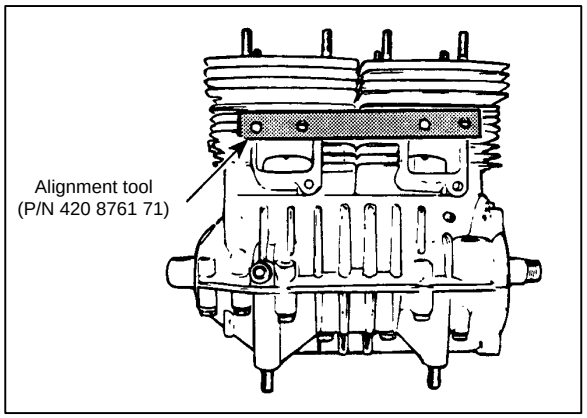
Install the piston ring compressor (P/N 420 8769 70) on the piston (complete).

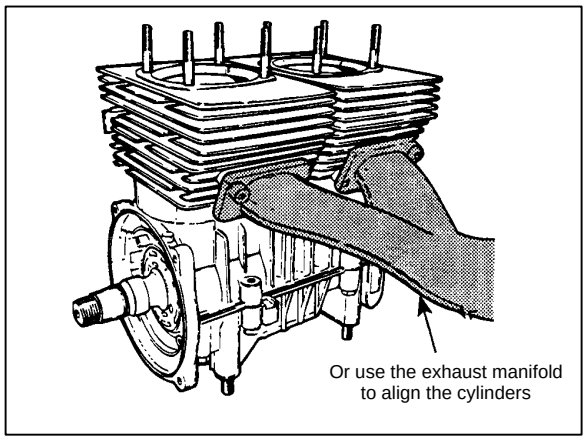
● *NOTICE:*

The piston ring compressor cannot be used on oversized pistons.

Verify the evenness of the intake connectors.

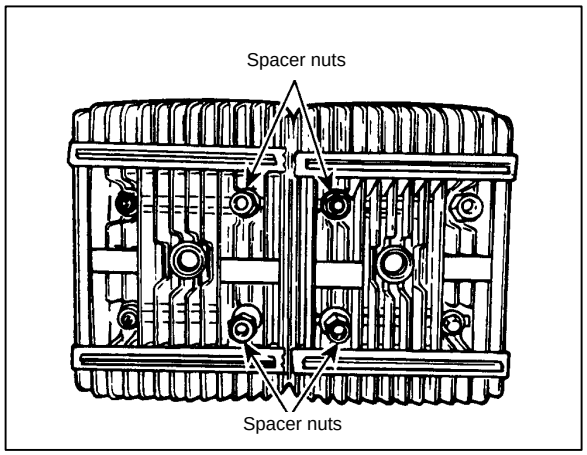
When installing a cylinder and/or a cylinder head, use the alignment tool or the exhaust manifold to verify the seal between the intake manifold and the exhaust before tightening the nuts of the cylinder head.





Place the spacer nuts as shown in the illustration.

Tighten the nuts of the cylinder head to 22 N-m (16 lbf - ft) in a criss-cross sequence. Tighten each cylinder head individually.



Install the armature flange, the fan housing, then the air deflector.

Install a gasket on each side of the deflector.

BOTTOM END

Cleaning

Throw away the ring seals, the gaskets and the O-rings. Clean all the metal parts with a solvent for non-ferrous metal. If necessary, use a sealer cleaner.

Remove any traces of Loctite™ at the conical end of the crankshaft.

Using a sealer cleaner, remove any trace of the sealer coating on the contact surfaces of the housing.

▼ CAUTION

Never use a sharp or pointed object which could leave scratches and thereby prevent the housing from being completely sealed.

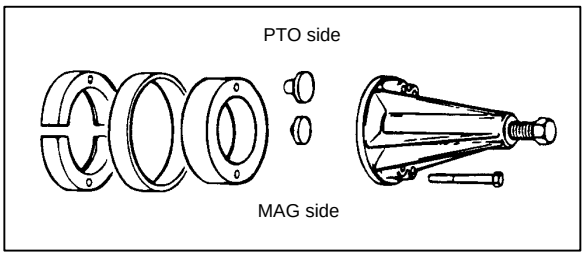
Dismantling

To remove the primary clutch, see the **"Primary transmission"** section.

To remove the magneto, see the **"Electrical system"** section.

Remove the 14 nuts and separate the half-cases.

Use a crankshaft protector and a special extractor to remove the roller bearings from the crankshaft. See illustration.



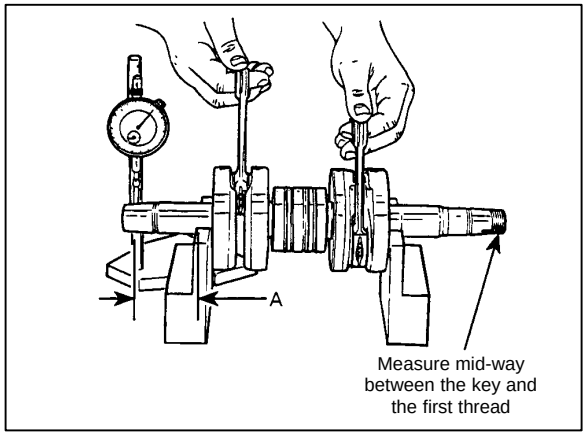
Inspection

Camber of the crankshaft

The camber of the crankshaft must be less than 0.08 mm (.0031 in.).

The camber of the crankshaft can also be measured at each end using a dial indicator.

First, measure the camber while the crankshaft is installed in the engine. If the camber exceeds the prescribed tolerance, it may be because of a worn bearing or a warped crankshaft. Remove the bearings and measure the camber once more on V-blocks at distance "A" as indicated in the following illustration.



Distance "A" mm (in)	Maximum PTO side mm (in)	Maximum MAG side mm (in)
82.5 (3.248)	0.06 (.002)	0.03 (.001)

● *NOTICE:*

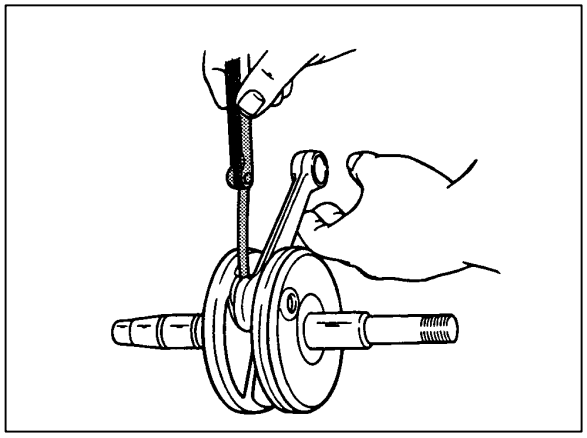
It is not possible to get an accurate measure of the camber of the crankshaft between the tailstock centres of a lathe.

If the camber exceeds the prescribed tolerance, repair or replace the crankshaft.

Axial play of the connecting rod head

New part MIN. - MAX	Wear limit
0.20 - 0.53 mm (.008 - .021 po)	1.00 mm (.039 po)

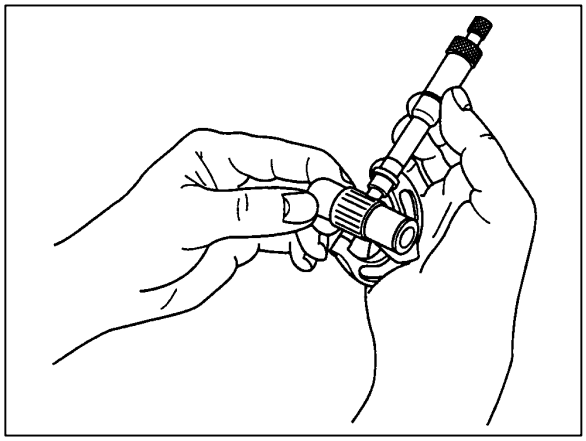
Using a thickness gauge, measure the distance which separates the stop washer from the counterweight of the crankshaft. If the distance exceeds the prescribed limits, replace the crankshaft or have it repaired.

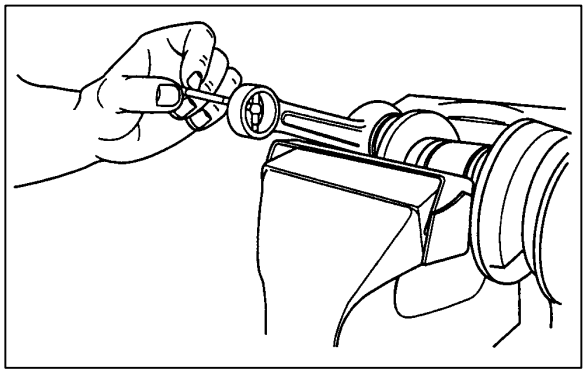


Play between the connecting rod and the piston pin

Measure the piston pin with its needle bearing. Compare to the inside diameter of the connecting rod.

New part MIN. - MAX	Wear limit
0.030 - 0.12 mm (.0001 - .0005 po)	0.15 mm (.0006 po)





Play between the connecting rod and the crank throw

New part MIN. - MAX	Wear limit
0.020 - 0.32 mm (.0008 - .0013 po)	0.05 mm (.0020 po)

Reassambling

Apply an anti-seize compound (P/N 413 7010 00) to the part of the crankshaft that takes the bearing.

To verify whether or not the play between the bearing and the counterweight is adequate, use a thickness gauge (P/N 420 8766 20).

Install the second bearing. Use the positioning gauge (P/N 420 8768 24) to position the bearing correctly.

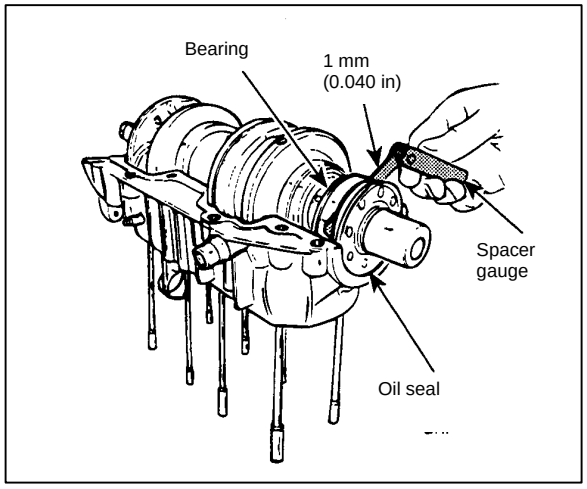
Place the bearings in a container filled with oil heated to 75^0C (167^0F). The bearings will dilate which will make installation easier. Install the bearings by placing the groove as indicated in the enlarged illustration.

The bearings are pushed along the crankshaft until they come to rest against the spoke. This spoke provides the space needed for lubricating the bearing.

When installing the ring seals, apply a thin coat of lithium grease on the lip of the ring seal.

To make sure the bearings are lubricated, there must be a space of 1.0 mm (0.040 in) between the ring seals and the bearings.

If installing solid ring seals (ones without ribs and without lugs), make sure there is at least a play of 1 mm (.040 in).



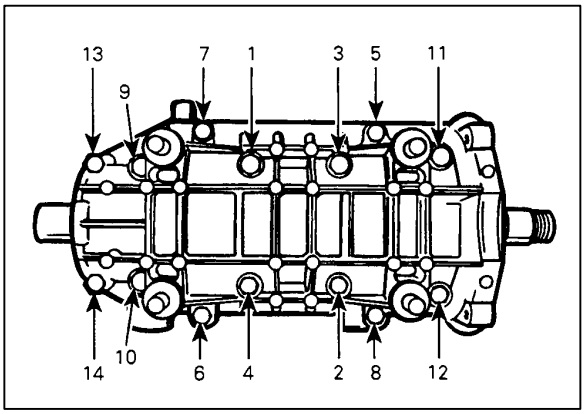
The 2 halves of the housing are matched in the factory and therefore, are not interchangeable and cannot be obtained separately.

Before assembling the 2 half-housings, spray new injection oil (or its equivalent) on all the moveable parts of the housing. Spray the Curing Spray (P/N 413 7081 00) on the contact surfaces to ensure that the sealant dries completely. In addition to speeding up the drying process, this product fills the spaces better.

Next, coat the contact surfaces of the housing with a coat of sealant.

Assemble the two halves of the housing and tighten the nuts manually Then, install and tighten the armature flange on the magneto side to correctly align the halves of the housing.

Tighten the nuts to 22 N-m (16 lbf-ft) in the order indicated in the illustration.



To install the primary clutch, see the **"Primary transmission"** section.

To install the magneto, see the **"Electrical system"** section.

CHECKING FOR LEAKS

When dealing with a 2-cylinder engine, it is not possible to check each cylinder individually because of the leaks at the position of the labyrinth sleeve at the centre of the crankshaft.

Preparation

1. Remove the calibrated exhaust pipe and the exhaust manifold.
2. Place plugs on the exhaust flanges and tighten them using the screws that were removed previously.
3. Remove the carburetors.
4. Insert plugs into the intake flanges. Tighten them using the ring clamps already in place.
5. Plug the vacuum hoses using the hose pinch clamps (P/N 529 0099 00).
6. Place the vacuum pump on one of the valves of the exhaust plug.

● *NOTICE:*

If necessary, lubricate the piston of the vacuum pump using a mild soap.

▼ CAUTION

Hydrocarbon-based lubricants, like motor oil, will damage the rubber ring of the pump piston.

7. Turn the crankshaft until the piston on the pump side reaches its lowest point. The exhaust port will then be open.

8. Turn on the pump increasing the pressure to **35.4 kPa (5 PSI)**. Do not exceed this pressure.

9. The engine must maintain this pressure for 3 minutes.

   If the pressure falls before 3 minutes, check the testing apparatus by spraying a soapy solution on the pump piston, on all the plugs and on the connections.

- If the testing apparatus has any leaks, air bubbles will indicate where they are.

- If the testing apparatus has no leaks, check the engine in accordance with the directions in this sub-section.

Procedure to follow

When the section being checked shows a leak, it is recommended that the following be tried before undertaking to service the engine since there may possibly be more than one leak in the.

When the section being checked does not show any leaks, continue pumping to maintain the pressure and check the following points until the leak is found.

When the exhaust manifold is installed, use a rubber hood. In this case, it is not necessary to bring the piston to its lowest point.

Verify the following:

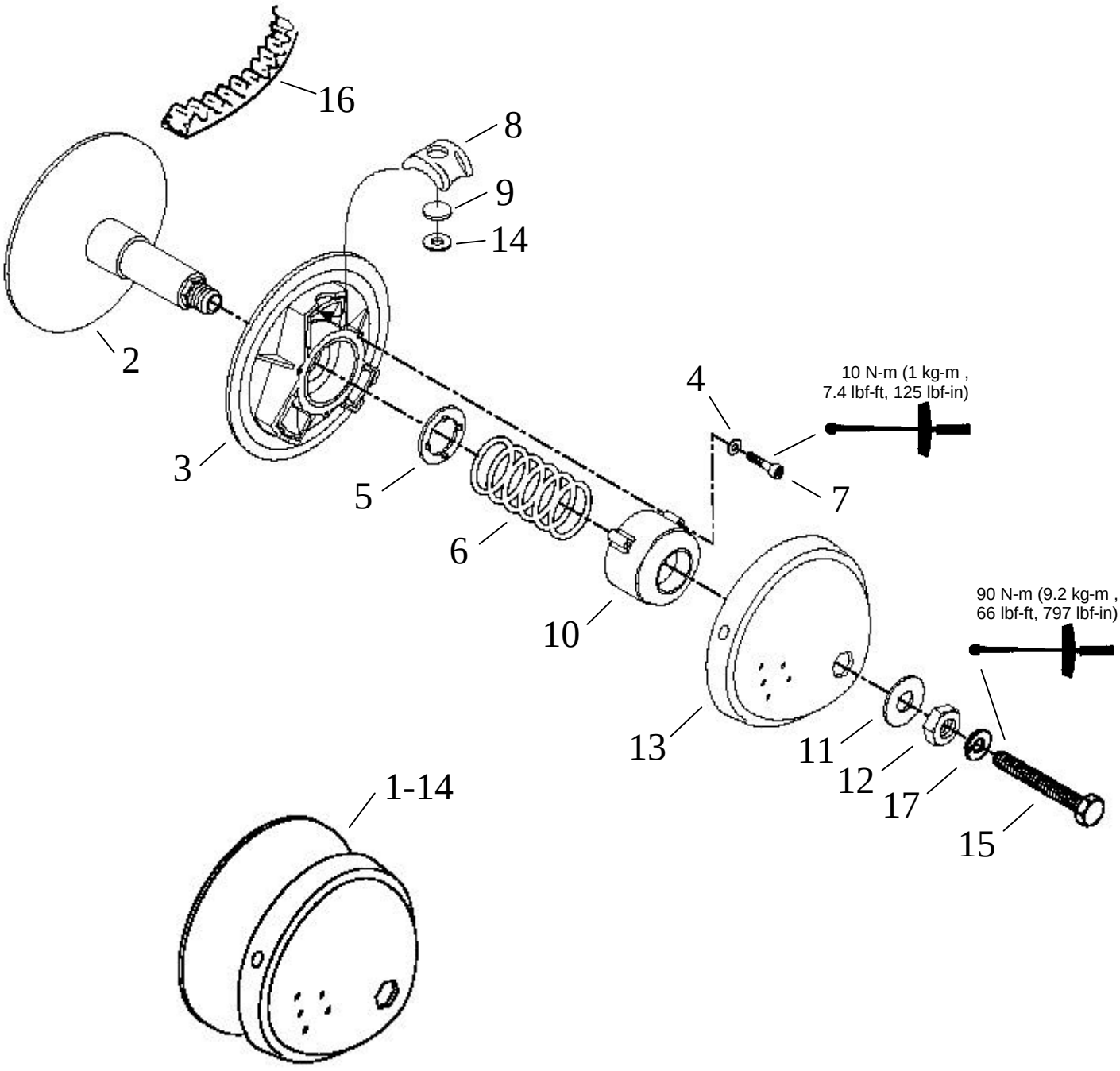
1. All the junction points and the threads of the screws and studs of the engine:

   - base of the spark plugs, insulation
   - cylinder head
   - cylinder base
   - half-housings (joint)
   - bleed screws and caps

2. Remove the primary clutch and check the exterior ring seal of the crankshaft. (PTO)

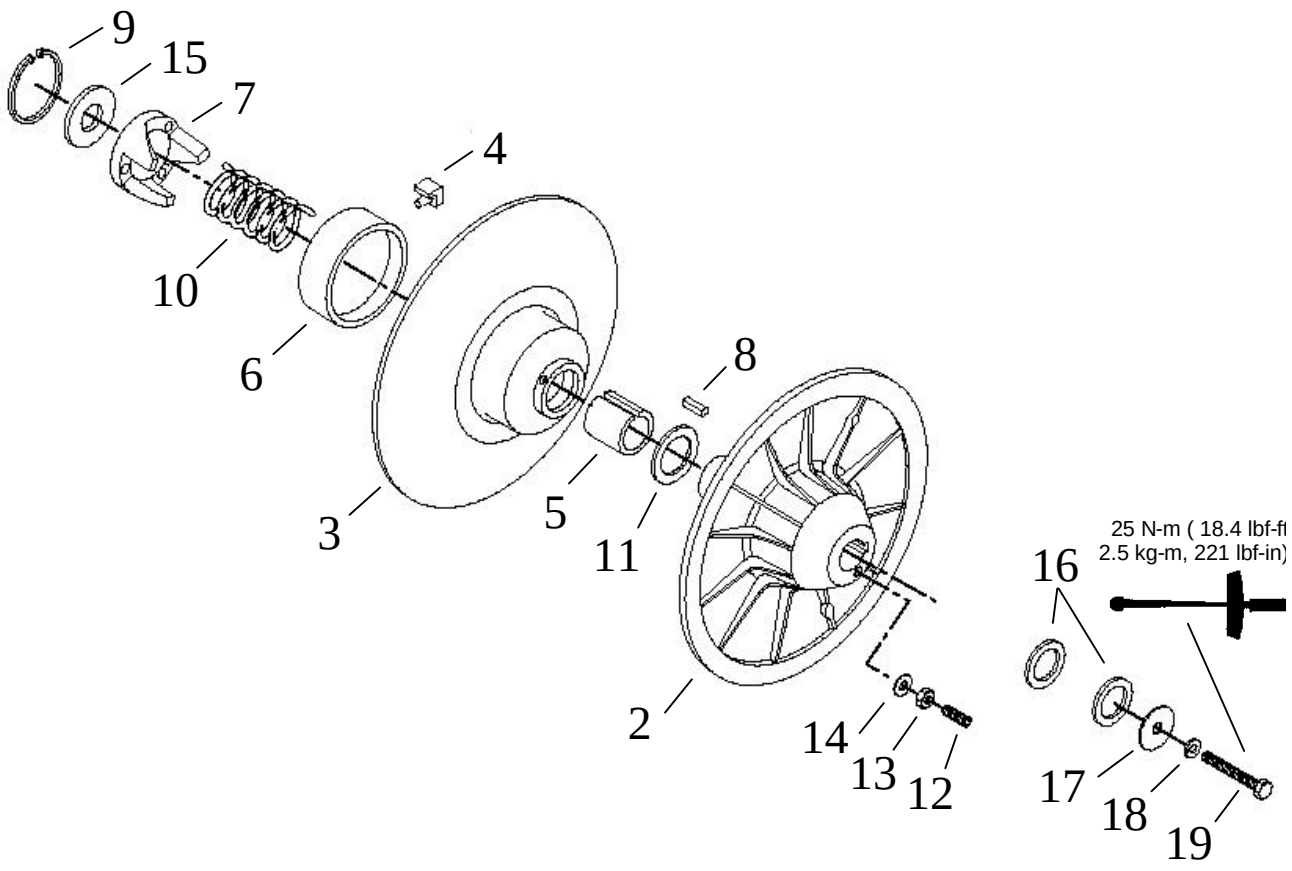
3. Remove the recoil starter and the magneto, and then check the ring seal of the crankshaft. (MAG)

PRIMARY TRANSMISSION SYSTEM / PRIMARY CLUTCH



Ref.	P/N	Qty	Primary Transmission / Primary Clutch Part Descriptions
1-14	0400-0077	1	Primary clutch Assy.
2	417 1212 00	1	Fixed sheave
3	417 1213 00	1	Moveable sheave
4	420 2453 70	3	Washer
5	417 1162 00	1	Guide washer
6	V10-55-102-22	1	Spring
7	222 9640 66	3	M6 x 40 allen screw
8	417 1181 00	3	Centrifugal block
9	0130-0142	18	Calibration weight
10	417 1214 00	1	Spring cap
11	417 1216 00	1	Washer
12	417 1183 00	1	Nut
13	417 1215 00	1	Cover
14	417 1145 00	3	Top cap
15	V1960	1	Primary clutch bolt, 1/2 - 20NF X 6 1/2"
16	10-251	1	Drive belt
17	V1850	1	Washer

PRIMARY TRANSMISSION SYSTEM / SECONDARY CLUTCH



Ref.	P/N	Qty	Primary Transmission / Secondary clutch Part Descriptions
1-15	8000-0001	1	Secondary clutch Assy.
2	504 1416 00	1	Fixed sheave
3	504 1432 00	1	Moveable sheave Assy.
4	414 9180 00	3	Cam slider
5	415 0112 00	1	Small Garlock bushing
6	860 4230 00	1	Large Garlock bushing
7	417 1264 22	1	Helix 50^{o} - 44^{o}
8	414 8208 00	1	Key
9	371 9031 00	1	Retaining ring
10	414 5589 00	1	Release Spring (beige)
11	504 1419 00	1	Washer
12	223 5630 65	3	M6x 30 screw
13	228 0610 45	3	M6 nut
14	420 2453 70	3	Washer
15	504 1418 00	1	Washer
16	504 1082 00	2	Shim
17	517 0787 00	1	Washer
18	000 0004 42	1	Lock washer
19	000 0295 30	1	M8 x 30 Hex head cap screw

GENERAL INFORMATION

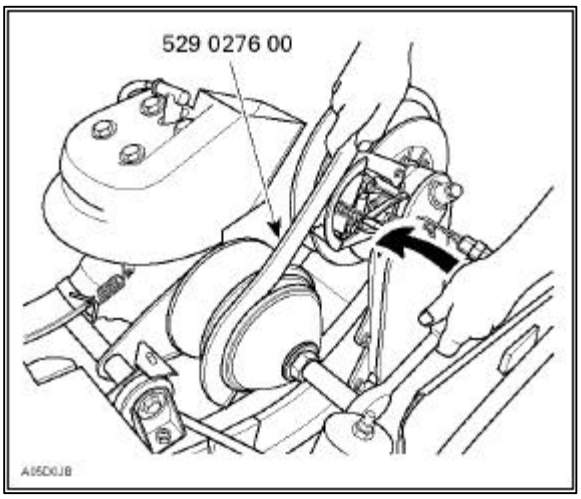
Certain parts of the primary clutch can be replaced (recoil spring, calibration weights, etc.) to improve the performance of the vehicle at high altitude. The "High Altitude Technical Data" appendix at the rear of this manual contains all the information for calibration at high altitude.

▼ CAUTION

Such modifications should only be carried out by experienced mechanics because of the effect the modifications could have on vehicle performance.

◆ WARNING

Any repair of the primary clutch must be carried out by an authorized Snow Hawk dealer or by a competent person. When installing parts, follow to the letter all the points given in the procedure and respect the assembly tolerances.



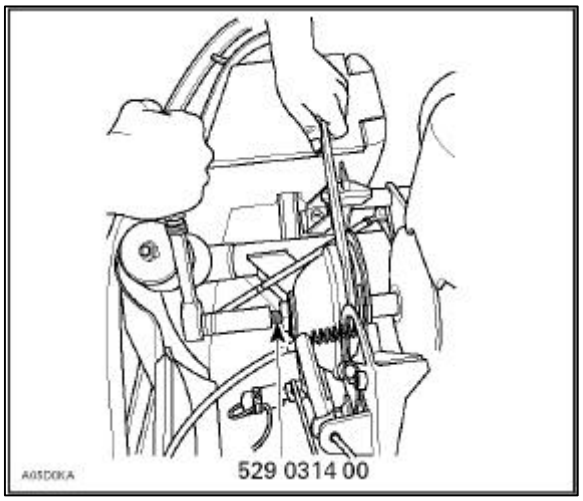
REMOVAL (PRIMARY CLUTCH)

If removing the primary clutch, first tighten the snap washer (No. 11) then unscrew the nut (No. 12).

Use the primary clutch tool (P/N 529 0276 00).

Remove the mounting bolt (No. 15).

Insert the primary clutch extractor (P/N 529 0314 00) then proceed to remove the primary clutch.



DISASSEMBLY

Unscrew the nut and remove the tab washer.

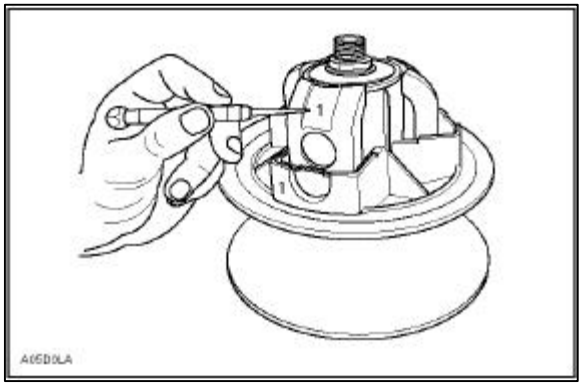
Identify the blocks (No. 1) and note their respective positions for reference when re-assembling. (See figure at right)

Spring cover

The clutch spring maintains pressure on its cover.

◆ WARNING

The clutch spring is very rigid. Never try to remove the spring cover without the correct tools.

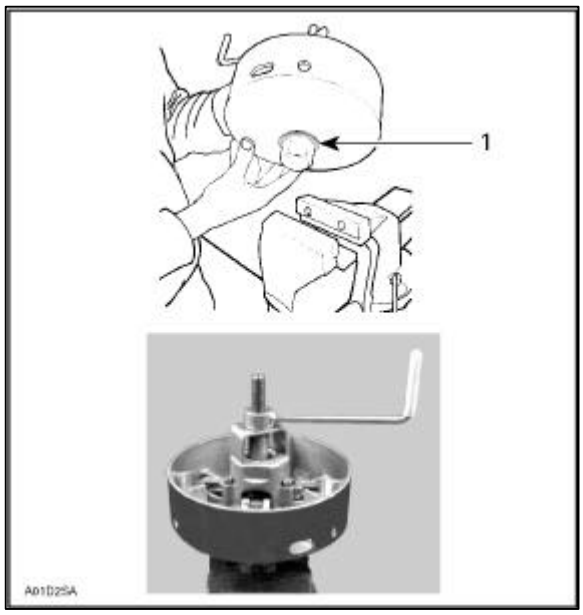


Using the spring compression tool (P / N 529 0273 00) as shown in the figure on the following page, remove the 3 allen screws (No. 7) that hold the spring cover in place and then unscrew the compressor.

Remove the guide washer (No. 5).

CLEANING

Clean the faces of the sheave and the shaft with very fine steel wool and a dry cloth. With a clean, dry cloth, clean the socket of the sliding sheave.



INSPECTION

Make sure the sliding sheave doesn't exhibit an excessive amount of play and that the shaft on which the half-pulley slides on is not damaged. Replace these parts if necessary.

REASSEMBLING

Install the guide washer (No. 5).

To install the spring and spring cover, again use the spring compression tool (P/N 529 0273 00). Tighten the three allen screws to 10 N-m (7.4 lbf-ft., 88 lbf-in., 1 kg-m)

Take care to install the slider blocks in their respective positions with their curved end facing the cup-shaped part of the retainer.

Be sure to place the arrow on the cap in line with the corresponding mark on the sliding sheave and that of the fixed sheave.

Tighten the end cap nut (No. 12) to 128 N•m (95 lbf•ft).

INSTALLATION

Tighten the primary clutch bolt (No. 15) to between 90 and 100 N-m (between 66 and 74 lbf-ft).

Re-install the drive belt.

Lift up and immobilize the rear of the vehicle and place it on a mechanical support.

◆ WARNING

Make sure that the track is free of anything that could be projected out of its rotation field. Keep hands, feet, tools and clothes away from the track. Make sure that no one is near the vehicle.

Have the vehicle accelerate at low speed (maximum 30 km/h or 20 mi/h) and apply the brake. Repeat 5 times.

Check once more to make sure the torque is between 90 and 100 N-m (between 66 and 74 lbf-ft.).

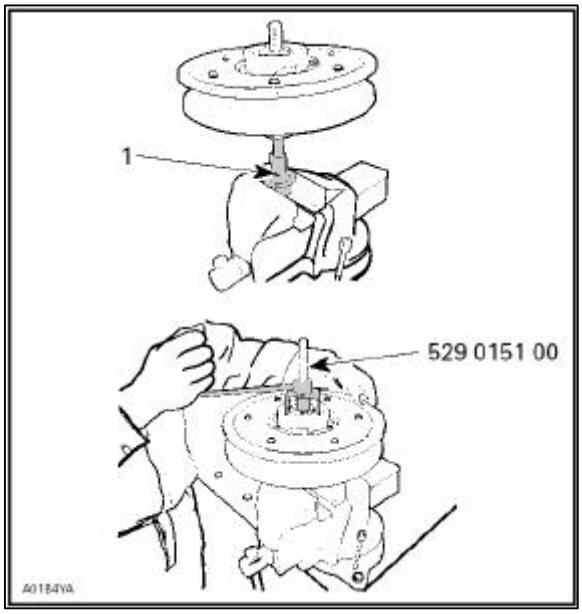
◆ WARNING

After the first ten hours of vehicle use, the transmission must be inspected to make sure that the mounting bolt is well tightened.

REMOVAL (SECONDARY CLUTCH)

Remove the drive-belt of the vehicle.

Remove assembly screw No. 19, lock washer No. 18, washer No. 17 and the No. 16 shims, then remove the secondary clutch from the jackshaft.



Jackshaft

If the jackshaft must be removed, see the section dealing with the **Secondary Transmission System**.

DISASSEMBLY

Using the spring compression tool (P/N 529 0273 00) remove circlip No. 9 and washer No. 15 to remove the helix and the 2 sheaves.

1- Insert this pin in the groove of the key.

◆ WARNING

The secondary clutch helix is equipped with a spring. For safety use the tool indicated above when dismantling.

CLEANING

Large bushing and small bushing

During the break-in period (about 10 hours of use) the teflon of the bushing moves toward the surface of the helix or of the shaft. The result is a light, constant friction of teflon against Teflon, so it is normal to note a coating of grey teflon on the cam or on the shaft. Do not remove this coating; it is not dust.

When it is necessary to remove a coating of dust from the cam or from the shaft, use a dry cloth to avoid removing the teflon that has been deposited there.

Cleaning the sheaves

Use Loctite Safety Solvent (P/N 413 7082 00).

INSPECTION

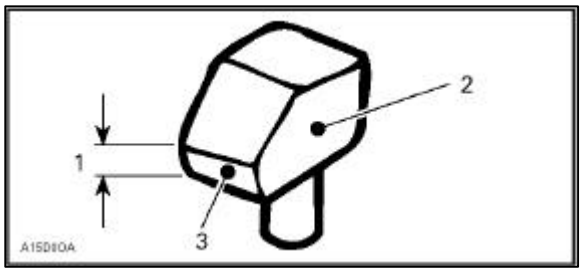
Bushings

Make sure there are no cracks or scratches on the bushings and that they can move freely when installed on the fixed sheave.

Using a bore dial gauge, measure the diameter of the bushing. These measures must be taken at least 5mm (1/4 in) from the edge of the bushing.

Replace the bushing if their diameter is greater than the prescribed limit of wear.

