A Few Words About Safety

Service Information

The service and repair information contained in this manual is intended for use by qualified, professional technicians. Attempting service or repairs without the proper training, tools, and equipment could cause injury to you and/or others. It could also damage this Honda product or create an unsafe condition.

This manual describes the proper methods and procedures for performing service, maintenance, and repairs. Some procedures require the use of special tools. Any person who intends to use a replacement part, service procedure, or a tool that is not recommended by Honda must determine the risks to their personal safety and the safe operation of this product.

If you need to replace a part, use Honda Genuine parts with the correct part number or an equivalent part. We strongly recommend that you do not use replacement parts of inferior quality.

For Your Customer's Safety

Proper service and maintenance are essential to the customer's safety and the reliability of this product. Any error or oversight while servicing this product can result in faulty operation, damage to the product, or injury to others.

⚠WARNING

Improper service or repairs can create an unsafe condition that can cause your customer or others to be seriously hurt or killed.

Follow the procedures and precautions in this manual and other service materials carefully.

For Your Safety

Because this manual is intended for the professional service technician, we do not provide warnings about many basic shop safety practices (e.g., Hot parts-wear gloves). If you have not received shop safety training or do not feel confident about your knowledge of safe servicing practices, we recommend that you do not attempt to perform the procedures described in this manual.

Some of the most important general service safety precautions are given below. However, we cannot warn you of every conceivable hazard that can arise in performing service and repair procedures. Only you can decide whether or not you should perform a given task.

⚠WARNING

Failure to properly follow instructions and precautions can cause you to be seriously hurt or killed.

Follow the procedures and precautions in this manual carefully.

Important Safety Precautions

Make sure you have a clear understanding of all basic shop safety practices and that you are wearing appropriate clothing and using safety equipment. When performing any service task, be especially careful of the following:

- Read all of the instructions before you begin, and make sure you have the tools, the replacement or repair parts, and the skills required to perform the tasks safely and completely.
- Protect your eyes by using proper safety glasses, goggles, or face shields anytime you hammer, drill, grind, or work around pressurized air, pressurized liquids, springs, or other stored-energy components. If there is any doubt, put on eye protection.
- Use other protective wear when necessary, for example gloves or safety shoes. Handling hot or sharp parts can cause severe burns or cuts. Before you grab something that looks like it can hurt you, stop and put on gloves.
- Protect yourself and others whenever you have equipment hoisted in the air. Anytime you lift this product with a hoist, make sure that the hoist hook is securely attached to the product.

Make sure the engine is off before you begin any servicing procedures, unless the instruction tells you to do otherwise. This will help eliminate several potential hazards:

- Carbon monoxide poisoning from engine exhaust. Be sure there is adequate ventilation whenever you run the engine.
- Burns from hot parts. Let the engine and exhaust system cool before working in those areas.
- Injury from moving parts. If the instruction tells you to run the engine, be sure your hands, fingers, and clothing are out of the way.

Gasoline vapors and hydrogen gasses from batteries are explosive. To reduce the possibility of a fire or explosion, be careful when working around gasoline or batteries.

- Use only a nonflammable solvent, not gasoline, to clean parts.
- Never store gasoline in an open container.
- Keep all cigarettes, sparks, and flames away from the battery and all fuel-related parts.

CONTENTS

INTRODUCTION

This manual covers the service and repair procedures for the Honda WT20XK1/K2/K3/K4, WT30XK1/K2/K3, and WT40XK0/K1/K2 water pumps.

All information contained in this manual is based on the latest product information available at the time of printing. We reserve the right to make changes at anytime without notice.

As you read this manual, you will find information that is preceded by a NOTICE symbol. The purpose of this message is to help prevent damage to this Honda product, other property, or the environment.

SAFETY MESSAGES

Your safety and the safety of others are very important. To help you make informed decisions, we have provided safety messages and other safety information throughout this manual. Of course, it is not practical or possible to warn you about all the hazards associated with servicing these products. You must use your own good judgment.

You will find important safety information in a variety of forms, including:

- Safety Labels – on the product.
- Safety Messages – preceded by a safety alert symbol ⚠ and one of three signal words, DANGER, WARNING, or CAUTION. These signal words mean:

⚠DANGER You WILL be KILLED or SERIOUSLY HURT if you don't follow instructions.

⚠WARNING You CAN be KILLED or SERIOUSLY HURT if you don't follow instructions.

⚠CAUTION You CAN be HURT if you don't follow instructions.

- Instructions – how to service these products correctly and safely.

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SERVICE RULES

- Use Honda Genuine or Honda-recommended parts and lubricants or their equivalents. Parts that do not meet Honda's design specifications may damage the unit.
- Use the special tools designed for the product.
- Install new gaskets, O-rings, etc. when reassembling.
- When torquing bolts or nuts, begin with larger-diameter or inner bolts first and tighten to the specified torque diagonally, unless a particular sequence is specified.
- Clean parts in cleaning solvent upon disassembly. Lubricate any sliding surfaces before reassembly.
- After reassembly, check all parts for proper installation and operation.
- Many screws used in this machine are self-tapping. Be aware that cross-threading or over-tightening these screws will strip the threads and ruin the hole.

Use only metric tools when servicing this unit. Metric bolts, nuts and screws are not interchangeable with non-metric fasteners. The use of incorrect tools and fasteners will damage the unit.

SYMBOLS

The symbols used throughout this manual show specific service procedures. If supplementary information is required pertaining to these symbols, it will be explained specifically in the text without the use of the symbols.

	Replace the part(s) with new one(s) before assembly.
	Use the recommend engine oil, unless otherwise specified.
	Use molybdenum oil solution (mixture of the engine oil and molybdenum grease in a ratio of 1:1).
	Use multi-purpose grease (lithium based multi-purpose grease NLGI #2 or equivalent).
	Use marine grease (water resistant urea based grease).
	Apply a locking agent. Use a medium strength locking agent unless otherwise specified.
	Apply sealant.
	Use automatic transmission fluid.
(○ x ○) (○)	Indicates the diameter, length, and quantity of metric bolts used.
page 1-1	Indicates the reference page.

ABBREVIATIONS

Throughout this manual, the following abbreviations are used to identify the respective parts or systems.

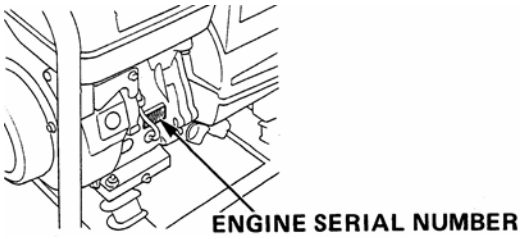
Abbreviated term	Full term
ACG	Alternator
API	American Petroleum Institute
Approx.	Approximately
Assy.	Assembly
ATDC	After Top Dead Center
ATF	Automatic Transmission Fluid
ATT	Attachment
BAT	Battery
BDC	Bottom Dead Center
BTDC	Before Top Dead Center
BARO	Barometric Pressure
CKP	Crankshaft Position
Comp.	Complete
CMP	Camshaft Position
CYL	Cylinder
DLC	Data Link Connector
EBT	Engine Block Temperature
ECT	Engine Coolant Temperature
ECM	Engine Control Module
EMT	Exhaust Manifold Temperature
EOP	Engine Oil Pressure
EX	Exhaust
F	Front or Forward
GND	Ground
HO2S	Heated Oxygen sensor
IAB	Intake Air Bypass
IAC	Idle Air Control
IAT	Intake Air Temperature
I.D.	Inside diameter
IG or IGN	Ignition
IN	Intake
INJ	Injection
L.	Left
MAP	Manifold Absolute Pressure
MIL	Malfunction Indicator Lamp
O.D.	Outside Diameter
OP	Optional Part
PGM-FI	Programmed-Fuel Injection
P/N	Part Number
Qty	Quantity
R.	Right
SAE	Society of Automotive Engineers
SCS	Service Check Signal
STD	Standard
SW	Switch
TDC	Top Dead Center
TP	Throttle Position
VTEC	Variable Valve Timing & Valve Lift Electronic Control

Bl	Black	G	Green	Br	Brown	Lg	Light green
Y	Yellow	R	Red	O	Orange	P	Pink
Bu	Blue	W	White	Lb	Light blue	Gr	Gray

1. SPECIFICATIONS

1. SERIAL NUMBER LOCATION

The engine serial number is stamped on the crankcase. Identify the engine by serial number when ordering parts or making technical inquiries.



2. SPECIFICATIONS

DIMENSIONS AND WEIGHTS

	WT20XK1	WT20XK2	WT20XK3	WT20XK4
Overall length	620 mm (24.4 in)			
Overall width	435 mm (17.1 in)		460 mm (18.1 in)	
Overall height	405 mm (15.9 in)		465 mm (18.3 in)	
Dry weight	38 kg (84 lb)		47 kg (104 lb)	
Operating weight	41.5 kg (92 lb)		50 kg (110 lb)	

	WT30XK1	WT30XK2	WT30XK3
Overall length	660 mm (26.0 in)		
Overall width	485 mm (19.1 in)		495 mm (19.5 in)
Overall height	510 mm (20.1 in)		515 mm (20.3 in)
Dry weight	58 kg (127.9 lb)		60 kg (132 lb)
Operating weight	63 kg (138.9 lb)		65 kg (143 lb)

	WT40XK0	WT40XK1	WT40XK2
Overall length	715 mm (28.1 in)		735 mm (28.9 in)
Overall width	485 mm (19.1 in)		535 mm (21.1 in)
Overall height	560 mm (22.0 in)		565 mm (22.2 in)
Dry weight	68 kg (149.9 lb)		78 kg (172 lb)
Operating weight	73 kg (161.0 lb)		84 kg (185 lb)

PUMP

	WT20XK1	WT20XK2	WT20XK3	WT20XK4
Type	Self-priming centrifugal pump			
Drive	Direct coupled			
Suction port diameter	50 mm (2 in)			
Discharge port diameter	50 mm (2 in)			
Maximum total head lift	26m (90 ft)		30m (100 ft)	
Maximum suction head lift	8 m (26 ft)			
Maximum delivery capacity	650 L (170 US gal, 143 Imp.gal)/min.		710 L (187 US gal, 156 Imp.gal)/min.	
Priming time	50 sec./5 m (16.4 ft)		60 sec./5 m (16.4 ft)	
Maximum speed under no load	3,900 ± 100 rpm			
Priming water capacity	6.0 L (1.58 US gal, 1.32 Imp.gal)			

	WT30XK1	WT30XK2	WT30XK3
Type	Self-priming centrifugal pump		
Drive	Direct coupled		
Suction port diameter	80 mm (3 in)		
Discharge port diameter	80 mm (3 in)		
Maximum total head lift	30m (100 ft)		27m (89 ft)
Maximum suction head lift	8 m (26 ft)		
Maximum delivery capacity	1,300 L (343 US gal, 286 Imp.gal)/min.		1,210 L (319 US gal, 266 Imp.gal)/min.
Priming time	50 sec./5 m (16.4 ft)		90 sec./4.5 m (14.8 ft)
Maximum speed under no load	3,900 ± 100 rpm		
Priming water capacity	10.0 L (2.64 US gal, 2.20 Imp.gal)		

	WT40XK0	WT40XK1	WT40XK2
Type	Self-priming centrifugal pump		
Drive	Direct coupled		
Suction port diameter	100 mm (4 in)		
Discharge port diameter	100 mm (4 in)		
Maximum total head lift	29m (95.1 ft)		26m (85 ft)
Maximum suction head lift	8 m (26 ft)		
Maximum delivery capacity	2,300 L (610 US gal, 506 Imp.gal)/min.		1,640 L (433 US gal, 361 Imp.gal)/min.
Priming time	90 sec./4.5 m (14.8 ft)		150 sec./4.5 m (14.8 ft)
Maximum speed under no load	3,900 ± 100 rpm		
Priming water capacity	10.0 L (2.64 US gal, 2.20 Imp.gal)		

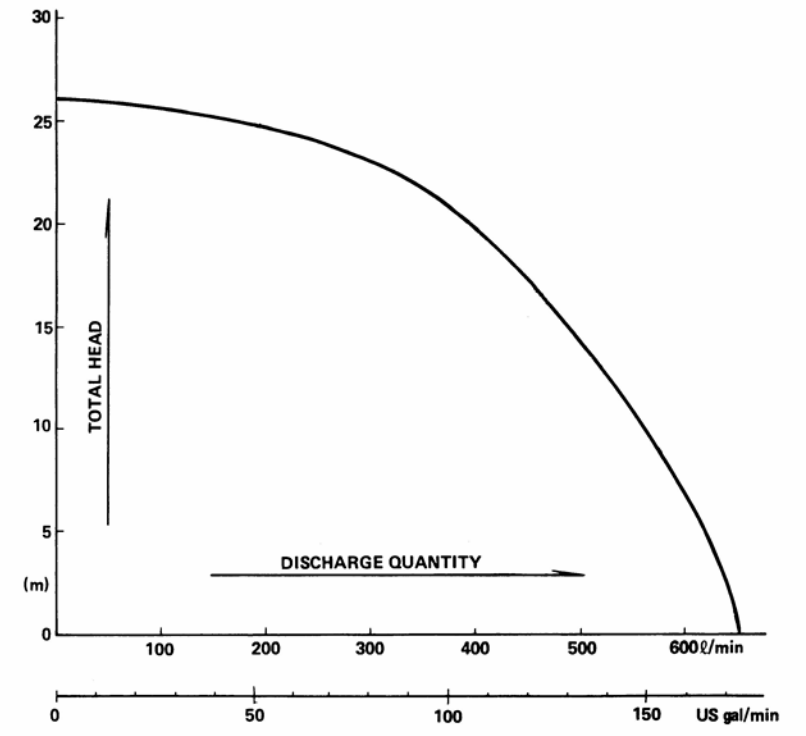
ENGINE

Model	GX140 (WT20XK1)	GX160K1 (WT20XK2/K3)	GX160T2 (WT20XK4)
Type	4-stroke, overhead valve single cylinder inclined by 25°		
Total displacement	144 cm^3 (8.8 cu.in)	163 cm^3 (9.9 cu.in)	
Bore and stroke	64 x 45 mm (2.5 x 1.77 in)	68 x 45 mm (2.68 x 1.77 in)	
Maximum horsepower	3.8 Kw/4,000 min^{-1} (5.0 HP/4,000 rpm)	4.0 Kw/4,000 min^{-1} (5.5 HP/4,000 rpm)	3.6 Kw/3,600 min^{-1} (4.8 HP/3,600 rpm)
Maximum torque	9.8 N•m (7.2 ft-lb)/ 2,500 rpm	11.0 N•m (8.0 ft-lb)/ 2,500 rpm	10.3 N•m (7.6 ft-lb)/ 2,500 rpm
Compression ratio	8.7:1	8.5:1	9.0:1
Cooling system	Forced air cooling		
Ignition system	Transistorized magneto ignition		C.D.I. (Capacitor Discharge Ignition) type magneto ignition
Ignition timing	25° B.T.D.C. (Fixed)		B.T.D.C. 18°/1,400 rpm
Spark plug	BP6ES (NGK) BPR6ES (NGK) W20EP-U (ND) W20EPR-U (ND)	BPR6ES (NGK) W20EPR-U (ND)	
Carburetor	Horizontal butterfly valve		
Air cleaner	Oil bath type	Dual element type	
Governor	Centrifugal		
Lubrication system	Forced splash type		
Oil capacity	0.6 L (20.2 oz, 0.53 Imp.qt)		0.58 L (19.6 oz, 0.51 Imp qt)
Starting system	Recoil starter		
Stopping system	Primary circuit ground		
Fuel tank capacity	3.6 L (0.95 US gal, 0.79 Imp. gal)		3.1 L (0.82 US gal, 0.68 Imp. gal)
Fuel	Regular gasoline (86 pump octane: unleaded preferred)		

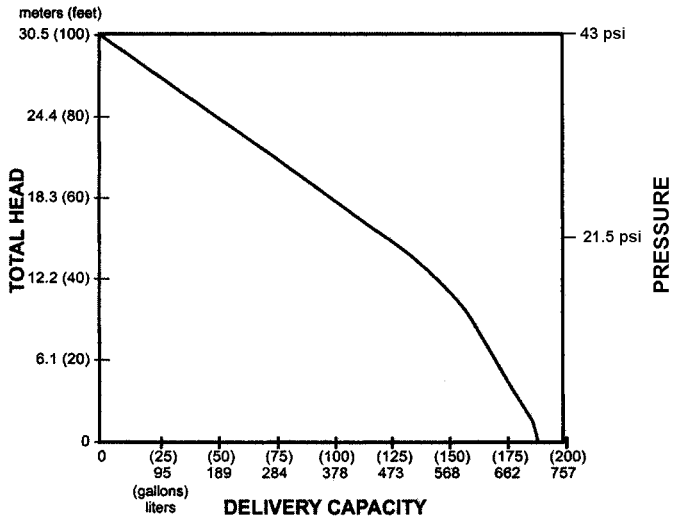
Model	GX240 (WT30XK1)	GX240K1 (WT30XK2/K3)	GX340 (WT40XK0)	GX340K1 (WT40XK1/K2)
Type	4-stroke, overhead valve single cylinder inclined by 25°			
Total displacement	242 cm^3 (14.8 cu.in)		337 cm^3 (20.6 cu.in)	
Bore and stroke	73 x 58 mm (2.9 x 2.3 in)		82 x 64 mm (3.2 x 2.5 in)	
Maximum horsepower	5.88 Kw/4,000 min^{-1} (8.0 HP/4,000 rpm)	6.0 Kw/4,000 min^{-1} (8.0 HP/4,000 rpm)	8.0 Kw/3,600 min^{-1} (11 HP/3,600 rpm)	8.2 Kw/3,600 min^{-1} (11 HP/3,600 rpm)
Maximum torque	17 N•m (12.3 ft-lb)/ 2,500 rpm	17 N•m (12.3 ft-lb)/ 2,500 rpm	24 N•m (17.4 ft-lb)/ 2,500 rpm	24 N•m (17.4 ft-lb)/ 2,500 rpm
Compression ratio	8.2:1		8.0:1	
Cooling system	Forced air cooling			
Ignition system	Transistorized magneto ignition		C.D.I. (Capacitor Discharge Ignition) type magneto ignition	Transistorized magneto ignition
Ignition timing	20° B.T.D.C. (Fixed)		B.T.D.C. 12°-29°	25° B.T.D.C. (Fixed)
Spark plug	BP6ES (NGK) W20EP-U (ND) BPR6ES (NGK) W20EPR-U (ND)	BPR5ES (NGK) W16EPR-U (ND)	BPR6ES-11 (NGK) W20EPR-U11 (ND)	BPR5ES (NGK) W16EPR-U (ND)
Carburetor	Horizontal butterfly valve			
Air cleaner	Oil bath type	Dual element type		
Governor	Centrifugal			
Lubrication system	Forced splash type			
Oil capacity	1.1 L (37.2 oz, 0.97 Imp.qt)			
Starting system	Recoil starter			
Stopping system	Primary circuit ground			
Fuel tank capacity	6.0 L (1.59 US gal, 1.32 Imp. gal)		6.5 L (1.72 US gal, 1.43 Imp. gal)	
Fuel	Regular gasoline (86 pump octane: unleaded preferred)			

3. PERFORMANCE CURVES

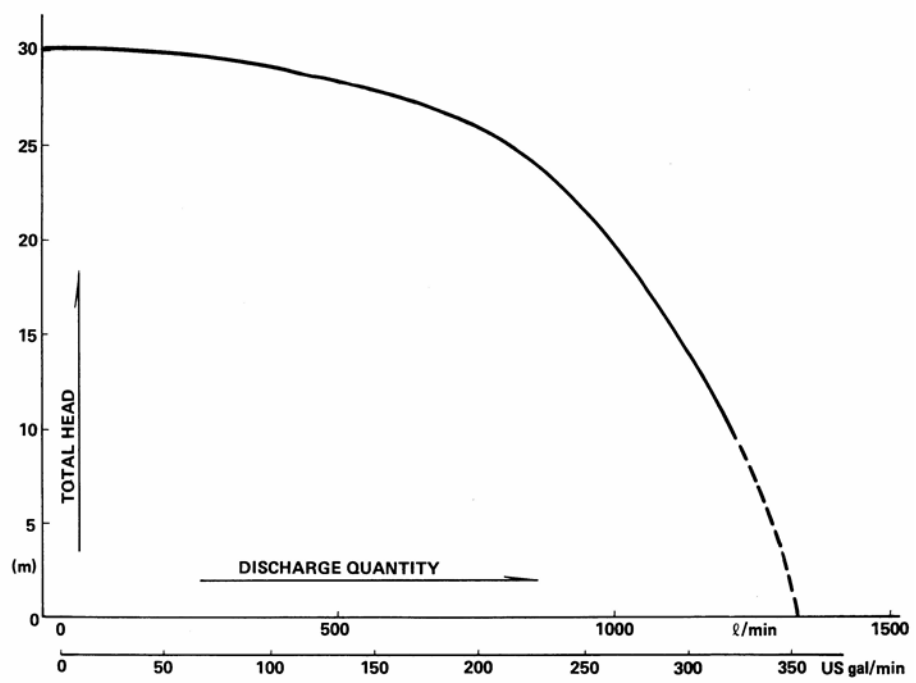
WT20XK1
WT20XK2



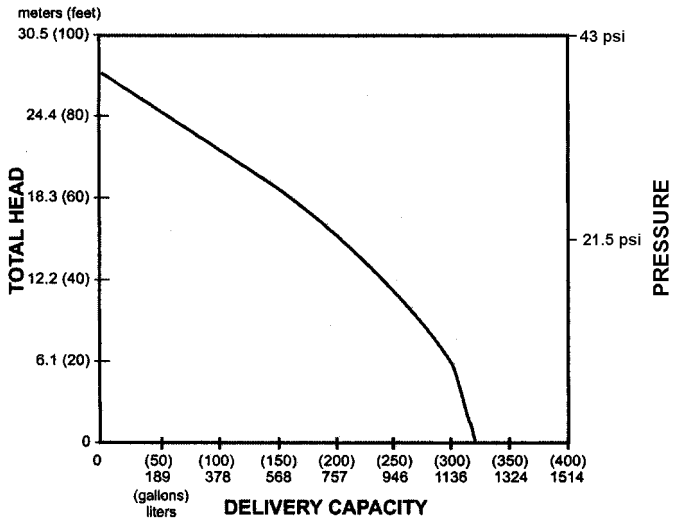
WT20XK3
WT20XK4



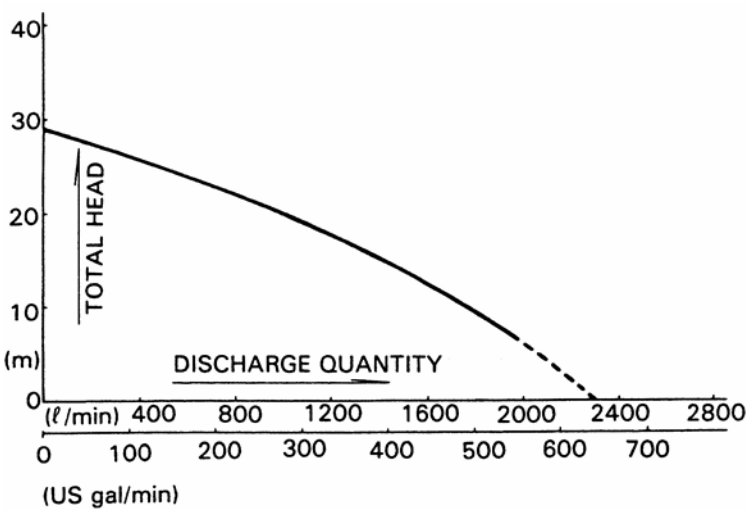
WT30XK1
WT30XK2



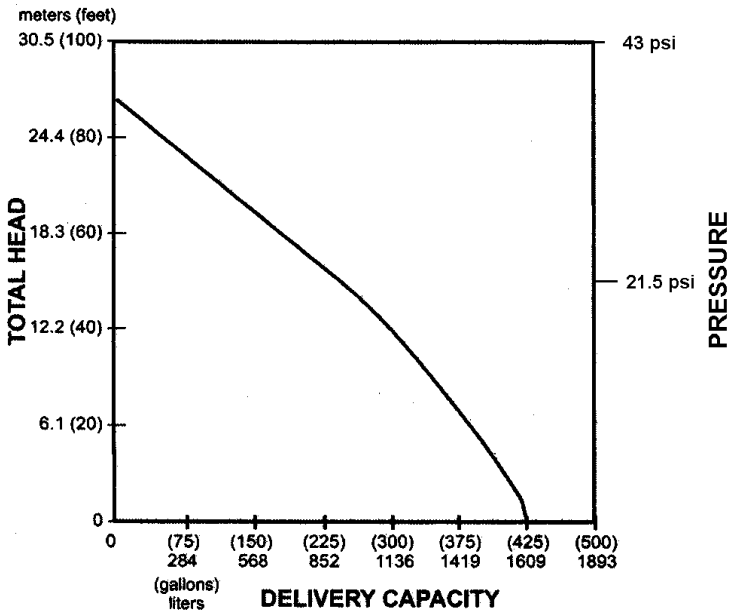
WT30XK3



WT40XK0
WT40XK1



WT40XK2



2. SERVICE INFORMATION

1. MAINTENANCE STANDARDS

PART	ITEM		WT20XK1 (with Honda GX140 engine)		WT20XK2 (with Honda GX160K1 engine)	
			STANDARD	SERVICE LIMIT	STANDARD	SERVICE LIMIT
Engine	Idle speed		1,400 +200 rpm -150 rpm	-----	1,400 rpm ± 150 rpm	-----
	Cylinder compression		6.0-8.5 kg/cm^2 (85-121 psi) at 600 rpm	-----	6.0-8.5 kg/cm^2 (85-121 psi) at 600 rpm	-----
Carburetor	Main jet		#65	-----	#70	-----
	Pilot screw		1-5/8 turns out	-----	2 turns out	-----
	Float height		12.2-15.2 mm (0.48-0.60 in)	-----	13.7 mm (0.54 in)	-----
Spark plug	Gap		0.7-0.8 mm (0.028-0.031 in)	-----	0.7-0.8 mm (0.028-0.031 in)	-----
Valves	Valve clearance	IN	0.15 ± 0.02 mm (0.006 ± 0.0008 in)	-----	0.15 ± 0.02 mm (0.006 ± 0.001 in)	-----
		EX	0.20 ± 0.02 mm (0.008 ± 0.008 in)	-----	0.20 ± 0.02 mm (0.008 ± 0.001 in)	-----
	Stem O.D.	IN	5.468-5.48 mm (0.215-0.216 in)	5.318 mm (0.209 in)	5.468-5.48 mm (0.215-0.216 in)	5.318 mm (0.209 in)
		EX	5.44 mm (0.214 in)	5.275 mm (0.208 in)	5.44 mm (0.214 in)	5.275 mm (0.208 in)
	Guide I.D.	IN/EX	5.50-5.512 mm (0.2165-0.217 in)	5.572 mm (0.219 in)	5.50-5.512 mm (0.2165-0.217 in)	5.572 mm (0.219 in)
	Seat width	IN	0.8 mm (0.032 in)	2.0 mm (0.08 in)	0.8 mm (0.032 in)	2.0 mm (0.08 in)
		EX	0.8 mm (0.032 in)	2.0 mm (0.08 in)	0.8 mm (0.032 in)	2.0 mm (0.08 in)
	Spring free length	IN/EX	34.0 mm (1.339 in)	32.5 mm (1.280 in)	30.5 mm (1.20 in)	29.5 mm (1.16 in)
Piston	Skirt O.D.		63.985 mm (2.519 in)	63.815 mm (2.512 in)	67.985 mm (2.6766 in)	67.845 mm (2.671 in)
	Piston-to-cylinder clearance		0.015-0.050 mm (0.0006-0.002 in)	0.12 mm (0.005 in)	0.015-0.050 mm (0.0006-0.002 in)	0.12 mm (0.005 in)
	Pin hole I.D.		18.002 mm (0.7087 in)	18.048 mm (0.711 in)	18.002 mm (0.7087 in)	18.048 mm (0.711 in)
	Pin O.D.		18.0 mm (0.7087 in)	17.954 mm (0.510 in)	18.0 mm (0.7087 in)	17.95 mm (0.707 in)
	Ring width	Top	1.5 mm (0.059 in)	1.37 mm (0.054 in)	1.5 mm (0.059 in)	1.37 mm (0.054 in)
		Second	1.5 mm (0.059 in)	1.37 mm (0.054 in)	1.5 mm (0.059 in)	1.37 mm (0.054 in)

PART	ITEM		WT20XK1 (with Honda GX140 engine)		WT20XK2 (with Honda GX160K1 engine)	
			STANDARD	SERVICE LIMIT	STANDARD	SERVICE LIMIT
Piston	Ring side clearance	Top/ Second/	0.015-0.045 mm (0.0006-0.0018 in)	0.15 mm (0.006 in)	0.015-0.045 mm (0.0006-0.0018 in)	0.15 mm (0.006 in)
	Ring end gap	Top/ Second	0.2-0.4 mm (0.008-0.016 in)	1.0 mm (0.04 in)	0.2-0.4 mm (0.008-0.016 in)	1.0 mm (0.04 in)
		Oil	0.15-0.35 mm (0.006-0.014 in)	1.0 mm (0.04 in)	0.15-0.35 mm (0.006-0.014 in)	1.0 mm (0.04 in)
Cylinder	Bore I.D.		64.0 mm (2.519 in)	64.165 mm (2.526 in)	68.00 mm (2.68 in)	68.165 mm (2.6837 in)
Connecting rod	Small end I.D.		18.002 mm (0.7087 in)	18.07 mm (0.711 in)	18.002 mm (0.7087 in)	18.07 mm (0.711 in)
	Big end I.D.		30.02 mm (1.181 in)	30.066 mm (1.184in)	30.02mm (1.182 in)	30.066 mm (1.1837 in)
	Big end oil clearance		0.04-0.063 mm (0.0016-0.0025 in)	0.12 mm (0.0047 in)	0.040-0.063 mm (0.0016-0.0025 in)	0.12 mm (0.005 in)
	Big end axial clearance		0.1-0.7 mm (0.004-0.028 in)	1.10 mm (0.043 in)	0.1-0.7 mm (0.004-0.028 in)	1.00 mm (0.04 in)
Crankshaft	Crank pin O.D.		29.98 mm (1.180 in)	29.92 mm (1.178 in)	29.98 mm (1.180 in)	29.92 mm (1.178 in)
Camshaft	Cam height	IN	27.7 mm (1.091 in)	27.45 mm (1.081 in)	31.85-32.25 mm (1.254-1.27 in)	31.10 mm (1.224in)
		EX	27.75 mm (1.093 in)	27.50 mm (1.083 in)	31.57-31.97 mm (1.243-1.259 in)	30.80 mm (1.213 in)
	Journal O.D.		13.984 mm (0.551 in)	13.916 mm (0.548 in)	13.984 mm (0.551 in)	13.916 mm (0.5479 in)
Crankcase	Camshaft holder I.D.		14.00 mm (0.551 in)	14.048 mm (0.553 in)	14.00 mm (0.55 in)	14.048 mm (0.5531 in)
Ignition coil	Resistance: Primary side Secondary side		 0.7 - 0.9 Ω. 6.3 - 7.7 kΩ.	 ----- -----	 0.8 - 1.0 Ω. 5.9 - 7.1 kΩ.	 ----- -----
	Air gap (at flywheel)		0.4 ± 0.2 mm (0.016 ± 0.008 in)	----- -----	0.4 ± 0.2 mm (0.016 ± 0.008 in)	----- -----

PART	ITEM		WT20XK3 (with Honda GX160K1 engine)		WT20XK4 (with Honda GX160T2 engine)	
			STANDARD	SERVICE LIMIT	STANDARD	SERVICE LIMIT
Engine	Idle speed		1,400 rpm ± 150 rpm	-----	1,400 rpm +200 rpm -150 rpm	-----
	Cylinder compression		6.0-8.5 kg/cm^2 (85-121 psi) at 600 rpm	-----	5.0-7.0 kg/cm^2 (74-100 psi) at 600 rpm	-----
Carburetor	Main jet		#70	-----	#70	-----
	Pilot screw		2 turns out	-----	2 turns out	-----
	Float height		13.7 mm (0.54 in)	-----	13.7 mm (0.54 in)	-----
Spark plug	Gap		0.7-0.8 mm (0.028-0.031 in)	-----	0.7-0.8 mm (0.028-0.031 in)	-----
Valves	Valve clearance	IN	0.15 ± 0.02 mm (0.006 ± 0.001 in)	-----	0.08 ± 0.02 mm (0.002 ± 0.001 in)	-----
		EX	0.20 ± 0.02 mm (0.008 ± 0.001 in)	-----	0.10 ± 0.02 mm (0.004 ± 0.001 in)	-----
	Stem O.D.	IN	5.468-5.48 mm (0.215-0.216 in)	5.318 mm (0.209 in)	5.468-5.48 mm (0.215-0.216 in)	5.318 mm (0.209 in)
		EX	5.44 mm (0.214 in)	5.275 mm (0.208 in)	5.425-5.44 mm (0.2136-0.2142 in)	5.275 mm (0.208 in)
	Guide I.D.	IN/EX	5.50-5.512 mm (0.2165-0.217 in)	5.572 mm (0.219 in)	5.50-5.512 mm (0.2165-0.217 in)	5.572 mm (0.219 in)
	Seat width	IN	0.8 mm (0.032 in)	2.0 mm (0.08 in)	0.7-0.9 mm (0.028-0.032 in)	2.0 mm (0.08 in)
		EX	0.8 mm (0.032 in)	2.0 mm (0.08 in)	0.90-1.10 mm (0.035-0.043 in)	2.0 mm (0.08 in)
	Spring free length	IN/EX	30.5 mm (1.20 in)	29.5 mm (1.16 in)	30.5 mm (1.20 in)	29.5 mm (1.16 in)
Piston	Skirt O.D.		67.985 mm (2.6766 in)	67.845 mm (2.671 in)	67.985-67.995 mm (2.6766-2.6770 in)	67.845 mm (2.671 in)
	Piston-to-cylinder clearance		0.015-0.050 mm (0.0006-0.002 in)	0.12 mm (0.005 in)	0.005-0.030 mm (0.0002-0.0012 in)	0.12 mm (0.005 in)
	Pin hole I.D.		18.002 mm (0.7087 in)	18.048 mm (0.711 in)	18.002-18.008 mm (0.7087-0.7090 in)	18.048 mm (0.711 in)
	Pin O.D.		18.0 mm (0.7087 in)	17.95 mm (0.707 in)	17.994-18.0 mm (0.7084-0.7087 in)	17.954 mm (0.7068 in)
	Ring width	Top	1.5 mm (0.059 in)	1.37 mm (0.054 in)	0.925-0.945 mm (0.0364-0.0372 in)	0.905 mm (0.0356 in)
		Second	1.5 mm (0.059 in)	1.37 mm (0.054 in)	0.940-0.960 mm (0.0370-0.0378 in)	0.92 mm (0.036 in)

PART	ITEM		WT20XK3 (with Honda GX160K1 engine)		WT20XK4 (with Honda GX160T2 engine)	
			STANDARD	SERVICE LIMIT	STANDARD	SERVICE LIMIT
Piston	Ring side clearance	Top/ Second/	0.015-0.045 mm (0.0006-0.0018 in)	0.15 mm (0.006 in)	0.060-0.095 mm (0.0024-0.0037 in)	0.15 mm (0.006 in)
	Ring end gap	Top/ Second	0.2-0.4 mm (0.008-0.016 in)	1.0 mm (0.04 in)	0.2-0.4 mm (0.008-0.016 in)	1.0 mm (0.04 in)
		Oil	0.15-0.35 mm (0.006-0.014 in)	1.0 mm (0.04 in)	0.10-0.35 mm (0.004-0.014 in)	1.0 mm (0.04 in)
Pump	Impeller clearance		0.3-0.6 mm (0.012-0.024 in)	-----	0.3-0.6 mm (0.012-0.024 in)	-----
Cylinder	Bore I.D.		68.00 mm (2.68 in)	68.165 mm (2.6837 in)	68.00-68.015 mm (2.6772-2.6778 in)	68.165 mm (2.6837 in)
Connecting rod	Small end I.D.		18.002 mm (0.7087 in)	18.07 mm (0.711 in)	18.005-18.020 mm (0.7089-07094 in)	18.07 mm (0.711 in)
	Big end I.D.		30.02mm (1.182 in)	30.066 mm (1.1837 in)	30.02-30.033 mm (1.1819-1.1824 in)	30.066 mm (1.1837 in)
	Big end oil clearance		0.040-0.063 mm (0.0016-0.0025 in)	0.12 mm (0.005 in)	0.040-0.063 mm (0.0016-0.0025 in)	0.12 mm (0.005 in)
	Big end axial clearance		0.1-0.7 mm (0.004-0.028 in)	1.00 mm (0.04 in)	-----	-----
Crankshaft	Crank pin O.D.		29.98 mm (1.180 in)	29.92 mm (1.178 in)	29.97-29.98 mm (1.1799-1.180 in)	29.92 mm (1.178 in)
Camshaft	Cam height	IN	31.85-32.25 mm (1.254-1.27 in)	31.10 mm (1.224in)	27.503-27.903 mm (1.0828-1.0985 in)	27.450 mm (1.0807in)
		EX	31.57-31.97 mm (1.243-1.259 in)	30.80 mm (1.213 in)		
	Journal O.D.		13.984 mm (0.551 in)	13.916 mm (0.5479 in)	13.966-13.984 mm (0.5498-0.5506 in)	13.916 mm (0.5479 in)
Crankcase	Camshaft holder I.D.		14.00 mm (0.55 in)	14.048 mm (0.5531 in)	14.00-14.018 mm (0.5512-0.5519 in)	14.048 mm (0.5531 in)
Ignition coil	Resistance: Primary side Secondary side		 0.8 - 1.0 Ω. 5.9 - 7.1 kΩ.	 ----- -----	 0.6 - 0.9 Ω. 5.6 - 6.9 kΩ.	 ----- -----
	Air gap (at flywheel)		0.4 ± 0.2 mm (0.016 ± 0.008 in)	----- -----	0.2-0.6 mm (0.008-0.023 in)	----- -----

PART	ITEM		WT30XK1 (with Honda GX240 engine)		WT30XK2 - W30XK3 (with Honda GX240K1 engine)	
			STANDARD	SERVICE LIMIT	STANDARD	SERVICE LIMIT
Engine	Idle speed		1,400 rpm ± 150 rpm	-----	1,400 rpm ± 150 rpm	-----
	Cylinder compression		6.0-8.5 kg/cm^2 (85-121 psi) at 600 rpm	-----	6.0-8.5 kg/cm^2 (85-121 psi) at 600 rpm	-----
Carburetor	Main jet		#88	-----	#88	-----
	Pilot screw		2-1/2 turns out	-----	1-5/8 turns out	-----
	Float height		11.9-14.5 mm (0.47-0.57 in)	-----	13.2 mm (0.52 in)	-----
Spark plug	Gap		0.7-0.8 mm (0.028-0.031 in)	-----	0.7-0.8 mm (0.028-0.031 in)	-----
Valves	Valve clearance	IN	0.15 ± 0.02 mm (0.006 ± 0.001 in)	-----	0.15 ± 0.02 mm (0.006 ± 0.001 in)	-----
		EX	0.20 ± 0.02 mm (0.008 ± 0.001 in)	-----	0.20 ± 0.02 mm (0.008 ± 0.001 in)	-----
	Stem O.D.	IN	6.59 mm (0.259 in)	6.44 mm (0.254 in)	6.59 mm (0.259 in)	6.44 mm (0.254 in)
		EX	6.55 mm (0.258 in)	6.40 mm (0.252 in)	6.55 mm (0.258 in)	6.40 mm (0.252 in)
	Guide I.D.	IN/EX	6.60 mm (0.260 in)	6.66 mm (0.262 in)	6.60 mm (0.260 in)	6.66 mm (0.262 in)
	Seat width	IN	1.1 mm (0.043 in)	2.0 mm (0.08 in)	1.1 mm (0.043 in)	2.0 mm (0.08 in)
		EX	1.1 mm (0.043 in)	2.0 mm (0.08 in)	1.1 mm (0.043 in)	2.0 mm (0.08 in)
	Spring free length	IN/EX	39.0 mm (1.54 in)	37.5 mm (1.16 in)	39.0 mm (1.54 in)	37.5 mm (1.16 in)
Piston	Skirt O.D.		79.985 mm (2.8734 in)	72.62 mm (2.859 in)	79.985 mm (2.8734 in)	72.62 mm (2.859 in)
	Piston-to-cylinder clearance		0.015-0.050 mm (0.0006-0.002 in)	0.12 mm (0.005 in)	0.015-0.052 mm (0.0006-0.002 in)	0.12 mm (0.005 in)
	Pin hole I.D.		18.002 mm (0.7087 in)	18.042 mm (0.7087 in)	18.002 mm (0.7087 in)	18.042 mm (0.7087 in)
	Pin O.D.		18 mm (0.7087 in)	17.95 mm (0.707 in)	18 mm (0.7087 in)	17.95 mm (0.707 in)
	Ring width	Top	1.5 mm (0.059 in)	1.37 mm (0.054 in)	1.5 mm (0.059 in)	1.37 mm (0.054 in)
		Second	1.5 mm (0.059 in)	1.37 mm (0.054 in)	1.5 mm (0.059 in)	1.37 mm (0.054 in)

PART	ITEM		WT30XK1 (with Honda GX240 engine)		WT30XK2 - WT30XK3 (with Honda GX240K1 engine)	
			STANDARD	SERVICE LIMIT	STANDARD	SERVICE LIMIT
Piston	Ring side clearance	Top/ Second/	0.015-0.045 mm (0.0006-0.0018 in)	0.15 mm (0.006 in)	0.015-0.045 mm (0.0006-0.0018 in)	0.15 mm (0.006 in)
	Ring end gap	Top/ Second	0.2-0.4 mm (0.008-0.016 in)	1.0 mm (0.04 in)	0.2-0.4 mm (0.008-0.016 in)	1.0 mm (0.04 in)
		Oil	0.2-0.4 mm (0.008-0.016 in)	1.0 mm (0.04 in)	0.2-0.4 mm (0.008-0.016 in)	1.0 mm (0.04 in)
Pump	Impeller clearance		0.2-1.0mm (0.01-0.04 in)	-----	0.4-0.8 mm (0.016-0.031 in)	-----
Cylinder	Bore I.D.		73.00 mm (2.874 in)	73.17 mm (2.881 in)	73.00 mm (2.874 in)	73.17 mm (2.881 in)
Connecting rod	Small end I.D.		18.005 mm (0.7089 in)	18.07 mm (0.711 in)	18.005 mm (0.7089 in)	18.07 mm (0.711 in)
	Big end I.D.		33.025 mm (1.3002 in)	30.07 mm (1.302 in)	33.025 mm (1.3002 in)	30.07 mm (1.302 in)
	Big end oil clearance		0.040-0.066 mm (0.0016-0.0026 in)	0.12 mm (0.005 in)	0.040-0.066 mm (0.0016-0.0026 in)	0.12 mm (0.005 in)
	Big end axial clearance		0.1-0.7 mm (0.004-0.028 in)	1.10 mm (0.043 in)	0.1-0.7 mm (0.004-0.028 in)	1.10 mm (0.043 in)
Crankshaft	Crank pin O.D.		32.985 mm (1.2986 in)	32.92 mm (1.296 in)	32.985 mm (1.2986 in)	32.92 mm (1.296 in)
Camshaft	Cam height	IN	31.2 mm (1.23 in)	30.95 mm (1.219 in)	31.627-31.827 mm (1.2452-1.2530 in)	31.477 mm (1.2392 in)
		EX	31.1 mm (1.22 in)	30.85 mm (1.219 in)	31.507-31.707 mm (1.2404-1.2483 in)	31.357 mm (1.2345 in)
	Journal O.D.		15.984 mm (0.6293 in)	15.92 mm (0.627 in)	15.984 mm (0.6293 in)	15.92 mm (0.627 in)
Crankcase	Camshaft holder I.D.		16 mm (0.630 in)	16.05 mm (0.632 in)	16 mm (0.630 in)	16.05 mm (0.632 in)
Ignition coil	Resistance: Primary side Secondary side		 0.7 - 0.9 Ω. 6.3 - 7.7 kΩ.	 ----- -----	 0.8 - 1.0 Ω. 5.9 - 7.1 kΩ.	 ----- -----
	Air gap (at flywheel)		0.4 ± 0.2 mm (0.016 ± 0.008 in)	----- -----	0.4 ± 0.2 mm (0.016 ± 0.008 in)	----- -----

PART	ITEM		WT40XK0 (with Honda GX340 engine)		WT40XK1/K2 (with Honda GX340K1 engine)	
			STANDARD	SERVICE LIMIT	STANDARD	SERVICE LIMIT
Engine	Idle speed		1,400 ± 150 rpm	-----	1,400 ± 150 rpm	-----
	Cylinder compression		6.0-8.5 kg/cm^2 (85-121 psi) at 600 rpm	-----	6.0-8.5 kg/cm^2 (85-121 psi) at 600 rpm	-----
Carburetor	Main jet		#98	-----	#92	-----
	Pilot screw		2-1/4 turns out	-----	1-1/2 turns out	-----
	Float height		11.9-14.5 mm (0.47-0.57in)	-----	13.2 mm (0.52 in)	-----
Spark plug	Gap		1.0-1.1 mm (0.039-0.043 in)	-----	1.0-1.1 mm (0.039-0.043 in)	-----
Valves	Valve clearance	IN	0.15 ± 0.02 mm (0.006 ± 0.0008 in)	-----	0.15 ± 0.02 mm (0.006 ± 0.0008 in)	-----
		EX	0.20 ± 0.02 mm (0.008 ± 0.0008 in)	-----	0.20 ± 0.02 mm (0.008 ± 0.0008 in)	-----
	Stem O.D.	IN	6.59 mm (0.259 in)	6.44 mm (0.254 in)	6.59 mm (0.259 in)	6.44 mm (0.254 in)
		EX	6.55 mm (0.258 in)	6.40 mm (0.252 in)	6.55 mm (0.258 in)	6.40 mm (0.252 in)
	Guide I.D.	IN/EX	6.60 mm (0.266 in)	6.66 mm (0.262 in)	6.60 mm (0.266 in)	6.66 mm (0.262 in)
	Seat width		1.1 mm (0.043 in)	2.0 mm (0.079 in)	1.1 mm (0.043 in)	2.0 mm (0.079 in)
	Spring free length	IN/EX	39.0 mm (1.54 in)	37.5 mm (1.48 in)	39.0 mm (1.54 in)	37.5 mm (1.48 in)
Piston	Skirt O.D.		81.985 mm (3.2277 in)	81.85 mm (3.2224 in)	81.985 mm (3.2277 in)	81.85 mm (3.2224 in)
	Piston-to-cylinder clearance		0.015-0.052 mm (0.0006-0.002 in)	0.12 mm (0.005 in)	0.015-0.052 mm (0.0006-0.002 in)	0.12 mm (0.005 in)
	Pin hole I.D.		20.002 mm (0.7875 in)	20.042 mm (0.7891 in)	20.002 mm (0.7875 in)	20.042 mm (0.7891 in)
	Pin O.D.		20.00 mm (0.7874 in)	19.95 mm (0.7854 in)	20.00 mm (0.7874 in)	19.95 mm (0.7854 in)
	Ring side clearance	Top/ Second	0.030-0.060 mm (0.0012-0.0024 in)	0.15 mm (0.006 in)	0.030-0.060 mm (0.0012-0.0024 in)	0.15 mm (0.006 in)
	Ring end gap	Top/ Second	0.2-0.4 mm (0.008-0.0016 in)	1.0 mm (0.04 in)	0.2-0.4 mm (0.008-0.0016 in)	1.0 mm (0.04 in)
		Oil			0.2-0.7 mm (0.1-0.03 in)	
Pump	Impeller clearance		0.2-1.0 mm (0.01-0.04 in)	-----	0.6-0.7 mm (0.024-0.028 in)	-----
Cylinder	Bore I.D.		82.0 mm (3.228 in)	82.17 mm (3.235 in)	82.0 mm (3.228 in)	82.17 mm (3.235 in)

PART	ITEM		WT40XK0 (with Honda GX340 engine)		WT40XK1/K2 (with Honda GX340K1 engine)	
			STANDARD	SERVICE LIMIT	STANDARD	SERVICE LIMIT
Connecting rod	Small end I.D.		20.005 mm (0.7876 in)	20.07 mm (0.7902 in)	20.005 mm (0.7876 in)	20.07 mm (0.7902 in)
	Big end I.D.		36.025 mm (1.4183 in)	36.07 mm (1.4201 in)	36.025 mm (1.4183 in)	36.07 mm (1.4201 in)
	Big end oil clearance		0.040-0.066 mm (0.0016-0.0026 in)	0.12 mm (0.005 in)	0.040-0.066 mm (0.0016-0.0026 in)	0.12 mm (0.005 in)
	Big end side clearance		0.1-0.7 mm (0.004-0.028 in)	1.10 mm (0.043 in)	0.1-0.7 mm (0.004-0.028 in)	1.10 mm (0.043 in)
Crankshaft	Crank pin O.D.		35.985 mm (1.4167 in)	35.93 mm (1.4146 in)	35.985 mm (1.4167 in)	35.93 mm (1.4146 in)
Camshaft	Cam height	IN	33.0 mm (1.299 in)	32.75 mm (1.289 in)	33.0 mm (1.299 in)	32.75 mm (1.289 in)
		EX	32.6 mm (1.283 in)	32.35 mm (1.274 in)	32.6 mm (1.283 in)	32.35 mm (1.274 in)
	Journal O.D.		15.984 mm (0.6293 in)	15.92 mm (0.627 in)	15.984 mm (0.6293 in)	15.92 mm (0.627 in)
Crankcase	Camshaft holder I.D.		16.0 mm (0.630 in)	16.05 mm (0.632 in)	16.0 mm (0.630 in)	16.05 mm (0.632 in)
Ignition coil	Primary side resistance		230 - 290 Ω.	-----	0.8 - 1.0 Ω	-----
	Secondary side resistance		3.6 - 4.6 kΩ.	-----	5.9 - 7.1 kΩ.	-----
	Air gap (at flywheel)		0.4 ± 0.2 mm (0.016 ± 0.008 in)	-----	0.4 ± 0.2 mm (0.016 ± 0.008 in)	-----
Pulser coil	Resistance		30 - 36 Ω.	-----	-----	-----

2. TORQUE VALUES

WT20X

Note:
Use standard torque values for items that are not listed in this table.