SECONDARY CLUTCH BUSHING WEAR LIMITS mm (in)	
Small bushing	38.30 (1.508)
Large bushing	89.15 (3.510)



Sliders

Check to see if the slider blocks are worn. Replace them when the thickness at the base is reduced to 1 mm (.039 in) or less.

1. Measure the thickness of the base here

2. Sliding sheave here

3. Lower side

Replacing the bushing

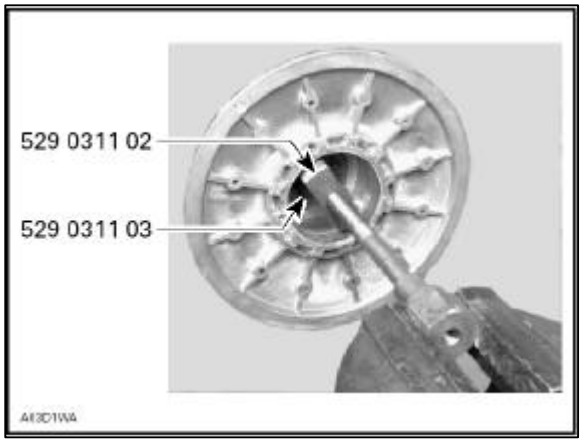
Large bushing

Remove the allen screws if necessary. Heat the screws to break the Loctite adherence. (See photo at right)

Remove the 3 slider blocks.

Install an application plate (P/N 529 0311 03) inside the sliding sheave.

Place the extractor (P/N 529 0311 02) under the bushing.



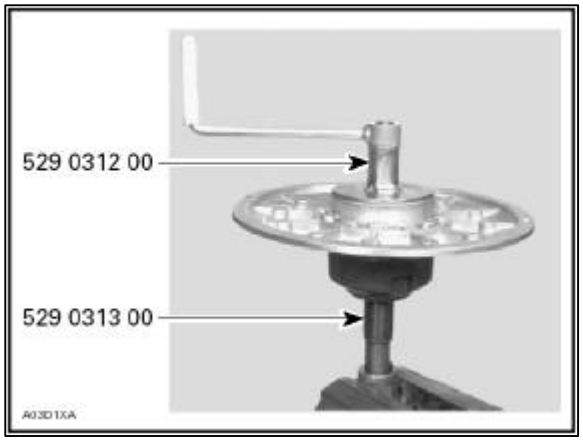
Install the extractor screw head in a vise.

Turn the half-pulley manually to take out the old bushing.

Before installing the bushing, file the bore of the sliding half-sheave to remove any burrs from the bore.

Coat the outside diameter of the bushing with Loctite 609 (P/N 413 7031 00). Place the new bushing on the sliding sheave, then tap it gently to install it correctly in the sliding sheave. Use tools (P/N 529 0312 00 and 529 0313 00) to install the bushing.

Install 3 allen screws and the washers supplied with the new bushing.



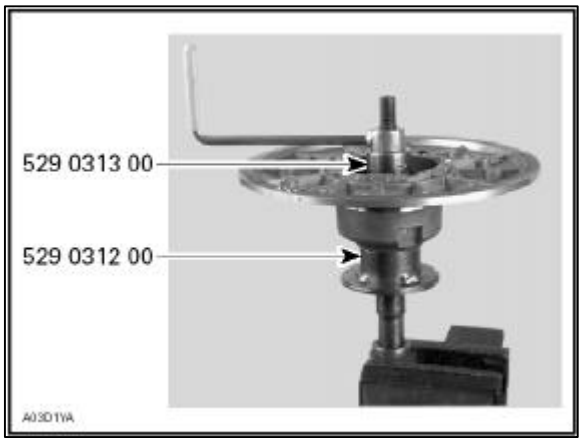
Small bearing

● *NOTICE:*

The procedure described below can be carried out using a press and the same tools.

Install the extractor in a vise.

Heat the part where the bushing is located. Turn the extractor handle and the sheave at the same time to remove the bushing.



IMPORTANT :

The screws and washers from the large bushing must be removed before the small bushing is installed.

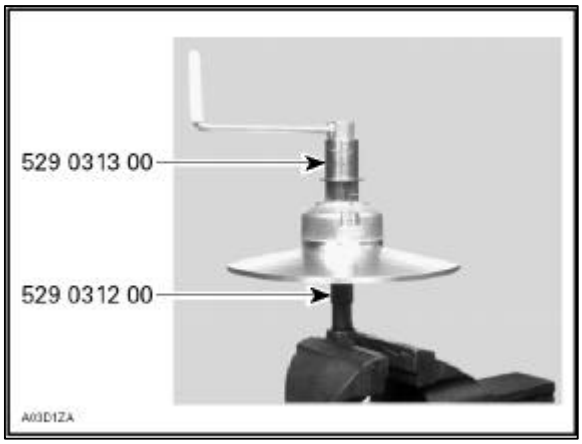
Coat the outside circumference of the bushing with Loctite 609 (P/N 413 7031 00).

Install the bushing as shown in the picture.

REASSEMBLING

Sliders

When replacing the slider blocks, always install 3 new slider blocks to ensure uniform pressure on the cam. To assemble the parts of the secondary, carry out, in reverse order, the operations for dismantling them.



Helix

Coat the inside of the helix with anti-seize compound.

INSTALLATION

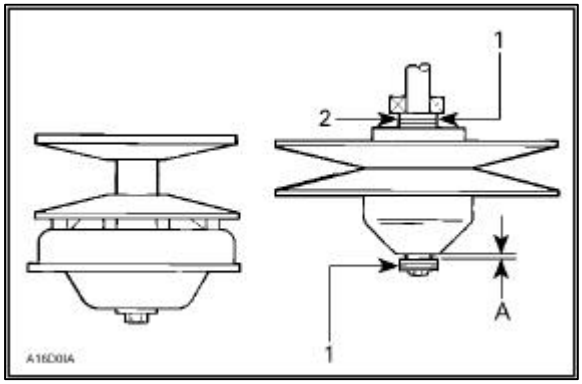
Jackshaft and anti-seize compound

▼ CAUTION

Always apply anti-seize compound (P/N 413 7010 00) on the jackshaft before the final installation of the pulley.

Re-install the pulley by carrying out, in reverse order, the operations for removing it.

Check the axial play of the secondary clutch on the jackshaft by pushing the pulley toward the MAG side of the vehicle so that it comes into contact with the inside shims (P/N 504 1082 00). Measure the axial play where the mounting bolt is situated between the shim(s) and the pulley. See the illustration.



TYPICAL - AS SEEN FROM ABOVE

1. Shims (P/N 504 1082 00) (if needed)

2. Contact

A. 0 to1 mm (0 à 3/64 in)

Secondary clutch mounting bolt

Tighten the screw to 25 N-m (18 lbf - ft).

ADJUSTMENT

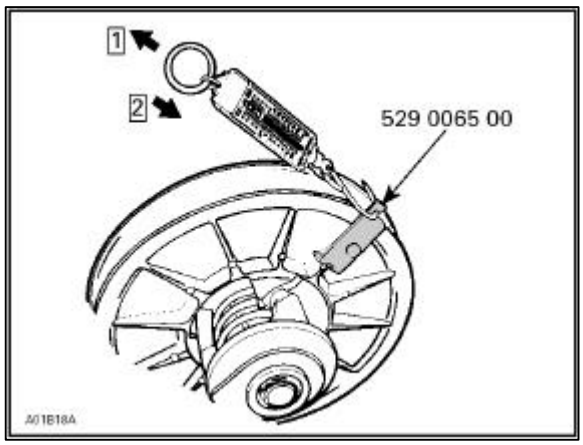
Spring Preload

General information

During the break-in period for the new spring, it is normal for it to settle slightly. The initial torsion of the spring is slightly higher to compensate for this setting. These characteristics apply after the break-in period (around 10 hours of use).

Initial spring preload

To verify the initial spring preload, use a spring scale hook (P/N 529 0065 00) and a spring scale.



Remove the drive belt.

Install the hook on the sliding sheave. While preventing the fixed sheave from turning, use a spring scale to pull on the sliding sheave perpendicularly to the rotational axis of the pulley.

Take a first measurement when the sliding sheave begins to turn. Let it turn 10 mm (3/8 in) Hold the spring scale in this position. Gently slacken the tension on the spring scale and take the second measurement when the sliding sheave begins to close. The initial spring preload will be the average of these two measurements.

TYPICAL

Step 1 : 1st measurement

Step 2 : 2nd measurement

$$\frac{1^{st}\text{ measurement (when open)} + 2^{nd}\text{ measurement (when closed)}}{2} = \text{Initial spring preload}$$

Example: $\frac{3.8\text{ kg (8.4 lb)} + 3.4\text{ kg (7.9 lb)}}{2} = 3.6\text{ kg (8 lb)}$ Real Initial spring preload

To correct the initial spring preload, change the position at which the end of the spring is inserted into the helix; turning it clockwise increases the torsion and counter-clockwise decreases it.

The original spring preload on the Snow Hawk is 6.8 kg or 14.9 lbf

NOTICE:

It is not possible to correct the initial torsion of the spring, try adjusting the position of the other end of the spring in the back of the sliding sheave (holes A, B and C).

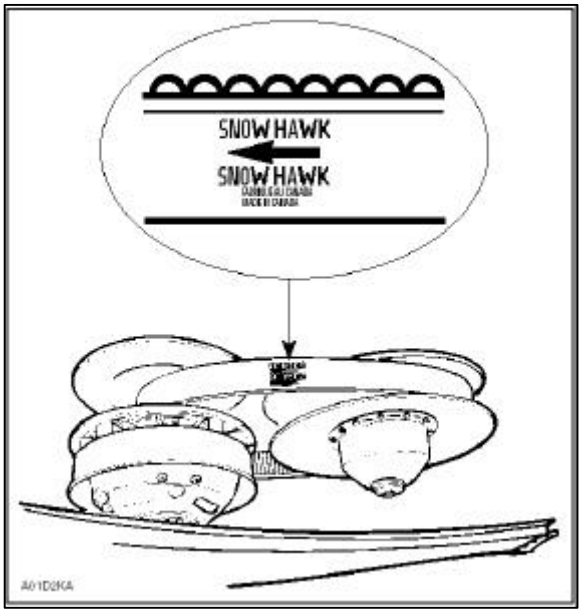
DRIVE BELT

Table for the Snow Hawk belt

MODEL	P/N	NEW WIDTH	MIN. WIDTH (WEAR LIMIT)
SNOW HAWK	10-251	1.375 ± 0.030	1.250 ± 0.030

DIRECTION OF ROTATION

In order for the drive-belt to last as long as possible it must be installed as is shown in the illustration respecting the direction of the rotation.



NOTICE:

In the case of a belt that has already been used, mark it and reinstall it in the same direction.

MEASURING THE DEFLECTION OF THE DRIVE BELT

NOTICE:

The deflection must be measured each time a new drive belt is installed.

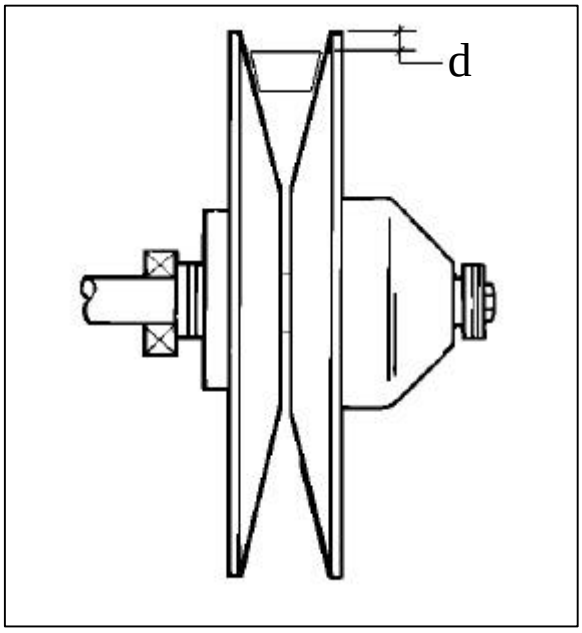
NOTICE:

To get a precise measurement when verifying the deflection of the belt, it is recommended that the belt first be used over a break-in distance of 50 km (30 mi.).

Before verifying the deflection of the belt, make sure that the vehicle is equipped with the correct drive belt.

To obtain maximum performance from the vehicle, adjust the belt tension according to the specifications given in the following table.

Model	Deflection mm (po)	Force kg (lb)	Distance into the secondary clutch
Snow Hawk	32 (1.25)	6.8 (15)	1-3 mm



NOTICE:

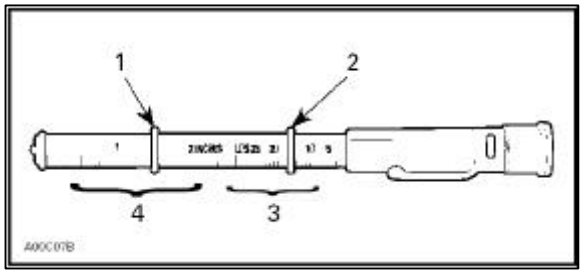
Contrary to a snowmobile, the belt of the Snow Hawk is pre-inserted into the secondary clutch from 1 to 3 mm.

D – 1 to 3 mm

Checking belt tension

Place a ruler or straight edge on the drive belt.

Use the tension gauge (P/N 414 3482 00) to verify the tension of the drive belt.

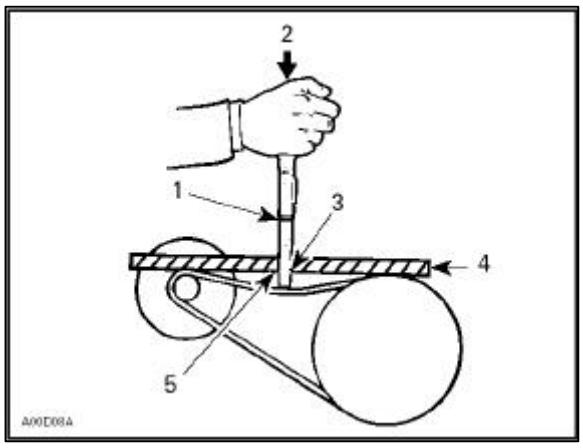


1. Lower ring
2. Upper ring
3. Force
4. Deflection

1. Slide the lower ring of the deflection scale to the required measurement.

2. Slide the upper ring of the deflection force scale to zero.

3. Exert pressure until the lower ring comes even with the ruler and note the force on the upper scale (above the ring).



1. Upper ring
2. Exert the required pressure
3. Lower ring
4. Reference ruler
5. Deflection

ADJUSTMENT OF THE DEFLECTION

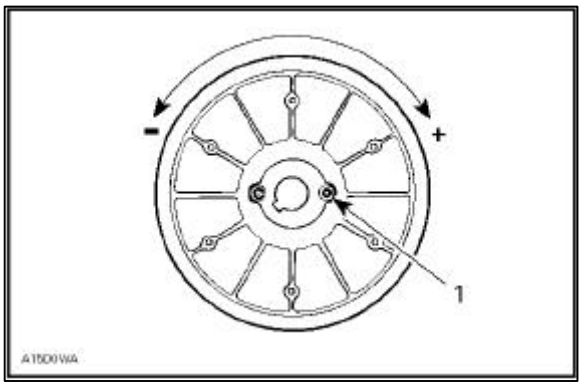
Then adjust the deflection using the Allen screws.

See the illustration.

To increase the deflection: turn the Allen screws clockwise.

To decrease the deflection: turn the Allen screws counter-clockwise.

1. Allen screw and locknut

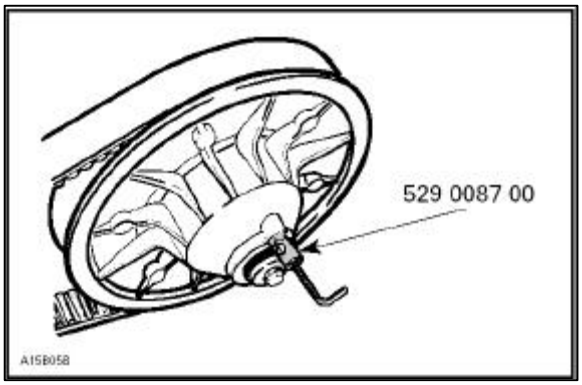


NOTICE:

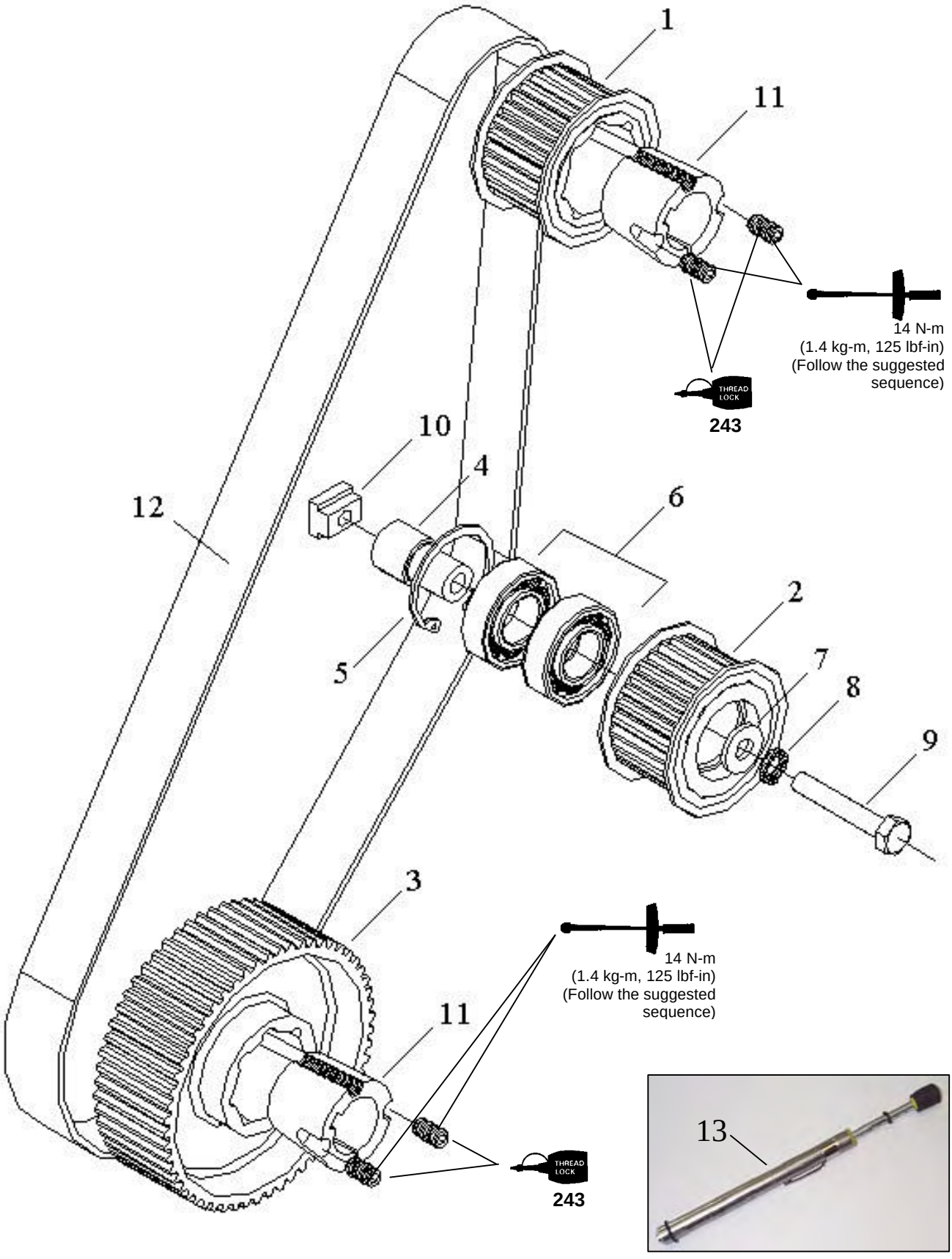
Turn the Allen screws a quarter turn at a time and then turn the secondary clutch to allow the drive belt to take its place in the pulley. Verify the deflection and repeat if necessary.

Hold the allen screws while tightening the lock nut so as to not upset the adjustment. Use adjustment tool (P/N 529 0087 00).

Hold the allen screws with the tool and tighten the nut with the socket. Use the socket handle from the tool kit.



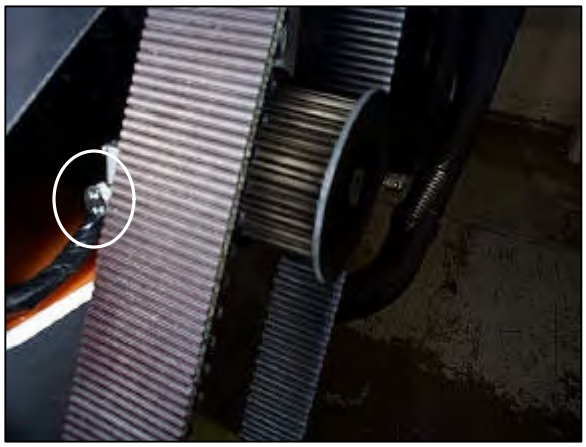
SECONDARY TRANSMISSION SYSTEM



Ref.	P/N	Qty	Secondary transmission system Parts Description
1	SH201	1	Drive Sprocket 28T
2	SH203	1	Tensioner Sprocket 28T
3	SH205	1	Drive Sprocket 56T
4	SH204	1	Tensioner shaft
5	184-153	1	Retaining Ring
6	6004-2RS KML	2	Roller bearing, tensioner
7	409.716	1	Washer
8	441.1	1	Split spring lock washer
9	20238P	1	Hex Bolt, M10 X 60mm
10	90974 A116	1	Sliding T-nut
11	1215X30	2	Taper Lock
12	8M 1280-36	1	36mm Cog Belt
13	43990092	-	Tensioning tool

Removal of Cog Belt

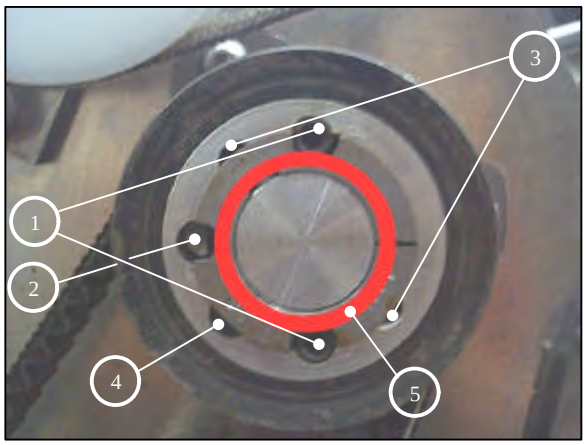
To gain access to the entire secondary transmission system, you must first completely remove the cab and bellypan. See **Chapter 1** for details.



Loosen the bolt that holds the tensioner sprocket in place. (Ref. No. 9 in the exploded view on the first page of this chapter)

Remove the tension on the cog belt system by unscrewing the tensioning bolt shown in the top picture at the right. Continue until the belt is no longer tight against the teeth of the tensioner sprocket.

Remove the two setscrews that hold the taper lock and the 28 tooth drive sprocket in place. (Position 1) Using a steel punch, tap the hub 2-3 times to loosen the grip between the taper lock and the sprocket.



Insert and thread in one of these two setscrews into the extraction hole (Position 2), at a maximum torque of **14 N-m (125 lbf-in).** The sprocket and taper lock assembly should now be free to slide off the shaft. If some resistance remains, tap the sprocket again with the punch.

At this point, begin to slide the belt off of the lower 56 tooth drive sprocket and simultaneously slide the entire 28 tooth driven sprocket assembly and belt off the jackshaft as shown in the picture at the right.

Installation of Cog Belt

Installation of a new cog belt is essentially the same as the steps outlined in the removal, but in reverse order. One must pay special attention to the re-installation of the taper lock system. The instructions below pertain to any taper lock installation, but in this case it refers to the case at the 28-tooth drive sprocket specifically:

1. Thoroughly clean the jackshaft and sprocket bore.
2. Align the 28-tooth sprocket and taper lock flush with the end of the jackshaft.
3. Applying Loctite 243, install the two installation set screws into position 1.
4. Torque the two set screws to **14 N-m (125 lbf-in)**
5. Tap the taper-lock face several times in the shaded region (position 5) with a steel punch and re-tighten the set screws.
6. Tap again and re-torque to **14 N-m (125 lbf-in)**.

◆ WARNING

Loctite 243 must be used at both taper lock installation setscrews to prevent them from loosening under use. Failure to do so could result in personal injury.

Lightly tighten the tensioner sprocket bolt (Ref. No. 9 in the exploded view of the secondary transmission system) and then proceed to re-apply tension to the system by tightening the tensioning bolt.

● *NOTE:*

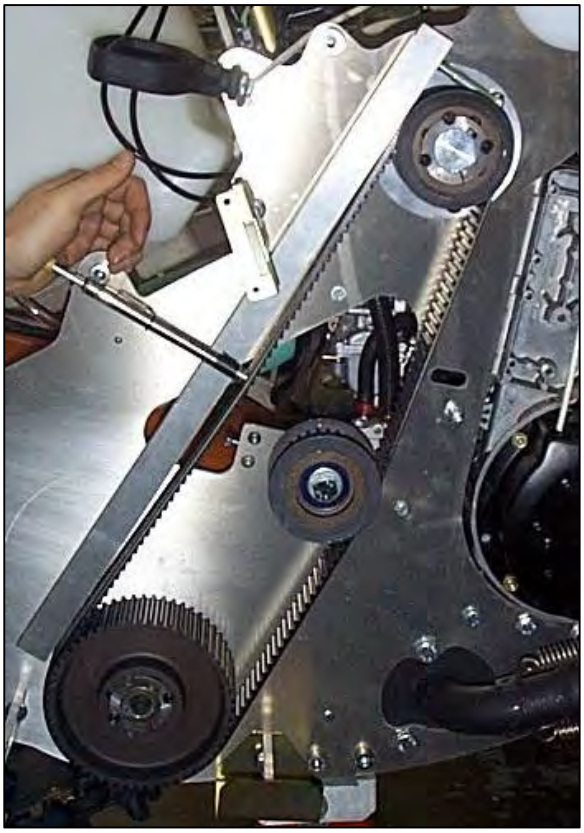
If either of the installation holes (shown as "Position 1" in the picture in the sidebar at the right) should become damaged, the taper lock can be rotated 45^{o} CCW in the sprocket bore and can then use the installation holes shown as "Position 3".

When tensioned properly, the secondary transmission system must have a deflection of approximately **7.3 mm (0.288")** under a load of **6.44 kg (14.2 lbs)** applied midspan between the uppermost (28T) and lowest (56T) cog sprockets. This tension must be verified using special tensioning tool P/N 43990092. The picture at the right demonstrates how to use a straightedge as a reference when verifying this deflection and also where the measurement should be taken.

Once the tension is correct, re-tighten the tensioner sprocket bolt to a torque of **48 N-m (425 lbf-in)**.

▼ CAUTION

Failure to provide or verify the correct tension in the secondary transmission system could lead to premature belt and/or component failure.



Inspection/Cleaning of Secondary Transmission System

- Check that the roller bearings in the tensioner sprocket bore are functioning properly.

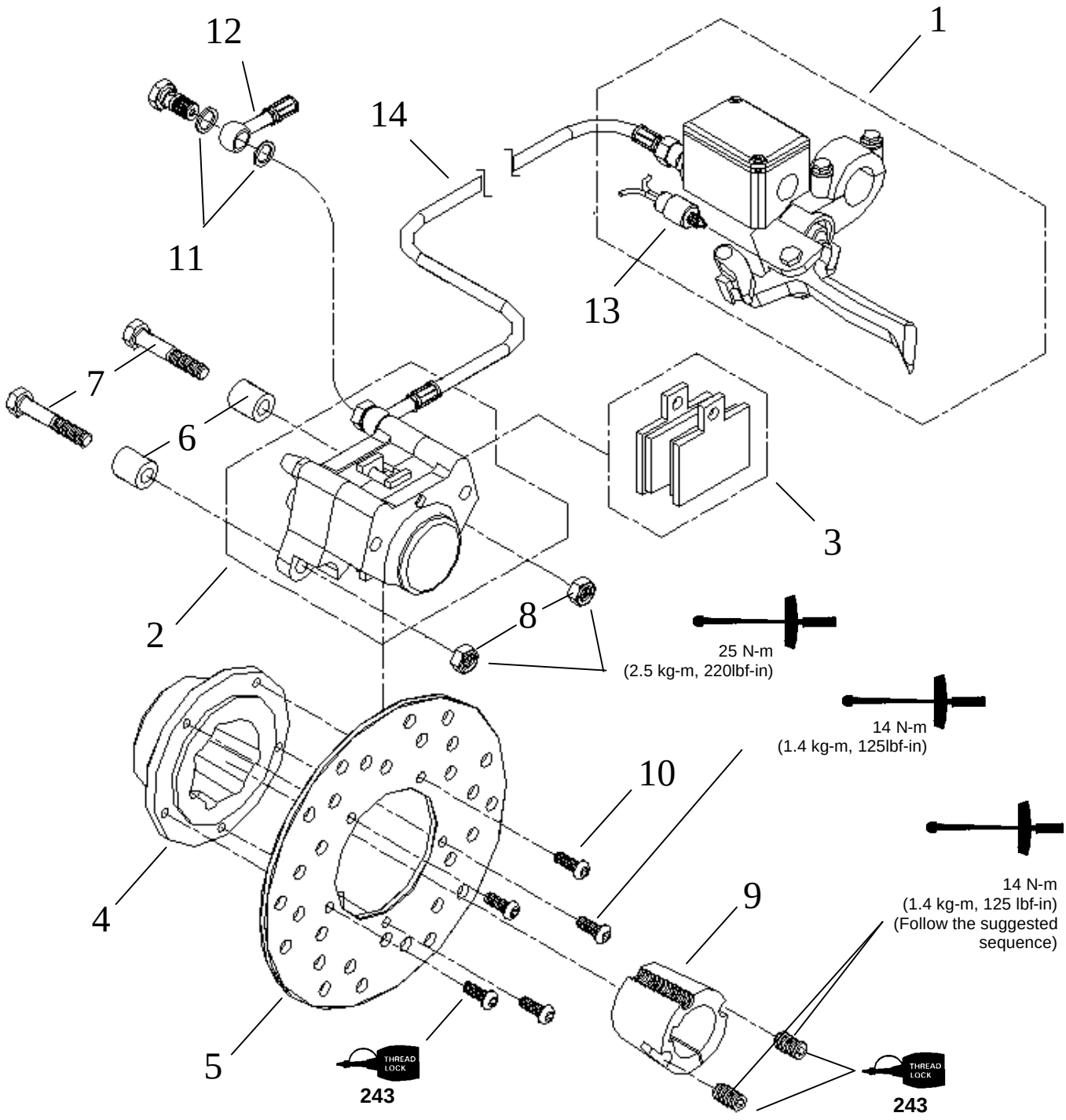
- Check for excessive dry surface cracking of the rubber in the cog belt. If excessive surface cracks are present, replace belt.

- Check that the secondary transmission system is dry and free of dirt, grime or debris. If necessary, clean the belt and sprockets with a non-corrosive cleaner.

◆ WARNING

Never operate the vehicle with the cab and/or bellypan removed. Failure to do so could result in personal injury.

HYDRAULIC BRAKE SYSTEM

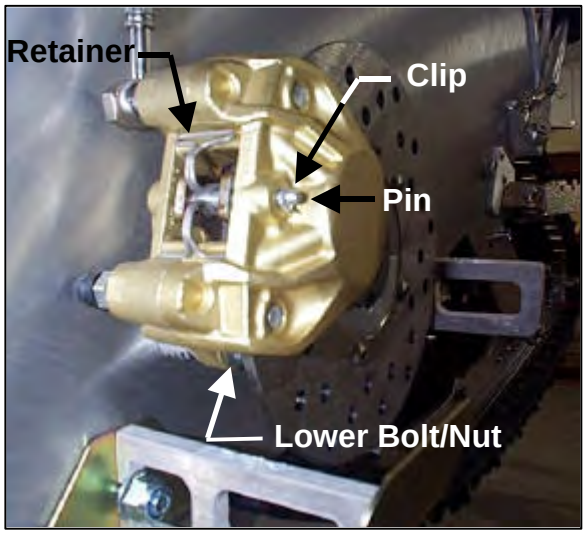


Ref.	P/N	Qty	Secondary transmission system Parts Description
1	10.6707.81	1	Master Cylinder
2	20.6951.50	1	Caliper
3	107.6949.11	1	Replacement Brake Pads (set of 2)
4	SH024	1	Brake Hub
5	08MQ004	1	Brake Disc
6	SH039	2	Brake Caliper Spacer
7	053.8.45	2	M8 x 45 Hex Bolt
8	23164	2	M8 Locknut
9	1215X30	1	Taper Lock (c/w setscrews)
10	22202AI	5	M6 x 16 Button Head Bolt
11	62196.13	2	Copper washer
12	06.2228.42	1	Banjo Bolt
13	110.4671.91	1	Microswitch
14	70.3003A	1	Steel Braided Brake Line

Removal/Installation of Brake Disc and/or Hub

To gain access to the brake system, the cab and bellypan must be completely removed. See **Chapter 1** for details.

To remove the brake disc and/or hub, the brake caliper must first be rotated up and out of the way. To do this, the lower M8 bolt that holds the caliper in place must be removed from inside the tunnel. The nut that holds this bolt in place is shown at the right.



● *NOTE:*

To change brake pads only, the caliper must be completely detached from the chassis of the vehicle with the brake line remaining secure.

Holding this nut with an open-end wrench, remove the bolt from inside the tunnel with a socket and ratchet.