Item		Thread dia. (mm)	Torque	
			N•m	ft•lb
Connecting rod bolt	(WT20XK1) (WT20XK2) (WT20XK3)	M7 x 1.0 (Special bolt)	10.8-13.2	7.8-9.5
	(WT20XK4)	M6 x 1.0	10	7
Cylinder head bolt		M8 X 1.25 X 60	22-26	15.9-18.8
Flywheel nut		M14 x 1.5 (Special nut)	70-80	50.6-57.9
Rocker arm pivot adjusting lock nut		M6 x 0.5 (Special nut)	8-12	5.8-8.7
Rocker arm pivot bolt		M8 x 1.25 (Special bolt)	22-26	15.9-18.8
Crankcase cover bolt		M8 x 1.25 X 32	22-26	15.9-18.8
Oil alert unit joint nut		M10 x 1.25 (Special nut)	8-12	5.8-8.7
Fuel filter		M10 x 1.25 (Special nut)	1-2	0.7-1.4
Exhaust pipe joint nut		M8 x 1.25	22-26	15.9-18.8
Air cleaner nut		M6 x 1.0	7-10	5.1-7.2
Spark plug	(WT20XK4)	M14 x 1.25 (Special)	18	13
Oil drain bolt		M10 x 1.25	15-20	10.8-14.5
Fuel tank mount bolt/nut		M6 x 1.0	8-12	5.8-8.7
Fuel strainer cup	(WT20XK4)	M24 x 1.0	3.9	2.9
Sealing bolt		M8 x 1.25	20-28	14.5-20.2
Inlet bolt		M8 x 1.25	6-8	4.3-5.8
Cover bolt setting bolt		M12 x 45	30	22
Volute casing liner bolt (*1)	(WT20XK3) (WT20XK4)	M6 x 16	12	9
Volute casing socket bolt (*1)	(WT20XK3) (WT20XK4)	M8 x 25	17	12
Suction flange bolt	(WT20XK3) (WT20XK4)	M10 x 25	7	5
Delivery flange bolt (*1)	(WT20XK3) (WT20XK4)	M8 x 22	5	4
Pump housing socket bolt (*1)	(WT20XK3) (WT20XK4)	M8 x 55	17	12
Pump mount rubber nut		M8	12	9
Delivery housing bolt		M10 x 30	12	16
Cover knob		M12	40	29
Standard torque		5 mm bolt, nut	4-7	2.9-5.1
		6 mm bolt, nut	8-12	5.8-8.7
		8 mm bolt, nut	20-28	14.5-20.2
		10 mm bolt, nut	35-40	25.3-28.9

(*1): Apply locking agent (Hondalock 2 or equivalent) to the threads.

WT30X

Note:
Use standard torque values for items that are not listed in this table.

Item		Thread dia. (mm)	Torque	
			N•m	ft•lb
Cylinder head bolt		M10 x 1.25 x 80	32-38	23.1-27.5
Pivot lock nut		M6 x 0.5	8-12	5.8-8.7
Pivot bolt		M8 x 1.25 (Special bolt)	22-26	15.9-18.8
Crankcase cover bolt		M8 x 1.25 x 35	22-26	15.9-18.8
Connecting rod bolt		M8 x 1.25 (Special bolt)	12-16	8.7-11.5
Air cleaner wing nut		M6 x 1.0	7-10	5.1-7.2
Exhaust pipe joint nut		M8 x 1.25	22-26	15.9-18.8
Oil drain bolt		M12 x 1.5	20-25	14.5-18.1
Fuel tank mount bolt/nut		M8 x 1.25	22-26	15.9-18.8
Fuel filter		M10 x 1.25	1.8-2.2	1.3-1.6
Fuel strainer cup		M24 x 1.0	3.9	2.9
Oil alert unit joint nut		M10 x1.25	8-12	5.8-8.7
Flywheel mount nut		M16 x 1.5 (Special nut)	110-120	79.5-86.8
Sealing bolt		M8 x 1.25	20-28	14.5-20.2
Inlet bolt		M10 x1.50	6-8	4.3-5.8
Cover bolt setting bolt		M12 x 45	30	22
Volute casing liner bolt (*1)	WT30XK3	M12 x 35	70	51
	WT30XK3 (*2)	M8 x 35	22	16
Suction flange bolt	WT30XK3	M10 x 25	7	5
Delivery flange bolt (*1)	WT30XK3	M10 x 30	7	5
Pump housing socket bolt (*1)	WT30XK3	M8 x 55	17	12
Pump mount rubber nut		M8	12	9
Delivery housing bolt		M10 x 30	22	16
Cover knob		M12	40	29
Standard torque		5 mm bolt, nut	4-7	2.9-5.1
		6 mm bolt, nut	8-12	5.8-8.7
		8 mm bolt, nut	20-28	14.5-20.2
		10 mm bolt, nut	35-40	25.3-28.9
		12 mm bolt, nut	50-60	36.2-43.4

(*1): Apply locking agent (Hondalock 2 or equivalent) to the threads.
(*2): WT30XK3 after S/N WABJ-1116267

WT40X

Note:
Use standard torque values for items that are not listed in this table.

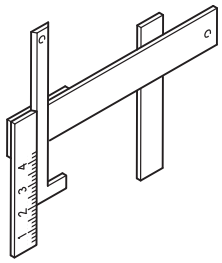
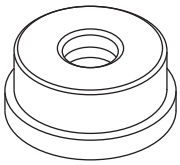
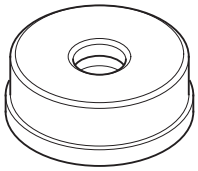
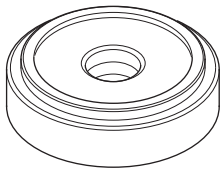
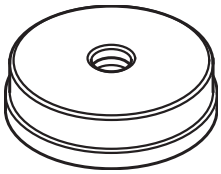
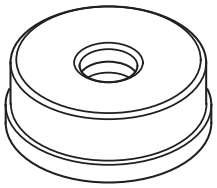
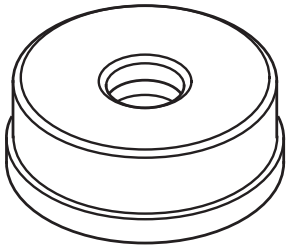
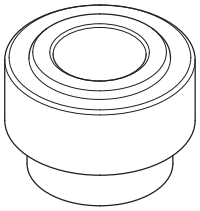
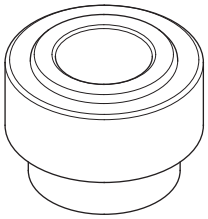
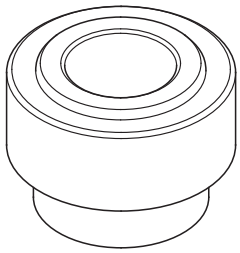
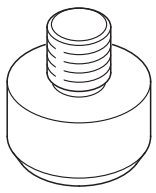
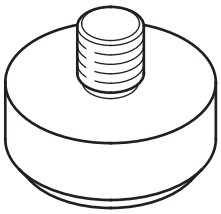
Item		Thread dia. (mm)	Torque	
			N•m	ft•lb
Cylinder head bolt		M10 x 1.25	35	25.3
Pivot lock nut		M6 x 0.5 (Special nut)	10	7.2
Pivot bolt		M8 x 1.25 (Special bolt)	24	17.4
Crankcase cover bolt		M8 x 1.25	24	17.4
Connecting rod bolt		M8 x 1.25 (Special bolt)	24	17.4
Air cleaner wing nut		M6 x 1.0	8.5	6.1
Exhaust pipe joint nut		M8 x 1.25	24	17.4
Oil drain bolt		M12 x 1.5	10	7.2
Fuel tank mount bolt/nut		M8 x 1.25	24	17.4
Fuel filter		M10 x 1.25	2	1.4
Fuel strainer cup		M24 x 1.0	3.9	2.9
Oil alert unit joint nut		M10 x 1.25	8-12	5.8-8.7
Flywheel mount nut		M16 x 1.5 (Special nut)	115	83.2
Pump-to-engine sealing bolt		3/8-16 UNC (Inch bolt)	35	25.3
Inlet bolt		M10 x 1.50	7	5.1
Cover bolt setting bolt		M12 x 45	30	22
Volute casing liner bolt (*1)	WT40XK2	M8 x 35	22	16
Suction flange bolt	WT40XK2	M12 x 25	10	7
Delivery flange bolt (*1)	WT40XK2	M12 x 30	10	7
Pump housing socket bolt (*1)	WT40XK2	5/16-24 UN	17	12
Pump mount rubber nut		M8	12	9
Delivery housing bolt		M10 x 30	22	16
Cover knob		M12	40	29
Standard torque		5 mm screw, bolt, nut	5	3.6
		6 mm screw	9	6.5
		6 mm bolt, nut	10	7.2
		6 mm flange bolt, nut	11	8
		8 mm bolt, nut	21	15.2
		8 mm flange bolt, nut	22	15.9
		10 mm bolt, nut	35	25.3
		10 mm flange bolt, nut	40	28.9

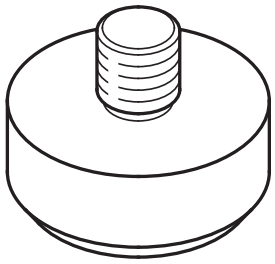
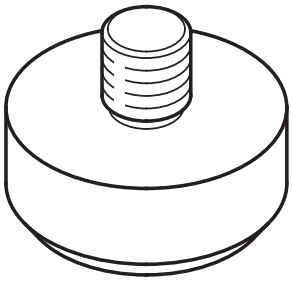
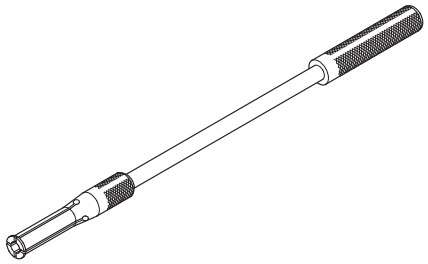
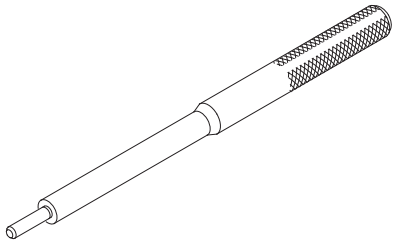
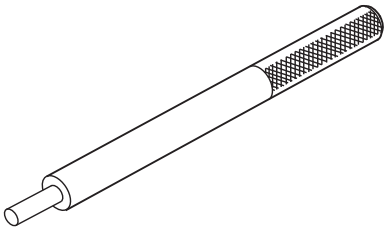
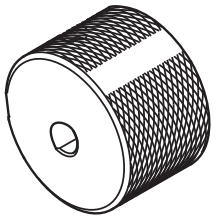
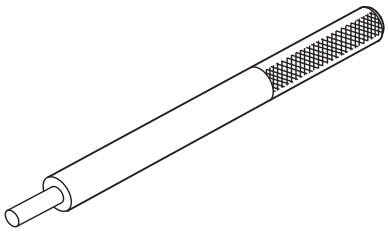
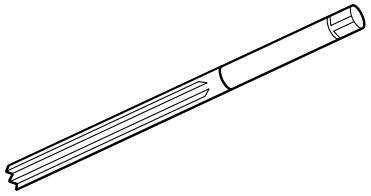
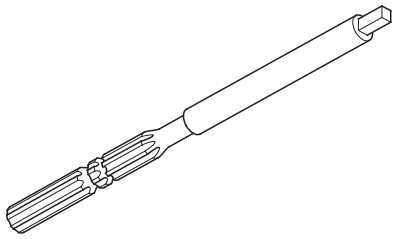
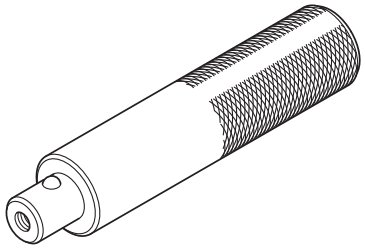
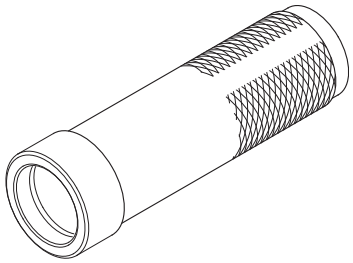
(*1): Apply locking agent (Hondalock 2 or equivalent) to the threads.

3. TOOLS

SPECIAL TOOLS

Special tools used in this manual can be ordered using normal American Honda parts ordering procedures.

Float level gauge 07401-0010000 	Bearing driver attachment, 32 x 35 mm 07746-0010100 	Bearing driver attachment 37 x 40 mm 07746-0010200 
Bearing driver attachment, 42 × 47 mm 07746-0010300 	Bearing driver attachment, 52 × 55 mm 07746-0010400 	Bearing driver attachment, 62 x 68 mm 07746-0010500 
Bearing driver attachment, 72 x 75 mm 07746-0010600 	Inner bearing driver attachment, 25 mm 07746-0030200 	Inner bearing driver attachment, 30 mm 07746-0030300 
Inner bearing driver attachment, 35 mm 07746-0030400 	Pilot, 15mm 07746-0040300 	Pilot, 25 mm 07746-0040600 

Pilot, 30 mm 07746-0040700 	Pilot, 35 mm 07746-0040800 	Bearing remover, 15 mm 07936-KC10500 
Valve guide driver 07942-8920000 	Valve guide driver 07942-6570100 	Weight 07936-371020A 
Valve guide driver 07742-0010200 	Valve guide reamer 07984-ZE2000D 	Valve guide reamer, 5.5 mm 07984-200000D 
Driver 07749-0010000 	Driver, 40 mm I. D. 07746-0030100 	

COMMERCIALLY AVAILABLE TOOLS

Tool name	Tool number	Application
Digital multimeter	FLU87A	Electrical testing
Valve seat cutter, 30 x 45 degree	NWYCU128	Valve seat reconditioning
Valve seat cutter, 60 degree	NWYCU114	
Solid pilot bar, 6.60 mm	NWY100-6.60	
Solid pilot bar, 6.62 mm	NWY100-6.62	
Solid pilot bar, 6.65 mm	NWY100-6.65	
T handle	NWYTW505	
Strap wrench	S-17	
Ring compressor	LIL18500	
Valve lapper	LIL21100	
Flywheel puller	OTC7403	Flywheel removal
Compression gauge	EEPV303A	Compression testing
Leak down tester	KLIAT1006M	
Cylinder bore gauge	FFL52548007	Cylinder honing
400-grit flex hone tool	Based on bore size	
Variable speed heavy-duty drill		

There are two convenient ways to order: online or by toll-free phone.

- To order online, go to the iN: SERVICE>Tools>Tool and Equipment Program>Online Catalog, and then search by model number.
- To order by phone, call 1-888-424-6857.
  Customer service representatives are available from 7:30 AM until 7:00 PM CT, Monday through Friday

1. MAINTENANCE SCHEDULE

REGULAR SERVICE PERIOD Perform at every indicated month or operating hour interval, whichever comes first. ITEM		EACH USE	FIRST MONTH OR 20HRS (2)	EVERY 3 MONTHS OR 50 HRS (2)	EVERY 6 MONTHS OR 100 HRS (2)	EVERY YEAR OR 300 HRS (2)	See page
Engine oil	Check level	○					3-2
	Change		○		○		
Air cleaner	Check	○					3-3
	Clean			○(1)			
	Replace					○	
Sediment cup	Clean				○		3-7
Spark plug	Check-Readjust				○		3-4
	Replace					○	
Spark arrester (optional part)	Clean-Inspect				○		3-8
Valve clearance	Check-Readjust					○	3-5
Combustion chamber cleaning	Clean	WT20X: After every 500 hours WT30X & WT40X: After every 1000 hours					13-2
Fuel tank & filter	Check fuel tube	Every 2 years [replace if necessary]					11-2
	Clean tank & filter					○	
Impeller	Check					○	5-2
Impeller clearance	Check					○	5-9
Pump inlet valve	Check					○	5-2
Pump casing	Clean	Clean after each use (3)					5-5

(1) Service more frequently when used in dusty areas.
(2) For professional commercial use, log hours of operation to determine proper maintenance intervals.
(3) Drain pump casing after each use (rinse if you were pumping dirty water).

2. ENGINE OIL

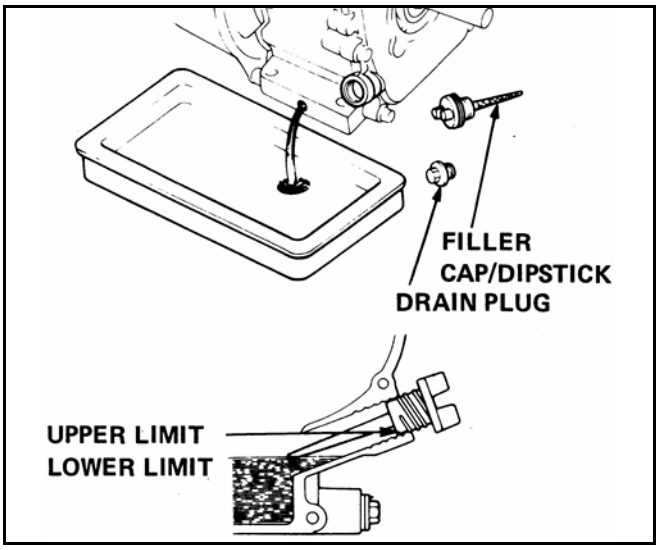
Check the OIL ALERT® system on this page at the time the engine oil is changed.

Draining can be performed rapidly and completely while the engine is still warm.

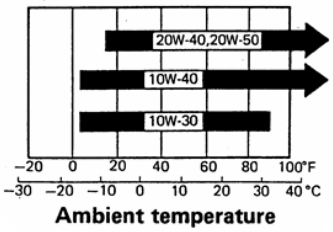
1. Remove the oil filler cap/dipstick and drain plug. Allow the oil to drain completely.
2. Reinstall the drain plug, and tighten it securely.
3. Fill the crankcase with recommended engine oil up to the lower edge of the oil filler neck.
4. Reinstall the filler cap/dipstick.

NOTICE

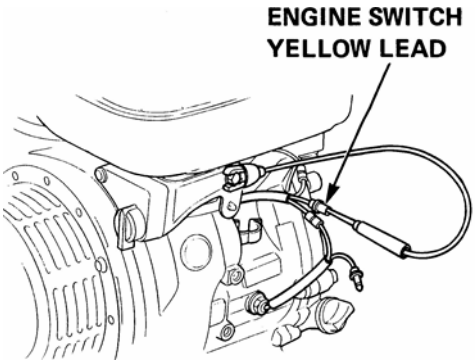
Be sure the engine is upright, not tilted, when checking the engine oil level.



RECOMMENDED ENGINE OIL:
SAE 10W40 is recommended for general, all-temperature use; service classification SJ or later.



OIL CAPACITY:
WT20X1/K2/K3: 0.60 L (20.2 oz, 0.53 Imp.qt)
WT20XK4: 0.58 L (19.6 oz, 0.51 Imp qt)
WT30X: 1.1 L (37.2 oz, 0.97 Imp.qt)
WT40X: 1.1 L (37.2 oz, 0.97 Imp.qt)

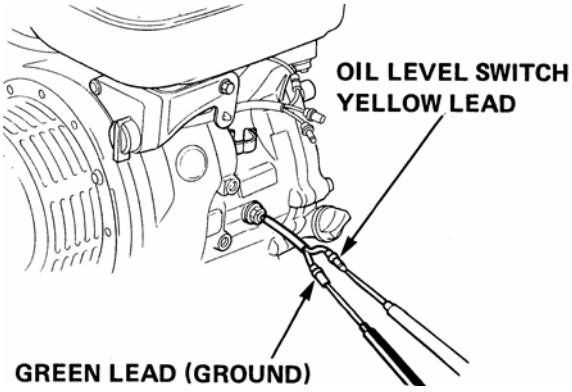


3. OIL ALERT

SERVICE BULLETIN #3 **SERVICE BULLETIN #4**

For convenience, perform this test in conjunction with the engine oil change.

1. With the engine running, disconnect the yellow lead from the engine switch, and ground the lead against the engine. The warning lamp should flash, and the engine should stop.
2. With the engine stopped, the crankcase filled with oil, and the oil level switch leads disconnected, check continuity between the yellow and green oil level switch leads. There should be no continuity.
3. With the engine stopped, the oil drained from the crankcase, and the oil level switch leads disconnected, check continuity between the yellow and green oil level switch leads. There should be continuity.

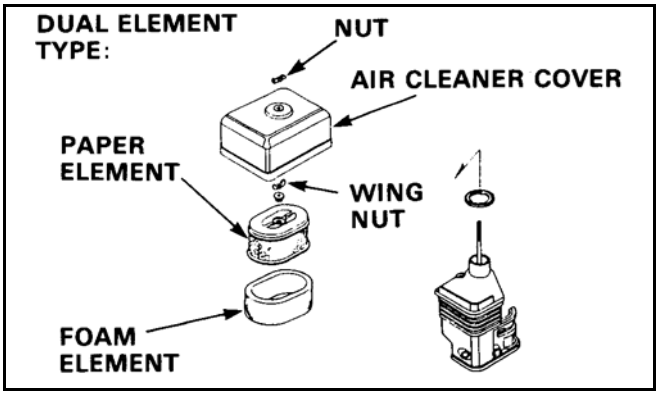


4. AIR CLEANER

A dirty air filter will restrict air flow to the carburetor, reducing engine performance. If the engine is operated in dusty areas, clean the air cleaner more often than specified in the MAINTENANCE SCHEDULE (P. 3-1).

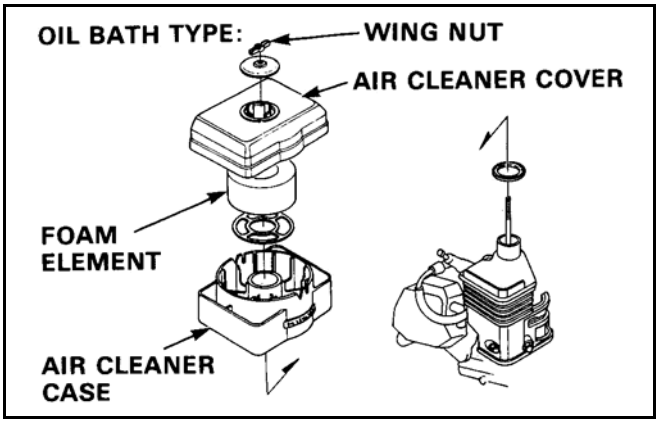
NOTICE

• Operating the engine without the air filters or with the filter installed loosely will allow dirt to enter the engine, causing rapid engine wear. Install the air filters securely.



DUAL ELEMENT TYPE

1. Foam element: Wash in high flash point solvent and dry.
2. Dip the foam element in clean engine oil, and squeeze out excess oil.
3. Paper element: Tap the element lightly on a hard surface to remove dirt, or blow compressed air through the filter from the inside. If extremely dirty or damaged, replace the element.



OIL BATH TYPE

Remove the following:

- Wing nut
- Air cleaner cap
- Air cleaner cover
- Air cleaner element

Carefully check the element for holes or tears and replace if damaged.

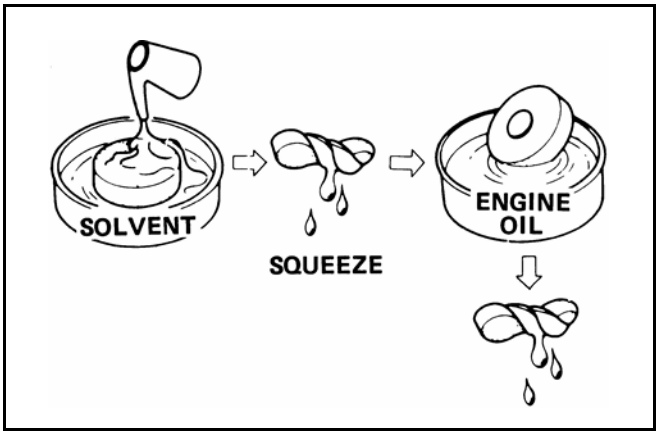
Clean the element if it is to be reused.

Check the oil contamination and oil level of the cleaner case.

If the oil level is low, fill with engine oil to the upper level of the air cleaner case. If the oil is dirty, clean the air cleaner case and add engine oil to the upper level of the air cleaner case.

OIL CAPACITY: 60 cc

Installation is the reverse order of removal.