Loosen the other (upper) bolt holding the caliper tight to the chassis as well, then swing the caliper up and clear of the disc. Re-tighten the upper bolt and nut enough to hold the caliper in this "swung up" position. Now completely clear from the brake disc itself, the disc can be removed either with or without the aluminum hub.

Brake Disc Only: Remove the five M6 x 16 button head bolts. (Reference No. 10 in the exploded view at the beginning of this chapter)

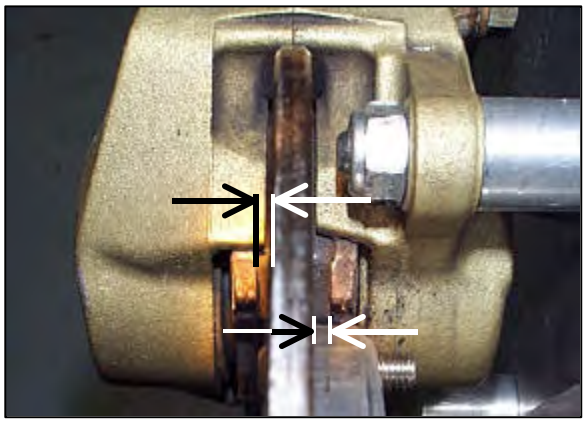
Brake Disc and Hub: Follow the procedure outlined on page 9-3 of **Chapter 9 – Secondary Transmission System** that outlines the removal of the Taper-Lock bushing and hub.

Cleaning and Inspection

Clean the brake parts with an all-purpose cleaner. Dry the parts well with compressed air when finished.

▼ CAUTION
Do not clean the brake pads with the cleaner. Brake pads must be replaced with new ones.

Verify that the thickness of the pad material (as shown between the arrows in the photo at the right) is greater than 1 mm (1/32 in). If the thickness is found to be less than this, replace the pads.



▼ CAUTION

Always replace the brake pads as a set.

Brake Pad Replacement:

To replace the brake pads, proceed as follows:

- Completely remove the caliper from the chassis of the vehicle by removing the two bolts that secure it.
- Remove the clip at the end of the pin, shown in the picture on page 10-3 of this chapter.
- Using a steel punch and a hammer, push the pin completely out of the brake caliper casting. Be sure to push the pin from the side shown in the picture at the right.
- Remove the retainer clip shown in the picture on page 10-3 of this chapter.
- Remove the pads and replace with a set of new ones.

Re-assemble the brake caliper and reinstall it on the chassis following the steps outlined above in the reverse order.

Brake Disc:

Verify whether the brake disc is scratched, cracked or discolored by heat and replace as required.

▼ CAUTION

Never machine the brake disc.

Re-/Installation of Brake Disc and/or Hub

Brake Disc Only: Install the five M6 x 16 button head bolts with Loctite 243 and torque to **14 N-m (125 lbf-in)**. (Reference No. 10 in the exploded view at the beginning of this chapter)

Brake Disc and Hub: Follow the procedure outlined on page 9-4 of **Chapter 9 – Secondary Transmission System** that outlines the installation of the Taper-Lock bushing and hub. As an alignment reference, the brake disc must ride approximately midway between the two brake pads.

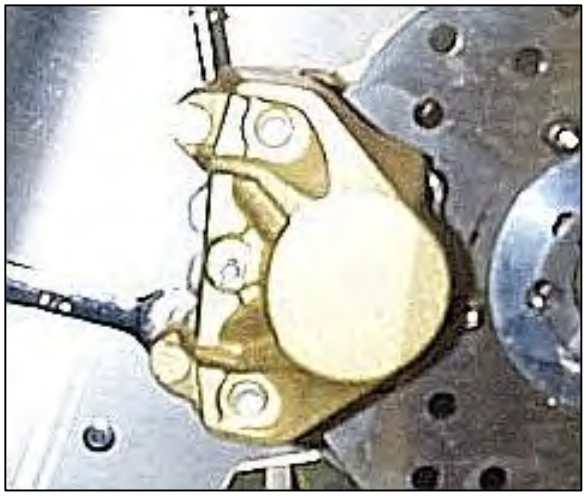
Re-attach the caliper to the chassis by securing the two mounting bolts that hold it in place and torque each to **25 N-m (220 lbf-in)**.

Adjustment / Maintenance

Change the brake fluid each year.

It is very important to have a sufficient amount of brake fluid in the reservoir at all times to avoid the creation of air bubbles in the system. If air should become trapped in the system, follow the procedure outlined below.

Pump the brake lever several times to build pressure in the system. While holding the lever in the "brakes applied" position with force, slightly unscrew the bleeder valve with a wrench (see figure at right) to ensure that all air is purged from the system. As the brake lever approaches the handlebar, re-tighten the bleeder valve.



Repeat several times or until the flow of fluid from the bleeder valve is completely free from air bubbles.

Ensure that the bleeder valve is tight and the rubber cover is placed over the fitting for protection when finished.

Brake Fluid

DOT 4 (**DOT 5** for intense use)

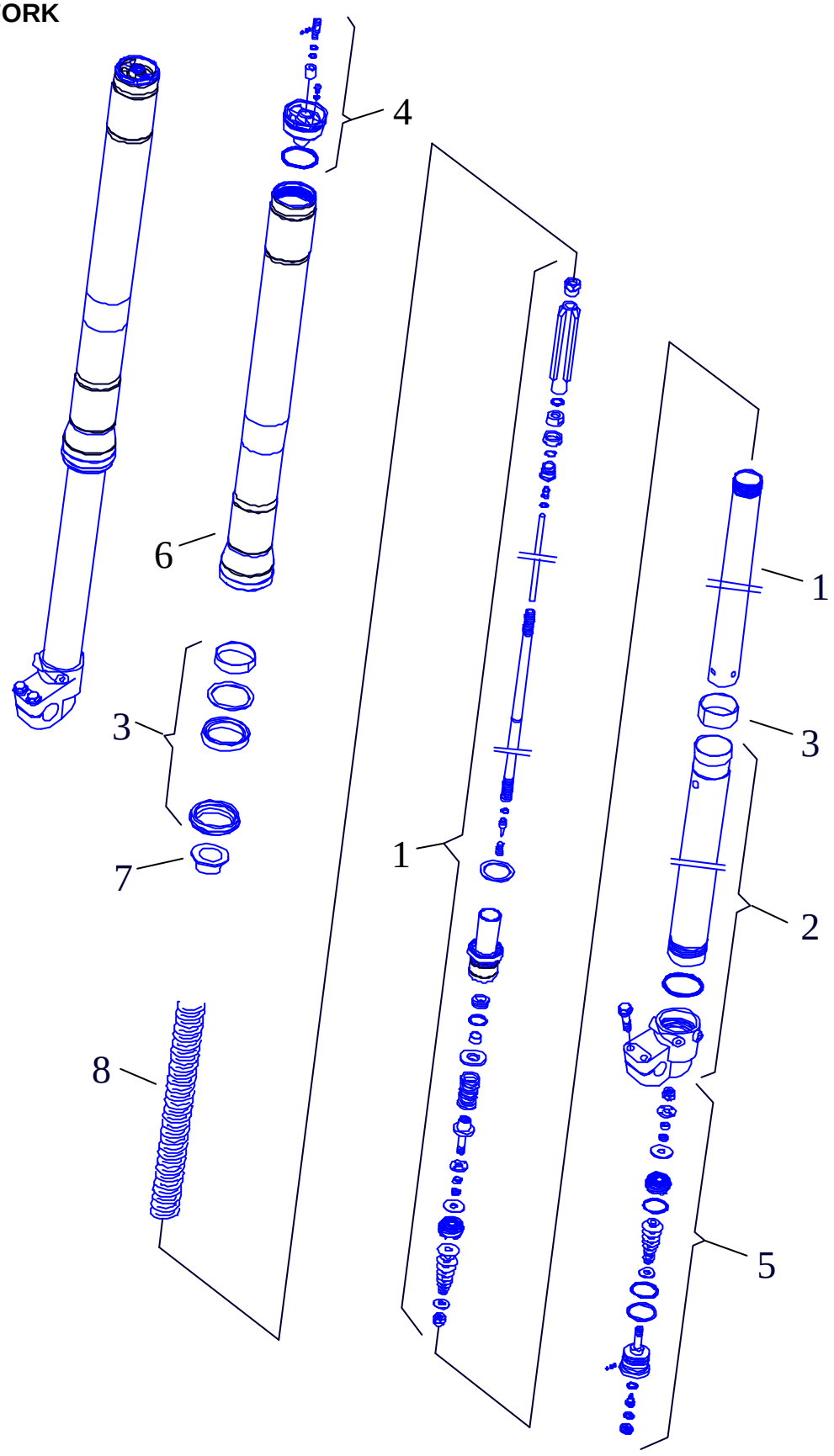
● *NOTE:*

Never use DOT 4 brake fluid for intense or competition use.

Brake Fluid Level

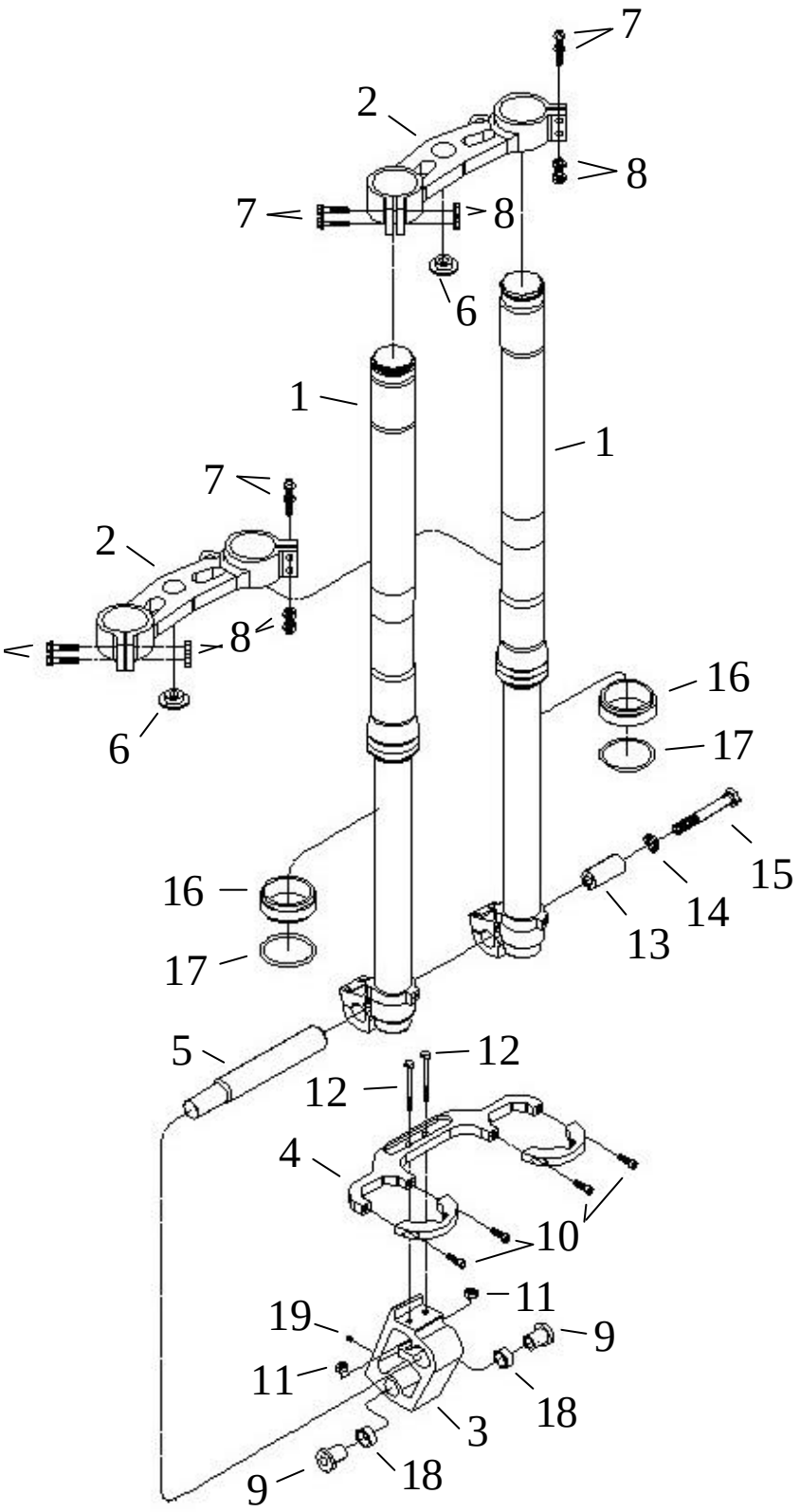
Refer to Section 2.5 of **Chapter 2 – Periodic Maintenance** for details.

FRONT FORK



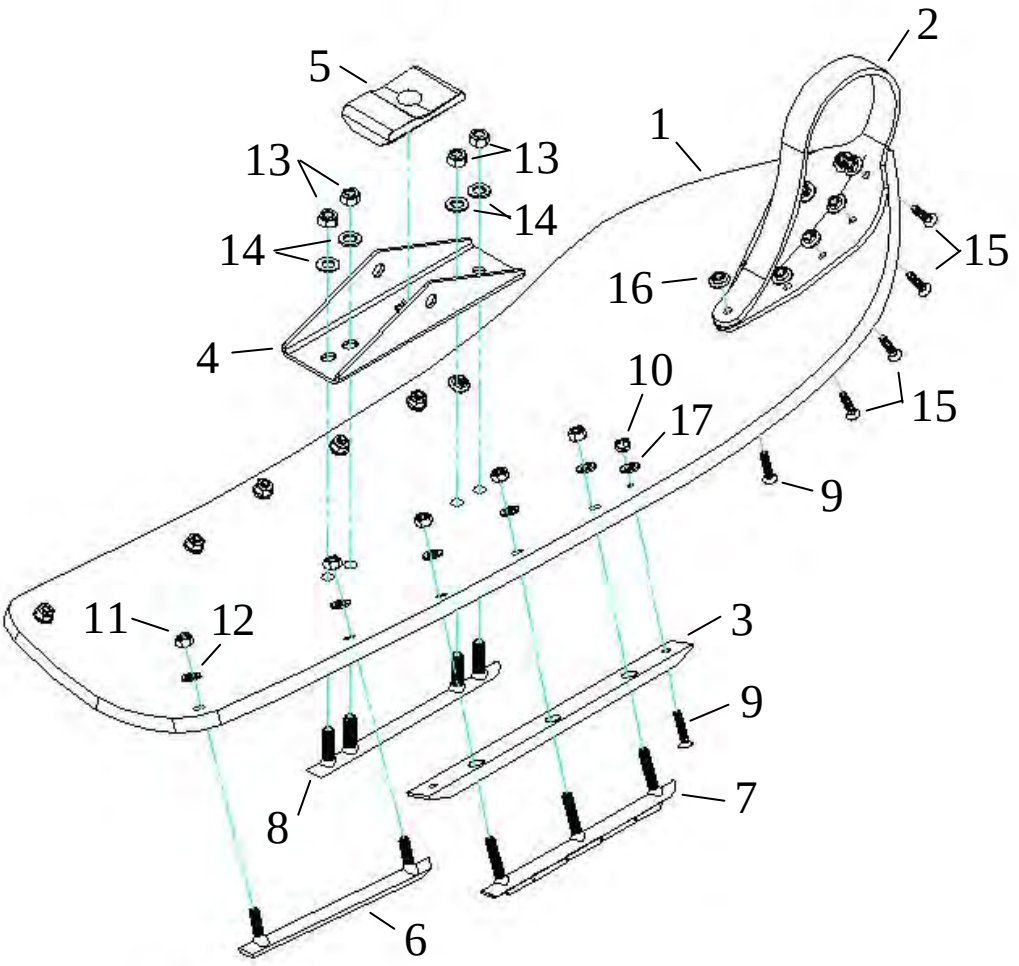
Ref.	P/N	Qty	Fork Part Descriptions
-		2	Fork leg Assy.
1	849,350,102	2	Cartridge Assy.
2	849,310,511	2	Inner tube
3	849,340,059	2	Fork seal and bushing kit
4	849,311,568	2	Top cap Assy.
5	849,350,103	2	Compression valve Assy.
6	949,409,760	2	Outer tube
7	949,603,733	2	Lower spring seat
8	949,313,954	2	Spring

FRONT FORK ASSEMBLY



Ref.	P/N	Qty	Fork Assy. Part Descriptions
1	791.464.018	2	Front fork leg USD 46 mm PAIOLI
2	SH 028	2	Triple clamp
3	SH 048	1	Aluminum fork adaptor
4	SH 019	1	Lower clamp Assy.
5	SH 059	1	Fork shaft
6	SH 066	2	Fork lower steering bushing
7	061.6.30	8	M6 x 30 Hex head flange bolt
8	23162F	8	M6 flanged locknut
9	SH 051	2	Steel 'T' bushing
10	084.6.2	4	M6 x 20 Button head bolt
11	23162	2	M6 locknut
12	20169P	2	M6 x 65 Hex head cap screw
13	SH 060	1	End shaft bushing
14	442.12	1	1/2'' Spring lock washer
15	057.12.90	1	M12 x 90 Hex head cap screw
16	SH 044	2	Fork collar
17	236.304	2	O-ring
18	P.64.12	2	Hardened bushing 3/4'' I.D 1'' O.D x 3/4''
19	2106	1	Zerk

SKI ASSEMBLY



Ref.	P/N	Qty	Front Ski Assy. Part Descriptions
1	SH 301	1	Ski
2	SH 302	1	Ski tip reinforcement and loop
3	SH 052	2	Plastic ski support
4	SH 303	1	Ski adaptor
5	570.048.800	1	Rubber ski cushion
6	SH 306	2	Steel runner
7	SH 305	2	60 degree carbide runner
8	SH 304	1	90 degree carbide runner
9	22106Al	3	M6 x 30 button head cap screw
10	23162	3	M6 locknut
11	333-107	10	5/16" locknut
12	341-107P	10	5/16" flat washer
13	SH 304-2	4	3/8" lock nut
14	SH 304-1	4	3/8" flat washer
15	22105Al	8	M6 x 25 flat head bolt
16	3.796	9	Flange nut (special)
17	21085Al	3	M6 Flat washer

FRONT FORK

Removal

- Loosen the fork leg top cap before removing the leg from its supports.

Disassembly

- Clean the fork.

I NOTICE:

The Paioli tool kit (P/N 449 450 020) is needed to service the fork.

t CAUTION

Scratches or other damage to inner tubes or gasket edges may cause oil leaks.

Scratches and other damage must be avoided. Use a mild detergent or an automobile cleaning product to dislodge any dirt.

t CAUTION

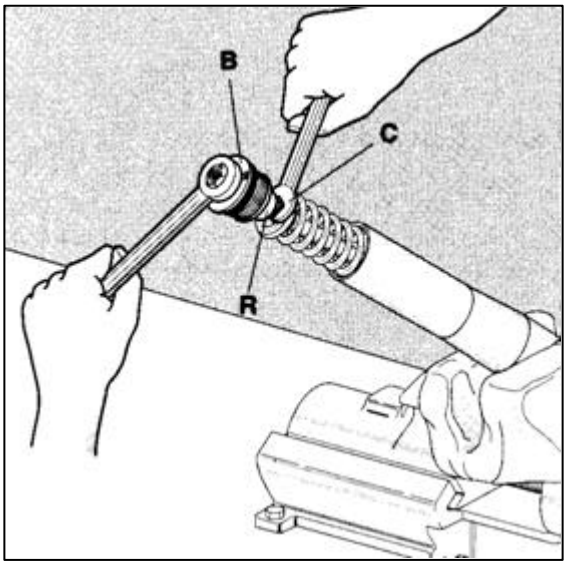
An inadequate dismantling of the fork leg top cap may damage the rebound adjustment needle resulting in a malfunction of the system.

To prevent such a situation, set the rebound adjustment to its fastest position (by turning it counterclockwise) before taking the cap off.

Take note of the initial position of this adjustment by counting the number of "clicks" between the initial position and the point where a slight resistance is felt (turning dockwise).

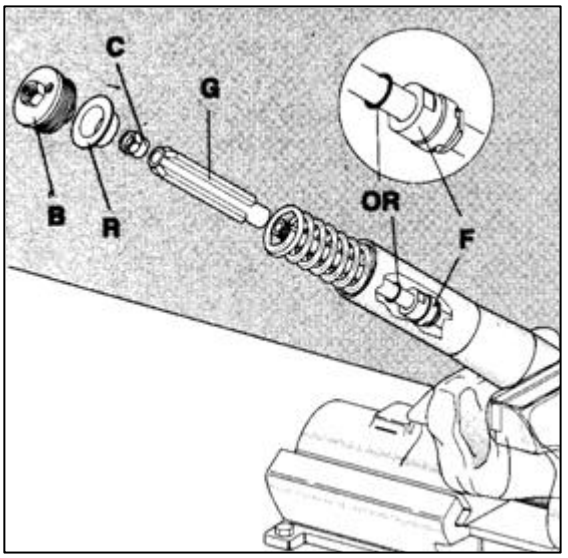
- Unscrew the fork leg top cap completely while holding the outer tube. Lower the outer tube slowly until it comes into contact with the lower section of the inner tube.

- Using your hand, push the top part of the spring down to provide enough space to insert the open end of a spanner wrench.



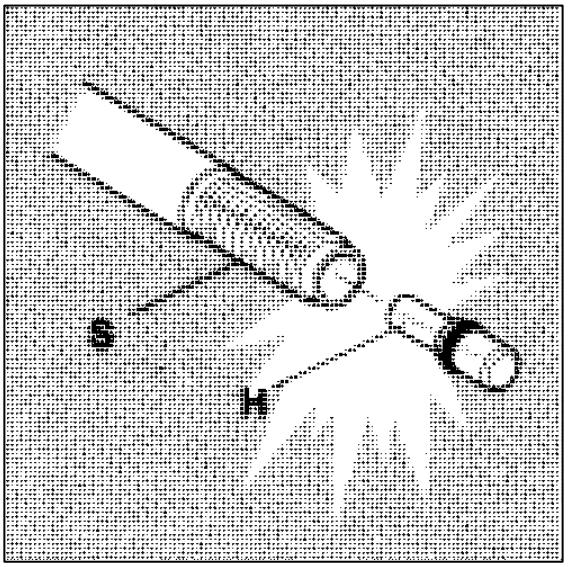
- Unscrew the lock nut (C) from the piston rod and remove the fork leg top cap (B).

- Remove the upper spring retainer (R), the lock nut (C), the fork spring guide (G) and the O-ring (F).



I NOTICE:

When the fork leg is turned upside down, the push rod, the needle and the return spring will fall from the piston rod. It is possible to collect them by turning the strut over slowly and keeping a finger near the tip of the piston rod.

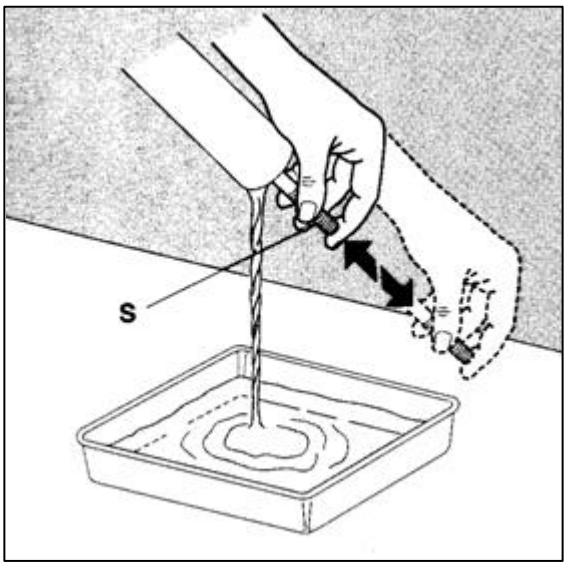


t CAUTION

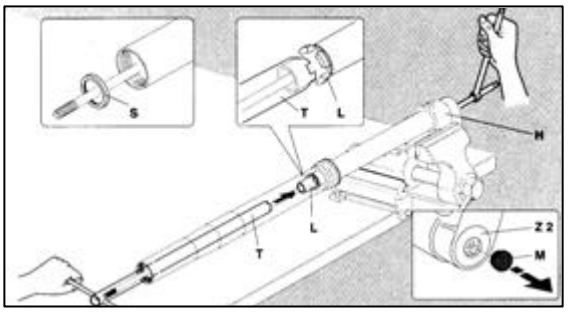
A damaged piston rod, needle or return spring may affect performance on the rebound stroke.

Be careful not to lose or damage any of those parts.

- Depress the piston rod (S) completely 8 to 10 times to force all the oil out.



- Install the lower part of the inner tube in a vise.

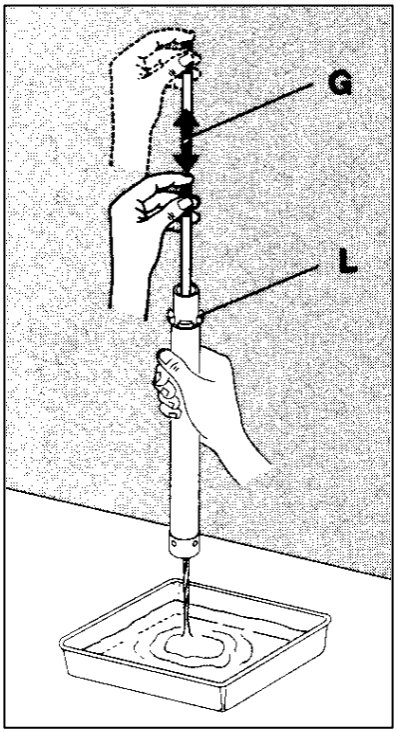


t CAUTION

Exerting too much pressure on the lower part of the inner tube can damage it and affect the stability of the ride.

Do not overtighten.

- Remove the rubber cap (M) located under the lower part of the inner tube.
- Remove the spring stop washer (S).
- Unscrew and remove the cartridge, by inserting a 14 mm allen key in the compression adjustment, and by inserting the special "T" tool (T) (long tube, three prongs at one end) provided with the maintenance tool kit into the cartridge head.



l NOTICE:

Before unscrewing the cartridge, make sure the special tool (T) is well fitted into the socket in the cartridge head.

- Empty the content of the cartridge (L) by pumping the piston rod (G) several times, until the cartridge is empty.

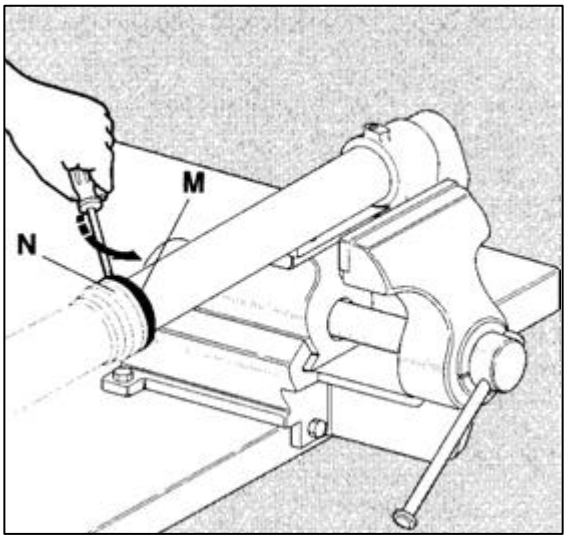
u WARNING

Never attempt to modify the cartridge!

Refer to authorized personnel to carry out this operation.

Modifications to the cartridge carried out by an unauthorized person can compromise the security of the operator and invalidate the warranty.

- Move the outer tube slowly back and forth for a few complete strokes to make sure it is in good working order.
- Remove the dust seal (M).

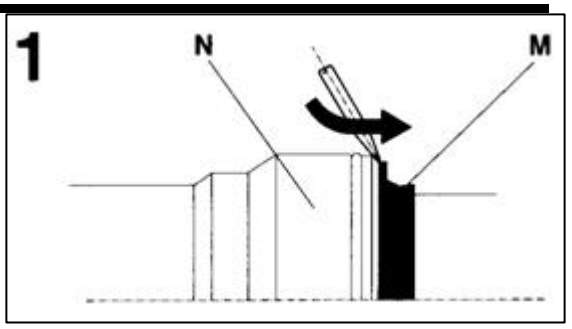


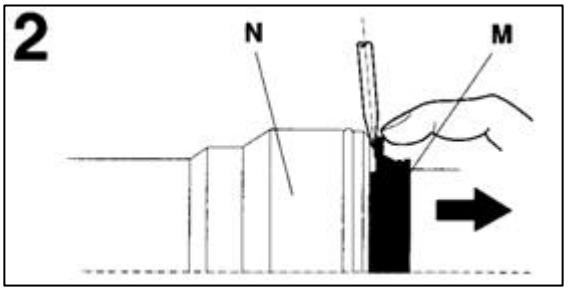
t **CAUTION**

Scratches on the outer tube will cause oil leaks.

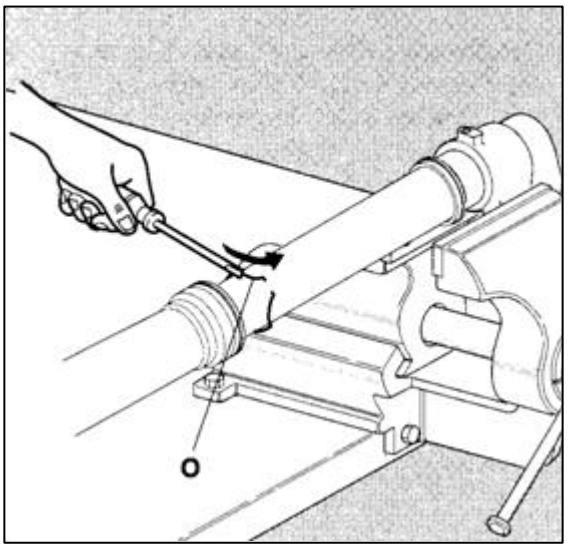
Be careful not to scratch the outer tube while removing the dust seal.

o Use a flat screwdriver to remove the dust seal.



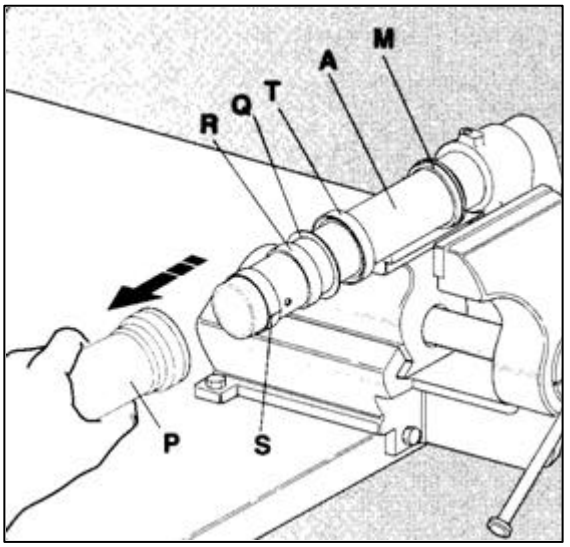


o Remove the stop ring.



o With a few sharp blows, pull the outer tube (P) out to separate it from the inner tube (A).

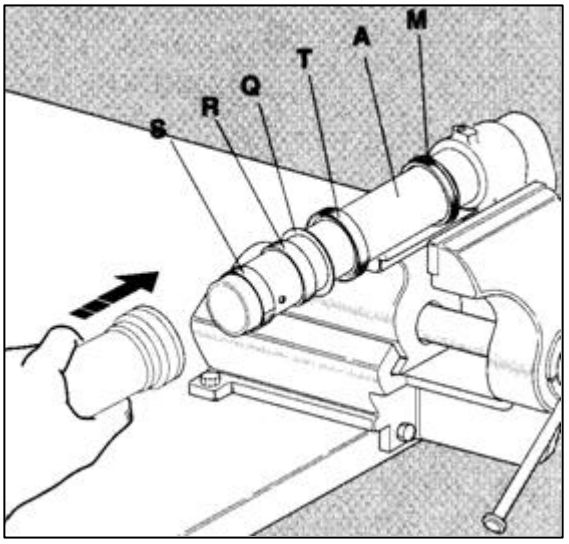
o The oil seal (T), the washer (Q), the dust seal (M) and the inner (R) and outer (S) bushings can be found on the inner tube. They must be removed and replaced with new parts.



Reassembling

- Remove all the elements from the inner tube, one at a time, and clean the tube.

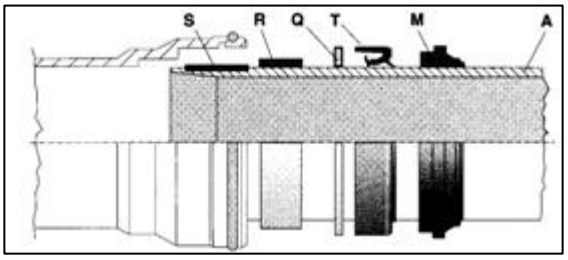
- Replace the seals and bushings with new ones, following the prescribed sequence. (See the illustration)



I NOTICE:

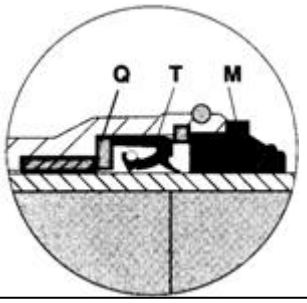
While installing seals, wrap the end of the strut with a band of adhesive tape so that the seals will not be damaged by the sharp edge.

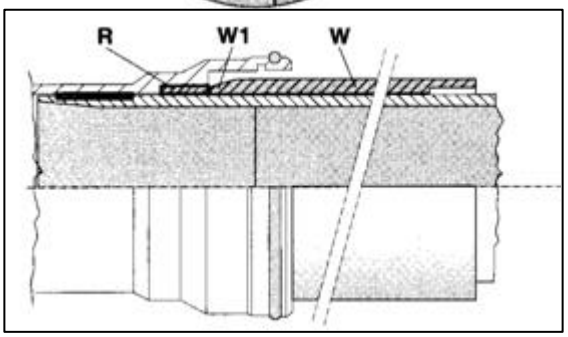
- Make sure the bushings (S & R) are well inserted in their respective positions by using the special tool (W) designed for that purpose and included in the fork maintenance tool kit.



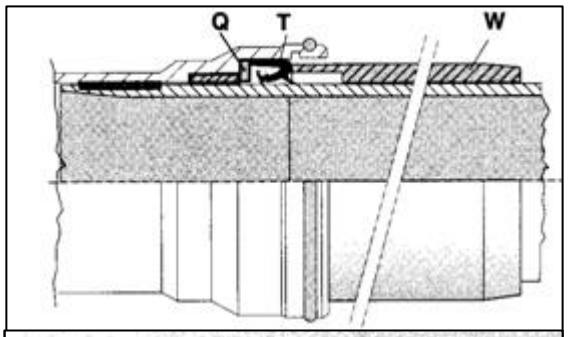
u WARNING

The oil and dust seals (T & M), contrary to the bushings ((S & R) and the washer (Q), must absolutely be installed on the inner tube in a specific direction for the fork to operate properly.

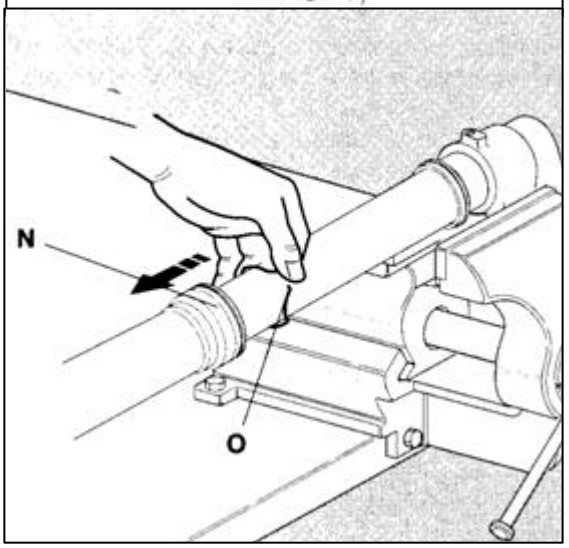




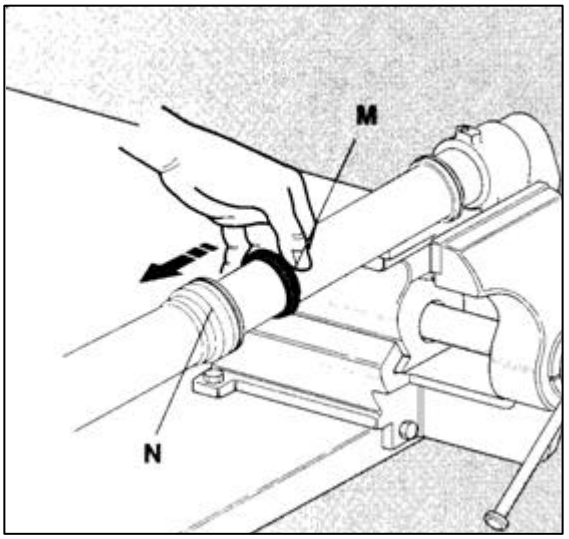
- Once the bushings (S & R) are correctly installed, use the other end of the special tool (W) to insert the washer (Q), and then the oil seal (T).



- Re-install the stop ring (O).

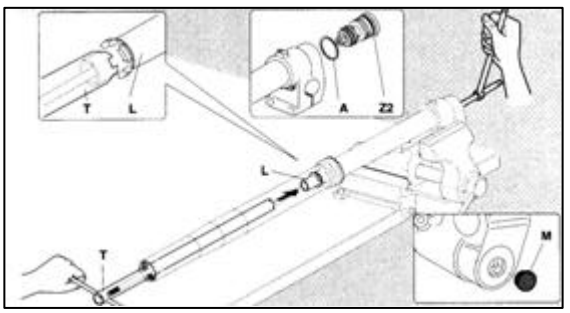


- Re-install the dust seal (M).



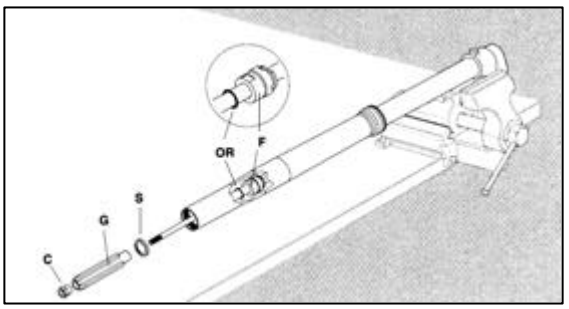
- Using a 14 mm allen key and the special tool (T), re-install the cartridge (L) the compression adjustment (Z") and the washer (A).

- Use a torque wrench to tighten the cartridge to **25 N-m (2.5 kg-m, 18.4 lbf-ft)**.

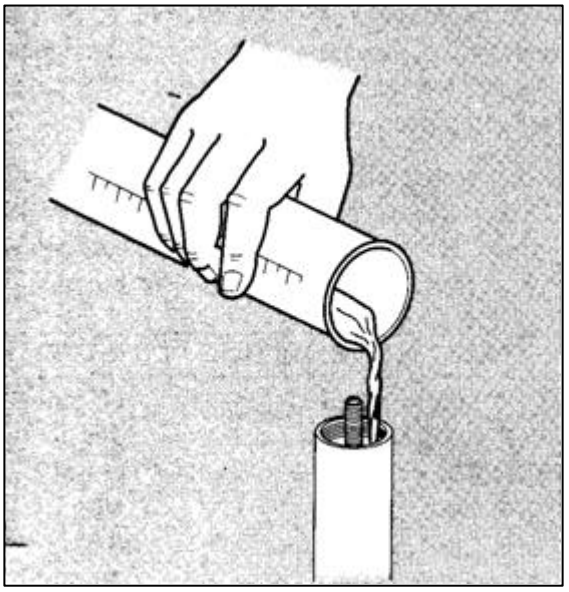


l NOTICE:

Before adjusting the torque, make sure the special tool (T) is well fitted into the socket at the end of the cartridge.



- Re-install the rubber cap (M).
- Install the spring stop washer (S).
- Make sure the O-ring (OR) is still in place. If not, re-install it and push it against the stroke stop (F) to secure it.
- Install the spring guide (G).
- Install and screw the lock nut (C) up against the guide until a slight resistance can be felt.
- Hold the fork leg in a vertical position, fully compressed, and fill it with fork fluid up to 50 mm (2 in) from the top of the outer tube.

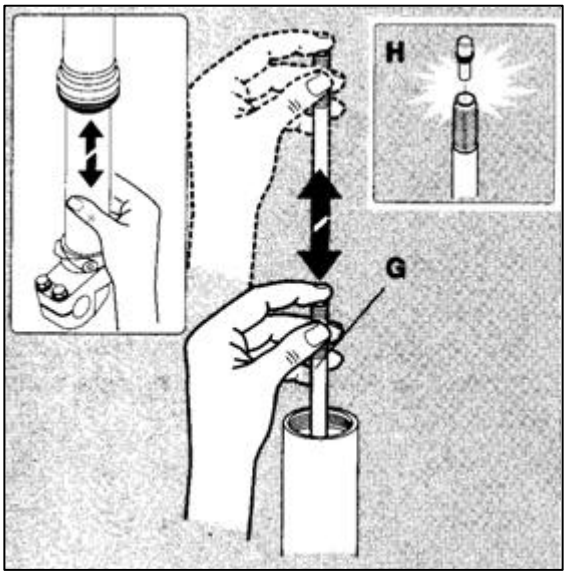


Recommended fluid: Cartridge fork fluid, S.A.E. 10W

- Move the piston rod in and out, in a series of complete alternating strokes, until a continual resistance can be felt during a complete stroke.

l NOTICE:

It is possible that fluid will have to be added a few times before reaching the point where a continuous resistance can be felt during a complete stroke.



u WARNING

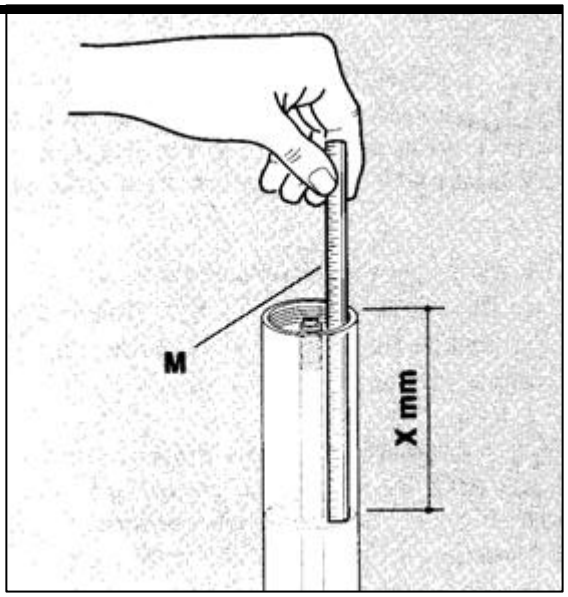
Keep a finger pressed against the opening of the piston rod since the needle, if it has not been taken out, can be ejected during this operation. If this happens, re-install the needle after the operation has been completed.

- With the fork leg still in a vertical position and fully compressed, adjust the fluid level.

Recommended level: X = 100 mm (3-5/16 in)

l NOTICE:

It may be necessary to add or to take out some fluid to reach the recommended level.



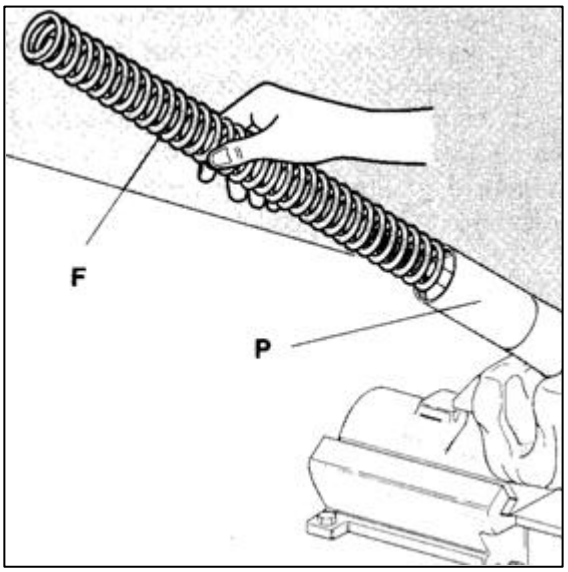
t **CAUTION**
The fluid level can be modified but must remain between 85 mm and 120 mm.

- Insert the needle return spring, the needle and the push rod.

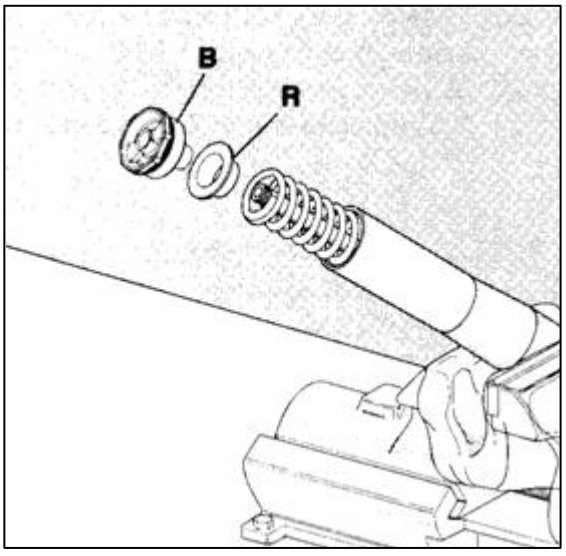
- Install the spring (F) inside the strut (P).

l NOTICE:

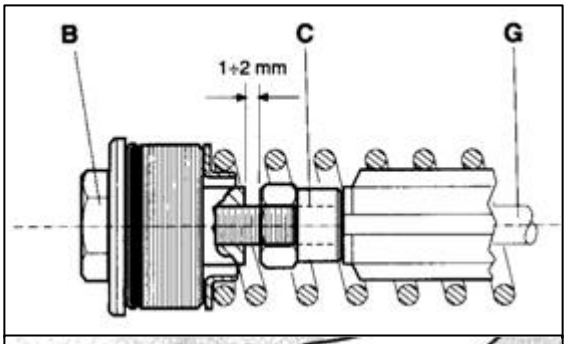
When the coils are closer to one another at one end of the spring, this end must be placed facing the upper part of the fork leg (i.e. towards the top cap).



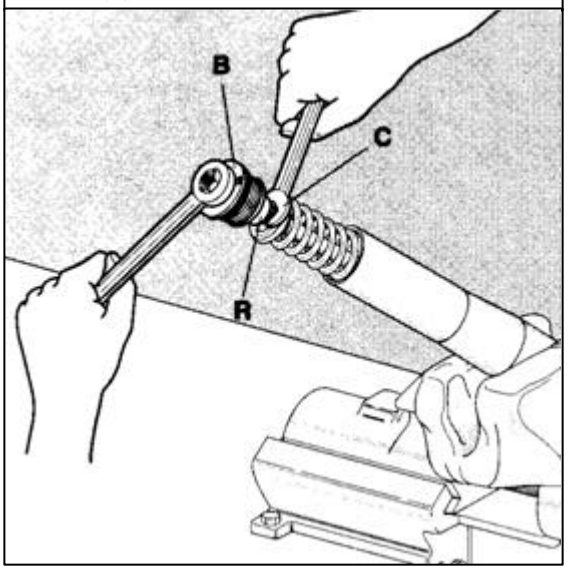
- Install the upper spring retainer (R) and the top cap (B) of the strut.



- The top cap (B) must be screwed on until the piston rod (G) touches the bottom of the cap (B) before the cap comes into contact with the lock nut (C). The space between the cap (B) and the nut (C) must be between 1 - 2 mm (0.040 – 0.080 in).



- Using your hand, push the top part of the spring down to provide enough space to reach the lock nut (C) with the open end of a 17 mm key wrench.
- Use a torque wrench and the special tool to adjust the torque to 18 – 20 N-m (1.8 – 2.0 kg-m, 13.2 –14.75 lbf-in).
- Screw the strut top cap onto
- the outer tube. Again, use the torque wrench and the special tool to adjust the torque to 25 N-m (2.5 kg – m, 18.4 lbf-in).



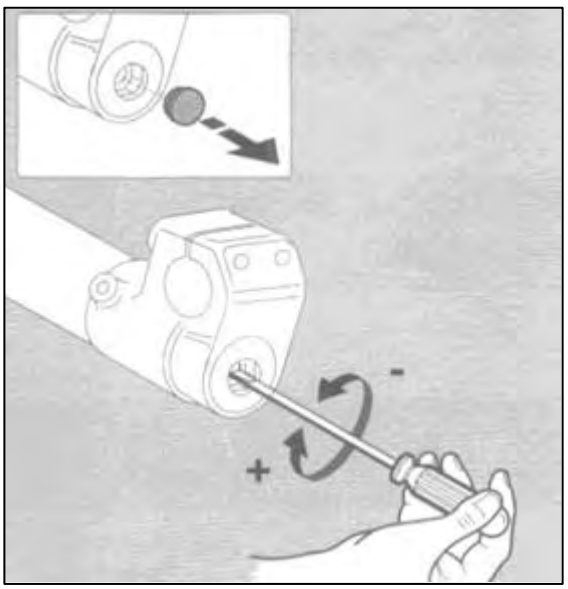
INSTALLATION

Follow the same procedure as for the removal but in the reverse order.

Adjustment of the front fork

- Compression

Using a screwdriver, it is possible to choose a precise setting for the speed of compression from a range of 26 positions, depending on the conditions of the terrain and the purpose for which the vehicle is used.

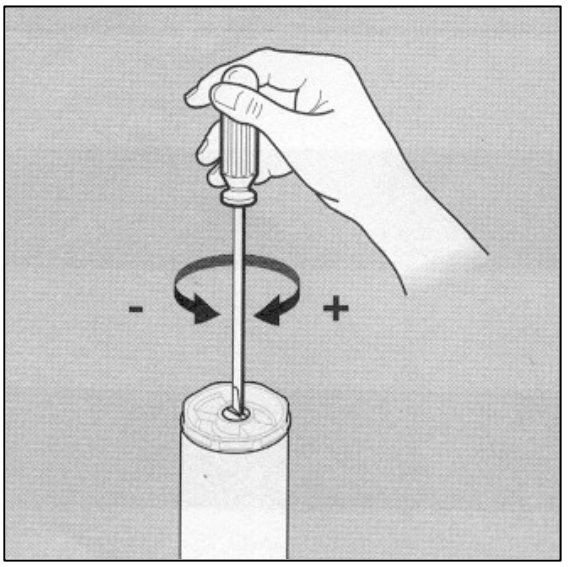


+ → **Stiffer** (Slower)

- → **Softer** (Faster)

o Rebound

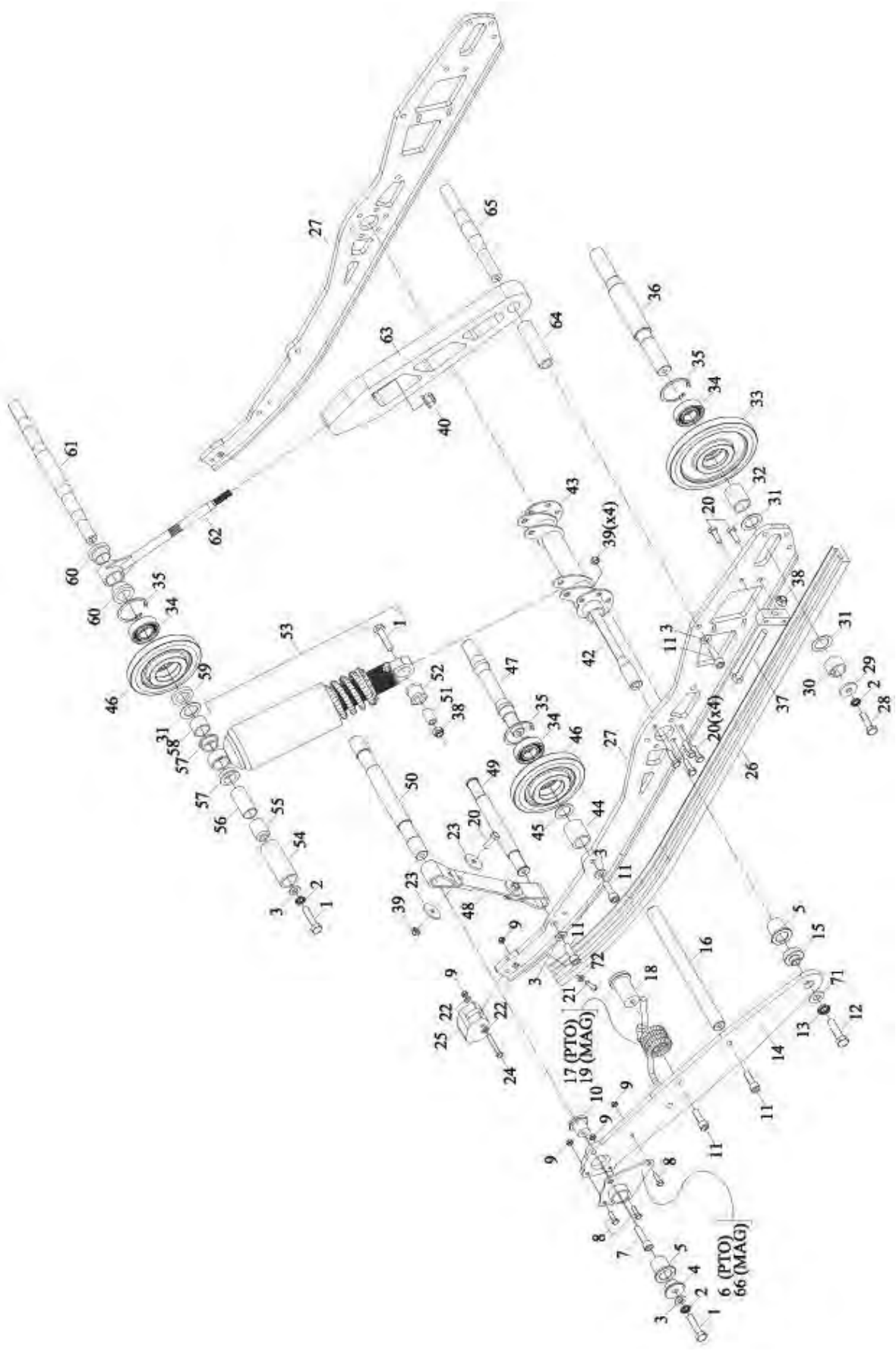
Using a screwdriver, it is possible to choose a precise setting for the speed of rebound from a range of 28 positions, depending on the conditions of the terrain and the purpose for which the vehicle is used.



+ → **Stiffer** (Slower)

- → **Softer** (Faster)

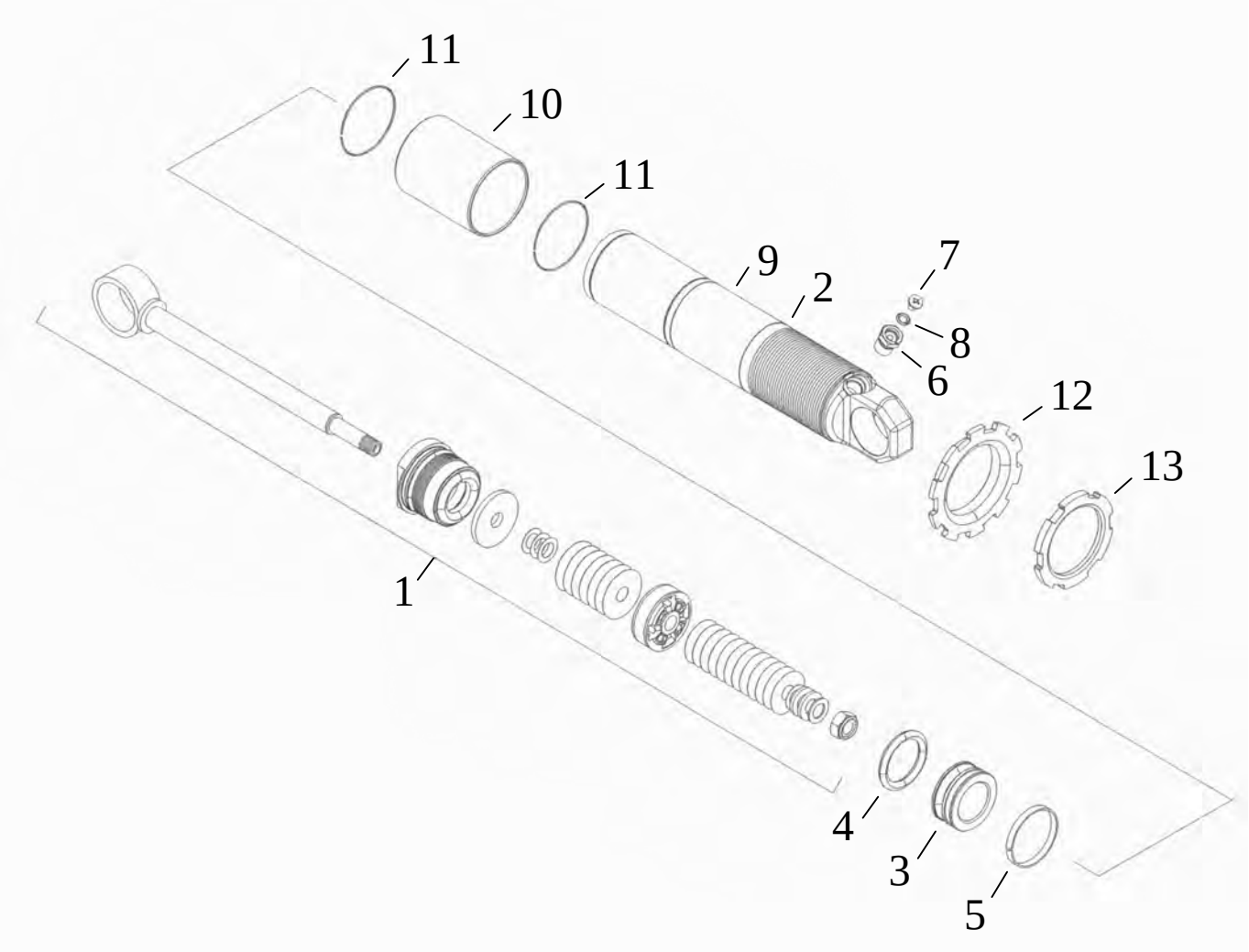
REAR SUSPENSION, SHOCKS AND TRACK



Reference #	Part Number	Description	QPV
1	20235P	M10x45 HEX HEAD CAP SCREW	6
2	21111P	M10 SPLIT SPRING LOCK WASHER	6
3	181-188	3/8" ID HIGH STRENGTH WASHER	10
4	SH416	OUTER BUSHING	2
5	SF-2836-20	OILITE BUSHING	4
6	SH43-SAG	BUSHING HOUSING	1
7	21683P	M10x40 SOCKET HEAD CAP SCREW	2
8	20159P	M6x20 HEX HEAD CAP SCREW	6
9	23162	M6 HEX ELASTIC NUT	10
10	SH415	FRONT INSIDE SWINGARM BUSHING	2
11	21681P	M10x30 SOCKET HEAD CAP SCREW	10
12	20272P	M12x45 HEX HEAD CAP SCREW	2
13	342-121P	1/2" SPLIT SPRING LOCK WASHER	2
14	SH402	SWINGARM	2
15	SH421	SWINGARM PRESS FIT BUSHING	2
16	SH411	SWINGARM MID SHAFT	1
17	T-362-1850-4.0 GAUCHE	TORSIONAL SPRING - LEFT	1
18	SH417	DYNAMIC STOPPER ADAPTOR	2
19	T-362-1850-4.0 DROIT	TORSIONAL SPRING - RIGHT	1
20	825-8CP	M8x25 HEX HEAD CAP SCREW	16
21	22105AI	M6x25 BUTTON HEAD S.S.	2
22	21085P	6mm ID WASHER	4
23	517 0787 00	LIMITER STRAP WASHER	8
24	20165P	M6x45 HEX HEAD CAP SCREW	2
25	025-00	RAIL CAP	2
26	04-218-22	HYFAX	2
27	SH401	SLIDE RAIL	2
28	732 6010 02	M10x35 HEX HEAD CAP SCREW (SPECIAL)	2
29	50 31833 00	10mm HEAVY WASHER	2
30	503 1898 09	REAR AXLE OUTER SPACER	2
31	504 1082 00	SHIM	6
32	503 139 600	REAR AXLE INNER SPACER	2
33	503 1895 68	165mm IDLER WHEEL ASSY. (PLASTIC)	2
34	405 4045 00	6205 BRG	0
35	371 9017 00	RETAINING RING	0
36	SH414	REAR AXLE SHAFT	1
37	20246CP	M10x110 HEX HEAD CAP SCREW	2
38	23166	M10 ELASTIC HEX NUT	4
39	23164	M8 HEX ELASTIC NUT	12
40	23167F	M12 HEX ELASTIC FLANGE NUT	1
41	057-00	TRACK TENSIONER BLOCK	2
42	SH412	PIVOT SHAFT	1
43	SH41-SA	LOWER SHOCK AXLE ASSY.	1
44	023-00	PVC SPACER	2
45	BR14L	SHIM	2
46	50 31889 97	135mm IDLER WHEEL ASSY. (PLASTIC)	4
47	010-00	WHEEL AXLE	1
48	SH409	LIMITER STRAP	2

Référence #	Part Number	Description	QPV
49	001-00X	LOWER LIMITER SHAFT	1
50	SH410	UPPER LIMITER SHAFT	1
51	503 1637 00	LOWER SHOCK EYE STEEL BUSHING	2
52	414 9423 00	LOWER SHOCK EYE RUBBER BUSHING	2
53	No Reference	REAR SHOCK ASSY	2
54	SH-423	BLACK PLASTIC SLEEVE	2
55	014-00	ADAPTOR	2
56	SH418	UPPER SHAFT SPACER	2
57	062-01	UPPER SHOCK EYE BUSHING	4
58	SH419	SPACER	2
59	018-00	NYLATRON SHIM	2
60	SH422	SOFTNESS ROD EYE BUSHING	2
61	SH420	UPPER SHAFT	1
62	SH42-SA	SOFTNESS DRAWBAR ROD	1
63	030-00X	SOFTNESS DRAWBAR	1
64	047-00	SOFTNESS DRAWBAR SPACER	2
65	033-00X	SOFTNESS DRAWBAR SHAFT	1
66	SH43-SAD	BUSHING HOUSING	1
67	013-00	SPRING HAT	0
68	503 1889 30	SPRING COVER	0
69	C-375-2650-10650	DUAL RATE SPRING 185/460	0
70	11300-10252-1	REAR SHOCK ONLY (KYB HPG)	0
71	181-190	1/2" HIGH STRENGTH WASHER	2
72	341-103P	3/16" FLAT WASHER	2

REAR SUSPENSION, SHOCKS AND TRACK



Ref.	P/N	Qt	Rear suspension, shocks and track Part Descriptions
1 - 13	11300-10252-1	2	Shock Assy.
1	11303-21209	1	Rod Assy.
2	11301-05056	1	Shock body
3	11301-03303	1	Floating piston
4	11301-03006	1	O-ring
5	11301-03805	1	Piston bushing
6	11302-09919	1	Compressed air valve
7	11201-90604	1	Screw
8	11301-03021	1	O-ring
9	11201-92151	1	Label
10	11301-91030	1	Collar
11	11301-03207	2	Stop ring
12	11301-03922	1	Spring preload adjustment collar
13	11301-90513	1	Jam nut

REAR SUSPENSION ADJUSTMENT

The rear suspension can be adjusted in three places

1- Adjustment of the spring preload

2- Adjustment of the softness drawbar (coupling)

3- Adjustment of the limiter strap

Spring tension

Loosen the jam nut (No. 1).

Using the special tool (No. 3), turn the spring preload adjustment collar (No. 2), screwing it in to stiffen the spring and unscrewing it to make the spring softer.

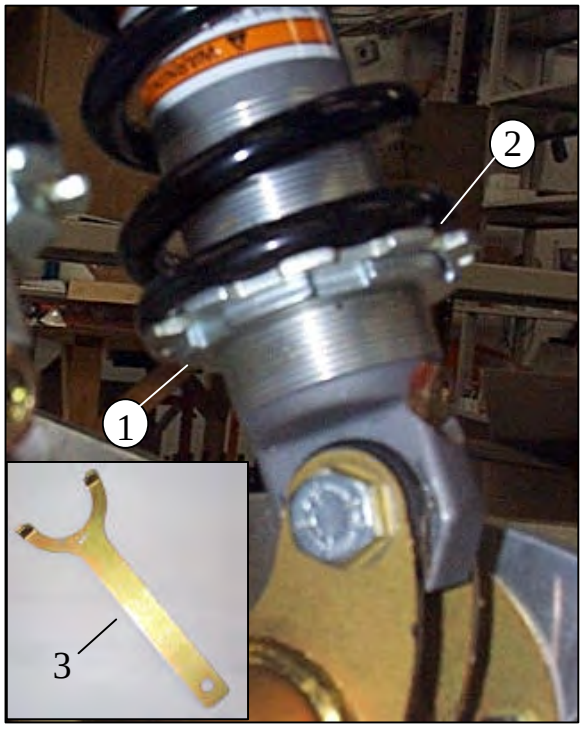
When the adjustment is finished, tighten the lock ring once more. (No. 1)

1. Jam nut

2. Spring adjustment ring

3. Special tool

The adjustment of the spring makes it possible to stiffen the suspension if it reaches the limit of its displacement and to make it feel softer if the driver is the one absorbing the shocks instead of the suspension.

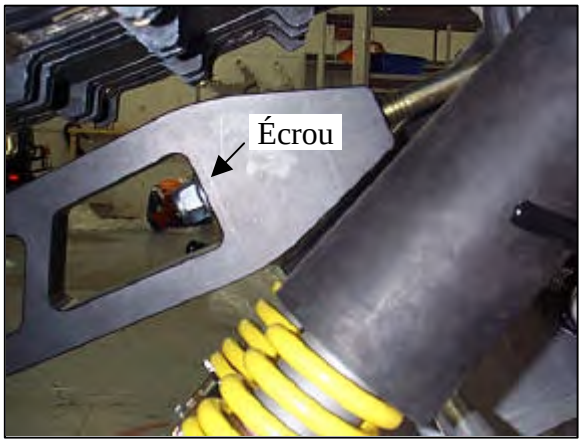


Softness drawbar

With the 18 mm ratcheting box-end wrench from the tool kit:

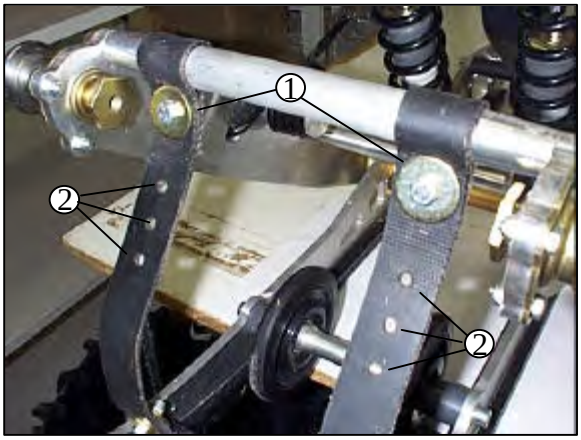
Screw in the nut: This puts more pressure on the front of the slide rail, which means the vehicle reacts more rapidly in turns. (Short wheelbase) This adjustment will also increase the front to rear coupling of the skidframe, which will in turn reduce the amount of kick back in moderately rough terrain.