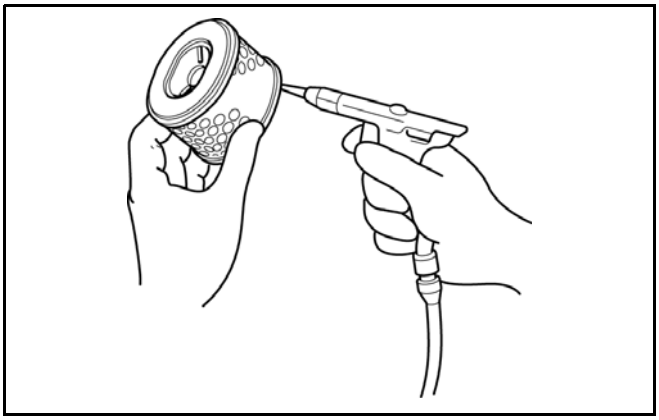


ELEMENT CLEANING

Foam:
Clean the filter in warm soapy water, rinse, and allow to dry thoroughly, or clean with a non-flammable solvent and allow to dry throughly.

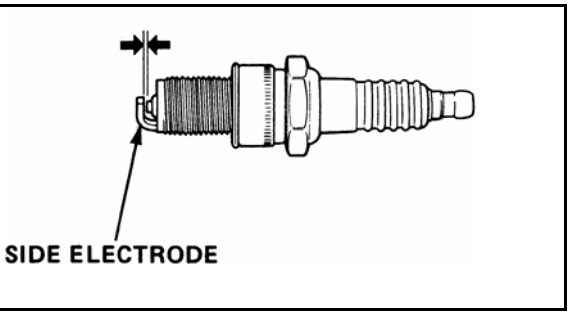
Dip the filter in clean engine oil, and squeeze out all the excess oil. Excess oil will restrict air flow through the foam element and may cause the engine to smoke at startup.

Paper:
Tap the inner filter lightly several times on a hard surface to remove dirt, or blow compressed air lightly (206 kPa, 30psi or less) through the paper filter from the inside out. Never try to brush the dirt off; brushing will force dirt into the fibers.



5. SPARK PLUG

1. Clean any dirt from around the spark plug.
2. Remove the plug cap, and use a spark plug wrench to remove the plug.
3. Visually inspect the spark plug. Replace it if the electrodes are worn, or if the insulator is cracked or chipped.
4. Check the plug gap with a wire-type feeler gauge and correct the gap as necessary by bending the side electrode.



Electrode gap	WT20X WT30X	0.7-0.8 mm (0.028-0.031 in)
	WT40X	1.0-1.1 mm (0.039-0.043 in)

Standard spark plug	WT20XK1 WT30XK1	BP6ES, BPR6ES (NGK) W20EP-U, W20EPR-U (ND)
	WT20XK2 WT20XK3 WT20XK4	BPR6ES (NGK) W20EPR-U (ND)
	WT30XK2 WT30XK3 WT40XK1 WT40XK2	BPR5ES (NGK) W16EPR-U (ND)
	WT40XK0	BPR6ES-11 (NGK) W20EPR-U11 (ND)

5. Make sure the sealing washer is in good condition, and with the washer attached, thread the plug in by hand to prevent cross-threading.
6. After the spark plug is seated, tighten with a spark plug wrench to compress the washer. When installing a new spark plug, tighten 1/2 turn after the spark plug seats to compress the washer. When reinstalling a used spark plug, tighten 1/8-1/4 turn after the spark plug seats to compress the washer.

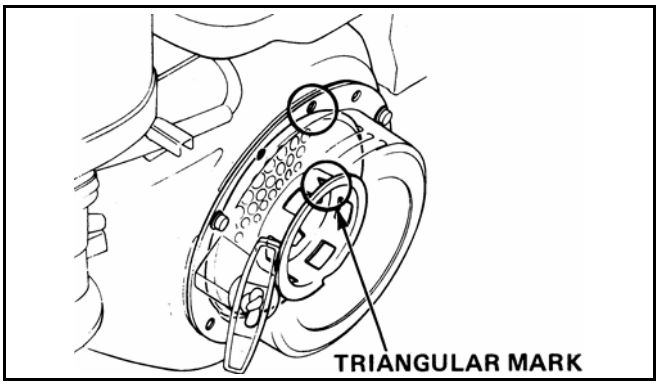
⚠ CAUTION

- The plug must be securely tightened. An improperly tightened plug can become very hot and possibly damage the engine.
- Never use a spark plug with an improper heat range.

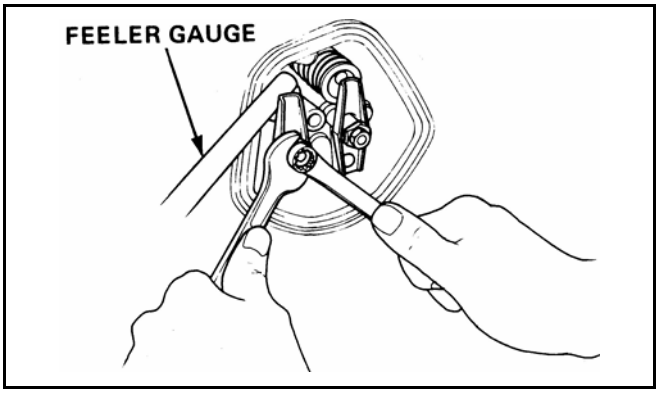
6. VALVE CLEARANCE

Valve clearance inspection and adjustment must be performed with the engine cold.

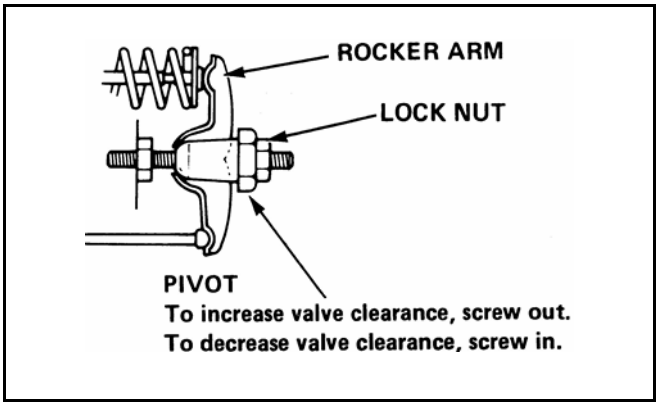
1. Remove the cylinder head cover, and set the piston at top dead center of the compression stroke (both valves fully closed). The triangular mark on the starter pulley will align with the top hole on the starter cover when the piston is at top dead center of the compression or exhaust stroke.
2. Insert a feeler gauge between the rocker arm and valve to measure valve clearance.



Standard valve clearance	WT20XK1 WT20XK2 WT20XK3 WT30X WT40X	IN	0.15 ± 0.02 mm (0.006 ± 0.001 in)
		EX	0.20 ± 0.02 mm (0.008 ± 0.001 in)
	WT20XK4	IN	0.08 ± 0.02 mm (0.002 ± 0.001 in)
		EX	0.10 ± 0.02 mm (0.004 ± 0.001 in)



3. If adjustment is necessary, proceed as follows:
   a. Hold the rocker arm pivot and loosen the pivot lock nut.
   b. Turn the rocker arm pivot to obtain the specified clearance.
   c. Retighten the lock nut while holding the rocker arm pivot.
   d. Recheck the valve clearance after tightening the lock nut.



7. CARBURETOR

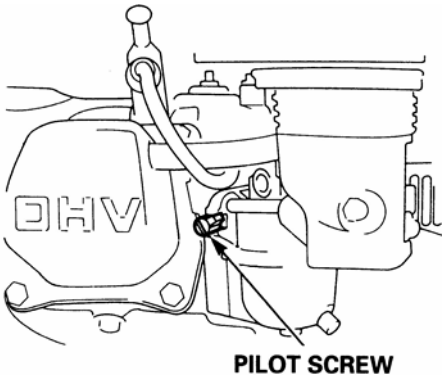
THROTTLE STOP AND PILOT SCREW

NOTICE

The pilot screw on WT20XK2/K3/K4, WT30XK2/K3, and WT40XK1/K2 models is fitted with a limiter cap (P. 10-6) that prevents excessive enrichment of the air-fuel mixture in order to comply with emissions regulations. Do not attempt to remove the limiter cap for pilot screw adjustments. The limiter cap cannot be removed without breaking the pilot screw.

ADJUSTMENT FOR MODELS WITHOUT A LIMITER CAP

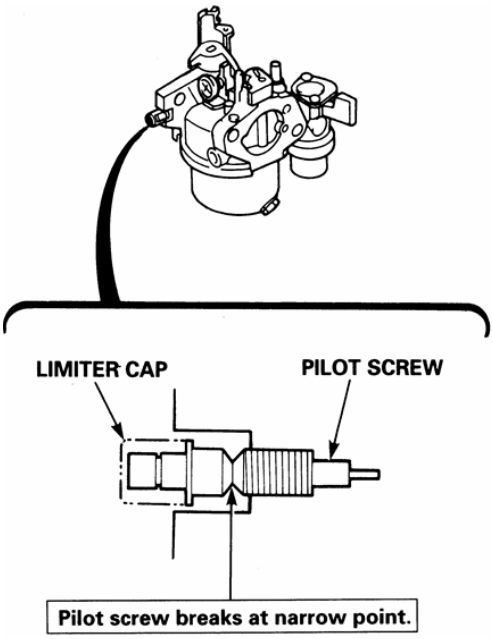
1. Start the engine and allow it to warm up to normal operating temperature.



2. With the engine idling, turn the pilot screw in or out to the setting that produces the highest idle rpm. The correct setting will usually be obtained at approximately the following number of turns out from the fully closed (lightly seated) position.

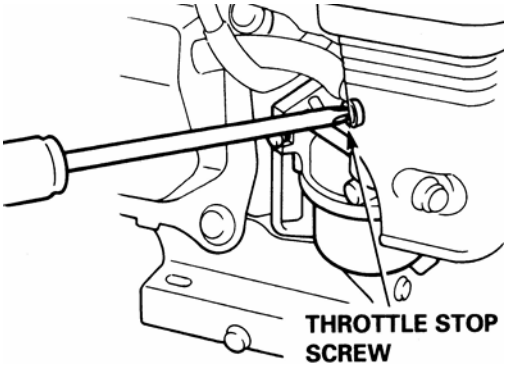
Pilot screw opening	WT20XK1	1-5/8 turns out
	WT30XK1	2-1/2 turns out
	WT40XK0	2-1/4 turns out

LIMITER CAP MODELS



3. After the pilot screw is correctly adjusted, turn the throttle stop screw to obtain the standard idle speed.

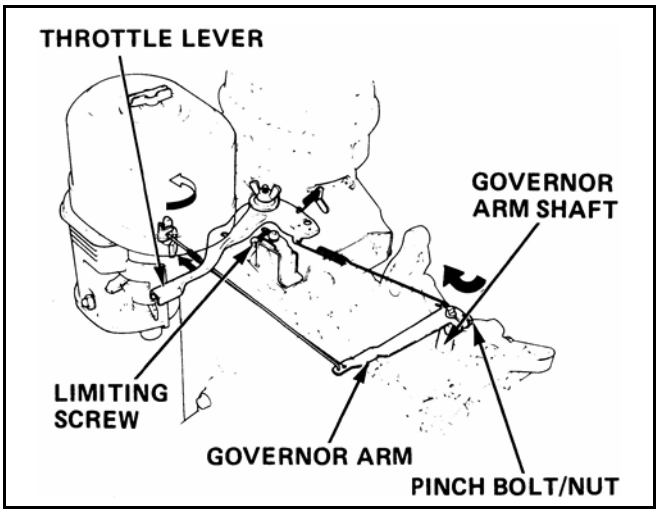
Standard idle speed	WT20XK1	1,400 rpm +200/-150 rpm
	WT30XK1	1,400 rpm ± 150 rpm
	WT40XK0	1,400 rpm ± 150 rpm



8. GOVERNOR

1. Loosen the nut on the governor arm pinch bolt, and move the governor arm to fully open the throttle.
2. Rotate the governor arm shaft as far as it will go in the same direction the governor arm moved to open the throttle. Tighten the pinch bolt.
3. Start the engine and allow it to warm up to normal operating temperature. Move the throttle lever to run the engine at the standard maximum speed, and adjust the throttle lever limiting screw so the throttle lever cannot be moved past that point.

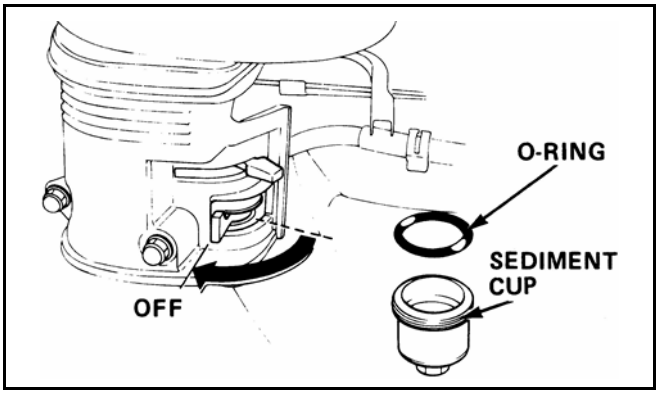
Standard maximum speed (at no load)	WT20X	3,900 ± 100 rpm
	WT30X WT40X	4,000 ± 100rpm



9. SEDIMENT CUP

1. Turn off the fuel valve and remove the sediment cup.
2. Clean the sediment cup with solvent.
3. Install the O-ring and sediment cup. Tighten the sediment cup to the specified torque value.

TORQUE: 3.9 N•m (2.9 ft-lb)



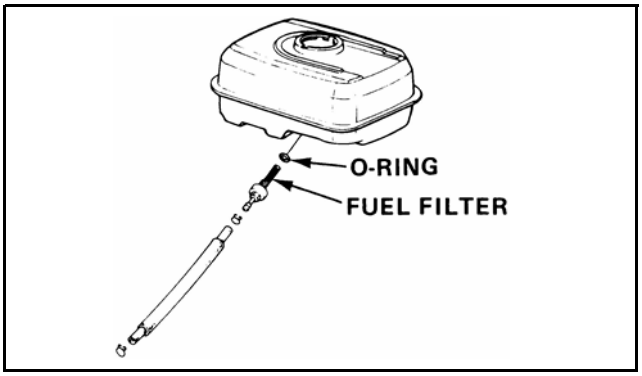
10. FUEL FILTER

⚠ WARNING

- Gasoline is extremely flammable and is explosive under certain conditions. Do not smoke or allow flames or sparks in the area.
- After installing the fuel filter, check for leaks, and make sure the area is dry before starting the engine.

1. Drain the fuel into a suitable container, and remove the fuel tank.
2. Disconnect the fuel line, and unscrew the fuel filter from the tank.
3. Clean the filter with solvent, and check to be sure the filter screen is undamaged. Also flush and clean the fuel tank, if necessary.
4. Place the O-ring on the filter and reinstall. Tighten the filter to the specified torque value. After reassembly, check for leaks.

TORQUE:
WT20X: 1.0-2.0 N•m (0.7-1.4 ft-lb)
WT30X: 1.8-2.2 N•m (1.3-1.6 ft-lb)
WT40X: 2 N•m (1.4 ft-lb)

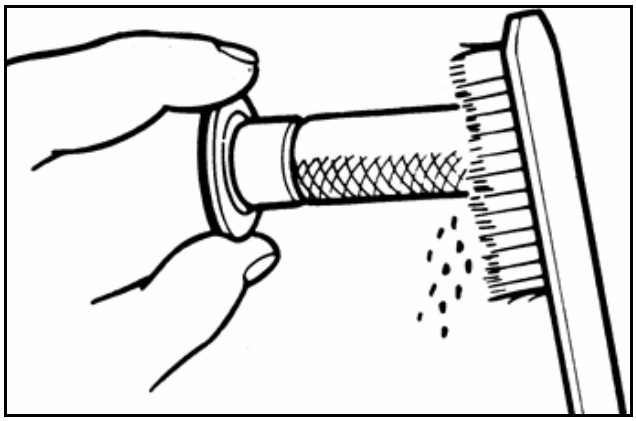


11. SPARK ARRESTER (OPTIONAL PART)

⚠ CAUTION

The engine and the muffler becomes very hot during operation, and remain hot for a while after stopping the engine. Be careful not to touch the muffler while it is hot. Allow it to cool before proceeding.

1. Remove the spark arrester.
   WT20X: (page 8-2)
   WT30X: (page 8-3)
   WT40X: (page 8-3)
2. Clean the carbon deposits from the spark arrester with a wire brush.
3. Check the spark arrester screen for damage. If the screen is damaged, replace the spark arrester.
4. Install the spark arrester in the reverse order of removal.



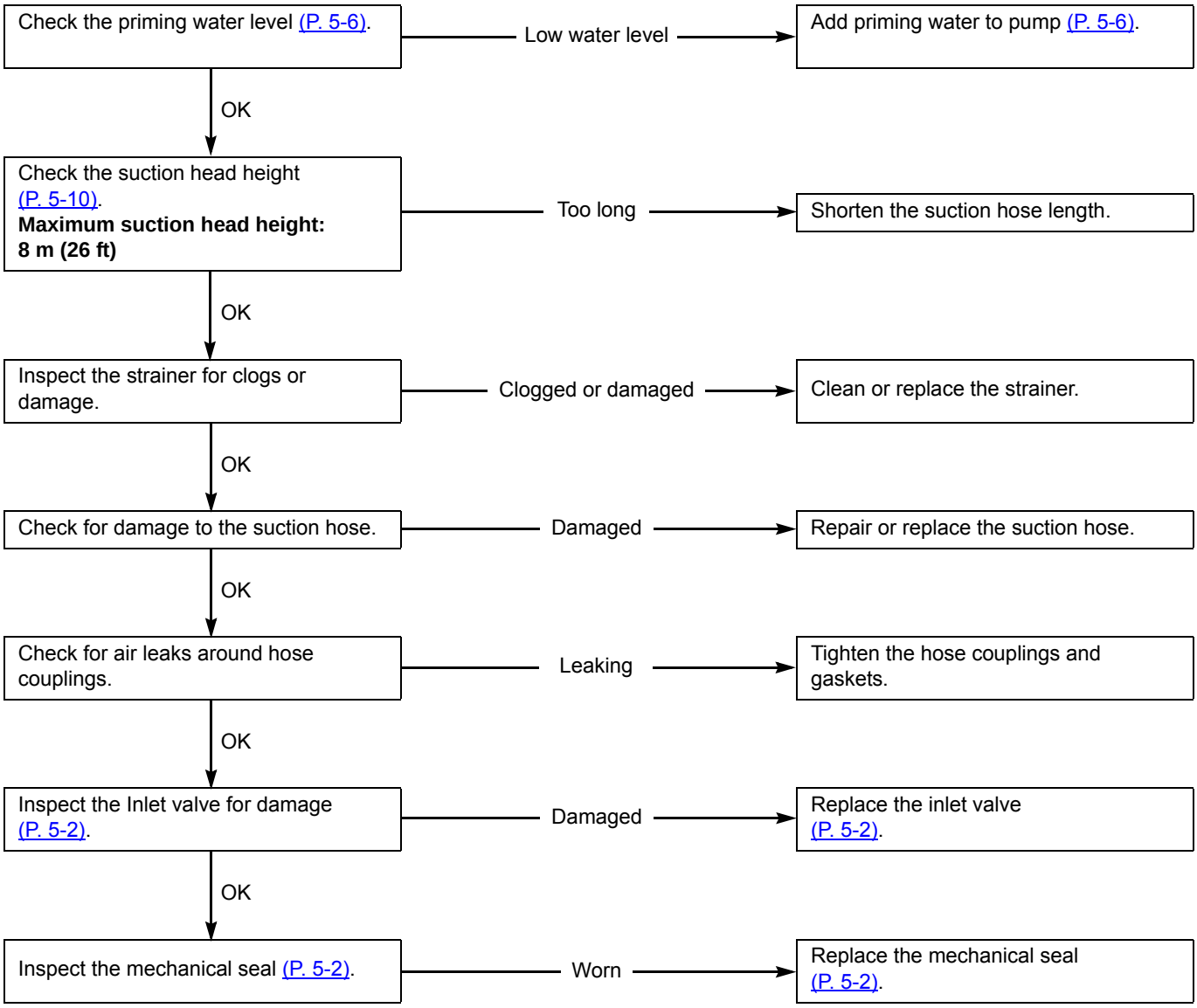
4. TROUBLESHOOTING

1. BEFORE TROUBLESHOOTING

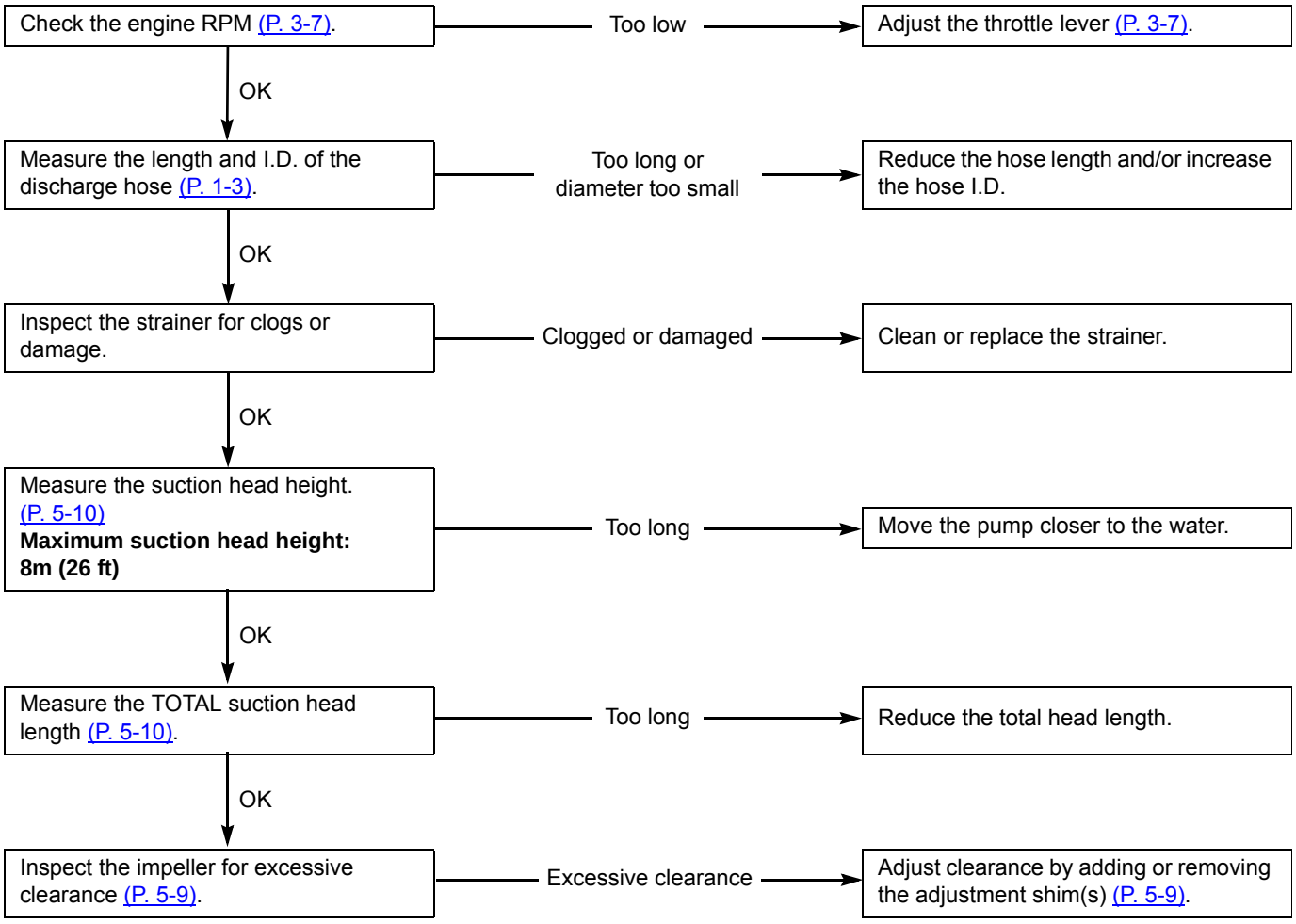
- Use a known-good battery for troubleshooting.
- Check that the connectors are connected securely.
- Check for sufficient fresh fuel in the fuel tank.
- Read the circuit tester's operation instructions carefully, and observe the instructions during inspection.

PUMP VAC TESTER

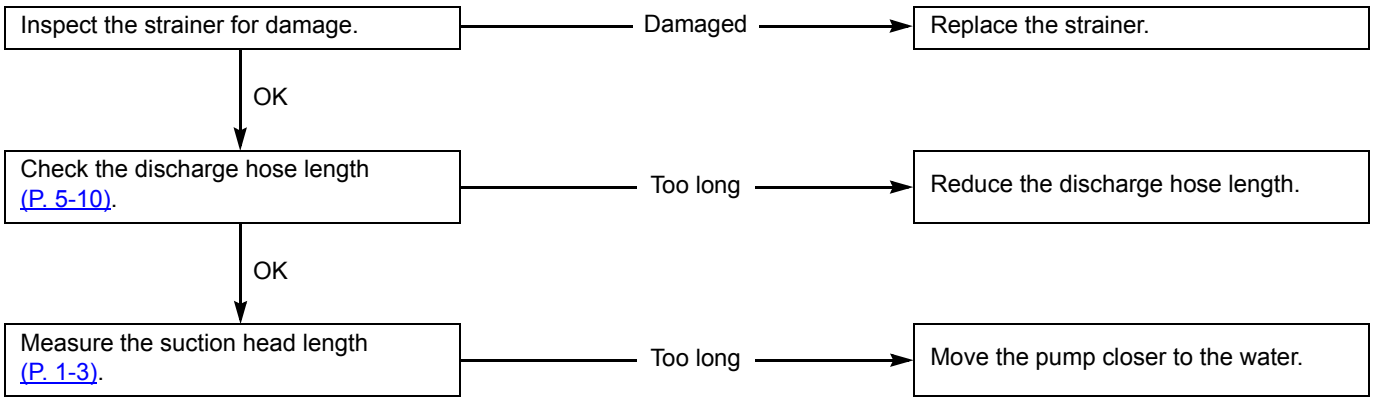
2. PUMP DOES NOT SELF-PRIME



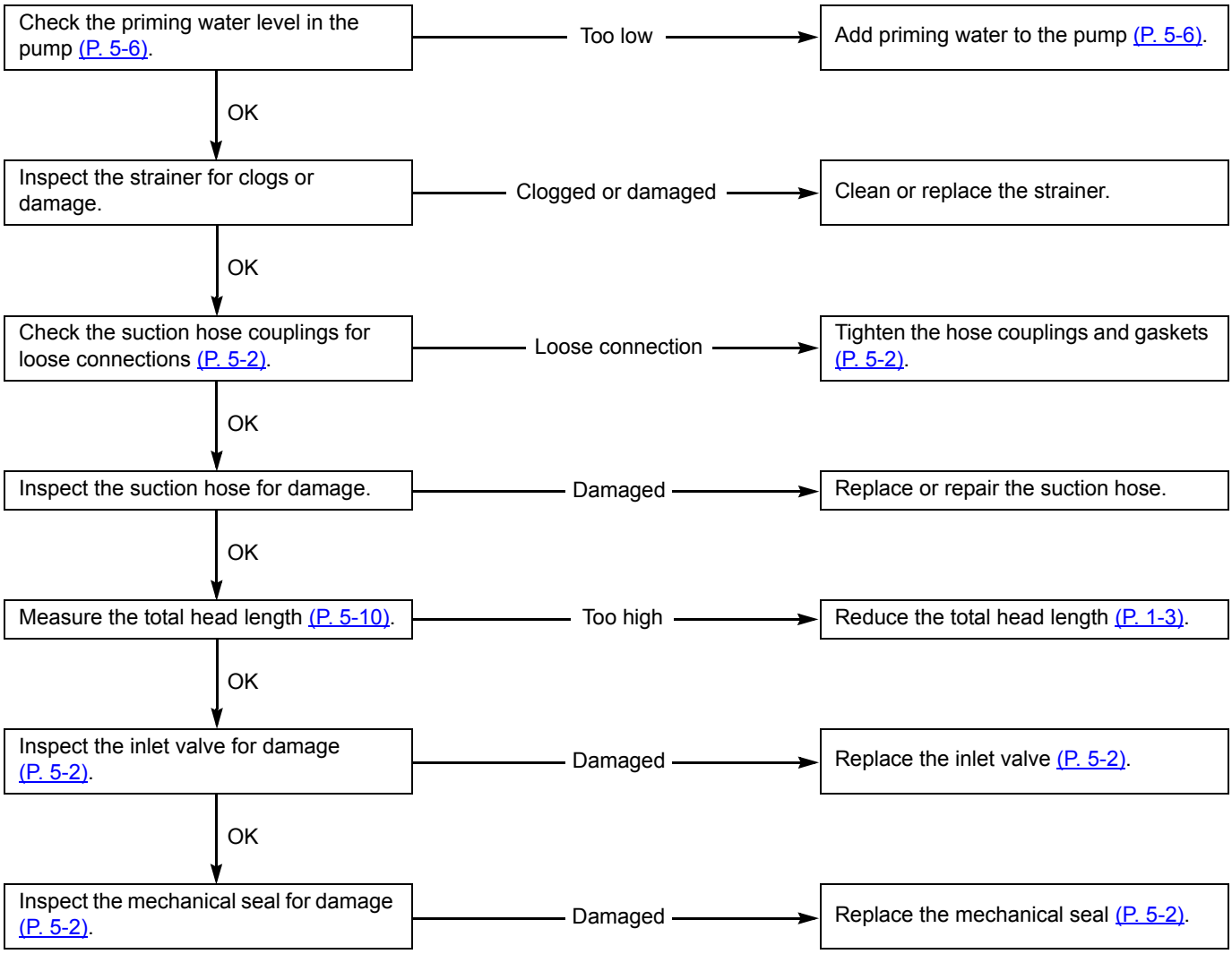
3. DISCHARGE VOLUME OR PRESSURE TOO LOW



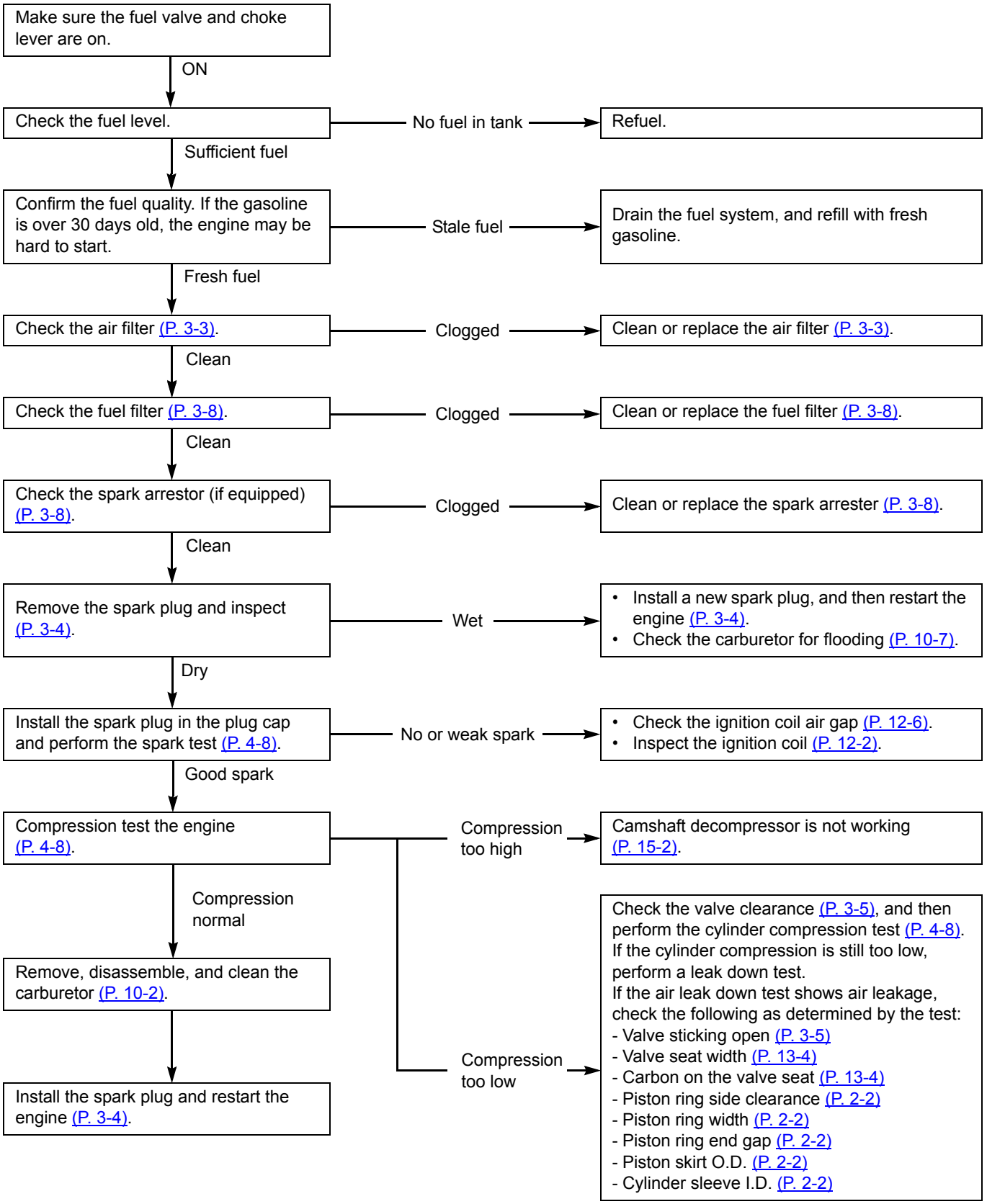
4. NOISE OR VIBRATION



5. SELF-PRIMING TIME TOO LONG



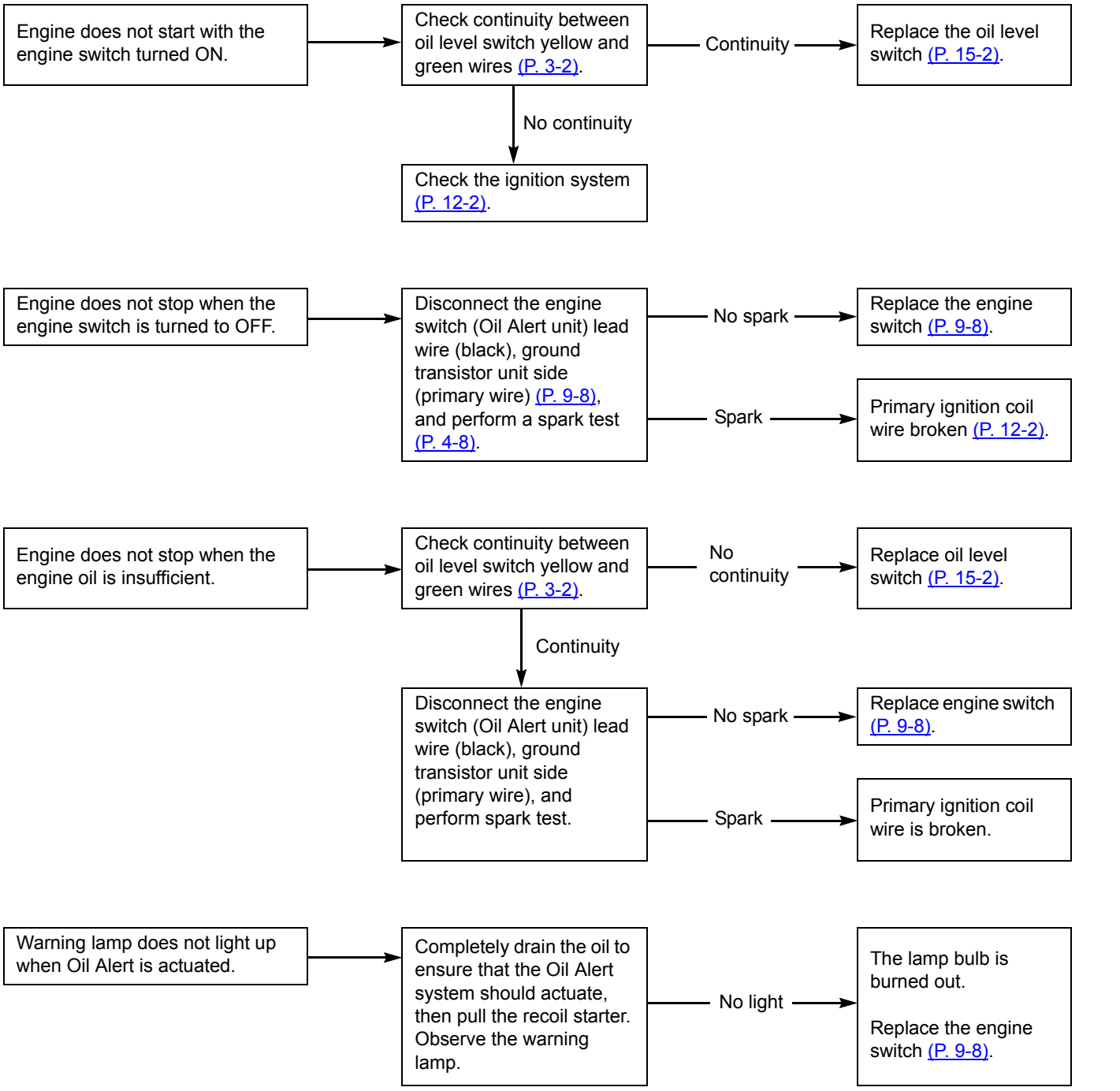
6. HARD STARTING OR POOR PERFORMANCE



7. OIL ALERT SYSTEM

SERVICE BULLETIN #3 SERVICE BULLETIN #4

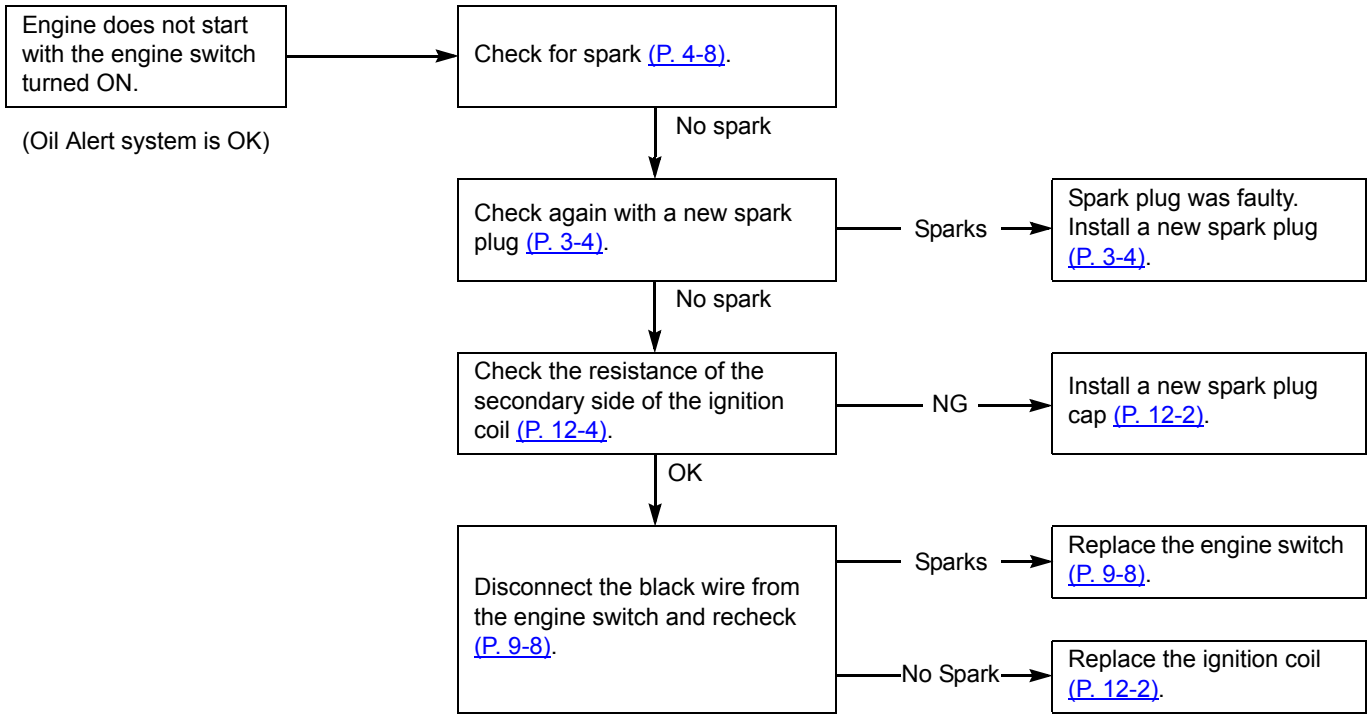
Check and adjust oil level before proceeding.



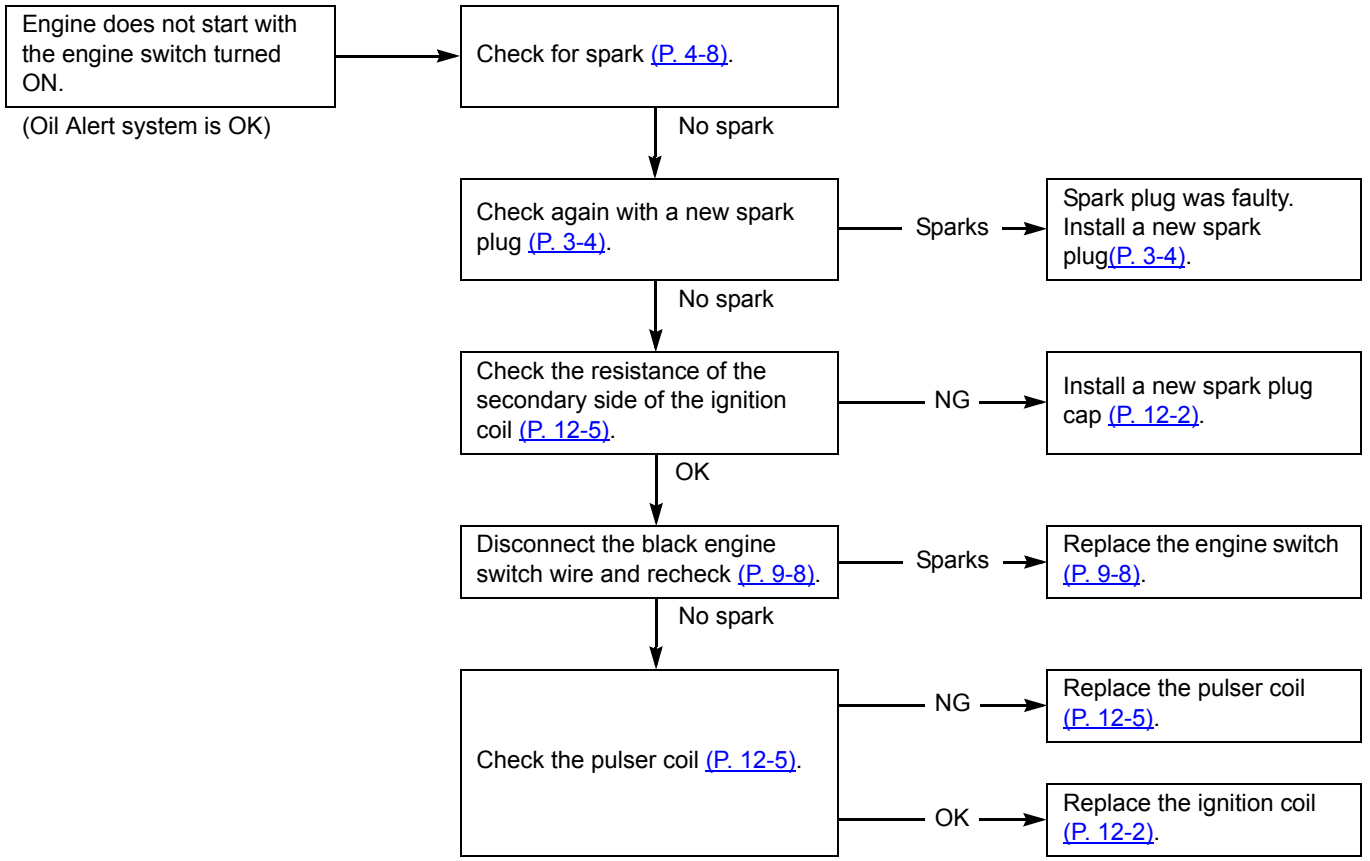
8. IGNITION SYSTEM

SERVICE BULLETIN #1

TRANSISTORIZED IGNITION COIL



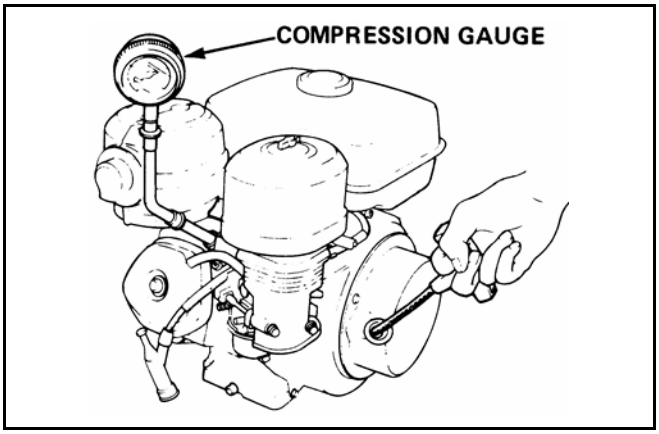
C.D.I. IGNITION COIL



9. CYLINDER COMPRESSION CHECK (MECHANICAL DECOMPRESSOR ENGAGED)

1. Remove the spark plug and install a compression gauge in the spark plug hole.
2. Crank the engine several times with the recoil starter and measure compression.

Cylinder compression	6.0 - 8.5 kg/cm^2 (85 - 121 psi) at 600 rpm

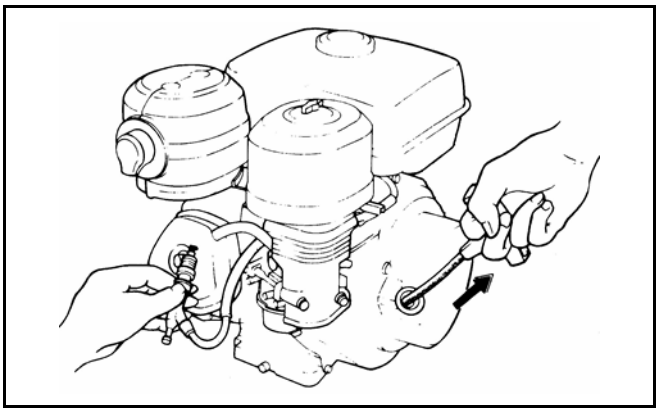


10. SPARK TEST

1. Remove the spark plug (P. 3-4), attach it to the spark plug cap, and ground the side electrode against the cylinder head cover.
2. Turn engine switch ON, pull the recoil starter, and check to see if sparks jump across the electrodes.

⚠ WARNING

- Never hold the spark plug lead with wet hands while performing this test.
- Make sure that no fuel has been spilled on the engine and that the plug is not wet with fuel.
- To avoid fire hazards, do not allow sparks near the plug hole.