Unscrew the nut: This puts less pressure on the front rail, which means the vehicle is more stable. (Long wheelbase) Reduces front to rear coupling.



Limiter straps

When the length of the limiter straps are adjusted, the position of the front of the slide rail is modified. (Angle of attack)



To change the length of the limiter straps, simply unscrew the nuts (No.1), remove the bolts and then position them in one of the holes labelled No. 2 at the right. While compressing the suspension slightly, you will be able to push the bolts through the remaining leg of the strap that runs up and over the upper shaft and then re-install the nuts and washers to hold this position.

If the limiter strap is shortened, the pressure on the front of the rail is reduced and the angle of attack is increased, which gives better performance in deep snow.

If the limiter strap is lengthened, the pressure on the front of the rail is increased, and the angle of attack and the pressure on the ski are decreased, which gives better performance on rough terrain.

MAINTENANCE OF SHOCK ABSORBERS

This type of shock absorber can be completely rebuilt. It can be calibrated, the shims can be replaced, or the sealing rings can be replaced as need be. The driver can choose the precise adjustment that corresponds to his or her driving style.

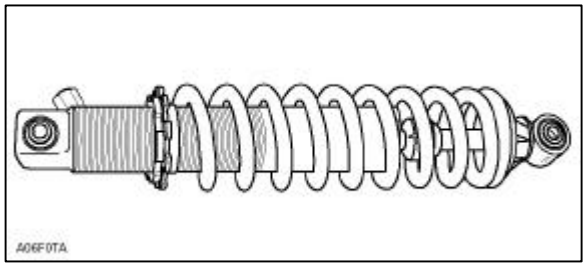
DISMANTLING

Free the nitrogen (N_2) pressure by removing the needle-type valve.

◆ WARNING

The nitrogen is under pressure; prudence is necessary when removing the pressure of this gas. Wearing safety glasses is necessary.

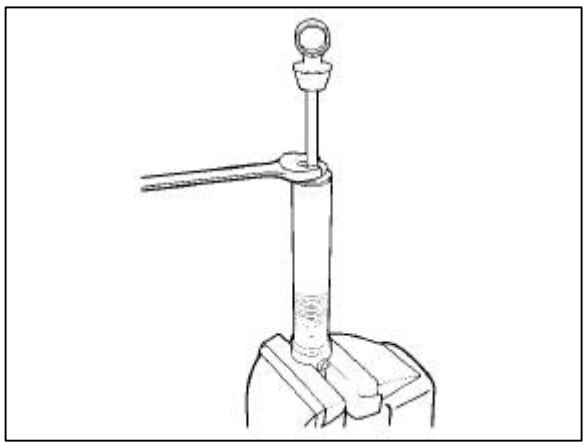
Remove the shock absorber spring by unscrewing the pre-load collar and jam nut then by removing the spring retainer hat. To carry out these operations, use tool (P/N 861 7439 00).



Install the shock absorber in a vise then remove the shock body cap (complete) from the body of the shock absorber using a 32 mm (1.25 in) open-end wrench. Unscrew the cap in a counter-clockwise direction.

● *NOTICE:*

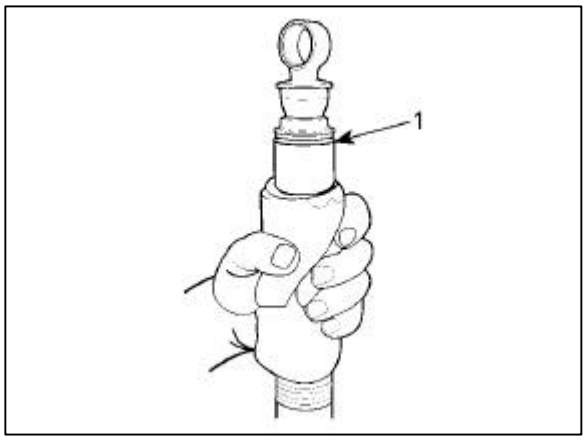
Before unscrewing the pre-load collar and jam nut, mark their position so as to be able to reinstall them correctly. To find out their original adjustment, refer to the end of the present section.



Shock body cap (complete) has been removed, gently lift the rod of the shock absorber and remove it from the body.

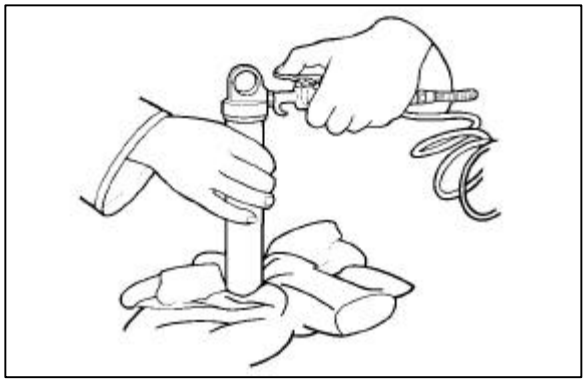
● *NOTICE:*

Pull the rod of the shock absorber out gently to avoid spilling oil or damaging the top cap and seal with the threads on the body of the shock absorber. Wrap it in a cloth when removing the shock absorber piston to soak up any oil that might run down the sides.



Store the old oil in a container. Never re-use this old oil when rebuilding a shock.

Remove the needle-type valve. Using compressed air, carefully extract the floating piston from the body of the shock absorber. Cover the opening of the shock absorber with a cloth to catch the floating piston. Make sure there is enough space in the cloth for the piston when it comes out.

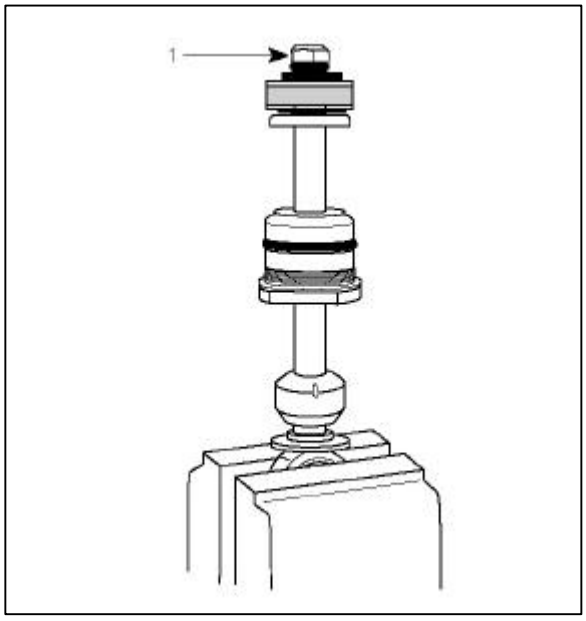


◆ WARNING

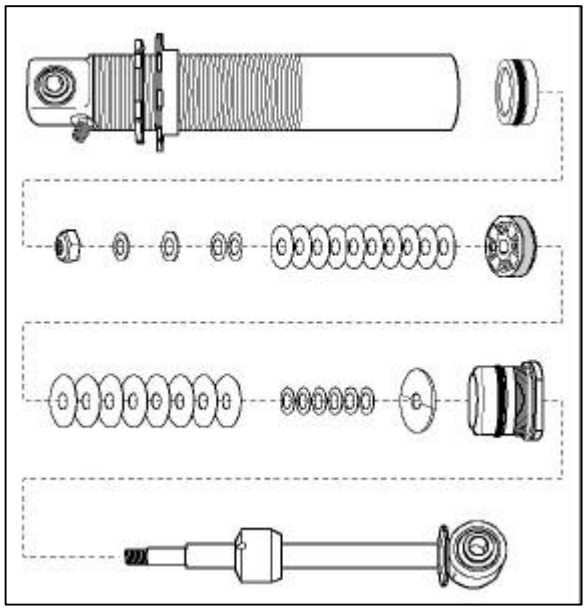
Always wear safety glasses and use a compressed air gun approved by the O.H.S.A when working with compressed air.

Clean the body of the shock absorber thoroughly using an appropriate solvent. Dry it using compressed air and inspect it carefully to detect any imperfections or marks indicating wear in the bore. Replace the shock absorber in case of wear.

Put the shock absorber rod in a vise, then remove the piston and the shims.



After removing the parts, always lay them out in the order in which they were dismantled.



● *NOTICE:*

In general, it is recommended that the lock nut from the shock absorber rod be replaced after the absorber has been reassembled 4 times to ensure adequate locking friction.

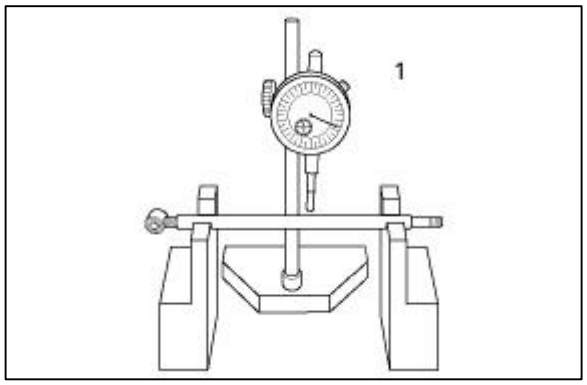
● *NOTICE:*

If it is necessary to re-calibrate the valves, it is absolutely essential to identify the order in which the shims are stacked (the number of shims and their thickness). The casing of the ring seal does not need to be removed if it is only an operation of re-calibration.

The shims can be measured using a sliding caliper or a micrometer.

The shock absorber rod is plated. It must be inspected in order to detect any visible marks of wear on the surface.

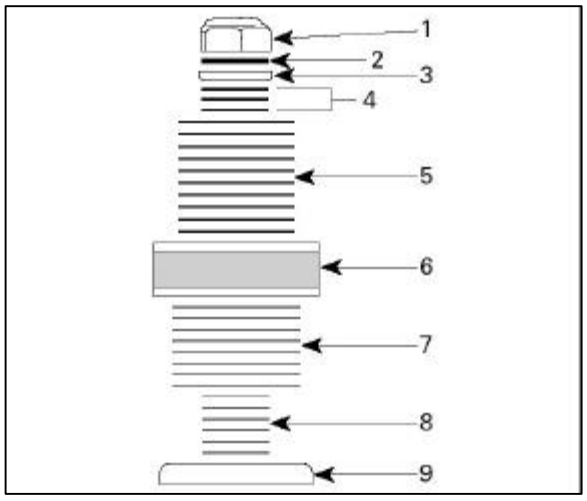
If there is a leak in the ring seal, it will be necessary to measure the camber of the rod which must not exceed 0.025 mm (.001 in).



Once the new shims or the replacement shims have been selected, reassemble everything by carrying out, in reverse order, the same operations as for dismantling. Tighten the piston nut between 11 and 13 N-m (1.1 and 1.3 kg-m, 8 and 9.5 lbf-ft)

▼ CAUTION

The nut for the rod of the shock absorber can only be used 4 times before it is replaced. Use only an original part to replace it; do not substitute any other kind of part for it.



Make sure that the number of washers between the nut of the shock absorber rod and the lock nut leave a sufficient number of threads for the nut of the shock absorber rod.

Install the lock nut with the rounded part facing down.

● *NOTICE:*

The stack of rebound shims must not touch the threads of the rod. The washer(s) under the nut on the rod prevent the nut from going to the end of the shoulder of the shock absorber rod.

REBOUND

Leave a play of about 0.203 mm (0.008 in) between the stack of shims and the lock nut.

When adjusting the shock absorber to increase the rebound damping, always use shims measuring 26 mm (1.02 in) against the piston to close the piston openings well. Even though the total thickness is the same, a large number of thin shims offer less damping effect than a small number of thick shims.

When adjusting the shock absorber to decrease the rebound damping, always use at least 3 shims measuring 26 mm (1.02 in) against the piston to prevent any breakage that could be caused by wear.

There are 4 kinds of pistons whose number of grooves varies between 0, 2, 4, and 6 according to the rapidity of the rebound. These grooves offer variations in the damping in relation to the shims.

COMPRESSION

When adjusting the shock absorber to increase the compression damping, always use shims measuring 30 mm (1.18 in) against the piston to close the piston openings well. Even though the total thickness is the same, 2 thin shims offer less damping than one thick shim.

When adjusting the shock absorber to decrease the compression damping, always use at least 3 shims against the piston to prevent any breakage that could be caused by wear.

Always use at least one washer measuring 0.114 mm (the use of 2 or more is recommended) between the stack of shims and the lock nut washer so that the shims will have enough space to work.

During compression the grooves of the lock nut must face the stack of shims.

GENERAL INFORMATION

Calibrating the shock absorber so that there is too much damping is a frequent error. When this is done, the suspension has too much give. The suspension cannot carry out a complete extension after the compression caused by a bump. After some time, the suspension becomes sluggish and no longer performs the movements of compression and extension efficiently.

Calibrating the shock absorber so that there is not enough damping means the damping will either be insufficient or badly controlled.

In such a case, the shock absorber moves up and down almost without any restriction. When going over a bump, the symptom most often noticed is that the snowmobile bounces.

P/N	Qty	Original Configuration Rear Shocks Shim Stack (Compression)
414 8883 35	3	Damping shim Ø15 x 0.203
414 8883 18	7	Damping shim Ø30 x 0.203

P/N	Qty	Original Configuration Rear Shocks Shim Stack (Rebound)
414 8883 37	1	Damping shim Ø15 x 0.114
414 8883 23	8	Damping shim Ø26 x 0.152
414 8883 22	3	Damping shim Ø26 x 0.203

● *NOTICE:*

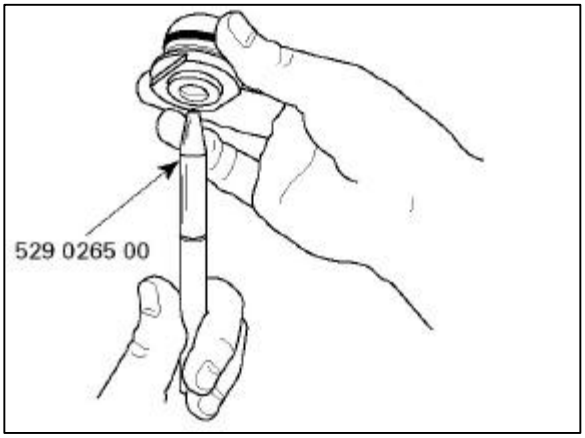
Carry out a meticulous inspection of the shims and replace any bent shims in order to get perfect calibration.

Not having enough damping might lead to believe that bubbles have formed in the shock absorber because the gas pressure is not high enough. Although such a situation is rare, checking the gas pressure is recommended.

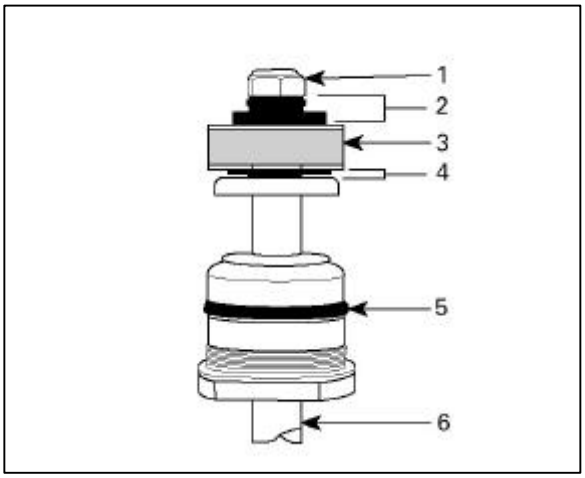
To replace the housing of the ring seal, use a ring seal guide (P/N 529 0265 00) to guide the ring seal over the shock absorber rod. Lubricate the guide before using it.

▼ CAUTION

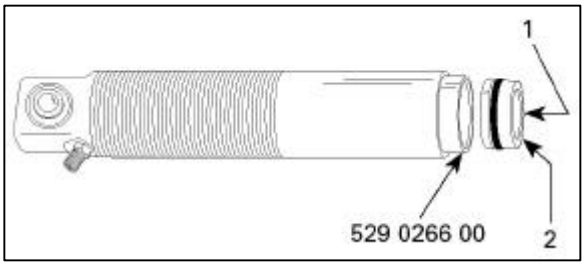
The ring seal will be damaged if the guide is not used.



Reassemble the shock absorber rod (complete) while taking care to correctly assemble the stack of shims according to the damping needed.



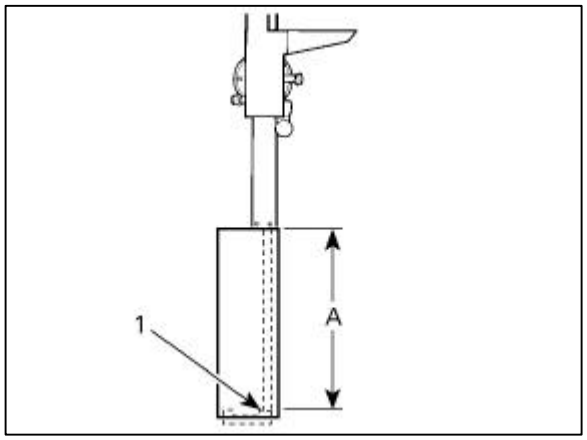
Install the floating piston in the body of the shock absorber. Use a grease with a molybdenum bisulphide base (ex: G-N Molykote Paste P/N 413 7037 00) to help the O-ring to pass more easily over the threads of the body of the shock absorber using the piston guide (P/N 529 0266 00).



● *NOTICE:*

Using G-N Molykote Paste (P/N 413 7037 00) lubricate the inside of the piston guide.

Install the piston to a depth of **A = 141.0 mm (5.55 in)**. Measure this distance starting from the upper end of the shock absorber.



● *NOTICE:*

If the floating piston is installed too far down in the body of the shock absorber, a light pressure exerted through the hole in the needle valve will push the piston up

◆ WARNING

Be very careful when using compressed air. Cover the opening in the shock absorber with a cloth to reduce any risk of injury.

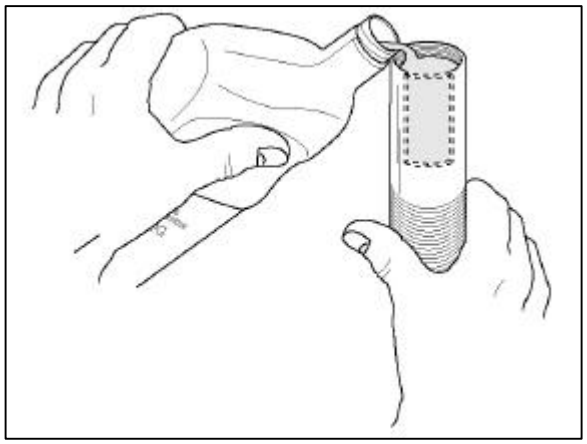
◆ WARNING

There is a risk that compressed air containing humidity will contaminate the gas chamber and cause the floating piston to rust.

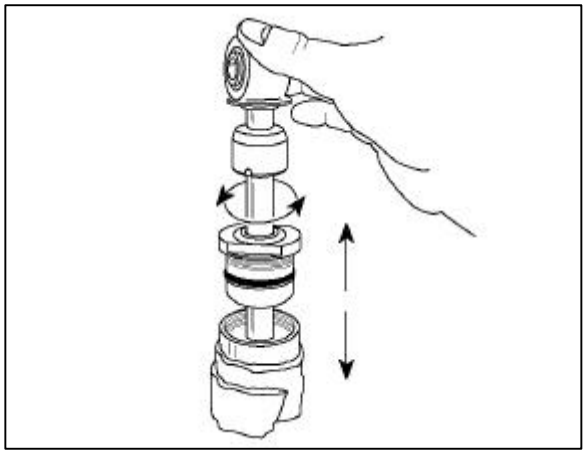
◆ WARNING

Always wear safety glasses when working with compressed air.

Replace the shock absorber oil by HGP Bombardier shock absorber oil (P/N 413 7094 00). Fill up to about 10 mm (0.393 in) from the base of the threads of the ring seal housing.



Insert the shock absorber rod (complete) in the body of the shock absorber. Lightly lubricate the ring seal of the piston with shock absorber oil to make installation easier.



Install the ring seal housing near the piston. Check the shock absorber oil capacity to make sure there is no air in the body of the shock absorber when it is being reassembled.

● *NOTICE:*

Some oil will spill during the installation of the shock absorber so wrap it in a rag to absorb this oil.

◆ WARNING

Take care not to damage the threads of the body of the shock absorber when inserting the piston.

It might be necessary to jiggle the rod slightly to make it easier to place the piston in the bore of the body of the shock absorber.

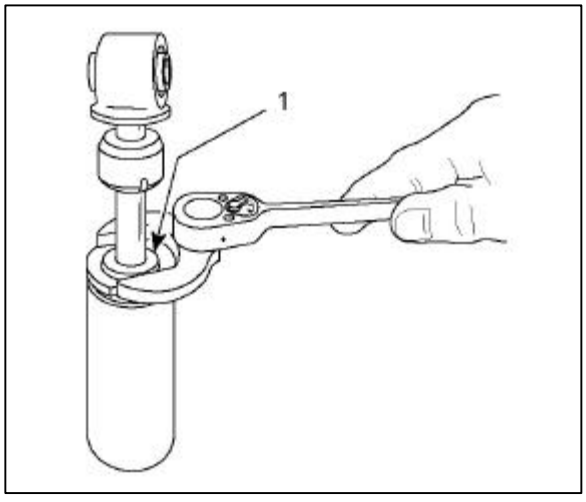
Gently insert the piston into the body of the shock absorber. A slight up-and-down movement might be needed to allow the air to pass through the piston (complete).

● *NOTICE:*

When the shock absorber rod is installed hastily, there is risk that the floating piston will be moved out of its initial position. This will have a negative effect on the way the shock absorber works.

Place the piston of the shock absorber rod in the oil and add a certain quantity of oil up as far as the base of the threads of the body of the shock absorber.

The ring seal housing can now be screwed into the body of the shock absorber. Proceed gently to allow for the oil flow of the shock absorber.



ADJUSTING THE NITROGEN PRESSURE

Nitrogen (N_2) can now be added to the body of the shock absorber. Replace the needle valve.

Adjust the pressure regulator to 2070 KPa (300 lb/in^2) of nitrogen. This pressure will re-establish the shock absorber pressure at its optimum level.

▼ CAUTION

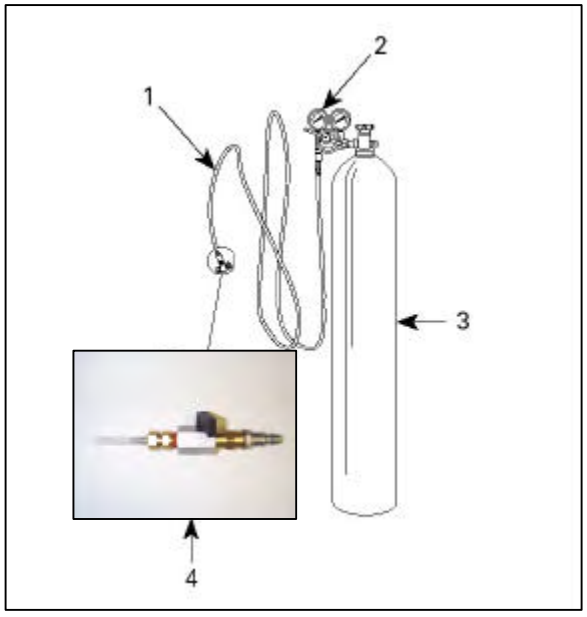
Do not exceed the recommended pressure.

◆ WARNING

Always wear safety glasses when working with high pressure gas. Never point gas under pressure at anyone.

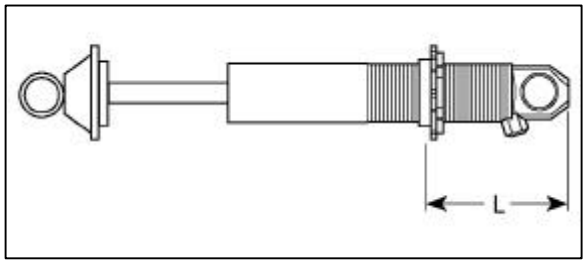
● *NOTICE:*

Make sure there are no gas or oil leaks. Carry out any necessary repairs before going on the next step.



1. Hose
2. Regulator
3. Nitrogen bottle
4. Charging tool (needle)

Replace the spring retainer hat, then the spring. Next, screw the pre-load rings up to the spring. Adjust the pre-load according to the length of the spring. The shock absorber can now be installed on the vehicle. **L = Position # 2**



MISCELLANEOUS INFORMATION

- Never replace nitrogen by another gas. Nitrogen was chosen for its qualities as an inert gas: since it is dry (no humidity) it does not contaminate the gas chamber of the shock absorber.

- When stacking shims, 2 thin shims stacked together are as thick as one thick shim, but offer less resistance than the latter. Refer to the table SHIM EQUIVALENCE FOR THE SAME DIAMETER as illustrated in this section.

Shim equivalence for the same diameter

Thickness mm	Quantity of shims		
0.114	11	5.6	2.4
0.152	4.7	2.4	1
0.203	2	1	
0.254	1		

- When stacking shims for rebound, always use shims measuring 22 mm (1.02 in) in diameter against the piston. Use at least 3 shims for the stack to avoid bending or breaking. Leave a play of about 0.203 mm (0.008 in) between the stacks of shims and the lock nut washer.

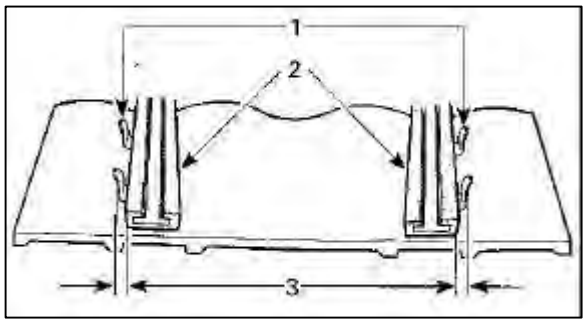
- When stacking shims for compression, always use shims measuring 30 mm (1.181 in) in diameter against the piston. Use at least 3 shims for the stack to avoid bending or breaking. Install at least one washer measuring 0.114 mm (installing 2 or more of them is recommended) between the stack of shims and the lock nut washer.

Track Alignment

▼ CAUTION

The track of each SNOW HAWK™ was aligned and adjusted in the factory but it is recommended that the following be checked.

- The alignment of the track

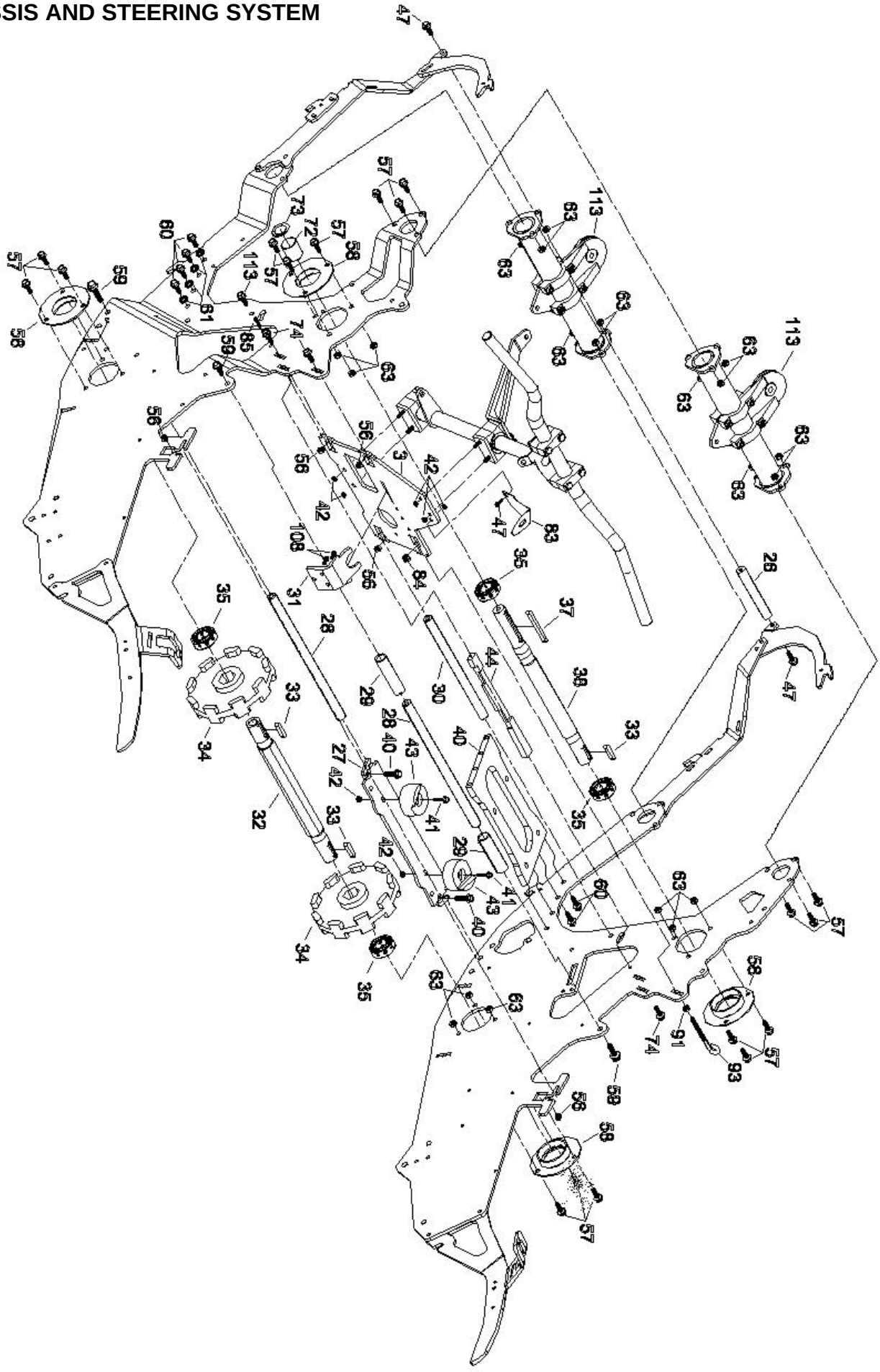


1. Guides
2. Hyfax (slides)
3. Equal distance

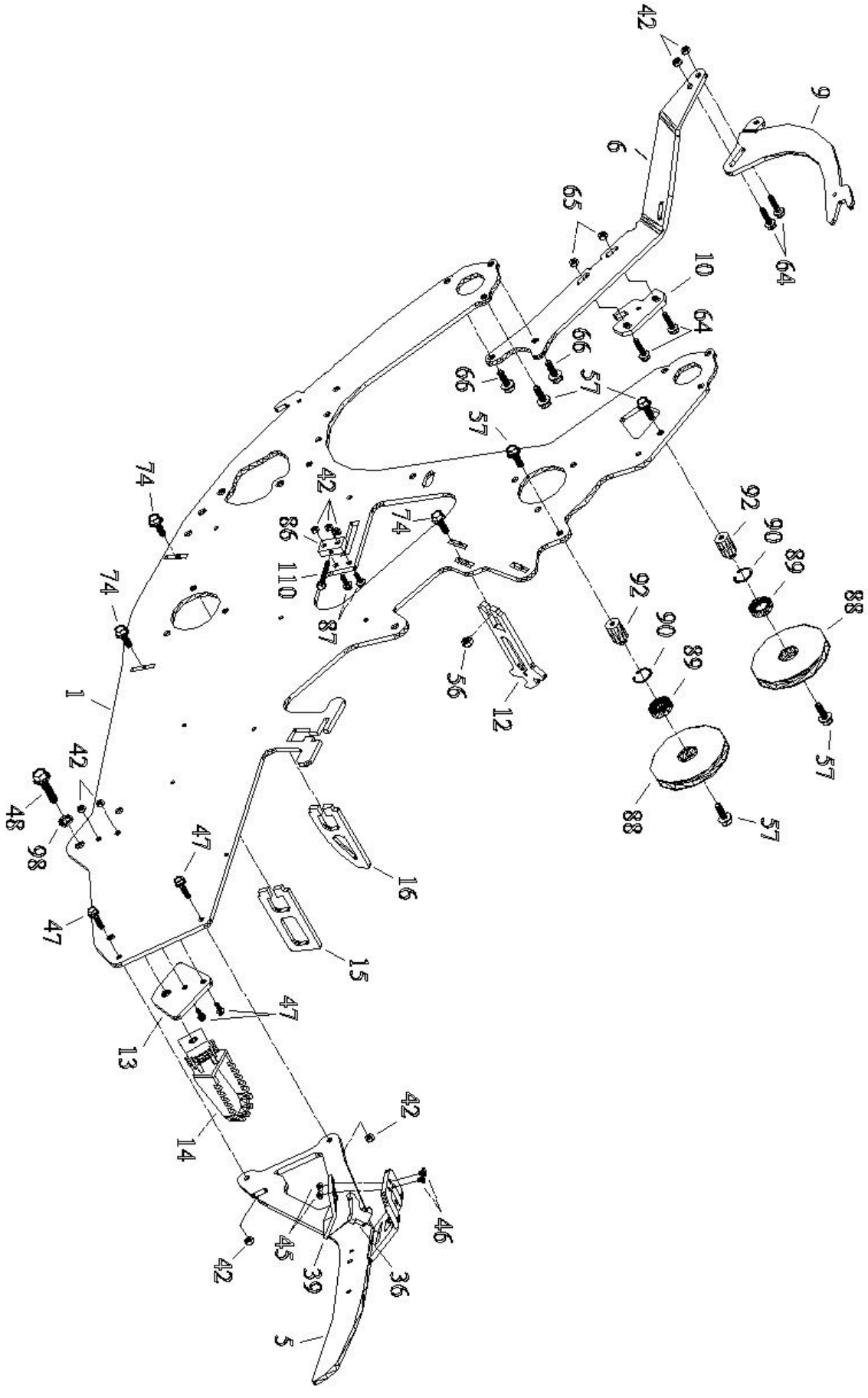
- Track tension

The track must have a maximum deflection of about 50 mm (2 in), just below the lower pivot of the swing arm, while under a perpendicular force of 80 N (8.0 kg, 18 lbf).

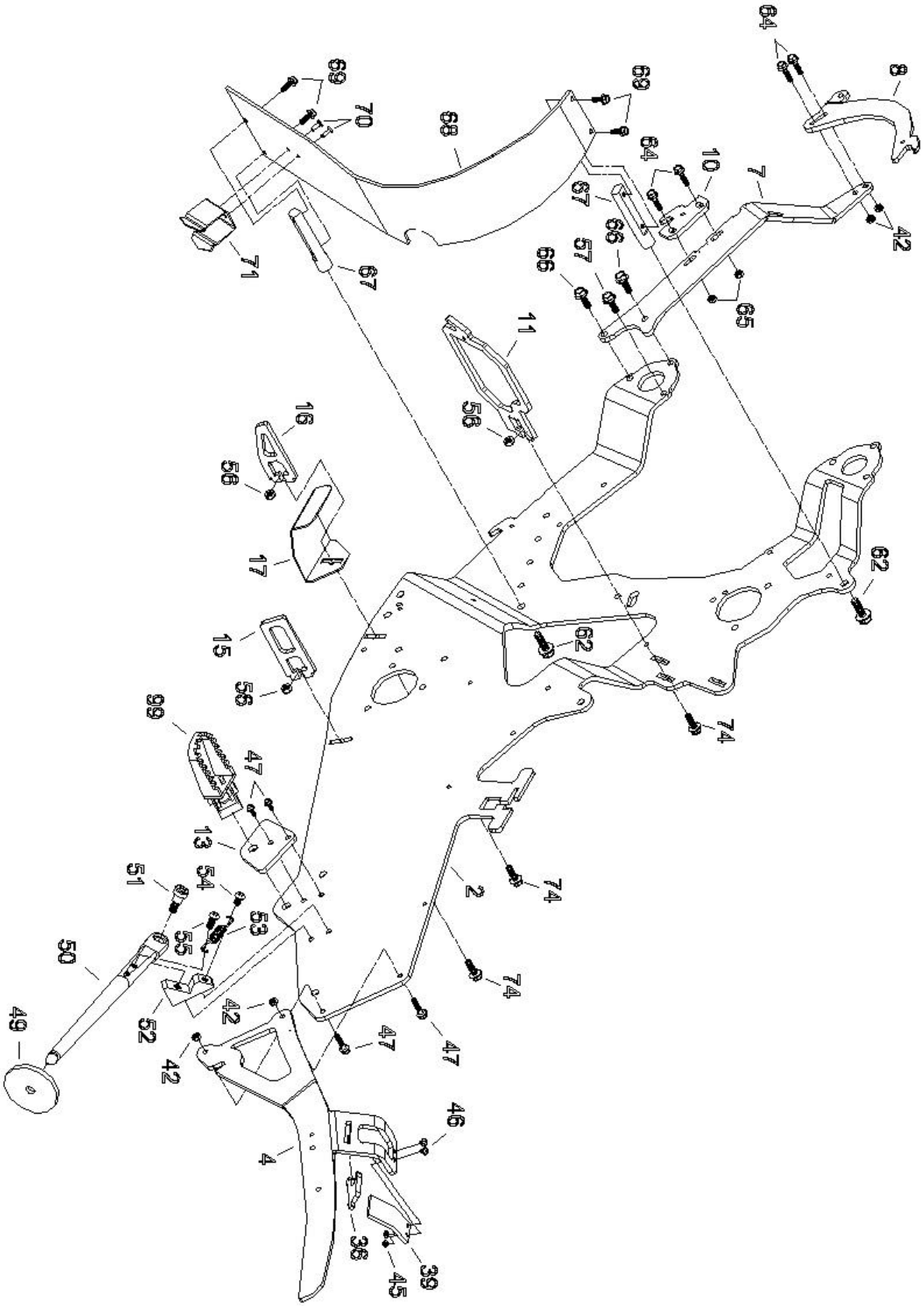
CHASSIS AND STEERING SYSTEM



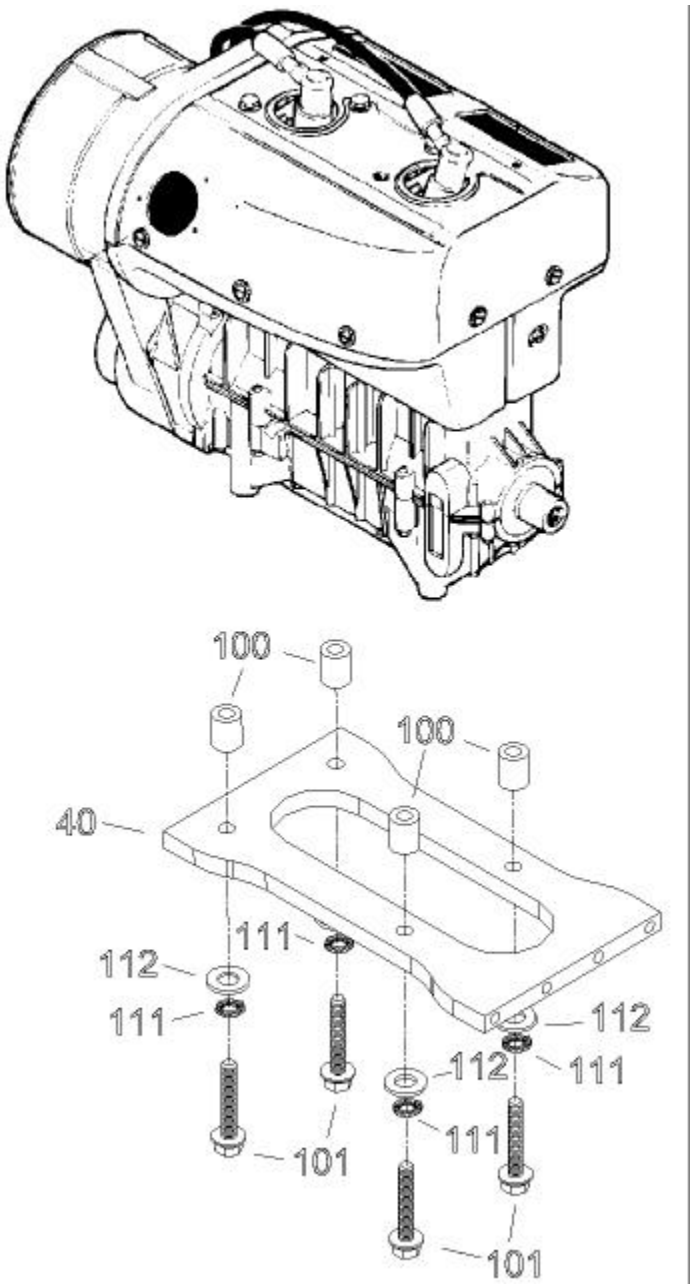
Frame right side (MAG) exploded view



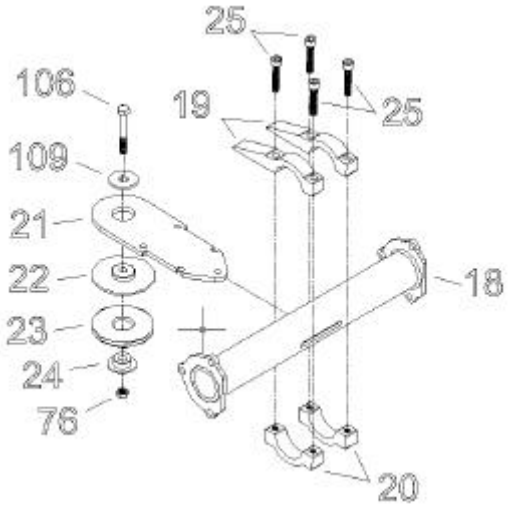
Frame left side (PTO) exploded view



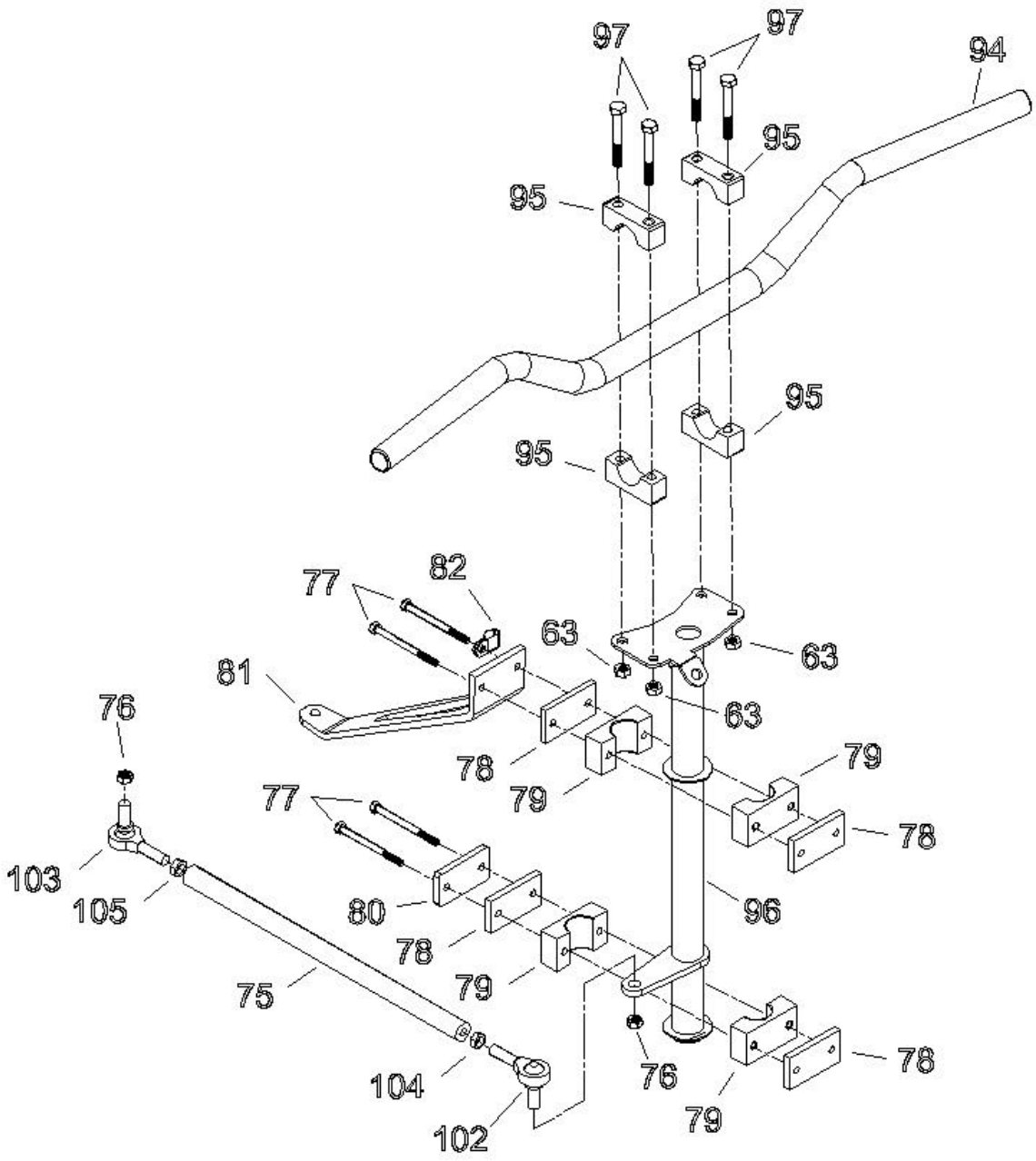
Engine support plate exploded view



Fork tube assembly exploded view



Steering column exploded view

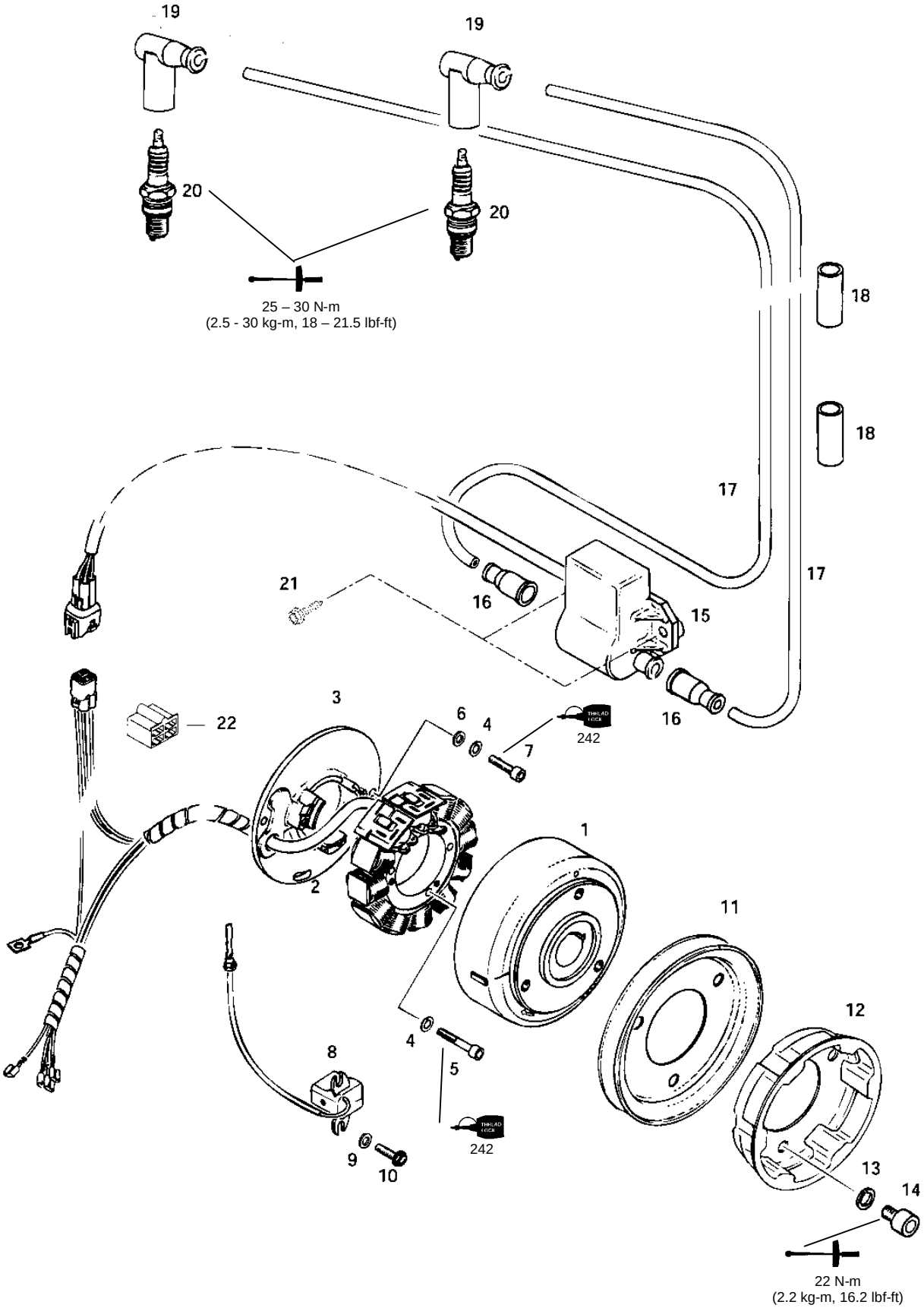


Ref.	P/N	Qty	Part Descriptions
1	SH 001	1	Frame right side
2	SH 002	1	Frame left side
3	SH 006	1	Handle bar plate support
4	SH 003L	1	Rear frame left side
5	SH 003R	1	Rear frame right side
6	SH 033R	1	Right front chassis extension
7	SH 033L	1	Left front chassis extension
8	SH 032L	1	Left front hood bungee hook
9	SH 032R	1	Right front hood bungee hook
10	SH 035	2	Front belly pan bungee hook
11	SH 030	1	Left side belly pan bungee hook
12	SH 031	1	Right side belly pan bungee hook
13	SH 009	2	Foot peg stiffener
14	SH 1021R	1	Right peg
15	SH 061	2	Rear lateral protector
16	SH 062	2	Front lateral protector
17	SH 080	2	Bellypan side shield support
18	SH 015A	2	Fork clamp tube
19	SH 012	4	Top clamp stiffener
20	SH 013	4	Bottom clamp stiffener
21	SH 005	2	Fork clamp support
22	SH 043	2	Fork steel bushing
23	SH 050	2	Fork MOS2 bushing
24	SH 066	2	Fork bushing
25	21655P	8	Socket head screw M8x40
26	SH 038	1	Front chassis spacer
27	SH 037	1	Rear module front bungee hook
28	SH 020	2	Long chassis spacer
29	047-00	2	Hypalon 1" x 0.750" x 3.625"
30	SH 021	1	Short chassis spacer
31	SH 018	1	Gas tank support bracket
32	SH 251	1	Sprocket shaft
33	SH 253	3	Key 1.5" (L)
34	04-108-39	2	Sprocket 9 teeth
35	6206-2RSKML	4	Bearing 6206
36	SH 036	2	Rear module rear bungee hook
37	SH 254	1	Key 3.375" (L)
38	SH 250	1	Jackshaft
39	SH 071	2	Rr module rr bungee hook positioner
40	SH 014	1	Engine support
41	053.6.30	2	Hex head cap screw M6x30
42	368.6	22	Hex elastic nut M6
43	SH 010	2	Tank support
44	SH 022	1	Carburetor support
45	341.102P	4	3/16" pop rivet backing plate
46	BSS-64-100	4	Pop rivet 3/16"
47	22204Al	11	Button head socket screw M6x20
48	20269P	2	Hex head cap screw M12x30
49	SH 112	1	Kickstand floater
50	SH 111	1	Kickstand ARM

51	339.163Al	1	1/2" shoulder screw socket screw
52	SH 110	1	Kickstand adaptor
53	02.108	1	Kickstand spring
54	404-339Al	1	Button socket cap screw 5/16" x 3/4" (L)
55	404-337Al	1	Button socket cap screw 5/16" x 1/2" (L)
56	23164F	11	Elastic hex nut M8 (flange head)
57	22214Al	24	Button head M8x20
58	SH 015	4	Bearing housing
59	084.10.30	4	Socket head cap screw M10x30 (GR 10.9)
60	057.8.30	8	Hex head cap screw M8x30
61	21110P	8	M8 split spring lock washer
62	22225Al	2	Button head M10x25
63	368.8	28	Hex elastic nut M8
64	061.6.25	8	Hex head flange bolt M6x25
65	23162F	4	Elastic hex nut M6 (flange head)
66	22216Al	4	Button head M8x30
67	SH 047	2	Belt guard support
68	SH 046	1	Belt guard cover
69	061.6.16	4	Hex head flange bolt M6x16 (GR 10.9)
70	BSS-68-100	2	Pop rivet 3/16"
71	12-164-01	1	Belt holder spare
72	SH 252	1	Jackshaft alignment collar
73	504.108.200	1	Shim
74	061.8.30	9	Hex head flange bolt M8x30
75	SH 055	1	Threaded aluminum drive rod
76	23166	2	Hex elastic nut M10
77	20171P	4	Hex head cap screw M6x75
78	SH 054	4	Rubber steering damper
79	SH 049	4	Plastic half steering bushing
80	SH 056	1	Steering damper support
81	SH 008	1	Handle bar stiffener
82	SH TCC	1	Throttle cable clamp
83	SH 034	1	Chock support
84	336-103	1	Hex flange stove nut 5/16"
85	130-119	2	#10x1"(L) slotted hex wood screw
86	SH 042	1	Belt tensioner block
87	22205Al	2	Button head M6x25
88	SH 058	2	Hand starter wheel
89	6000LL	2	Bearing 6000
90	184-110	2	Retaining ring
91	330-516	1	Hex nut 5/16"
92	SH 057	2	Handle starter wheel spacer
93	EYB5162P	1	Turned eyebolt full thread 5/16"x2',x3.125"
94	18-95267	1	Handle bar
95	SH 016	4	Handle bar clamp
96	SH 13-SA	1	Steering column
97	053.8.45	4	Hex head cap screw M8x45
98	442.12	2	1/2" split spring lock washer
99	SH 1021L	1	Left peg
100	SH 017	4	Engine support spacer

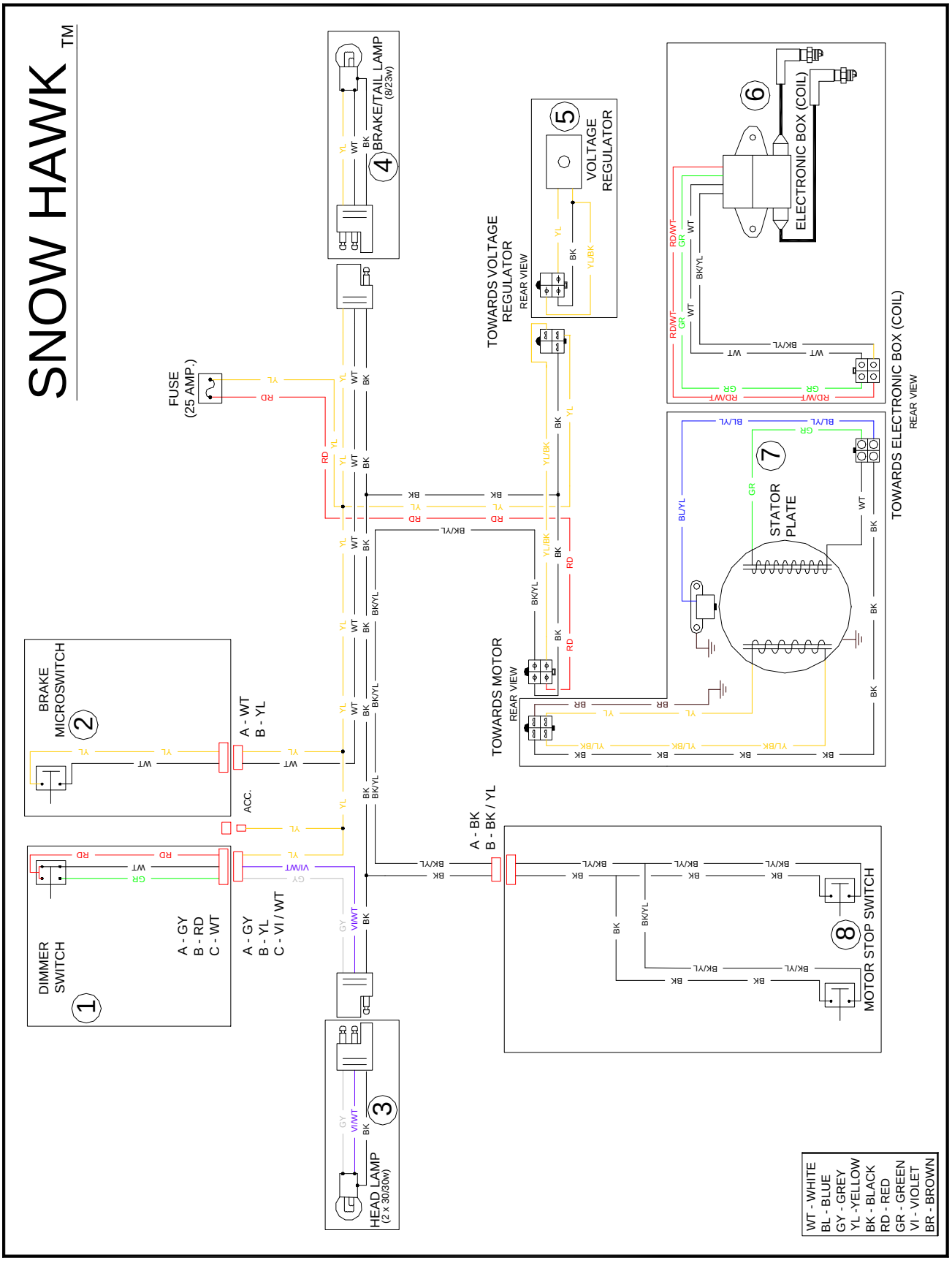
101	20238P	4	Hex head cap screw M10x60
102	506.151.495	1	LH ball joint
103	506.151.492	1	RH ball joint
104	250.100.016	1	LH jam nut M10
105	732.610.010	1	RH jam nut M10
106	053.10.55	2	Hex head cap screw M10x55
107	SH 01SA	2	Fork tube assembly
108	057.6.20	3	Hex head cap screw M6x20
109	503.183.300	2	Washer 10MM (special)
110	057.6.60	1	Hex head cap screw full threaded M6x60
111	21111P	4	Spring lock washer 10MM
112	181.188	4	High strength washer 3/8"
113	057.8.30	2	socket head cap screw M8x30

ELECTRICAL SYSTEM / ENGINE



Ref.	P/N	Qty	Electrical System Part Descriptions
1 - 5	420 8862 55	1	Magneto (Ducati) 12V240W
1	420 9968 20	1	Flywheel
2 - 5	420 8866 05	1	Stator plate Assy. 12V240W
3	-	1	Stator plate P12W 160/240
4	420 9457 50	5	5 mm Lock washer
5	420 9408 80	3	M5 x 30 allen bolt
6	420 9275 71	2	5.3 mm washer
7	420 8405 15	2	M5 x 18 allen bolt
8	420 9657 62	1	Pickup Assy.
9	420 8278 00	2	5.5 mm washer
10	420 9419 25	2	M5x 16 Taptite screw
11	420 9804 85	1	V-Belt pulley
12	420 8524 12	1	Starting pulley
13	420 8453 10	3	Lock washer
14	420 8415 20	3	M8x12 allen bolt
15 - 19	420 9657 57	1	Electronic box Assy.
16	420 9605 50	2	Protection cap
17	420 9655 28	2	Ignition cable 640 mm
18	-	2	Protection hose
19	414 8640 00	2	Spark plug protector
20	414 9611 00	2	Spark plug(NGK BR9ES)
21	365 9014 00	2	#12 x 1" Hex tapping screw
22	409 2049 00	1	Female housing

ELECTRICAL DIAGRAM / OVERVIEW OF ELECTRICAL PARTS



Ref.	P/N	Qty	Electrical System / Accessories Part Descriptions
1	01-120-02	1	Dimmer switch
2	110 4671 91	1	Brake microswitch
3	AN-125	1	Head lamp Assy.
4	70321	1	Tail lamp Assy.
5	-	1	Voltage regulator (see exploded view section #3)
6	-	1	Electronic box (see previous exploded view)
7	-	1	Stator plate (see previous exploded view)
8	410 1067 00	1	Tether switch
8	410 1055 00	1	Engine cut of switch)

● *NOTICE:*

It is not necessary to remove the engine from the chassis to carry out the following operations.

● *NOTICE:*

Clean all metal parts with a solvent for non-ferrous metal.

▼ CAUTION

Always use a clean cloth to clean the stator plate.

DISMANTLING

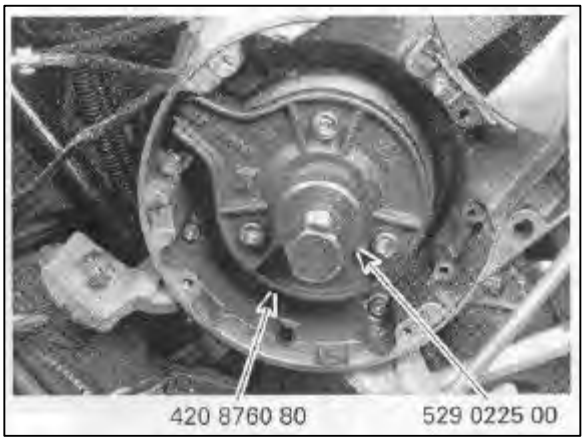
To reach the magneto, remove the following parts.

- o the calibrated exhaust pipe and the muffler
- o the recoil starter
- o the V-belt pulley
- o the recoil starter pulley

● *NOTICE:*

Before dismantling the stator assembly, trace guide marks on the stator plate to make reassembling easier.

To remove the fixing nut of the magnetic flywheel, install the stator plate puller (P/N 420 8760 80) and M8 x 20 screws.



Remove the nut from the magnetic flywheel using a 30 mm socket.

To remove the magnetic flywheel, use the magneto puller (P/N 529 0225 00).

Tighten the puller nut while hitting the head of the nut with a hammer to release the magnetic flywheel from its taper.

Making repairs

To replace the generator lighting coil:

- o Heat the stator plate to 93^0C (200^0F) around the screw holes to break the adherence of the locking adhesive.

To replace the starter coil:

- o Disconnect the blue wire with the yellow stripes from the starter coil.
- o Remove the grommet from the housing at the point where the starting coil comes out of the magneto housing.

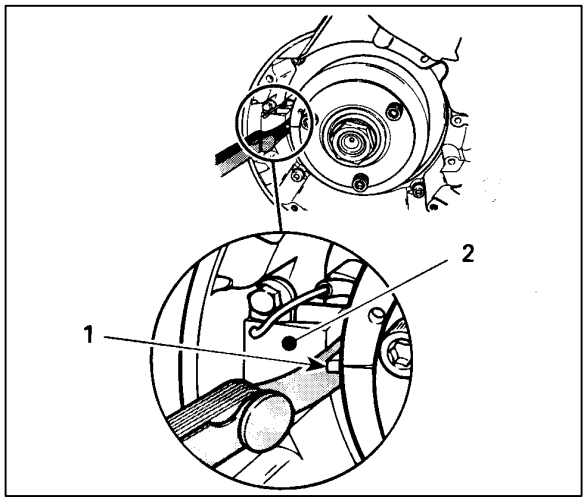
- Remove the fixing screws retaining the coil.
- Remove the starting coil and gently pull the wire.
- Install the new starting coil.
- Re-install the parts that had been removed, proceeding in the reverse order.

Positioning the starting coil

When removing or replacing the starting coil or the magnetic flywheel, it is important to verify and to adjust the gap between the starting coil and the bulge on the flywheel. This adjustment is aimed at making sure the play between these pieces is minimal - without contact at any speed - so that the starting coil can produce adequate electrical power.

Follow this procedure:

- Turn the flywheel so that one bulge is in line with the starting coil.
- Using a 0.45 mm (.018 in) to 0.55 mm (.022 in) thickness gauge, check the gap between the central pole of the starting coil and the flywheel offset.
    1. Flywheel offset
    2. Starting coil
- Make any necessary adjustments by unscrewing the mounting screws and moving the starting coil nearer to the offset or farther away.
- Tighten the screws and check the gap once again.



To replace the plate

- Disconnect the 2 connectors.
- Remove the connectors of the yellow wires with black stripes, and of the yellow, the green and then the white wires from their casings.
- Remove the grommet from the housing in the place where the bundle of wires comes out of the magneto housing.
- Remove the mounting screws from the stator plate.
- Remove the stator plate with the stator and pull the wires carefully.
- Install the new parts and the other parts which had been removed.

Reassembling

Clean the end of the crankshaft (taper).

Coat the taper with Loctite 242 (blue).

Place the woodruff key, the flywheel and the lock washer on the crankshaft.

Clean the threads of the nut and coat it with Loctite 242 (blue) before tightening it to **105 N-m (10.5 kg-m, 77 lbf-ft)**.

When reassembling, coat all the electrical connectors with silicone insulating grease (P/N 413 7017 00) to prevent corrosion or to prevent humidity from getting in.

▼ CAUTION

Do not use silicone sealing grease or the contacts will corrode.

ADJUSTING THE IGNITION TIMING

If, for some reason or another, there is any doubt about the precision of the ignition adjustment, it can be verified in the following way.

Checking the position of the adjustment mark on the flywheel

Before checking the adjustment, it may be necessary to check the position of the adjustment mark on the flywheel. The following verifications must be carried out:

1. To locate the missing or broken disk key in the flywheel area, which would modify the ignition time, eventually causing the engine to stall.

2. To locate precisely and to trace an adjustment mark on a spare flywheel.

3. To check the exact location of the adjustment mark traced at the factory.

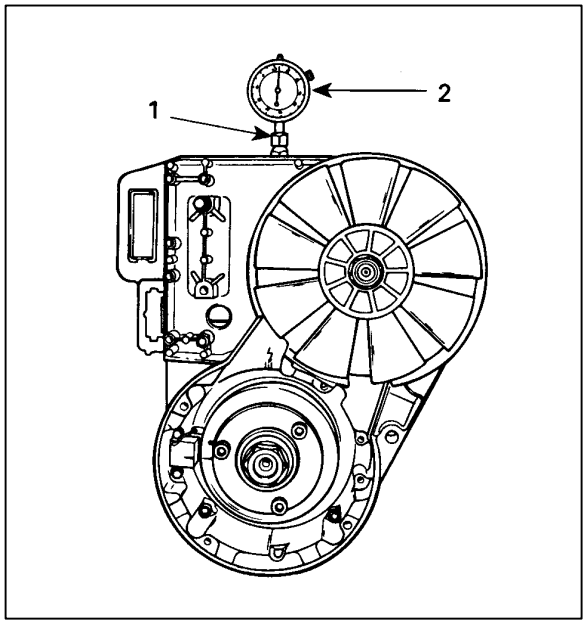
4. To detect an inadequate flywheel.

To check the position of the adjustment mark on the flywheel, proceed as follows:

1. Clean the surface around the spark plugs and then remove these spark plugs.

2. Remove the recoil starter from the engine.

3. Install the TDC indicator in the spark plug opening (on the magneto side) and carry out the following adjustment :



1) Adapter lock nut

2) Indicator on the cylinder on the MAG side

- o Place the flywheel approximately at the TDC
- o Set the adapter indicator and tighten the lock nut of the roller. Do not tighten the lock nut on the adapter.
- o Screw the adapter into the spark plug opening and tighten it to prevent it from moving around inside the opening.
- o Have the dial facing the magneto. Push the indicator in until the needle starts to move and push it in an additional 5 to 6 mm (around 1/4 in). Tighten the adapter lock nut manually.