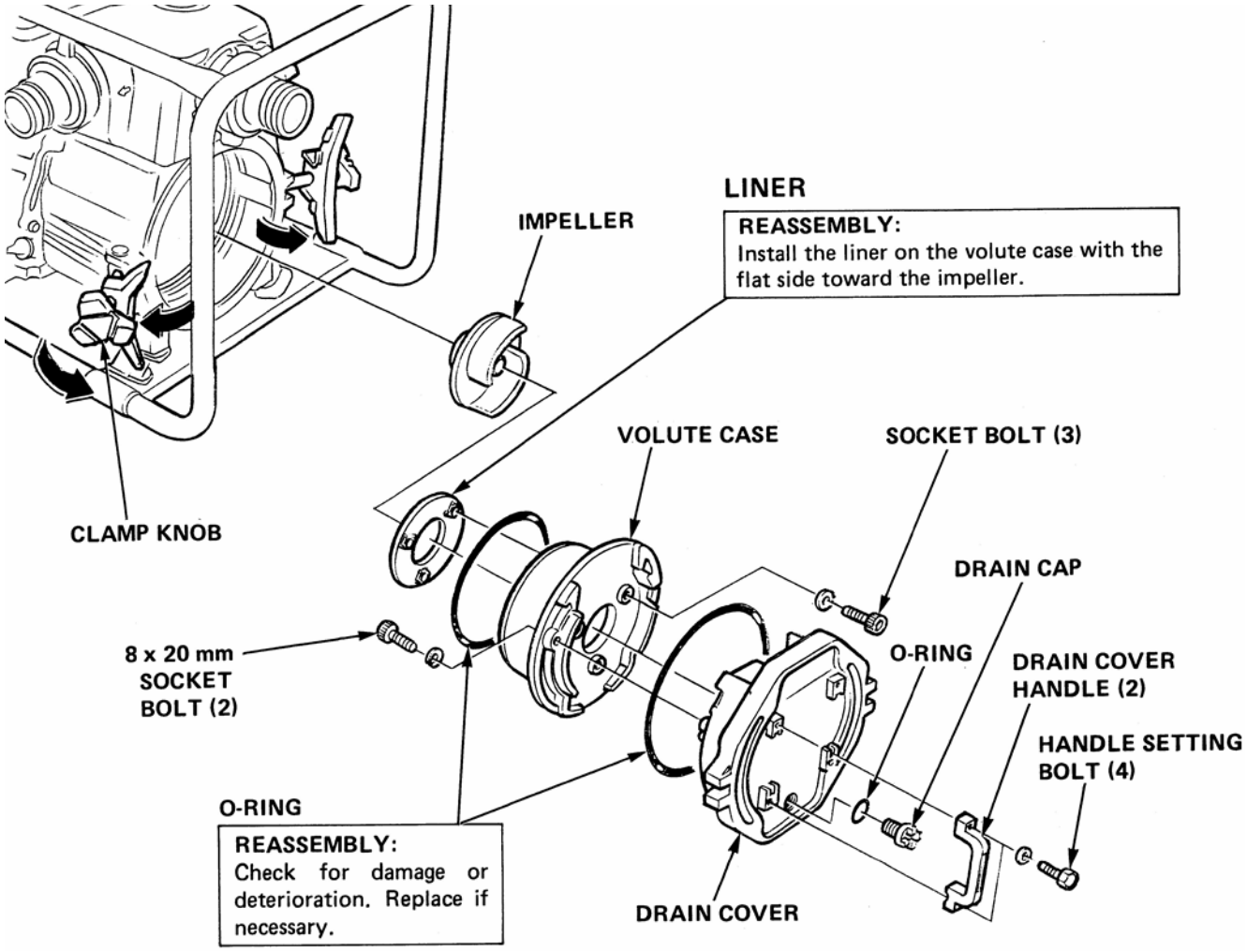


5. PUMP

1. DISASSEMBLY/REASSEMBLY

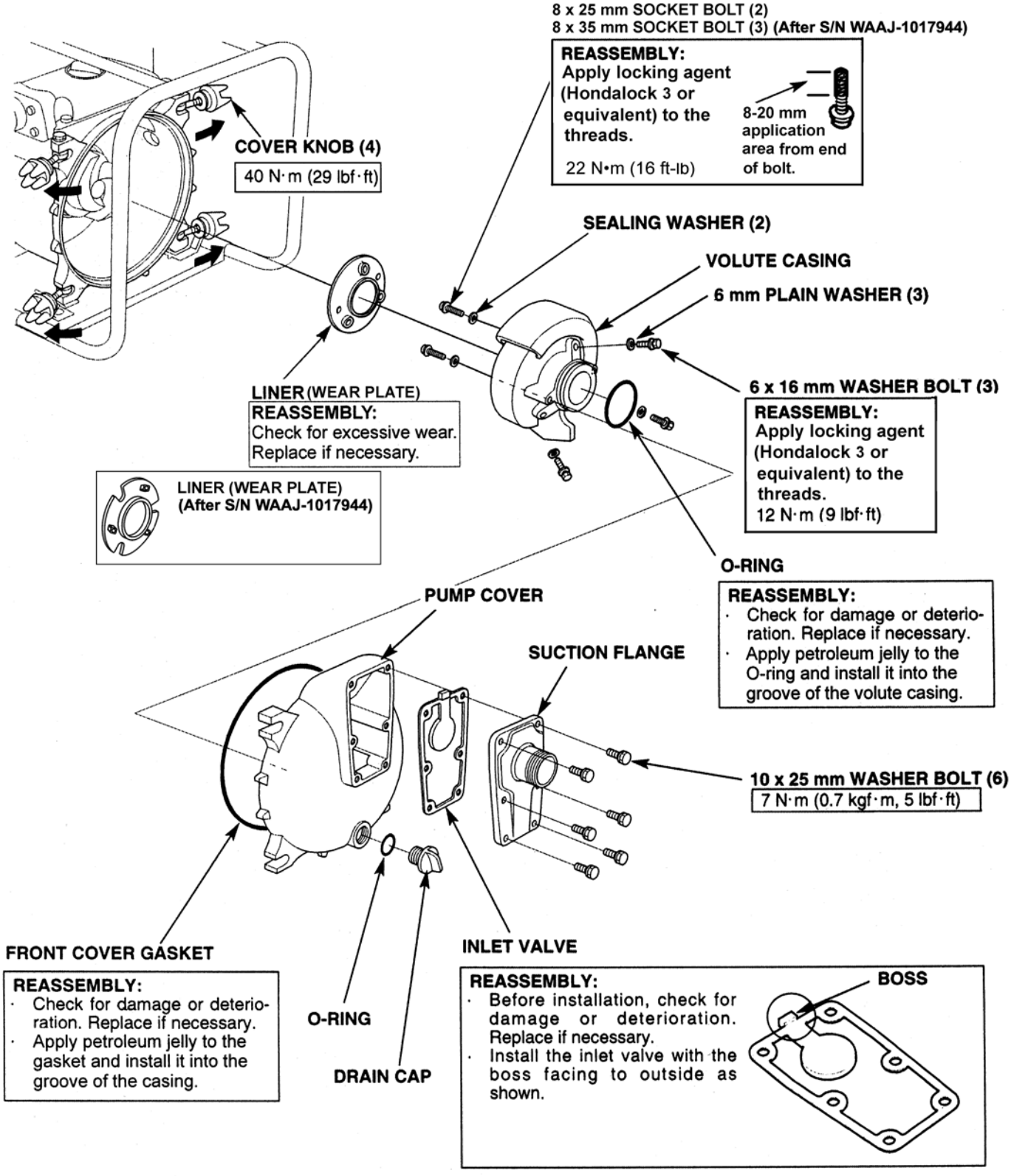
WT20XK1/K2
WT30XK1/K2
WT40XK0/K1

1. Loosen the clamp knobs, pivot the clamps out as shown, then pull the drain cover out of the pump casing.
2. Remove the two socket bolts, and then remove the volute case from the drain cover.
3. Remove the three liner setting bolts, and then remove the liner from the volute case.
4. Remove the impeller by turning it counterclockwise. If necessary, tap the impeller lightly with a hammer to start it turning.
5. Install the removed parts in the reverse order of removal.



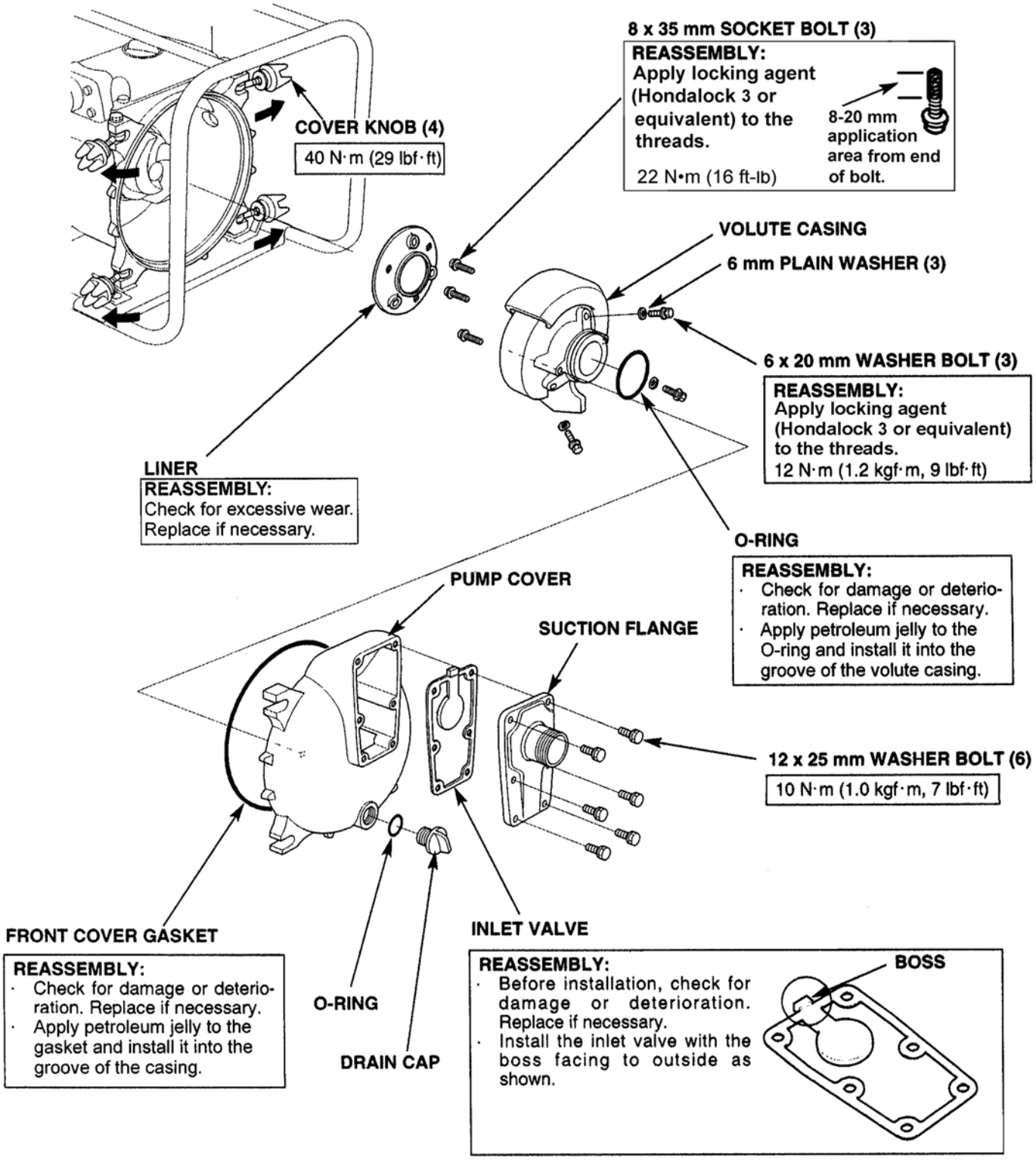
WT20XK3
WT20XK4

SERVICE BULLETIN #6



WT30XK2
WT30XK3
WT40XK2

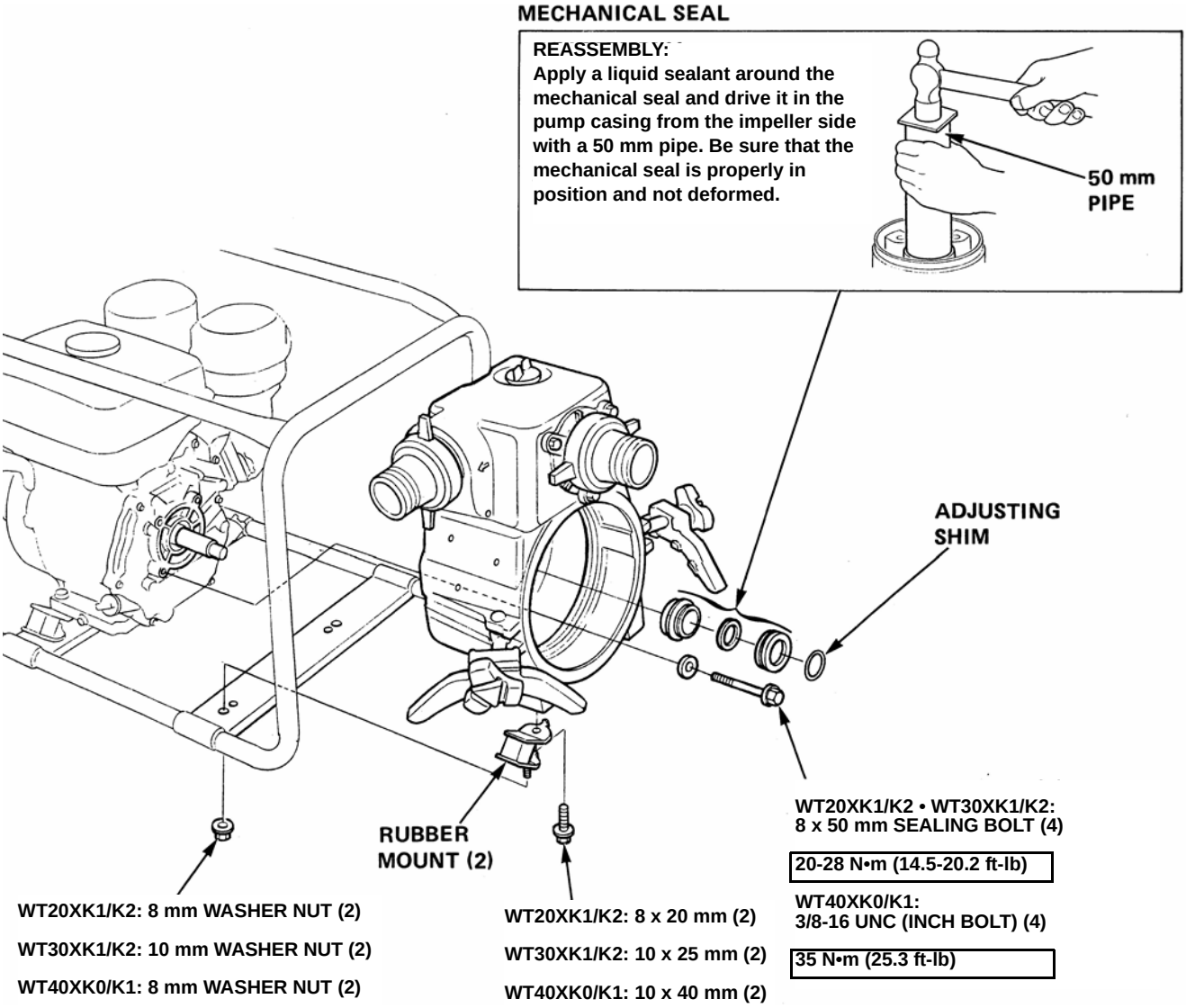
SERVICE BULLETIN #6

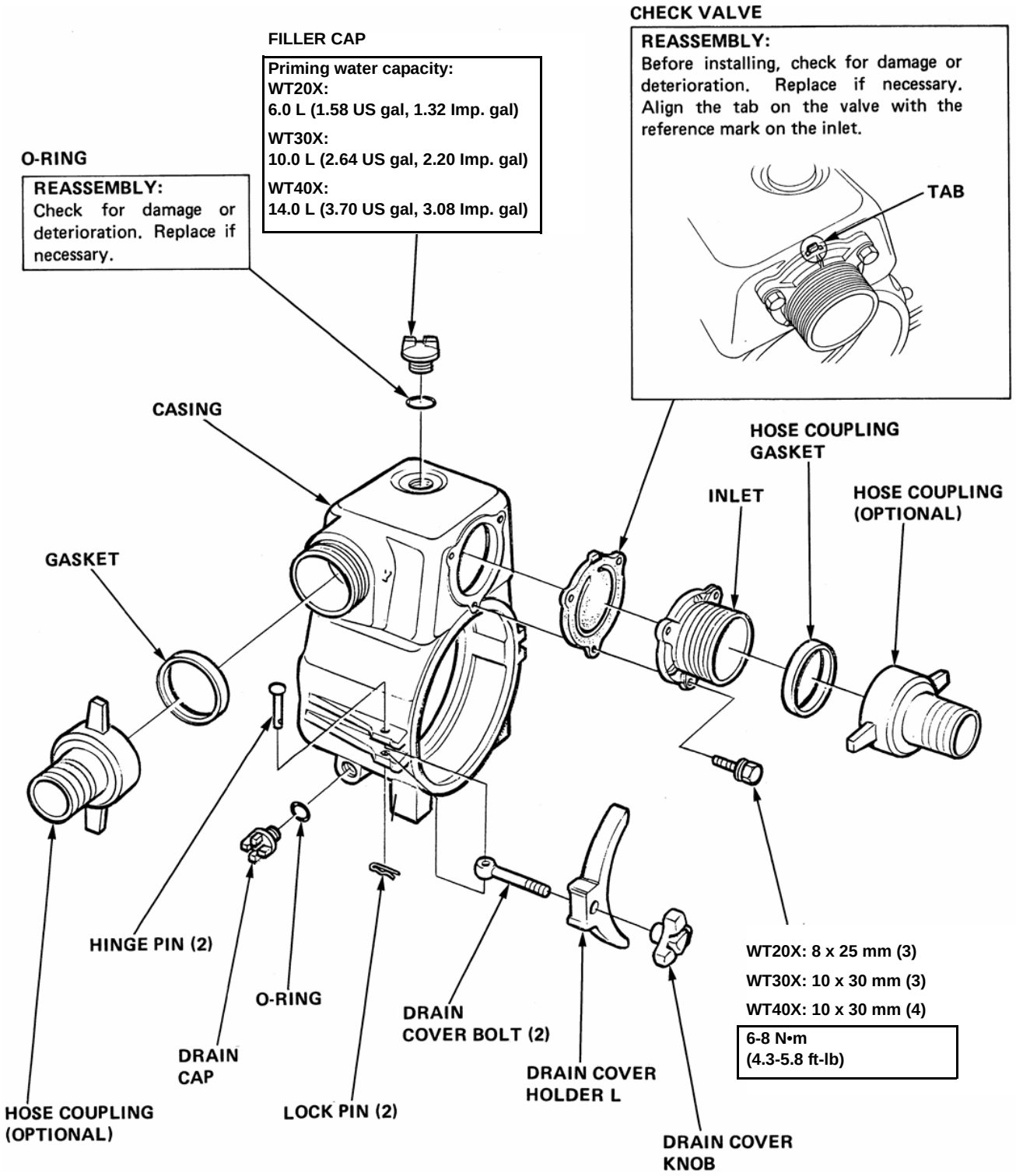


2. PUMP REMOVAL

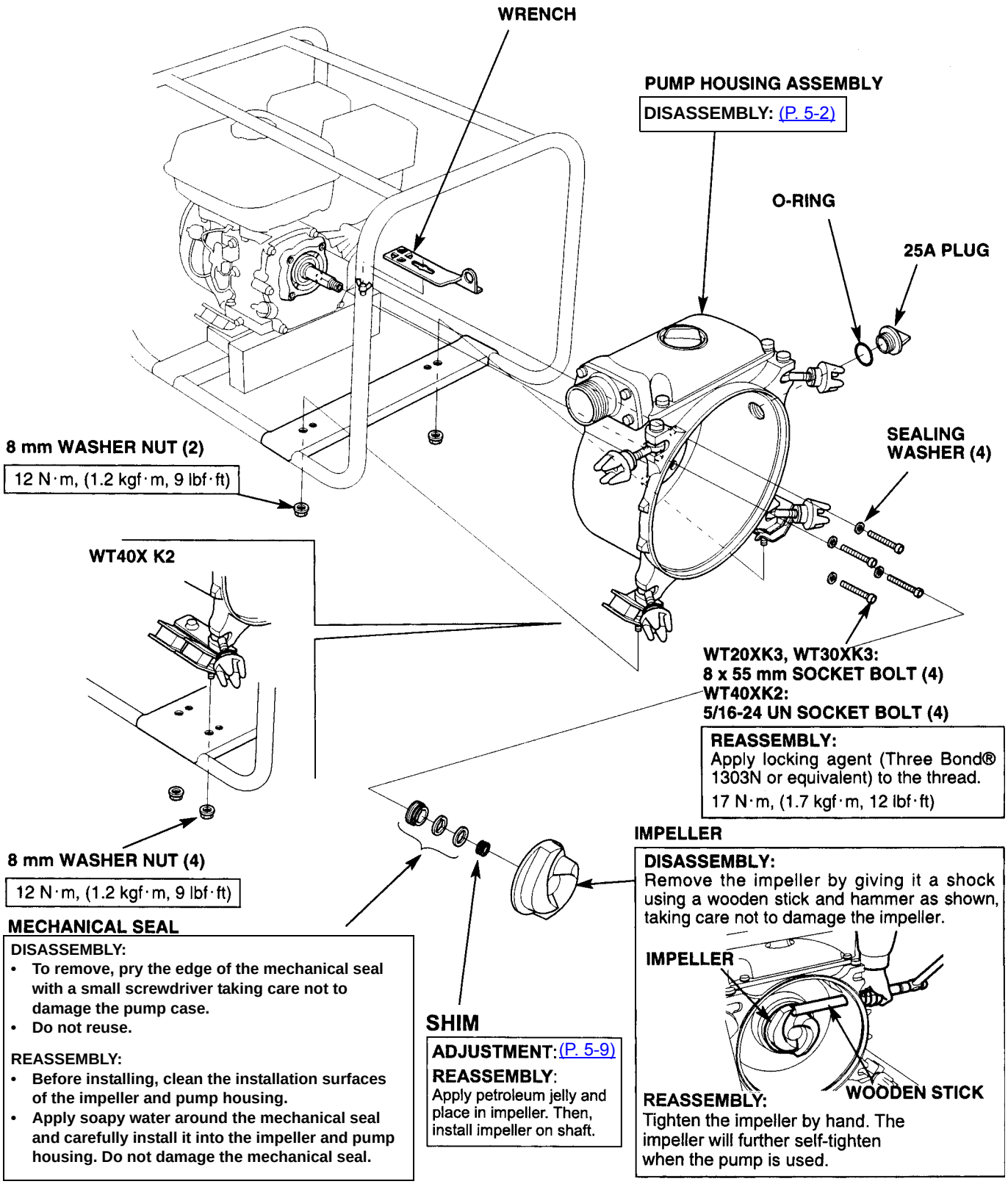
WT20XK1/K2
WT30XK1/K2
WT40XK0/K1

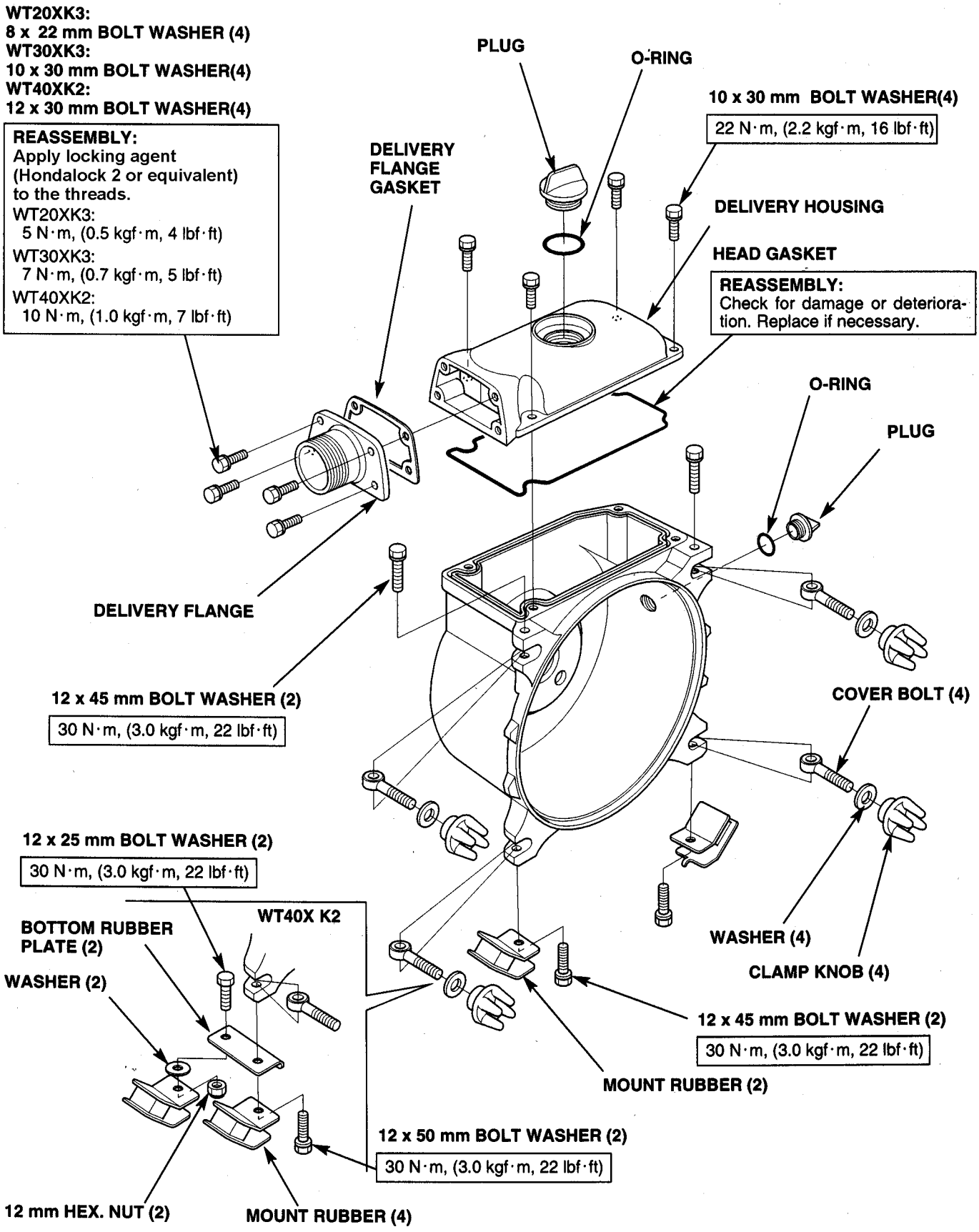
1. Remove the two washer nuts.
2. Remove the four sealing bolts from the casing, and then remove the pump casing.
3. Remove the impeller shims. Note the number of shims.
4. Drive the mechanical seal out of the pump casing with a driver, and then remove the liquid sealant from the pump casing.