4. To determine the TDC of the piston, proceed as follows:

- o Slowly turn the flywheel from the back to the front in the area of the TDC while observing the needle. Note that the needle only stops when the piston changes direction.
- o Turn the face of the dial so that the "0" is aligned with the needle when it stops.
- o Once more, slowly turn the flywheel from the back to the front in the area of the TDC and set the face of the dial to "0" until the needle stops exactly at "0" before changing direction.
- o The "0" gives the exact TDC

5. To check the position of the adjustment mark on the flywheel, proceed as follows:

● *NOTICE:*

During the verification of the ignition, for certain operations, the flywheel must be turned in a clockwise direction when placed facing the magneto. If for some reason, the flywheel must be turned back (in a counter-clockwise direction), turn it at least a quarter turn counter-clockwise, and then turn it clockwise. The final movement of the flywheel during a critical verification must be carried out in a clockwise direction to make sure that all play in the movable parts of the engine has been eliminated.

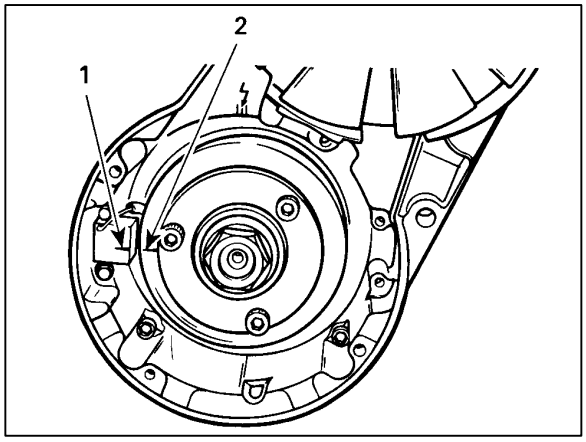
- Turn the flywheel a quarter turn counter-clockwise and then turn it gently again clockwise until the needle indicates **1.66 mm (0.065 in)**.

- Make sure the mark on the flywheel is correctly lined up with the mark on the starter coil. (See the illustration)

- If the marks are not lined up, check the part numbers of the magneto and the starter coil and check the condition of the woodruff key. If these are the correct parts and the woodruff key is in good condition, continue the procedure.

    1) Mark on the starter coil

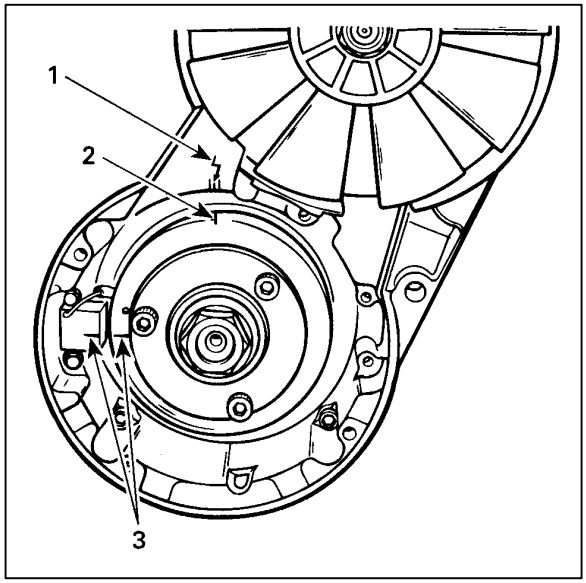
    2) Mark on the magnetic flywheel



● *NOTICE:*

These marks cannot be used to verify the adjustment of the dynamic ignition (when the engine is turning) with a stroboscopic lamp. To carry out this kind of operation, it is necessary to trace a new mark on the flywheel.

6. Trace a new mark on the flywheel and proceed as follows:



   - o Remove the cover of the engine fan.
   - o Hold the flywheel so that the old marks are lined up.
   - o Trace a mark on the flywheel so that it is in line with the arrow of the housing: (see the illustration). Use this new mark for all future adjustments (dynamic adjustment).
     1) Housing arrow
     2) Trace a mark here
     3) Keep the alignment of the adjustment marks previously verified (static adjustment)
   - o Reinstall the recoil starter
   - o Verify the ignition adjustment using a stroboscopic lamp

Verifying the ignition adjustment

Use a stroboscopic lamp (P/N 529 0092 00). To verify the ignition adjustment, see the illustration and proceed as follows:

● *NOTICE:*

The engine must be cold during the adjustment. Avoid having the engine run at low speed for more than 20 seconds and carry out the adjustments quickly.

◆ WARNING

Place the tips of the ski against a wall. Lift the rear of the vehicle so that the track does not touch the ground and install it on a support.

Make sure that no one goes in front of or behind the vehicle while the engine is running.

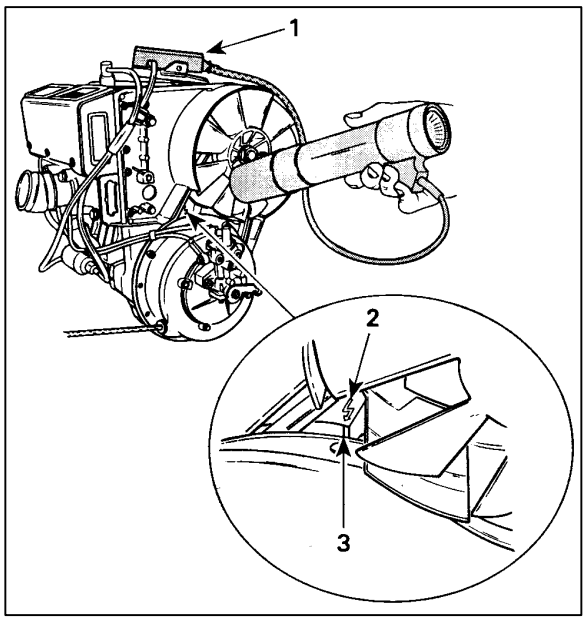
Keep away from the track and do not wear loose-fitting clothing which could be caught up in the moving parts.

1. Plug the stroboscopic lamp into the spark plug wire and the connectors into the battery.

● *NOTICE:*

To avoid inaccurate readings caused by a parallax, stand directly facing the adjustment marks on the flywheel and the housing when observing them.

2. Start the engine and increase its speed to 2000 RPM while observing the adjustment marks (see the illustration). The mark previously traced on the flywheel and the arrow on the housing should be perfectly in line. If they are not in line, this is perhaps because of a defect where the starter coil is concerned (check to see if the coil is well grounded) or where the CDI module is concerned. Replace one part at a time and re-verify the adjustment marks (verify the condition of the connectors before replacing any of the parts).



● *NOTICE:*

It is possible to verify the ignition adjustment when the speed of the engine is between 2000 and 6000 r.p.m.

1. Plug of the stroboscopic lamp (MAG side)
2. Housing arrow
3. Mark on the flywheel

Reinstall the parts that had been removed, proceeding in the reverse order.

VERIFYING THE CDI DUCATI SYSTEM

● *NOTICE:*

Before carrying out the following verifications, make sure that the emergency switches are working correctly and that they are in the ON position.

◆ WARNING

To prevent severe electric shocks when starting the engine, do not touch any of the components linked to the electronic ignition system (ignition coil, high tension wire, bundle of wires, etc.), or the wires of the ignition timing tester.

● *NOTICE:*

*To carry out the following verifications, a **Bombardier Ignition Timing Tester** (P/N 419 0033 00) will be needed.*

POWER OF THE STARTER COIL

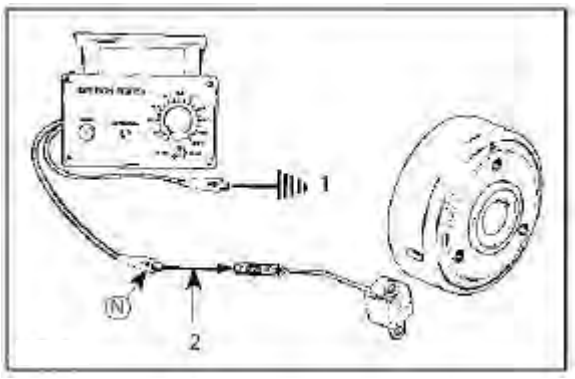
1. Disconnect the connector of the RED wire close to the area of the ignition module.

2. Plug in the wires of the ignition timing tester, then place the switch and the dials in the following positions:

Tester Wires	Wires of the tester component	Position of the tester switch	Position of the tester dial
N (2)	White/Red wire of		45
P (1)	Engine ground		

3. Start the motor and check the "indicator" light.

4. Push the "RESET" button and repeat step 3 twice more.



Results:

a) **The "indicator" light comes on**: The power created by the starter coil corresponds to the prescribed tolerances.

b) **The "indicator" light does not come on:** The problem is a result of a defect in the starter coil or a bad ground.

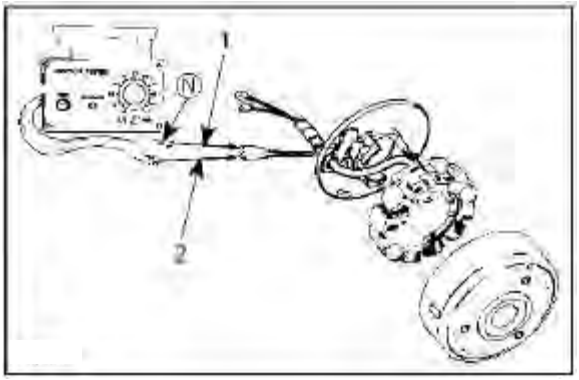
POWER OF THE MAGNETO

(Generator ignition coil)

1) Unplug the 2-wire connectors between the ignition module and the bundle of wires from the magneto.

2) Plug in the wires of the tester, then place the switch and the dial in the following positions:

Tester wires	Wires of the tester component	Position of the tester switch	Position of the tester dial
N (1)	GREEN wire from the bundle of magneto wires	"LOW"	80
P (2)	WHITE Wire from the bundle of magneto wires		



3) Start the motor and check to see that if the “Indicator" light is illuminated.

4) Push the "RESET" button and repeat step 3 twice more.

Results:

a) **The "Indicator" light comes on:** The power created by the generator ignition coil corresponds to the prescribed tolerances.

b) **The "Indicator" light does not come on:** The problem is a result of a defect in the generator ignition coil.

POWER OF THE IGNITION COIL

A paper clip measuring about 20 mm (3/4 in) will be used as a test adapter for the following verification.

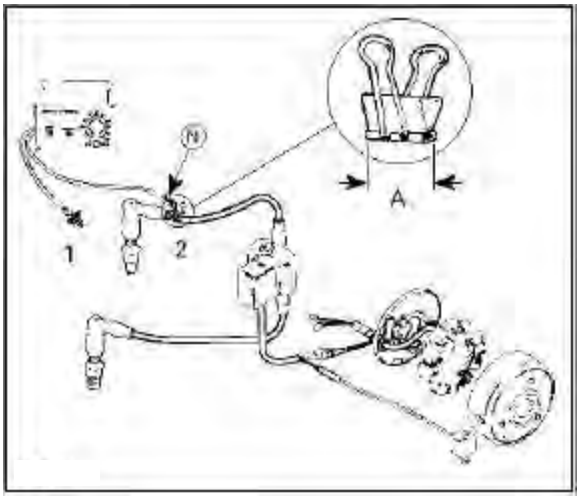
1) Fix the test adapter around the spark plug cable, in other words, near the spark plug on the MAG side.

2) Connect the tester wires, then place the switch and the dial in the following positions:

Tester wires	Wires of the tester component	Position of the tester switch	Position of the tester dial
N (2)	Test adaptor (paper clip on the spark plug wire)	"LOW"	70
P (1)	Engine ground		

● *NOTICE:*

If the N wire of the tester is connected to the cable of the spark plug on the PTO side, the result will be a different reading.



3) Start the motor and check the "Indicator" light.

● *NOTICE:*

If the engine starts, let it turn at low speed while observing the indicator. Then turn the engine off.

4) Push the "RESET" button and repeat step 3 twice more.

Results:

a) **The "Indicator" light comes on:** The ignition system is as it should be.

b) **The "Indicator" light does not come on:** The problem is a result of a defect in the coil or in the ignition.

IGNITION MODULE

The ignition module cannot be verified using the Bombardier tester. When the other components have been tested and correspond to the prescribed tolerances, the module is probably defective. Try a new module.

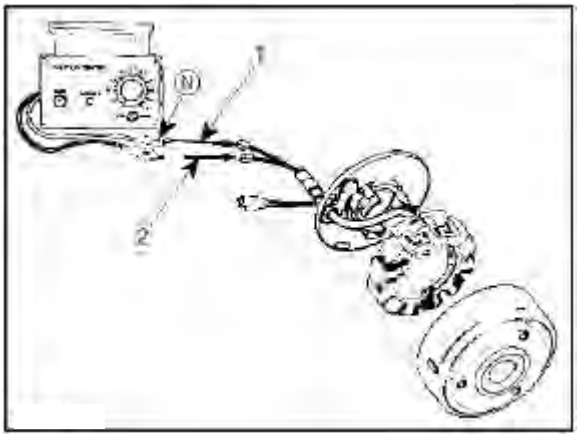
POWER OF THE GENERATOR LIGHTING COIL

The generator lighting coil is not part of the ignition system. It is a separate system designed to supply power to the lighting system as well as other mechanisms controlled by alternating current. However, this system can be checked with the same tester.

1) Disconnect the junction block from the bundle of wires near the engine (the one with the YELLOW and YELLOW wires).

2) Connect the tester wires, then place the switch and the dial in the following positions:

Tester wires	Wires of the tester component	Position of the tester switch	Position of the tester dial
N (1)	YELLOW wire from the bundle of wires from the magneto	"LOW"	80
P (2)	YELLOW wire from the bundle of wires from the magneto		



3) Start the motor and check the "Indicator"

4) Push the "RESET" button and repeat step 3 twice more.

Results:

a) **The "Indicator" light comes on:** The power created by the generator lighting coil corresponds to the prescribed tolerances.

b) **The "Indicator" light does not come on:** The problem is a result of a defect in the generator lighting coil**.**

MEASURING THE RESISTANCE

It is also possible to verify the components of the magneto system using a digital display ohmmeter.

● *NOTICE:*

All measurements must be taken when the parts are at room temperature (approx. 20^0C, 68^0F). Temperature has a considerable effect on resistance measurements.

Disconnect the connecter near the ignition coil and the magneto. Measure the resistance between each of the connectors. Consult the following table to see the resistances and the colours of the wires.

PART NAME		WIRE COLOUR(*)	RESISTANCE (OHMS)
MAGNETO	Starter coil	RED with engine ground	140 - 180
	Generator ignition coil	WHITE with GREEN	230 - 330
	Generator lighting coil	YELLOW with YELLOW	0.23 - 0.28
IGNITION COIL	Secondary coil (*1) (spark plug cap removed)	End of each wire under high voltage	9 300 - 10 500
SPARK PLUG CAP	Spark plug cap	-	4 500 - 5 500

● *NOTICE:*

An ignition coil may be defective in spite of an adequate resistance reading. A drop in voltage can occur under high tension, something an ohmmeter cannot detect.

● *NOTICE:*

*1 → The primary coil of the ignition coil cannot be measured since there is no outside connection.

INSPECTION OF THE VOLTAGE REGULATOR

When lights burn out repeatedly it could mean that the voltage regulator is defective.

▼ CAUTION

Never have the engine running when the voltage regulator is defective or when it is not working; the CDI DUCATI module could be damaged.

Verification

Check the regulator ground to make sure that the circuit is complete. If need be, connect a ground wire from the regulator to the engine.

● *NOTICE:*

Use a voltmeter that can measure alternating current (AC). To get precise readings, use a voltmeter with an effective tension voltmeter (RAMS).

- o Connect one wire of the voltmeter to a BLACK/YELLOW wire.
- o Connect the other wire of the voltmeter to a YELLOW wire
- o Lift the rear of the vehicle and put it on a support.
- o Start the engine and let it turn at low speed without touching the accelerator.

◆ WARNING

Make sure that no debris is blocking the track since it could be thrown into the air.

Keep hands, tools, feet and clothes away from the track. Make sure that no one is near the vehicle.

- o Slowly increase the engine speed.
- o If the indicator shows more than 15 volts, the regulator is defective and must be replaced.

▼ CAUTION

Never increase the speed of the engine so that the tension exceeds 15 volts because the lightbulbs will burn out.

● *NOTICE:*

No matter what kind of voltmeter is used, peak tension or effective tension, the tension must not exceed 15 volts (a defective regulator will allow the tension to go over 15 V if the speed of the engine is increased).

DIMENSIONS AND TOLERANCES

ENGINE			
Engine type			Rotax 503
Bore		mm	72.00
		(in)	(2.835)
Stroke		mm	61.00
		(in)	(2.402)
Displacement		cm^3	496.70
		(in^3)	(30.31)
Compression Ratio			6.20
Max RPM Range			7000-7200
Piston ring type	(1^{st}, 2^{nd})		ST/R
Piston ring opening	(new)	mm	0.2
		(in)	(0.008)
	(wear limit)	mm	1.00
		(in)	(0.039)
Piston ring/groove play	(new)	mm	0.04
		(in)	(0.0016)
	(wear limit)	mm	0.2
		(in)	(0.008)
Piston/Cylinder play	(new)	mm	0.08
		(in)	(0.031)
	(wear limit)	mm	0.2
		(in)	(0.008)
Maximum connecting rod axial play	(new)	mm	0.2
		(in)	(0.008)
	(wear limit)	mm	1.00
		(in)	(0.039)
Maximum crankshaft axial play		mm	0.3
		(in)	(0.018)
Maximum crankshaft curvature		mm	0.08
		(in)	(0.031)

ELECTRICAL			
Magneto output		W	240
Ignition type			CDI
Spark plug type			NGK BR9ES
Spark plug gap		mm	0.45
		(in)	(0.018)
Ignition timing before TDC		mm	1.66
		(in)	(0.065)
Primary Ignition coil		**W**	230 - 330
Lighting coil		**W**	0.23 - 0.28
Secondary Ignition coil		**W**	5.1 - 6.3
Head lamp bulb		W	30/30
Tail lamp bulb		W	18/23
Fuse		A	25

CARBURETION			
Carburator type			Mikuni VM34
Main jet	(MAG/PTO)		205 / 220
Jet needle			P-O (#159)
Pilot jet			60
Needle #			6DH2-3
Slide cutaway			2.5
Float height		mm	23.9mm
		(in)	(0.94)
Airscrew position			1.5 turns
Idle RPM			1500
Fuel type			Unleaded, 86 Octane

COOLING SYSTEM			
Type			Fan
Axial fan belt adjustment	Deflection	mm	9.5
		(in)	(0.375)
	Force	kg	5
		(lbf)	(11)

TORQUES			
Cylinder head bolts	N-m (lbf-ft)		22 (16)
Intake boots			22 (16)
Crankcase bolts			22 (16)
Magneto nut			105 (77)
Axial fan nut			65 (48)
Recoil starter housing bolts			10 (7)
Primary clutch bolt			90 (66)
Secondary clutch bolt			31.7 (23)
Taper-Lock installation setscrews			14 (10.4)
Spark plugs			25 (18)
Handlebar mounting bolts			36.5 (27)
Fork leg bolts (in triple clamps)			6.8 (5)
Fork pivot bolts			45 (33)
Ski-center runner nuts			19 (14)
Lower clamp bolts			23 (17)
Ski saddle/fork adaptor nut			85 (63)

PRIMARY TRANSMISSION			
Primary clutch			IBC Powerbloc
Number of weights per arm			9 (27 total)
Primary spring colour			Violet (red/blue)
Engagement RPM			3450
Secondary clutch			Formula
Secondary clutch spring pretension		kg (lbf)	6.8 15
Secondary spring colour			Beige
Helix type (progressive)			50^{o} - 44^{o}
Nominal spacing between pulleys Z		mm (in)	72.55 (2.810)
X (*see section 8-11*)		mm (in)	20.18 (0.785)
Y-X (*see section 8-11*)	MIN/MAX	mm (in)	0 / 2 (0 / 0.079)

	Primary transmission belt P/N		10-251
	Width of primary trans. Belt (new)	mm	34
		(in)	(1.34)
	(wear limit)	mm	31.75
		(in)	(1.25)
	Drive belt adjustment Deflection	mm	32
		(in)	(1.25)
	Force	kg	6.8
		(lbf)	(15)
	SECONDARY TRANSMISSION		
	Drive sprocket number of teeth		28
	Driven sprocket number of teeth		56
	Secondary transmission belt P/N		8M 1280-36
	Cog belt adjustment Deflection	mm	7.3
		(in)	(0.288)
	Force	kg	6.44
		(lbf)	(14.2)
	**CHASSIS**		
	Overall length	mm	2698
		(in)	(105)
	Overall width	mm	835
		(in)	(32.5)
	Overall height	mm	1233
		(in)	(48)
	Dry weight	kg	160
		(lb)	(350)
	Track width	mm	308
		(in)	(12)
	Track length (ST/LT)	mm	3074 / 3495
		(in)	(121 / 136)
	Track adjustment Deflection	mm	50
		(in)	(2)
	Force	kg	8
		(lbf)	(18)
	FRONT SUSPENSION		
	Type		Inverted, 46mm Paioli
	Travel	mm	308
		(in)	(12)
	Oil level	mm	100
		(in)	(3.3125)
	Oil type		SAE 10W
	REAR SUSPENSION		
	Type		Expert X
	Travel	mm	385
		(in)	(15)
	Shock type		KYB, rebuildable
	Oil Type		KYB, No. snow
	Hyfax P/N		04-218-22

	**FLUIDS**		
	Fuel tank capacity	L	17.5
		U.S. gal.	4.5

SPECIAL TOOLS

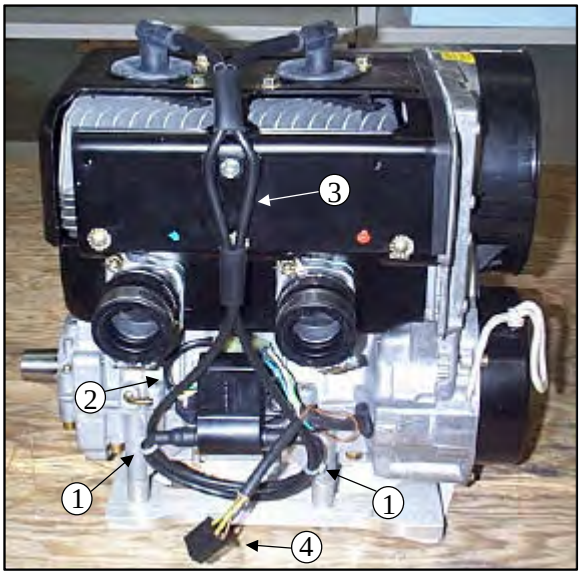
P/N	Item Description
X-1756	Primary Clutch Puller
529 027 300	Spring Compressor
43990092	Belt Tensioning Tool
529 027 600	Primary Clutch Tool
529 031 103	Application Plate
529 031 102	Extractor
529 031 200	Secondary slider installation tool
529 031 300	Secondary slider installation tool
529 008 700	Secondary belt changing tool
404 112 000	Mikuni VM Toolkit
529 009 900	Hose Pinch Clamp
420 876 357	Cooling Fan Nut Removal Tool
529 021 000	Piston Wrist Pin Extractor
529 023 400	Rubber Cushion
529 016 900	Piston Circlip Installation Tool
420 876 970	Piston Ring Compressor
413 701 000	Anti-Seize Compound
420 876 620	Thickness Gauge
420 876 824	Positioning Gauge
413 708 100	Curing Spray
449.450.020	A.D Boivin Complete Fork Servicing Toolkit
949.000.046	Fork Top Cap Tool
949.000.045	Fork Cartridge Removal Tool
949.000.016	Fork Seal Drivers
08-0B75	Needle Adapter
413 709 400	Kayaba Shock Oil
420 876 080	Stator plate puller
529 022 500	Magneto puller
419 003 300	Ignition timing tester

WIRE, CABLE AND HOSE ROUTING

◆ WARNING

Make sure that all the wires are well set in the terminals and that the connector holders are well installed. Keep the wires away from any rotating, moving, heating or vibrating part. If necessary, use good retaining devices.

When reassembling, it is important to always re-install the wires to the stock positions.



SPARK PLUG WIRES AND ELECTRONIC BOX

1- Nylon fasteners

2- Electronic box wires

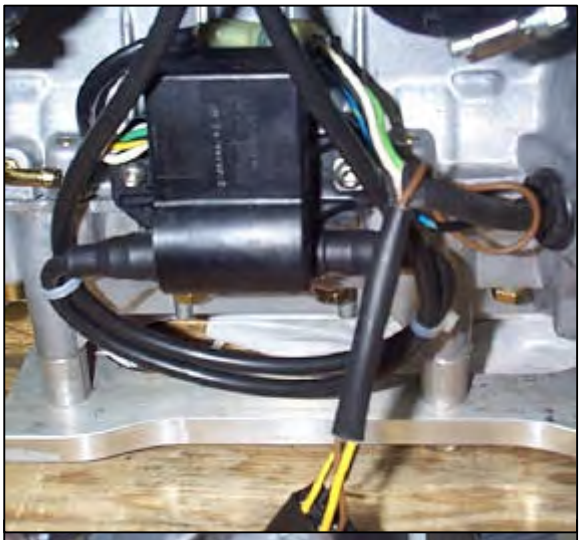
3- Spark plug wires

4- Engine electrical power output

When replacing the electronic box or the spark plug wires, it is important that the wires be put back in the stock arrangement.

The connecting wire for the electronic box (No. 2) and the two spark plug wires (No. 3) must be installed in the way shown in the photograph.

Use two tie wraps (No. 1) to keep the spark plug wires in place.



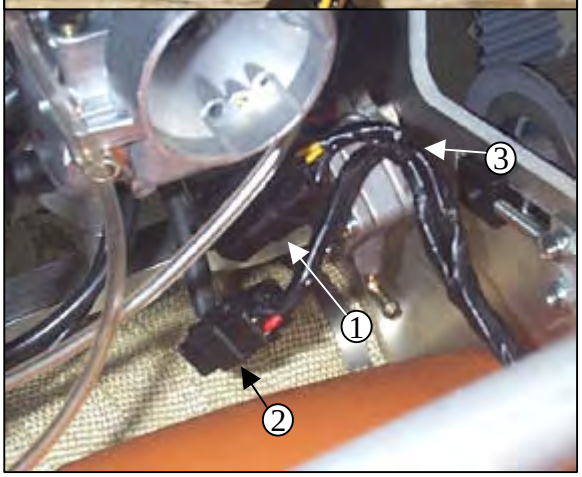
ROUTING THE WIRES

1- Connection to the voltage regulator

2- Connection to the engine power source

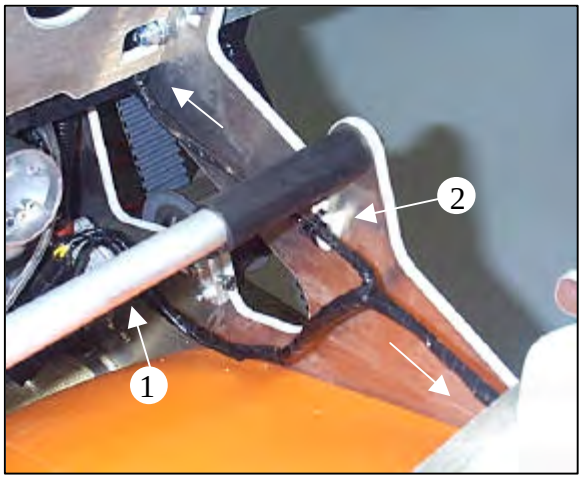
3- Tie wrap

Using a tie wrap, attach the two bundles of wires together to the empty hole in the fuel pump.



Under the transversal shaft (No. 1) of the chassis, the wiring separates into two segments, one going toward the front of the vehicle and the other going toward the back

Using a tie wrap, secure the wiring that goes toward the front of the vehicle in the cable attachment (No. 2).

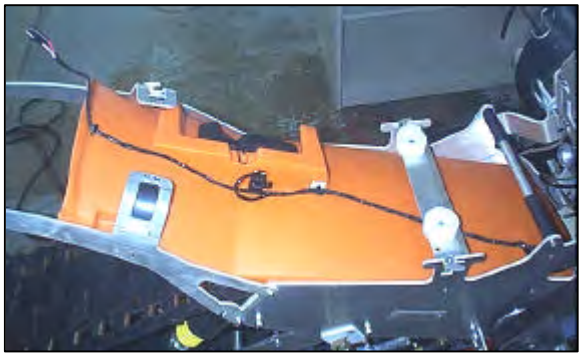


2- Nylon cable attachment

◆ WARNING

It is important that the wires be installed exactly where they are intended to avoid interference during operation. (Refer to the photograph on the right)

The section of the wiring harness going toward the rear of the vehicle must pass under the gas tank bracket.



1- Tie wrap

2- Adhesive nylon cable fastener

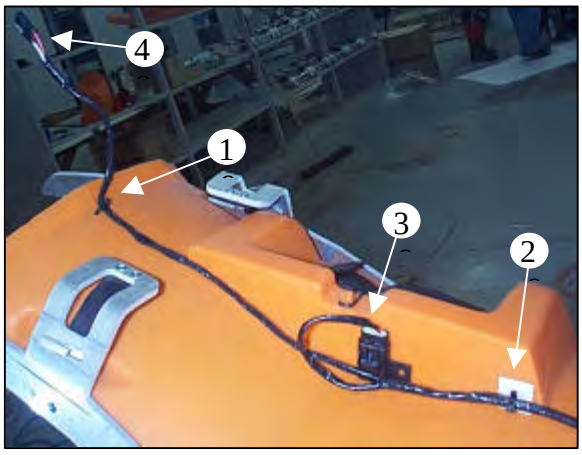
3- Safety fuse

4- Tail light connection

Using a tie wrap, secure the wiring in the adhesive nylon fastener (No.2).

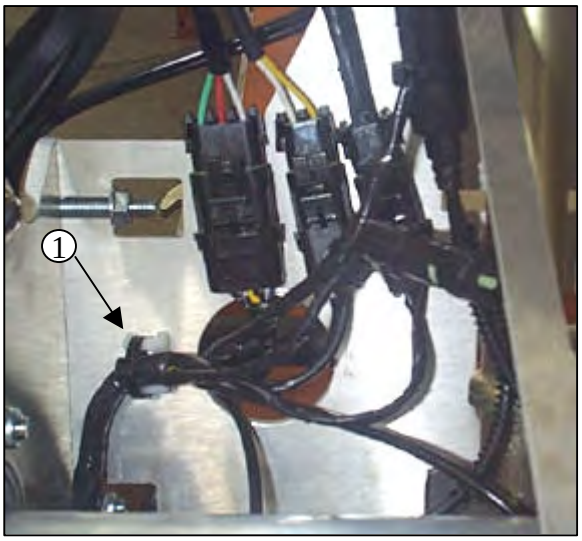
Position the fuse (No. 3) correctly in the connector holder.

Using a tie wrap, secure the wiring harness to the two holes. (Refer to the photograph on the right - No. 1).



The forward wiring section comes up inside the steering column plate of the vehicle and is anchored with a tie wrap in the nylon cable fastener (No. 1).

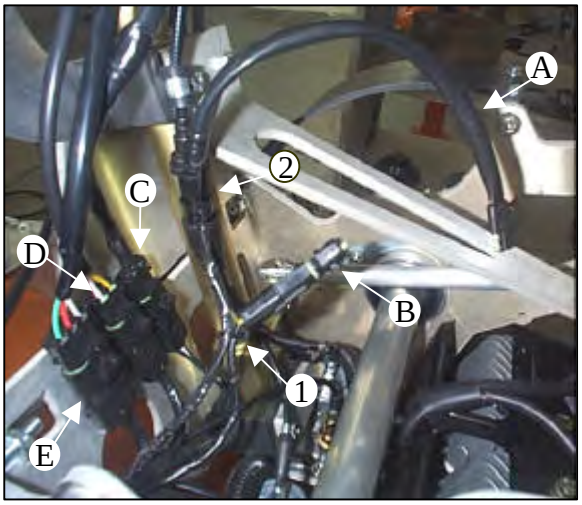
1. Nylon cable fastener



After the nylon cable fastener, the wiring divides into five segments (A-E).

Secure the accessories wire to the wire for the headlight, using a tie wrap (No. 1).

Join the wire for the headlight to the accelerator cable, using a nylon fastener (No. 2).



A- Headlight wire

B- Accessories wire

C- Engine cutoff and emergency stop

D- Stop lamp microswitch

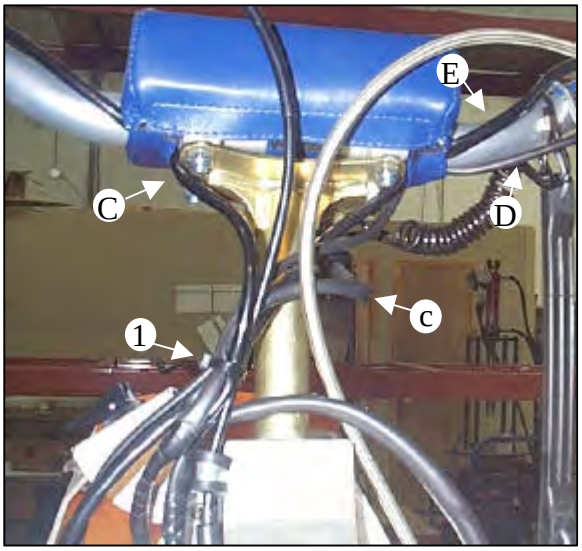
E- Dimmer switch

Bring together the wires of the switch for the lights (E), of the switch for the stop light (D) of the engine cutoff and emergency stop (C) and the accelerator cable, and join them using a nylon fastener (No. 1).