CHECK VALVE
REASSEMBLY:
Before installing, check for damage or deterioration. Replace if necessary. Align the tab on the valve with the reference mark on the inlet.
TAB
FILLER CAP
Priming water capacity:
WT20X:
6.0 L (1.58 US gal, 1.32 Imp. gal)
WT30X:
10.0 L (2.64 US gal, 2.20 Imp. gal)
WT40X:
14.0 L (3.70 US gal, 3.08 Imp. gal)
O-RING
REASSEMBLY:
Check for damage or deterioration. Replace if necessary.
CASING
HOSE COUPLING GASKET
INLET
HOSE COUPLING (OPTIONAL)
GASKET
HINGE PIN (2)
O-RING
DRAIN CAP
LOCK PIN (2)
DRAIN COVER BOLT (2)
DRAIN COVER HOLDER L
HOSE COUPLING (OPTIONAL)
DRAIN COVER KNOB
WT20X: 8 x 25 mm (3)
WT30X: 10 x 30 mm (3)
WT40X: 10 x 30 mm (4)
6-8 N•m
(4.3-5.8 ft-lb)

WT20XK3/K4
WT30XK3
WT40XK2




WT20XK3:
8 x 22 mm BOLT WASHER (4)
WT30XK3:
10 x 30 mm BOLT WASHER(4)
WT40XK2:
12 x 30 mm BOLT WASHER(4)
REASSEMBLY:
Apply locking agent
(Hondalock 2 or equivalent)
to the threads.
WT20XK3:
5 N·m, (0.5 kgf·m, 4 lbf·ft)
WT30XK3:
7 N·m, (0.7 kgf·m, 5 lbf·ft)
WT40XK2:
10 N·m, (1.0 kgf·m, 7 lbf·ft)
PLUG
O-RING
10 x 30 mm BOLT WASHER(4)
22 N·m, (2.2 kgf·m, 16 lbf·ft)
DELIVERY FLANGE GASKET
DELIVERY HOUSING
HEAD GASKET
REASSEMBLY:
Check for damage or deterioration. Replace if necessary.
O-RING
PLUG
DELIVERY FLANGE
12 x 45 mm BOLT WASHER (2)
30 N·m, (3.0 kgf·m, 22 lbf·ft)
COVER BOLT (4)
12 x 25 mm BOLT WASHER (2)
30 N·m, (3.0 kgf·m, 22 lbf·ft)
WT40X K2
BOTTOM RUBBER PLATE (2)
WASHER (2)
WASHER (4)
CLAMP KNOB (4)
12 x 45 mm BOLT WASHER (2)
30 N·m, (3.0 kgf·m, 22 lbf·ft)
MOUNT RUBBER (2)
12 x 50 mm BOLT WASHER (2)
30 N·m, (3.0 kgf·m, 22 lbf·ft)
12 mm HEX. NUT (2)
MOUNT RUBBER (4)

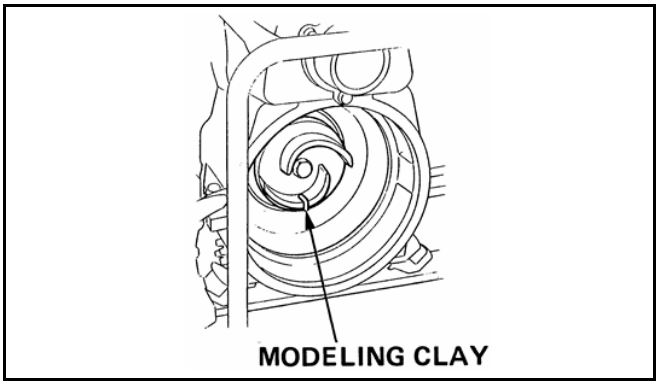
3. IMPELLER CLEARANCE ADJUSTMENT

WT20XK1/K2
WT30XK1/K2
WT40XK0/K1

1. Remove the drain cover (P. 5-2).
2. Put a piece of modeling clay on the impeller as shown.
3. Install the drain cover, and tighten the clamp knobs securely.
4. Remove the drain cover.
5. Check the impeller-to-liner clearance by measuring the thickness of the modeling clay.

Specified clearance	0.2-1.0 mm (0.01-0.04 in)

6. If the measurement is not within the specification, adjust the clearance by adding or removing shims.



WT20XK3/K4
WT30XK3
WT40XK2

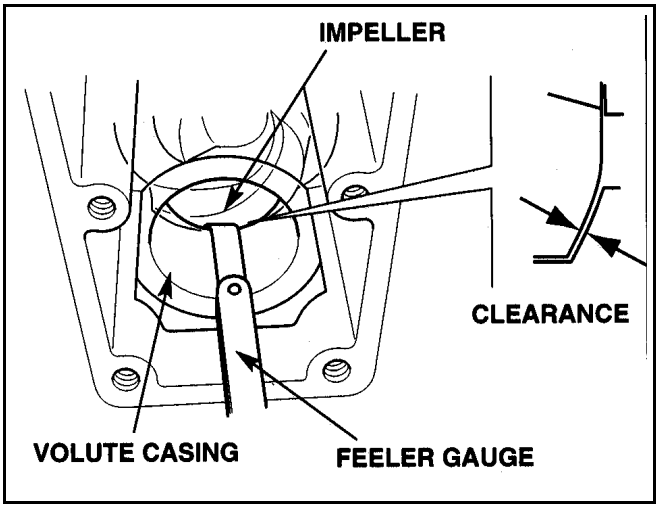
SERVICE BULLETIN #6

1. Remove the suction flange (P. 5-3)
2. Measure the clearance between the impeller and volute casing using a feeler gauge.

Specified clearance	WT20XK3 WT20XK4	0.3 - 0.6 mm (0.012 - 0.024 in)
	WT30XK3	0.4 - 0.8 mm (0.016 - 0.031 in)
	WT40XK2	0.6 - 0.7 mm (0.024 - 0.028 in)

3. If the clearance is not within specification, add or remove shims behind the impeller.
4. Reinstall the check valve with the boss facing outside and install the suction flange.
5. Tighten the 10 x 25 mm (WT20XK3/K4, WT30XK3) or 12 x 25 mm (WT40XK2) washer bolts to the specified torque.

Torque:
WT20XK3/K4: 7 N•m (5 ft-lb)
WT30XK3: 7 N•m (5 ft-lb)
WT40XK2: 10 N•m (7 ft-lb)



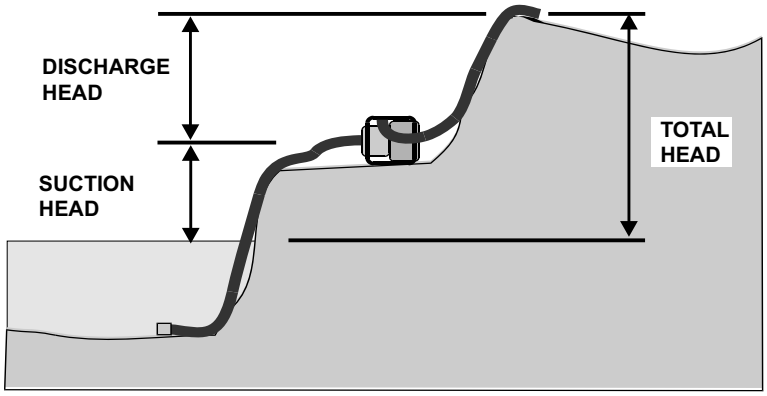
4. PUMP PLACEMENT

For best pump performance, the pump must be as close to the water level as possible, and the suction and discharge hoses must not be longer than necessary. This will enable the pump to produce the greatest output with the least self-priming time.

As *head* (pumping height) increases, pump output decreases. The length, type, and size of the suction and discharge hoses can also significantly affect pump output.

Discharge head capability is always greater than suction head capability, so it is important for suction head to be the shorter part of the total head.

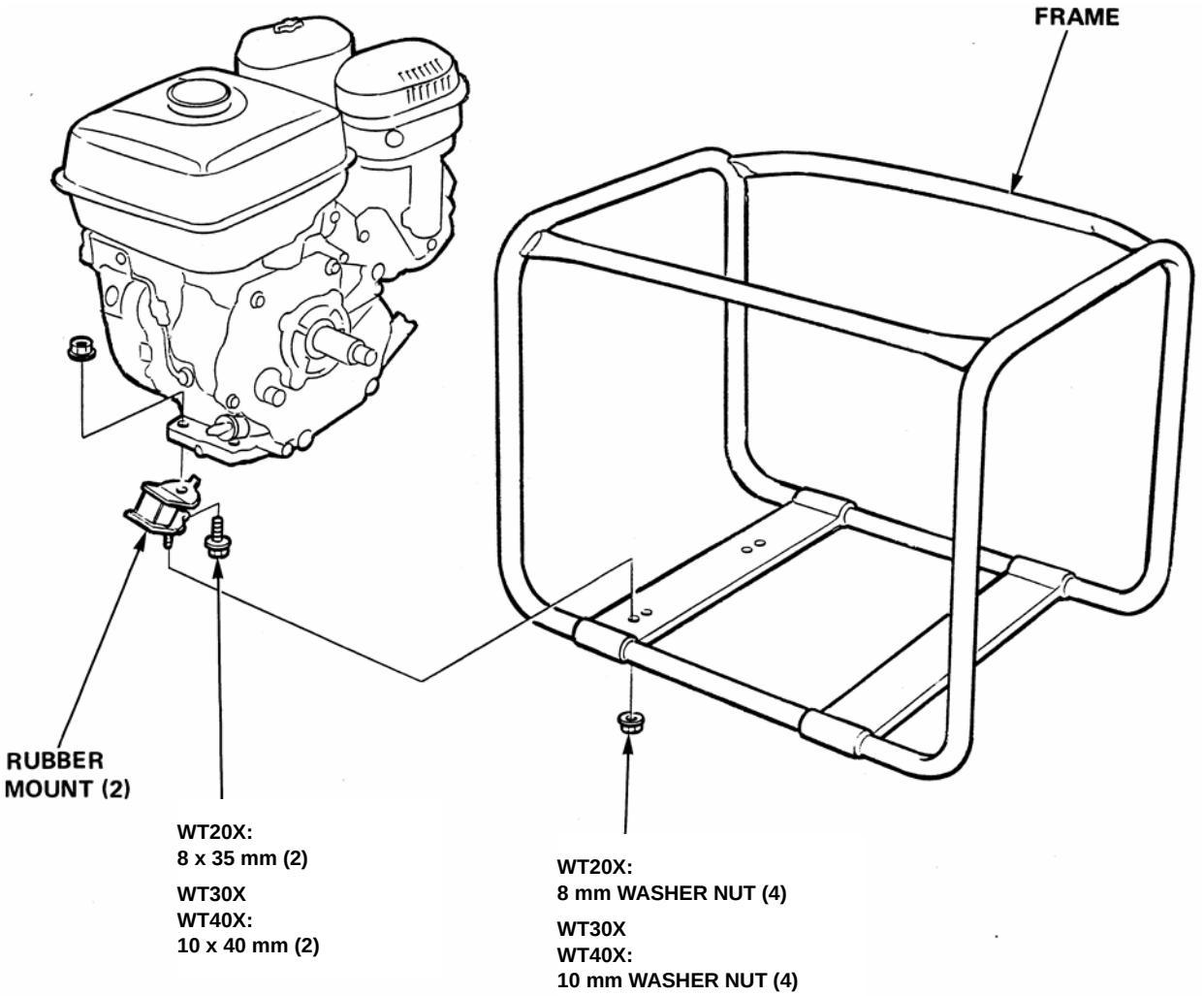
Minimizing suction head (placing the pump near the water level) is also very important for reducing self-priming time. Self-priming time is the time it takes the pump to bring water the distance of the suction head during initial operation.



6. ENGINE REMOVAL

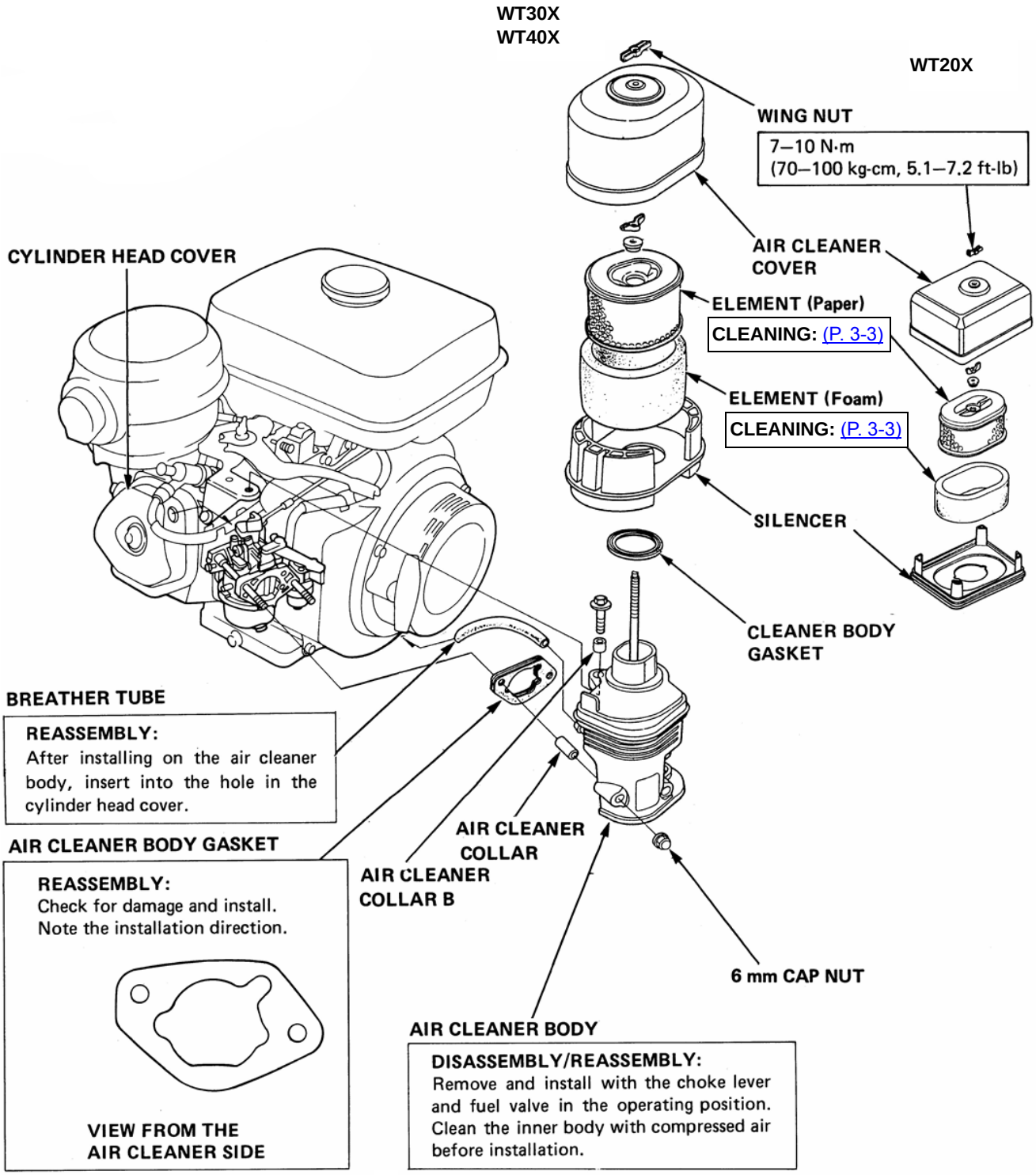
1. ENGINE REMOVAL

1. Remove the pump (P. 5-2).
2. Remove the two washer nuts, then remove the engine.



7. AIR CLEANER

1. DISASSEMBLY/REASSEMBLY

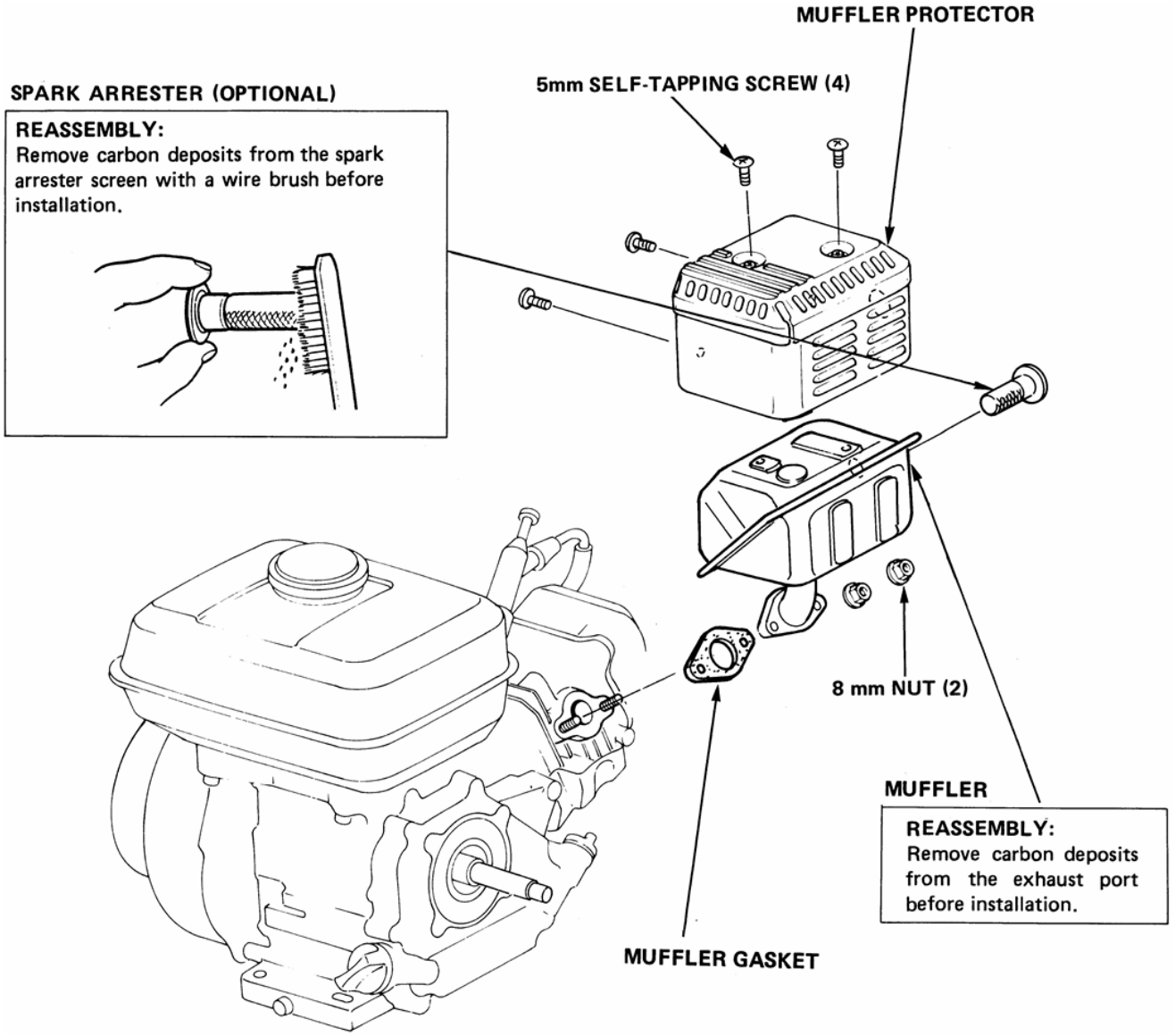


8. MUFFLER

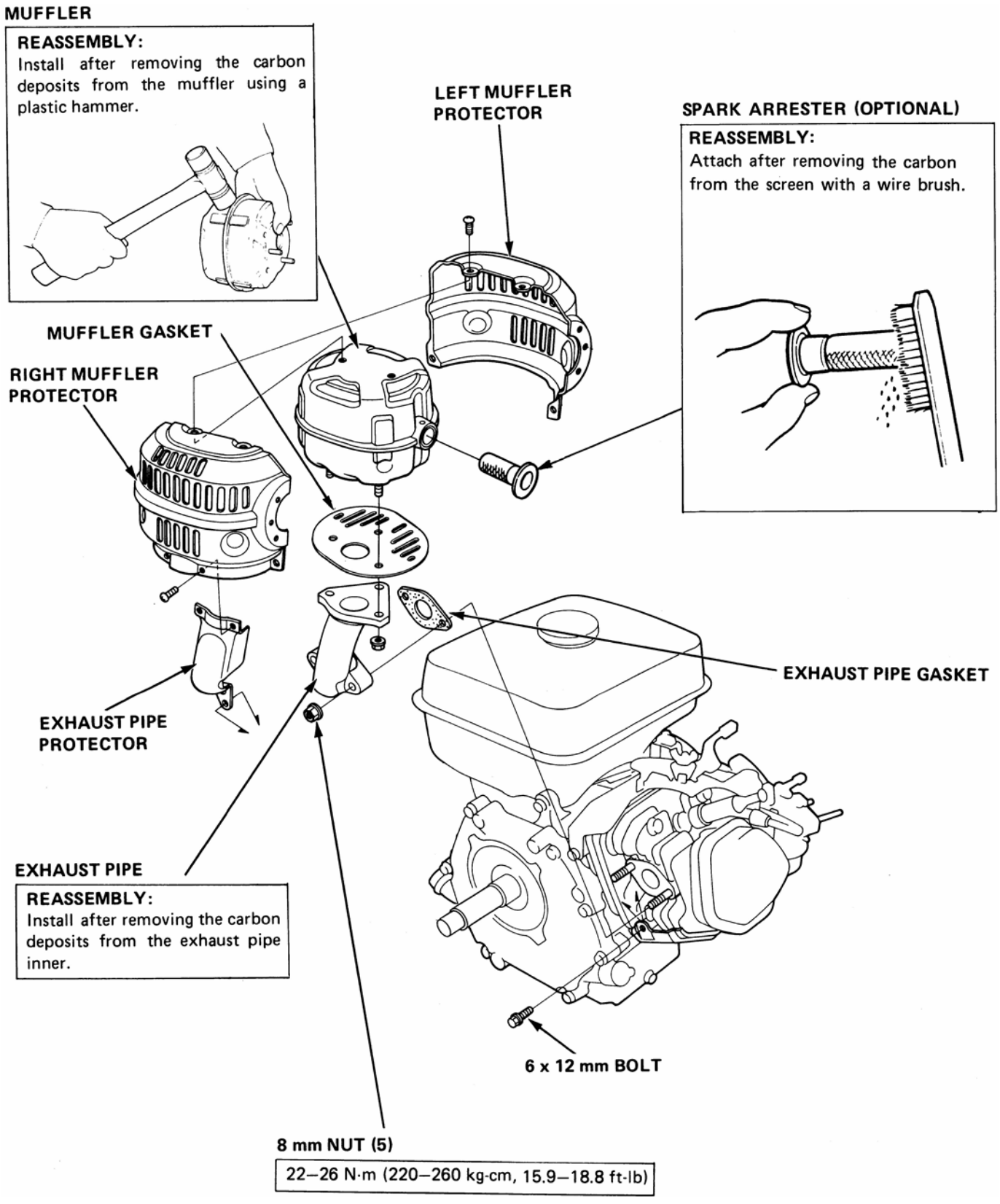
1. DISASSEMBLY/REASSEMBLY

WT20X

1. Loosen the 8mm nuts (2) and detach the muffler.
2. Detach the 5 mm self-tapping screw and remove the muffler protector.