The wires for the engine cutoff and the emergency stop separate into two segments after the junction of wires in No. 1.

C- Emergency stop

c- Engine cutoff

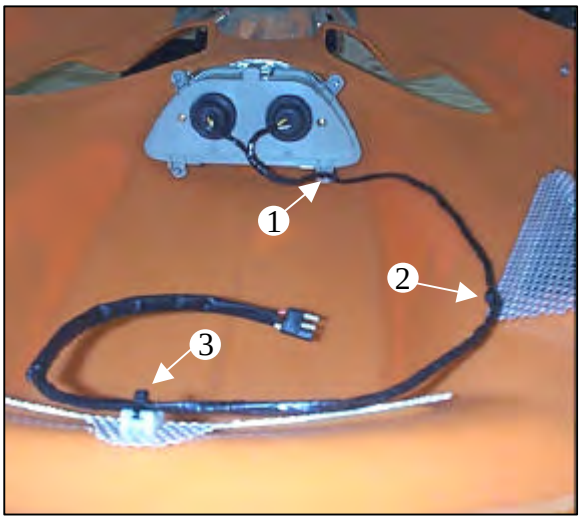


Place the wires for the emergency stop, the switch for the stop light, and the switch for the lights under the protective cushion (see the photograph).

The cab

Nylon fasteners anchor the cab wiring in three places:

1. On the retaining screw of the light (No. 1)
2. On the protective screen (grille) (No. 2)
3. On a nylon cable attachment secured to the back protective screen (grille) of the cabin (No. 3).



CABLE ROUTING

Throttle cable

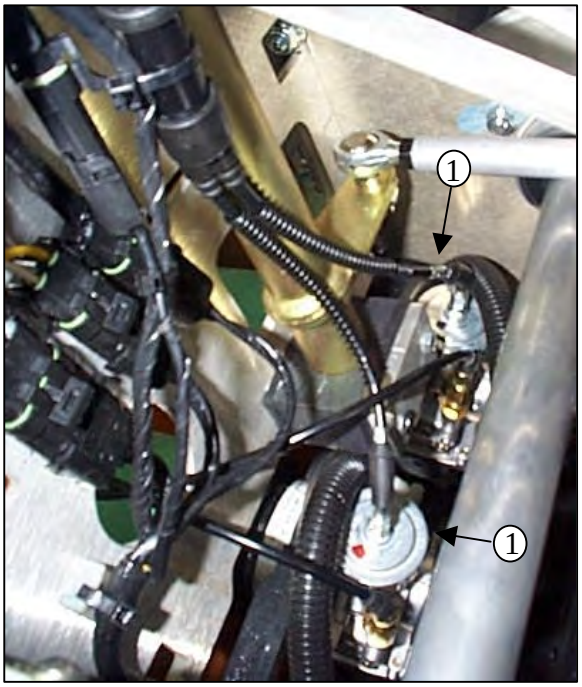
- The throttle cable is secured in the accelerator (No. 1).
- Pass the cable in front of the handlebars.
- Using a cable collar, attach the accelerator cable to the retaining screw of the steering column (No. 2).

◆ WARNING

Before installing them, make sure the cables are in good condition. Install the ends of the cables carefully and secure them solidly in place. Make sure they are routed where they should be and keep them away from any rotating, moving, heating or vibrating part.

The accelerator cable divides into two cables, one for each carburetor (No. 1).

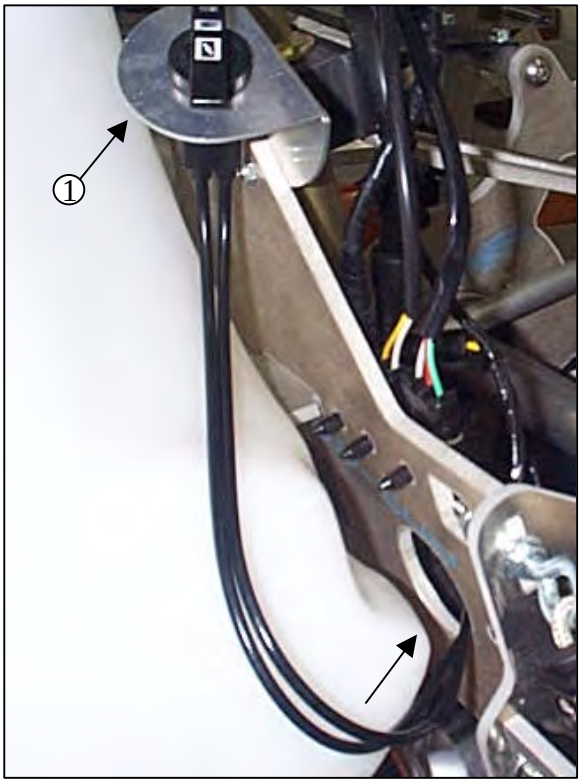
(See section 3, **Fuel System**, for instructions on installing the throttle cable on the carburetors.)



Choke cables

- Install the choke cables in the part that holds the cables up (No. 1).

- Run the cables along the gas tank and pass them through the hole in the plate of the steering column (see the arrow on the photograph).



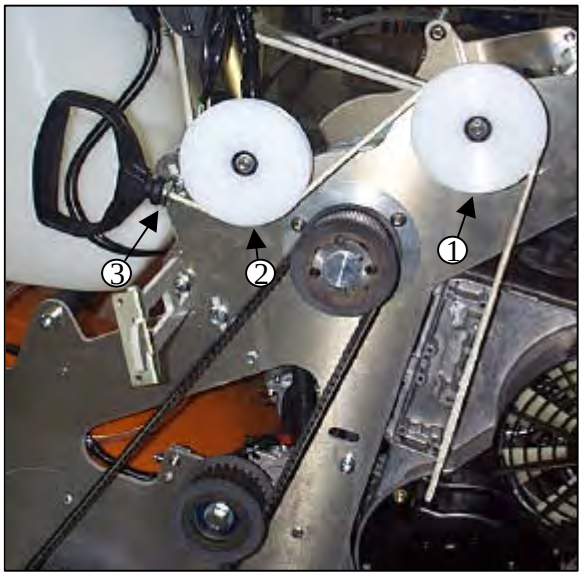
- Pass the choke cables under the electric wires and over the carburetor cables.
- Then install the choke cables on the carburetors.

● *NOTICE:*

One of the two choke cables is longer than the other. Install it on the carburetor that is farther away.

Recoil starter cord

- Pass the recoil starter cord over the pulley (No. 1).
- Then pass it under the pulley (No. 2).
- Then pass the cord through the guide ring (No. 3).
- Install the starter handle.

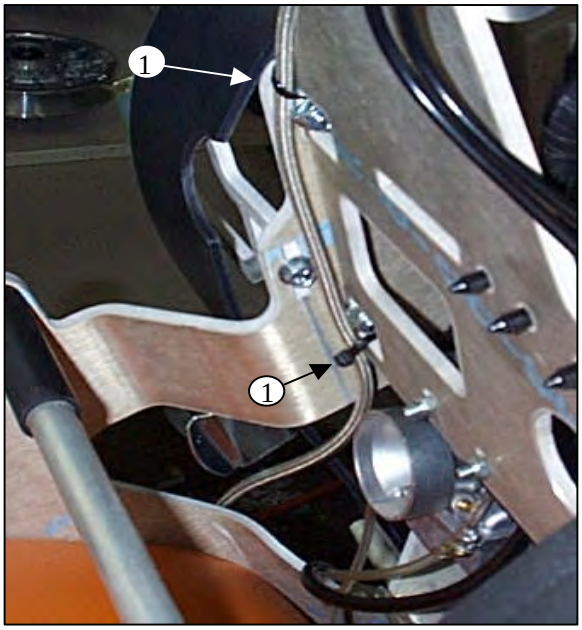


HOSE ROUTING

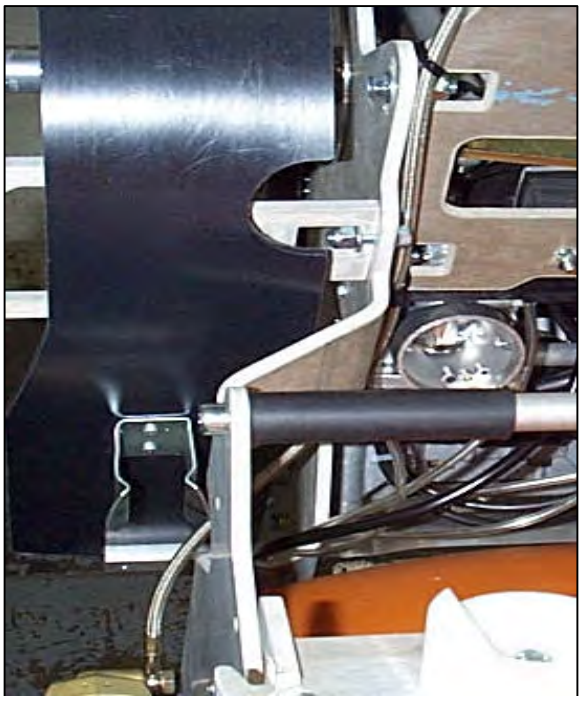
◆ WARNING

Always make sure that the conduits are well secured to the connectors, that they are neither perforated nor mixed-up, and that they are well positioned, far from any rotating, moving, heating or vibrating parts. In addition, check to make sure there are no leaks. Replace them if necessary.

Brake hose

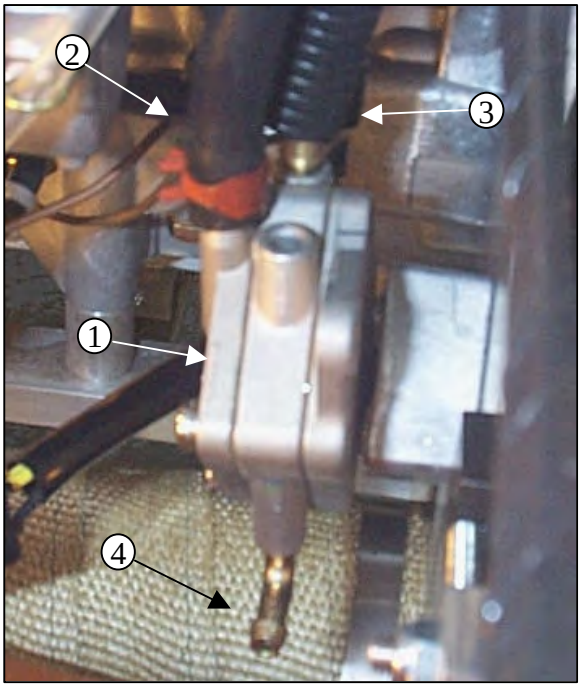


- The brake hose is secured to the brake master cylinder.
- Pass the hose in front of the handlebars and steering column.
- The hose then goes down behind the steering column plate.
- The brake hose is attached along the plate of the steering column with two tie wraps (No. 1).
- The hose then goes outside the chassis through the hole on the left side, near the brake system.
- The hose is then secured to the calliper.



Fuel feeder lines:

The fuel pump (No. 1) has two intakes and two outlets.

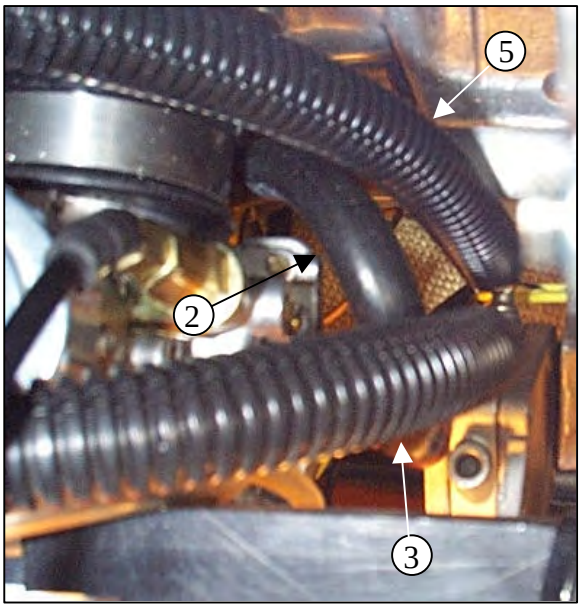


The two intakes are:

1. The gas tank feed (No. 4)
2. The vacuum (No. 2)

The two outlets are:

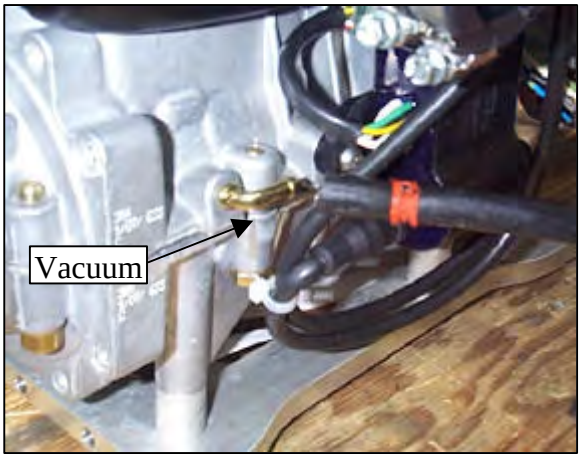
1. The carburetor feed on the MAG side (No. 3).
2. The carburetor feed on the PTO side (No. 5).



After leaving the pump, the vacuum hose goes along the base of the engine under the two carburetor intake adapters.

The hose is installed onto in the vacuum fitting at the base of the engine.

Make sure the spring clamp is well installed to ensure an airtight seal.



Hose (No. 3) passes under the choke cable and the throttle cable, and connects to the MAG side carburetor.

Hose (No. 5) passes along the base of the engine housing and over the two carburetor intake adapters. It goes around the throttle cable and the choke cable, and connects to the PTO side carburetor.

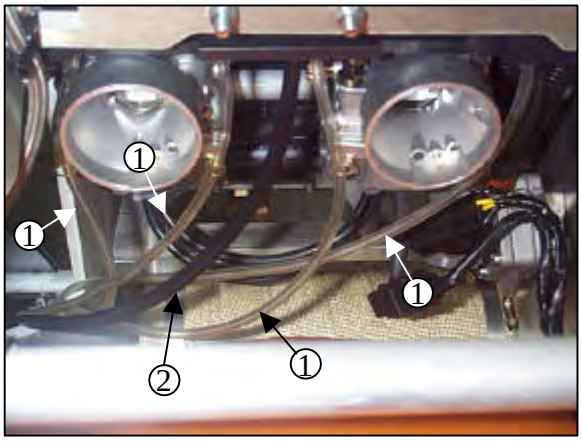
Carefully install all the spring clamps.

Overflow hose and carburetor vent hoses

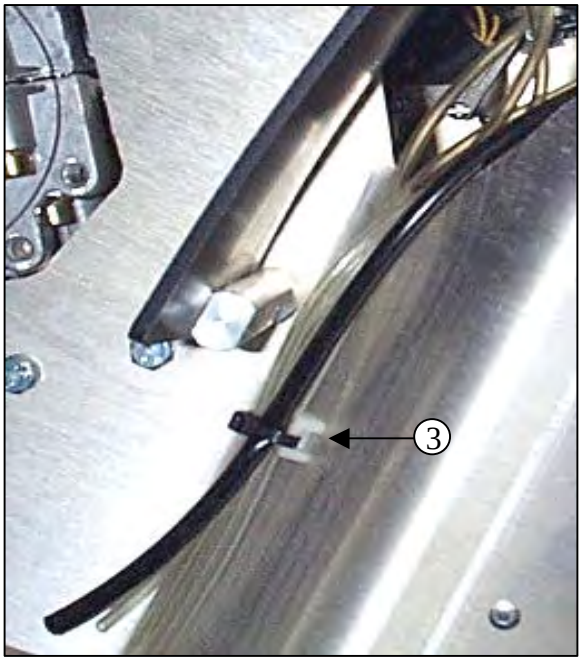
The overflow hose is connected to the cap of the gas tank. It is then routed down through the steering column tube.

The overflow hose (No. 2) comes out at the end of the steering column and passes between the two carburetors.

The carburetor vent hoses (No. 1) and the overflow hose (No. 2) are grouped together and pass outside the chassis through a hole near the brake system.



The hoses go along the chassis and are attached to the nylon cable fastener by a tie wrap.



SPECIFICATIONS

SNOW HAWK SPECIFICATIONS	
ENGINE	
Engine type	Rotax 503, fan cooled, piston port
No. of cylinders	2
Displacement	496.7 (cc) / 30.3 (in^3)
Bore	72 (mm) / 2.8 (in)
Stroke	61 (mm) / 2.4 (in)
Carburation	2 x Mikuni VM 34 (choke)
Exhaust Sytem	Tuned pipe and silencer
DRIVE SYSTEM	
Primary clutch	IBC Power Bloc
Secondary clutch	IBC Formula, cam on countershafti
Max RPM	7100 RPM
Engagement	3450 RPM
Clutch C-C distance	304.8 (mm) / 11.9 (in)
Upper sprocket - # teeth	28
Lower sprocket - # teeth	56
Secondary transmission	High efficiency cog belt (8mm)
Drive sprocket diameter	177 (mm) / 6.9 (in)
Brake system	Brembo; floating 34 mm twin piston on 175 mm disc
SUSPENSION	
Front suspension	PAIOLI 46mm inverted fork - adj. rebound and compression damping
Vertical Travel	308 (mm) / 12 (in)
Rear Suspension	A.D. Boivin EXPERT " X " c/w rebuildable Kayaba HPG shocks
Vertical Travel	385 (mm) / 15 (in)

DIMENSIONS	
Overall length	2698 (mm) / 105 (in)
Overall width	835 (mm) / 32.5 (in)
Overall height	1233 (mm) / 48 (in)
Official dry weight	350 (lbs) / 160 (kg)
Seat height	860 (mm) / 33.5 (in)
Ground clearance	283 (mm) / 11 (in)
Ski length	920 (mm) / 35.8 (in)
Ski width	257 (mm) / 10 (in)
Nominal track width	308 (mm) / 12 (in)
Nominal track length	3074 (mm) *3495* (mm) / 121 (in) *136* (in)
Lug height	58 (mm) / 2.25 (in)
CAPACITIES	
Fuel capacity	17.5 (liters) / 4.5 (US gal)
Recommended fuel	Pre-mix 40 : 1
Recommended octane level	87
Recommended oil	Bombardier pre-mix oil
Electrical output (AC)	240W @ 6000 RPM
Headlight high/low beam	2 x 30 / 30 W
MATERIALS	
Chassis	6061-T6 Aluminium
Hood	HMW Polyethylene
Bellypan	HMW Polyethylene
Ski	UHMW polyethylene
Color	Blue / Orange

HIGH ALTITUDE TECHNICAL DATA

700, rue Jean-Marchand
Lévis , QC Canada G6V 9G6
Tél.: (418) 838-3783 Fax.: (418) 838-3957
Web site: www.adboivin.com

2002 Snow Hawk Hi-Altitude Carburetor and Clutching Set-up:

GENERAL

Since the 2002 Snow Hawk uses individual carburetor filters, carburetor inlet temperature is not always the same as outside temperature, thus jetting is not. Influences from engine heat and the exhaust system have a tendency to increase the engine bay temperature relative to outside air temperature. We have plotted their approximate relationship in the graph shown on the fourth page of this guide.

PROCEDURE - JETTING

How to use the Jetting chart:

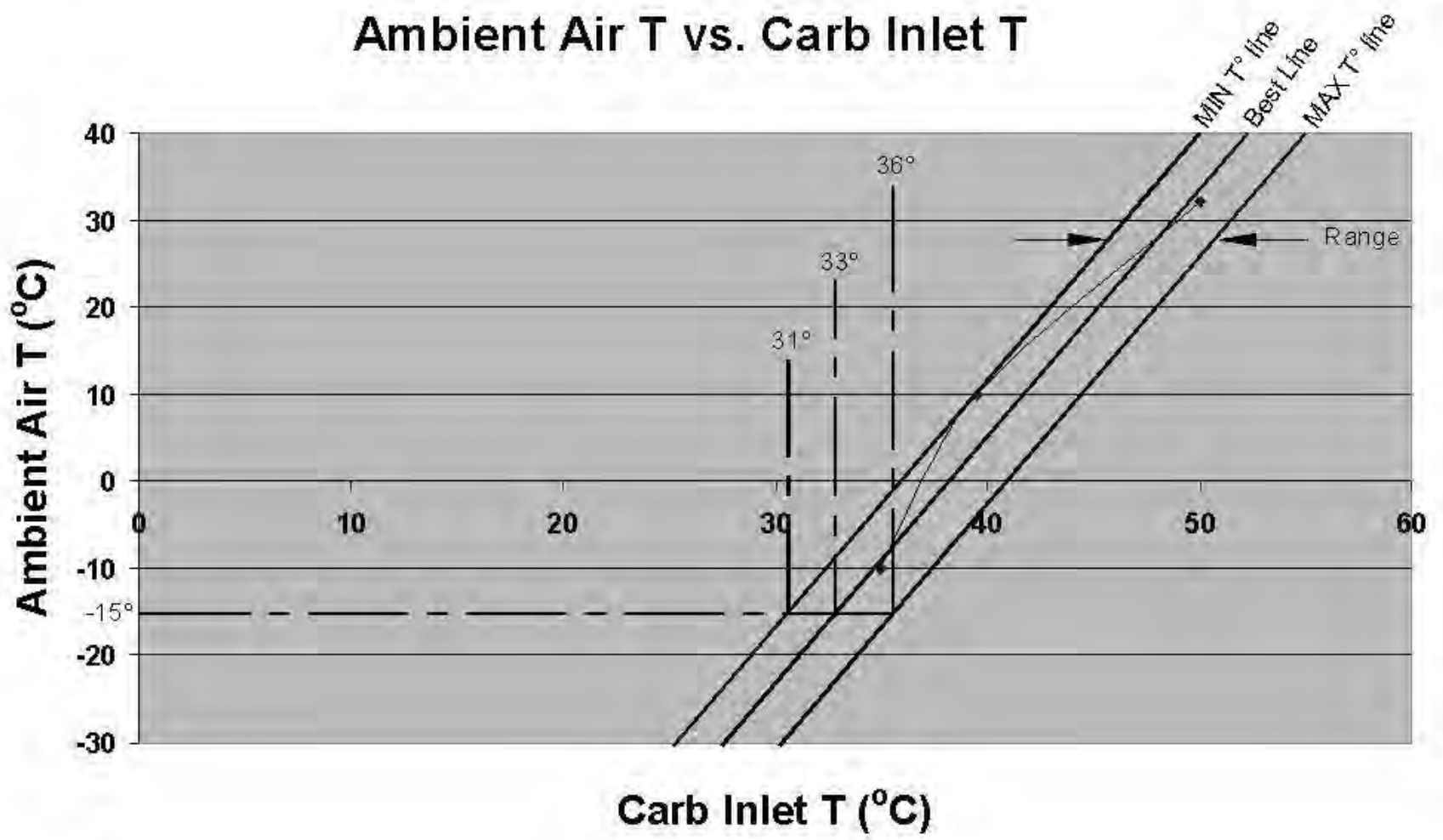
1. Measure the outside (ambient) air temperature
2. Determine the altitude at your location
3. Using the chart on page four of this guide, determine the range of temperatures at the carb inlet by first drawing a horizontal line to the right, away from the vertical ambient air temperature axis.
4. Second, draw a vertical line upwards from each of the intersection points where the horizontal line crosses over the **Best Line**, the **MIN T^{o} line** and the **MAX T^{o} line**.
5. The temperature values where each of these vertical lines intersect the horizontal carb inlet temperature axis are the approximate min, median and max temperatures that are normally found at the carb inlet during normal operation at the specified outside air temperature.
6. Adjust jetting set-up according to the carb inlet temperature given by the intersection of the **Best Line** and the **ambient air temperature** line.
7. After a short trial run, observe the plug color and performance feel of the vehicle closely. If the mixture is too rich, try jetting according to the **MAX T^{o} line**; If the mixture is too lean, try jetting according to the **MIN T^{o} line**.
8. The correct set-up will normally lie in this range.
9. An example is shown on page three of this guide where the outside air temperature (ambient) is shown as **–15^{o}C**. The resulting approximated carb inlet temperature ranges from **31^{o}C** (minimum carb inlet temperature) to **36^{o}C** (maximum carb inlet temperature) with the best approximation of the carb inlet temperature at **33^{o}C**.

NOTE: *This set-up is a recommendation only. It is the responsibility of the owner to pay close attention to spark plug color and engine performance when modifying the stock set-up to avoid lean burn-down.*

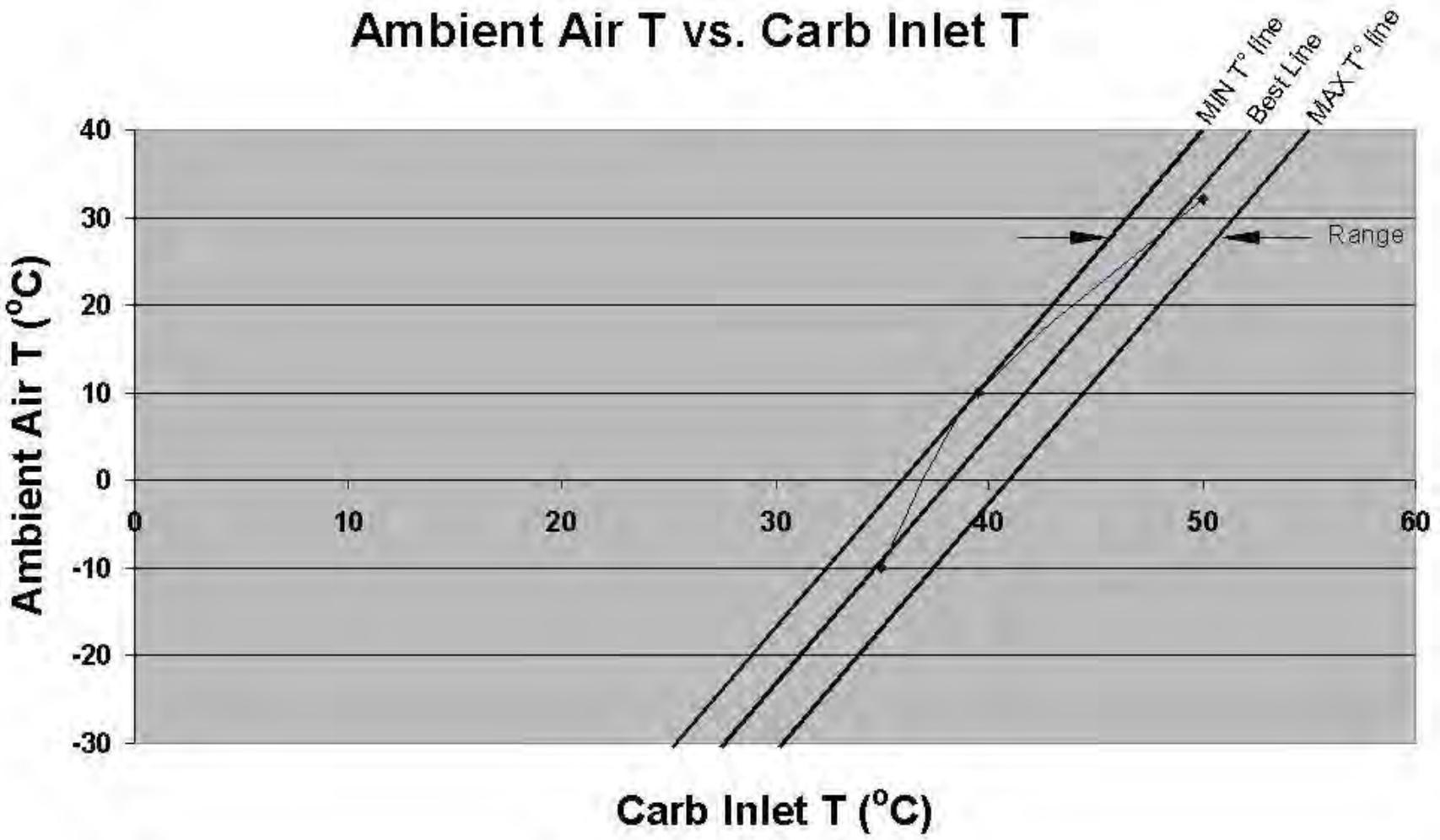
PROCEDURE – CLUTCHING

As a rule of thumb, it is recommended to remove one weight from each arm of the primary clutch for each 2000ft increase in elevation. As a reference, the sea level (0 ft elevation) set-up has nine weights at each of the three primary clutch arms.

Snow Hawk 2002 - Ambient-to-Carburetor Temperature Reference Chart



Snow Hawk 2002 - Ambient-to-Carburetor Temperature Reference Chart



MAIN JET CHART

@CARB

°C / °F	0 / 0	1000 / 305	2000 / 610	3000 / 914	4000 / 1219	5000 / 1524	6000 / 1829	7000 / 2134	8000 / 2438	9000 / 2743	10000 / 3048	Feet / Meter
20 / 68	230 / 220	220 / 210	220 / 200	210 / 190	200 / 190	190 / 180	180 / 170	180 / 160	170 / 160	160 / 150	160 / 150	PTO / MAG
25 / 77	230 / 210	220 / 210	210 / 200	200 / 190	190 / 180	190 / 170	180 / 170	170 / 160	170 / 150	160 / 150	150 / 140	PTO / MAG
30 / 86	220 / 205	220 / 200	210 / 200	200 / 190	190 / 180	180 / 170	180 / 170	170 / 160	160 / 150	150 / 150	150 / 140	PTO / MAG
35 / 95	220 / 210	210 / 200	200 / 190	190 / 190	190 / 180	180 / 170	170 / 160	160 / 160	160 / 150	150 / 140	140 / 140	PTO / MAG
40 / 104	210 / 200	210 / 200	200 / 190	190 / 180	180 / 170	180 / 170	170 / 160	170 / 150	160 / 150	150 / 140	140 / 130	PTO / MAG
45 / 113	210 / 200	200 / 190	190 / 180	180 / 180	180 / 170	170 / 160	160 / 150	150 / 150	150 / 140	140 / 140	140 / 130	PTO / MAG
50 / 122	200 / 190	190 / 190	190 / 180	180 / 170	170 / 160	160 / 160	160 / 150	150 / 140	140 / 140	140 / 130	130 / 130	PTO / MAG

NOTE: These values are suggestions only, tuners are reminded to pay very close attention to plug color and performance feel in order to avoid lean burndown.

PILOT JET CHART

@CARB

°C / °F	0 / 0	1000 / 305	2000 / 610	3000 / 914	4000 / 1219	5000 / 1524	6000 / 1829	7000 / 2134	8000 / 2438	9000 / 2743	10000 / 3048	Feet / Meter
20 / 68	65 / 65	60 / 60	60 / 60	55 / 55	55 / 55	55 / 55	50 / 50	50 / 50	45 / 45	45 / 45	45 / 45	PTO / MAG
25 / 77	65 / 65	60 / 60	60 / 60	55 / 55	55 / 55	50 / 50	50 / 50	50 / 50	45 / 45	45 / 45	40 / 40	PTO / MAG
30 / 86	60 / 60	60 / 60	55 / 55	55 / 55	55 / 55	50 / 50	50 / 50	45 / 45	45 / 45	45 / 45	40 / 40	PTO / MAG
35 / 95	60 / 60	60 / 60	55 / 55	55 / 55	50 / 50	50 / 50	45 / 45	45 / 45	45 / 45	40 / 40	40 / 40	PTO / MAG
40 / 104	60 / 60	55 / 55	55 / 55	50 / 50	50 / 50	50 / 50	45 / 45	45 / 45	40 / 40	40 / 40	40 / 40	PTO / MAG
45 / 113	60 / 60	55 / 55	55 / 55	50 / 50	50 / 50	45 / 45	45 / 45	45 / 45	40 / 40	40 / 40	40 / 40	PTO / MAG
50 / 122	55 / 55	55 / 55	50 / 50	50 / 50	45 / 45	45 / 45	45 / 45	40 / 40	40 / 40	40 / 40	35 / 35	PTO / MAG

NOTE: * When the difference between suggested pilot jet size is less than 15, the correction can be made through airscrew adjustment.
*Shaded areas indicate stock set-up

TUNING: *The "zero setting" for a pilot jet is with the airscrew set to 1.5 turns out from full tight (I.e. zero position).
*To effectively reduce the size of a pilot jet, turn the airscrew further out; 1/4 turn outwards [CCW] is equal to reducing a pilot jet one size, or equivalently reducing the jet number by 5.
*Airscrew range of adjustment varies from 1 to 3 turns outwards. 1 to 2 turns outwards is optimal.

WARRANTY INFORMATION

VEHICLE SERIAL NUMBER	
PLACE OF PURCHASE	
DATE OF PURCHASE	
REGISTERED OWNER	
ADDRESS	
CITY	
STATE/PROVINCE	
ZIP/POSTAL CODE	

Please complete and keep this copy of your warranty registration card in your service manual for future reference.

- -

VEHICLE SERIAL NUMBER	
PLACE OF PURCHASE	
DATE OF PURCHASE	
REGISTERED OWNER	
ADDRESS	
CITY	
STATE/PROVINCE	
ZIP/POSTAL CODE	

Please complete and mail this copy of your warranty registration card to us in order to activate the one year parts warranty for your Snow Hawk.

MAIL TO:

A D BOIVIN design INC.

700, rue Jean-Marchand
Lévis , QC Canada G6V 9G6
Tél.: (418) 838-3783 Fax.: (418) 838-3957
Attn : Warranty Claims