WT30X
WT40X

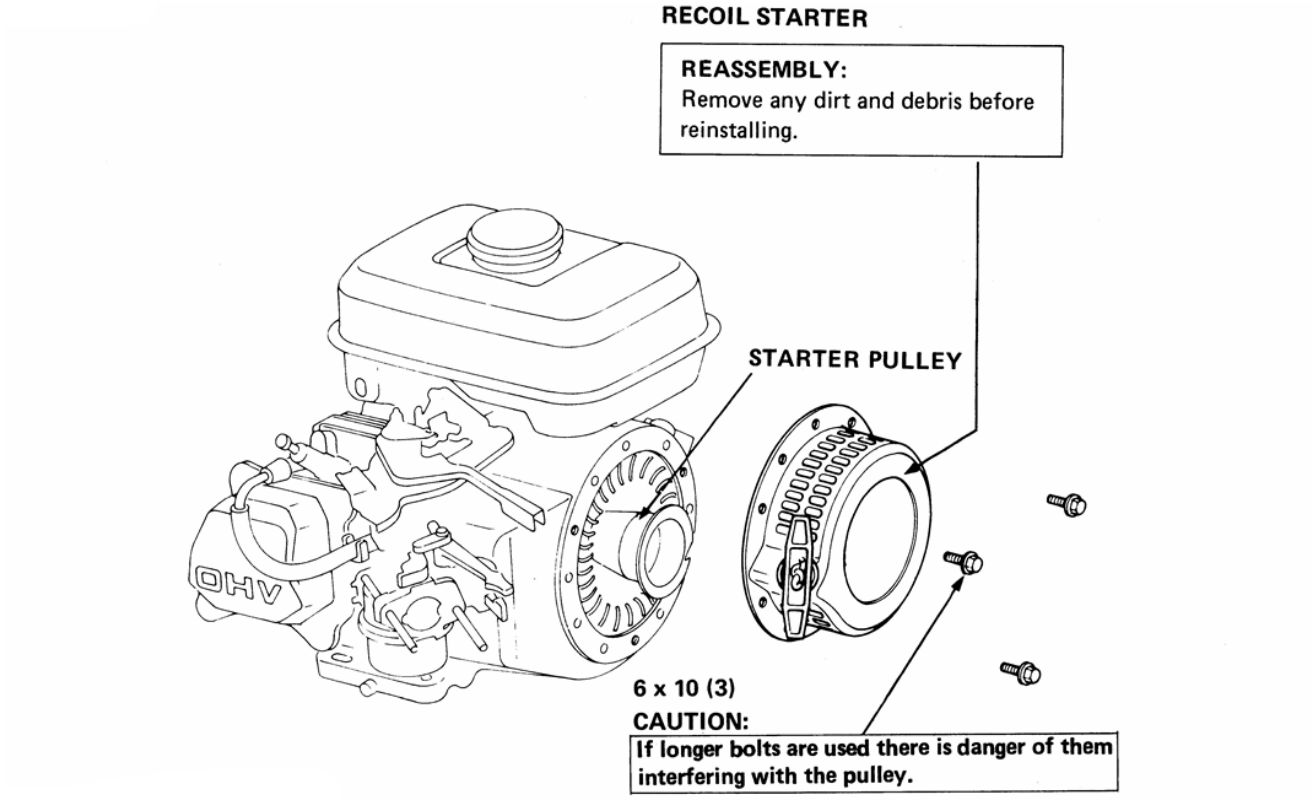

MUFFLER
REASSEMBLY:
Install after removing the carbon deposits from the muffler using a plastic hammer.
LEFT MUFFLER PROTECTOR
SPARK ARRESTER (OPTIONAL)
REASSEMBLY:
Attach after removing the carbon from the screen with a wire brush.
MUFFLER GASKET
RIGHT MUFFLER PROTECTOR
EXHAUST PIPE GASKET
EXHAUST PIPE PROTECTOR
EXHAUST PIPE
REASSEMBLY:
Install after removing the carbon deposits from the exhaust pipe inner.
6 x 12 mm BOLT
8 mm NUT (5)
22–26 N·m (220–260 kg-cm, 15.9–18.8 ft-lb)

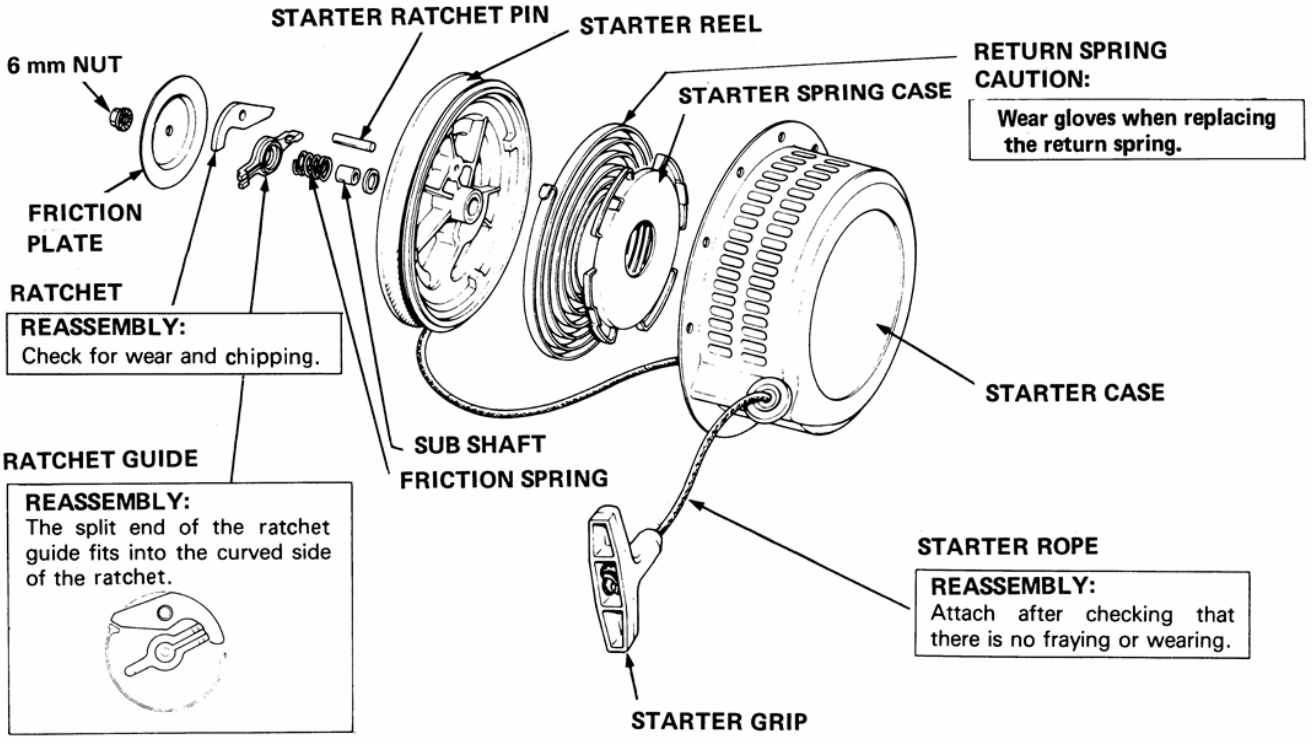
9. RECOIL STARTER / FAN COVER

1. RECOIL STARTER

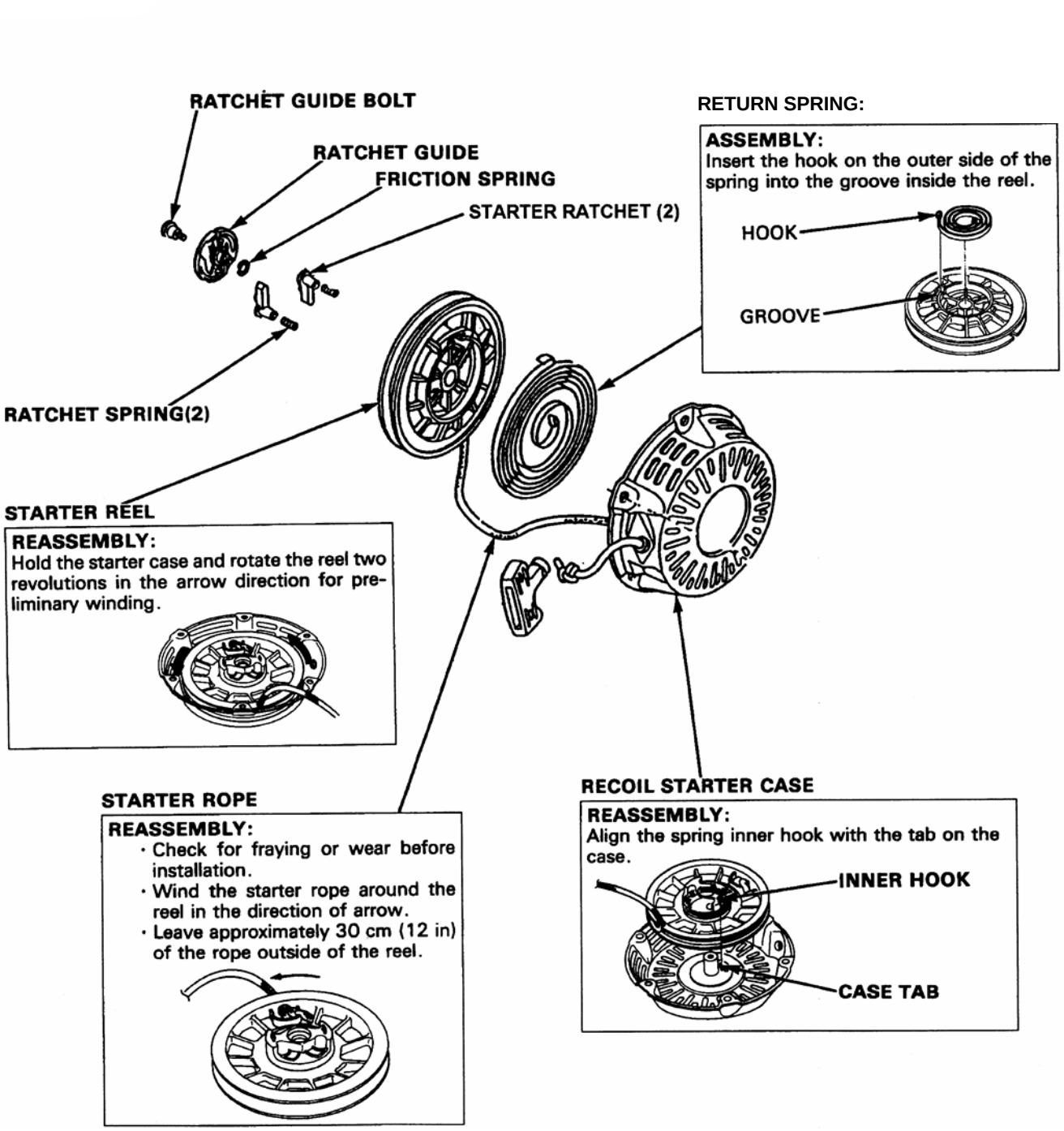
DISASSEMBLY/REASSEMBLY

WT20XK1

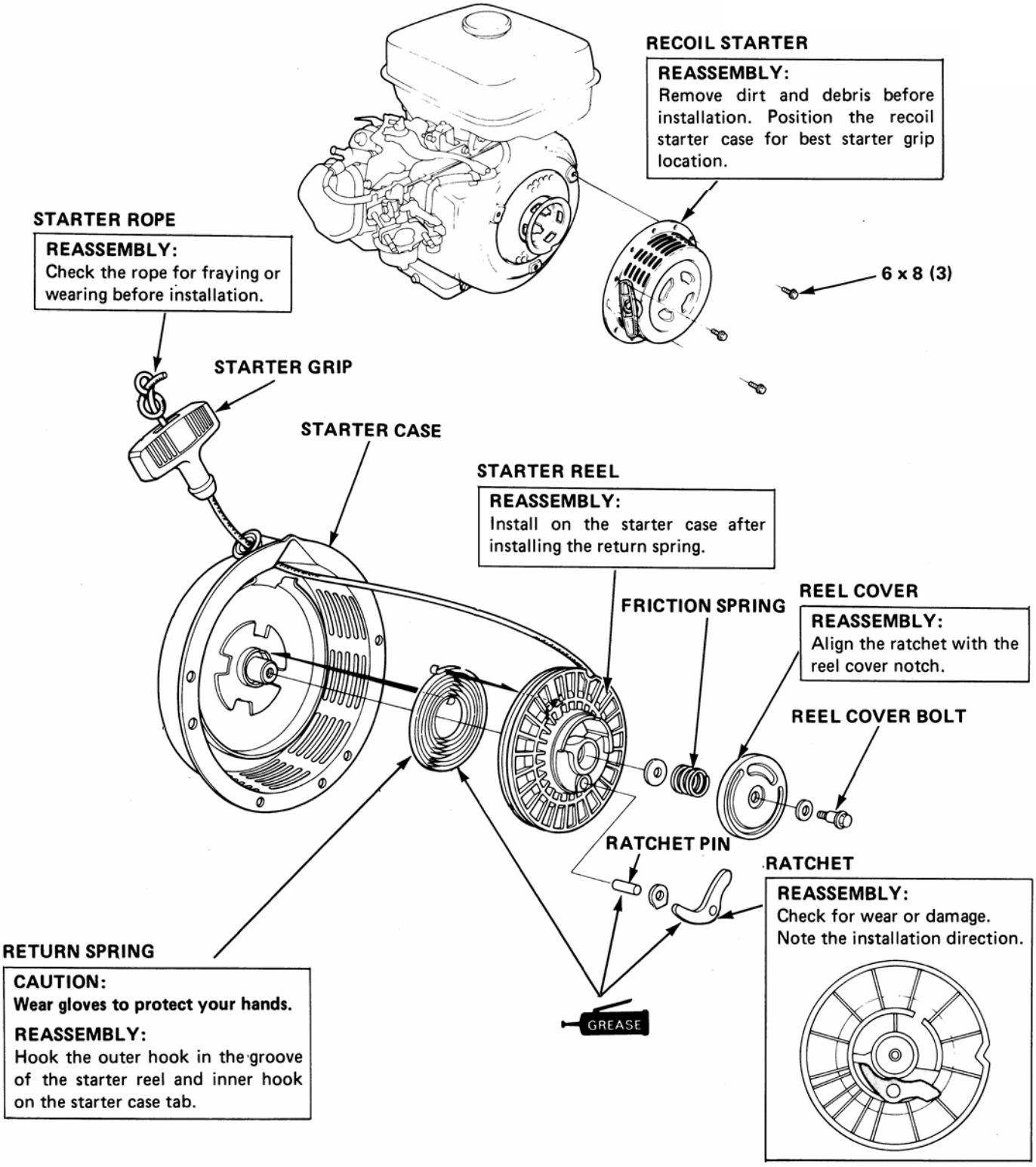




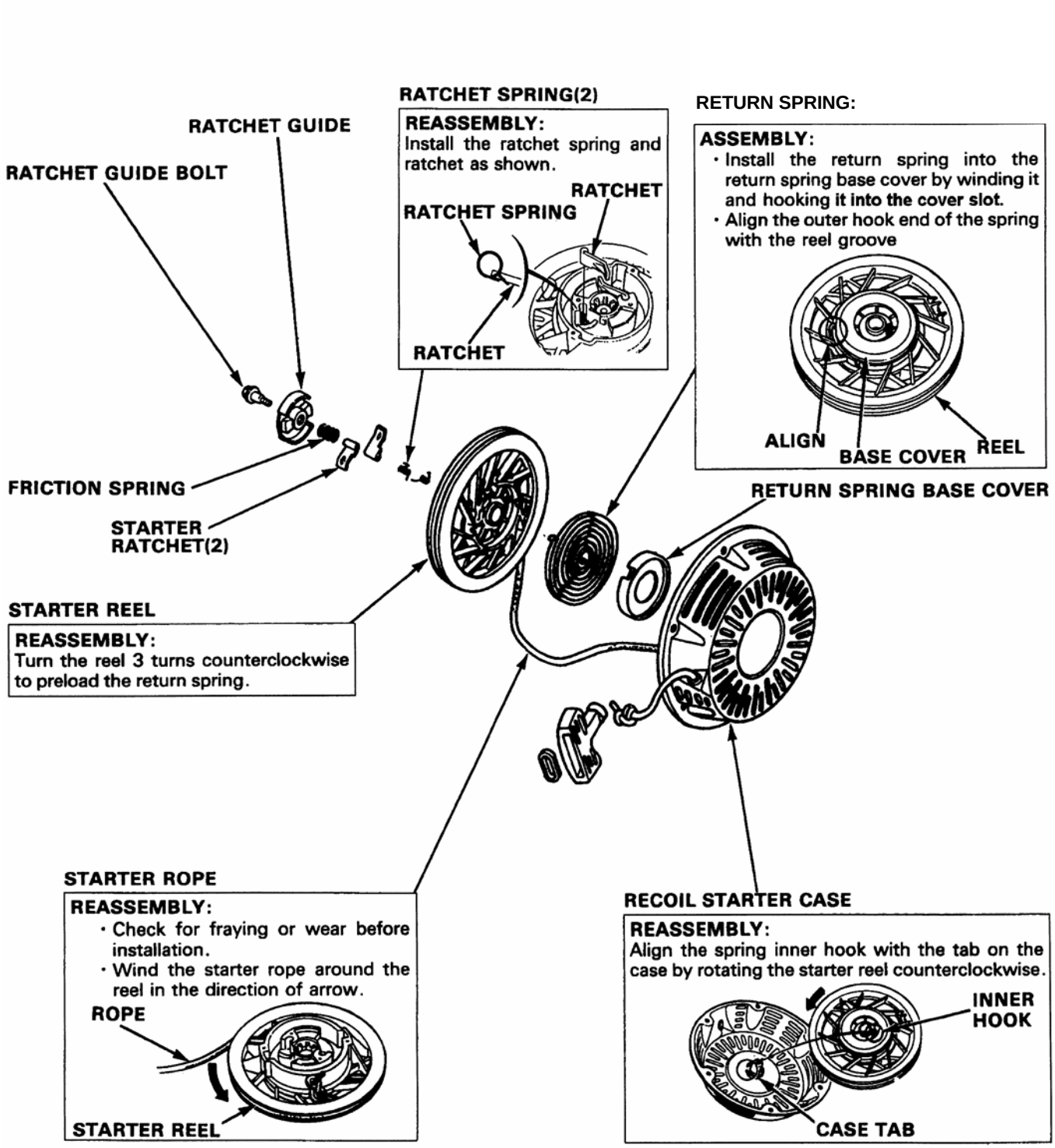
WT20XK2
WT20XK3
WT20XK4



WT30XK1
WT40XK0

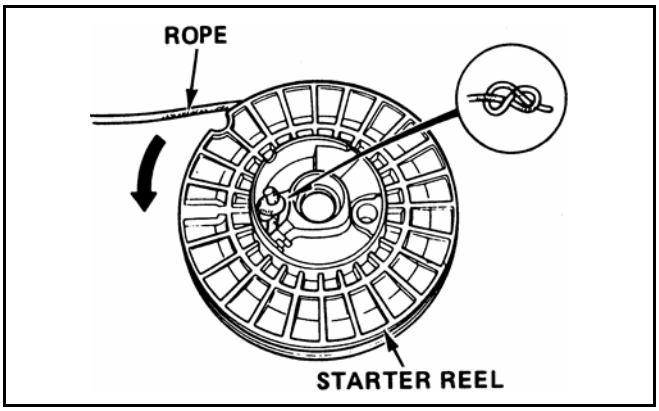


WT30XK2
WT30XK3
WT40XK1
WT40XK2

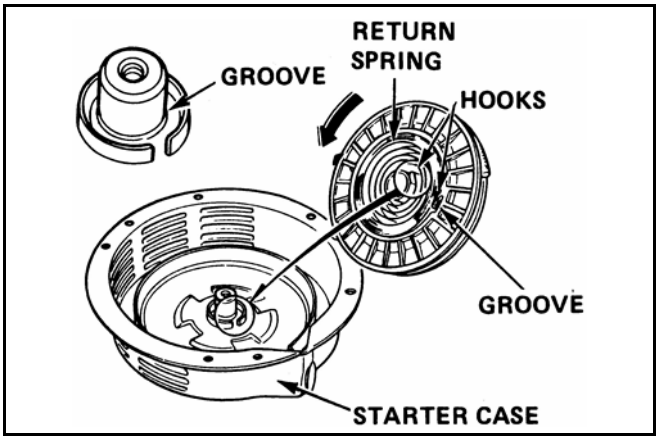


RECOIL STARTER ASSEMBLY

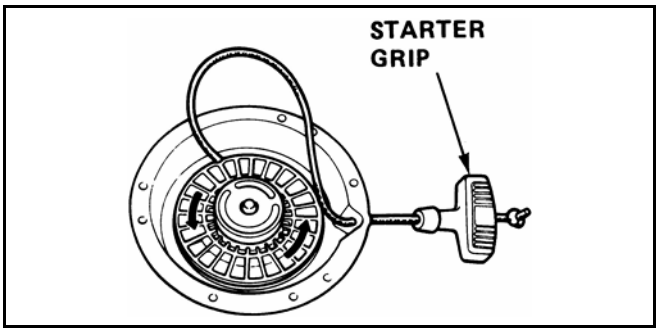
1. Feed the end of the rope through the hole in the starter reel, and tie a knot in the rope end.
   Wind the rope onto the reel in the direction shown, and wedge the rope end in the notch on the edge of the reel.



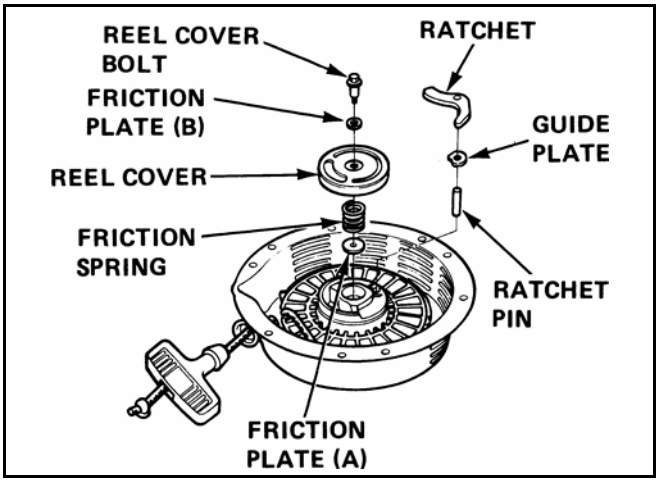
2. Hook the spring outer hook in the reel groove, and install the reel on the starter case, so that the spring inner hook is hooked to the starter case tab by turning the reel counterclockwise.



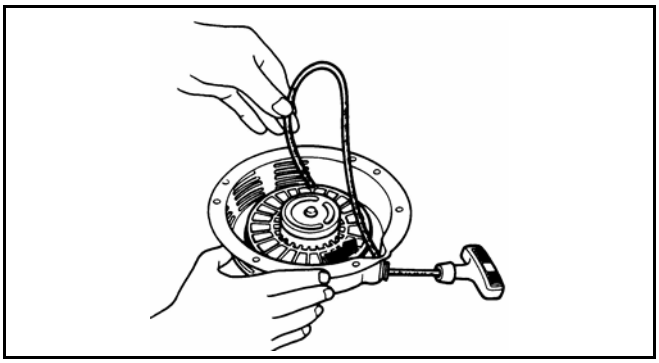
3. With a length of the rope extending from the starter reel notch, pull the end of the rope out of the case, feed it through the starter grip, and tie a knot in the end of the rope.



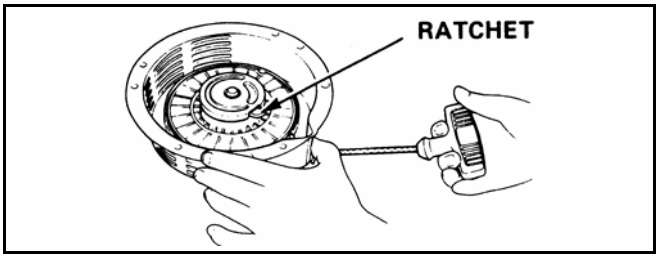
4. Install the friction plate, friction spring, ratchet pin, guide plate, and reel cover. Tighten the reel cover bolt.



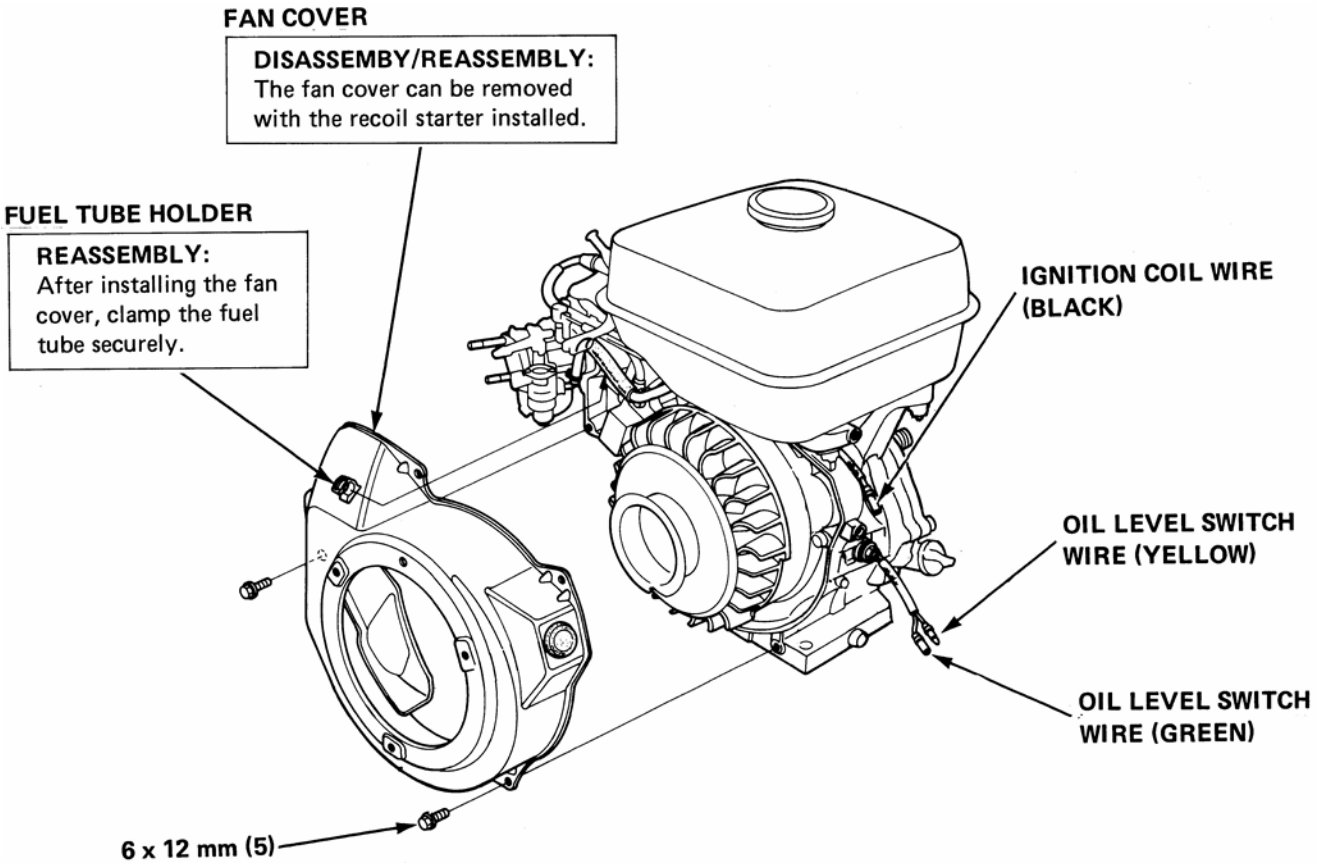
5. Rotate the reel 3 full turns in the direction of the arrow.



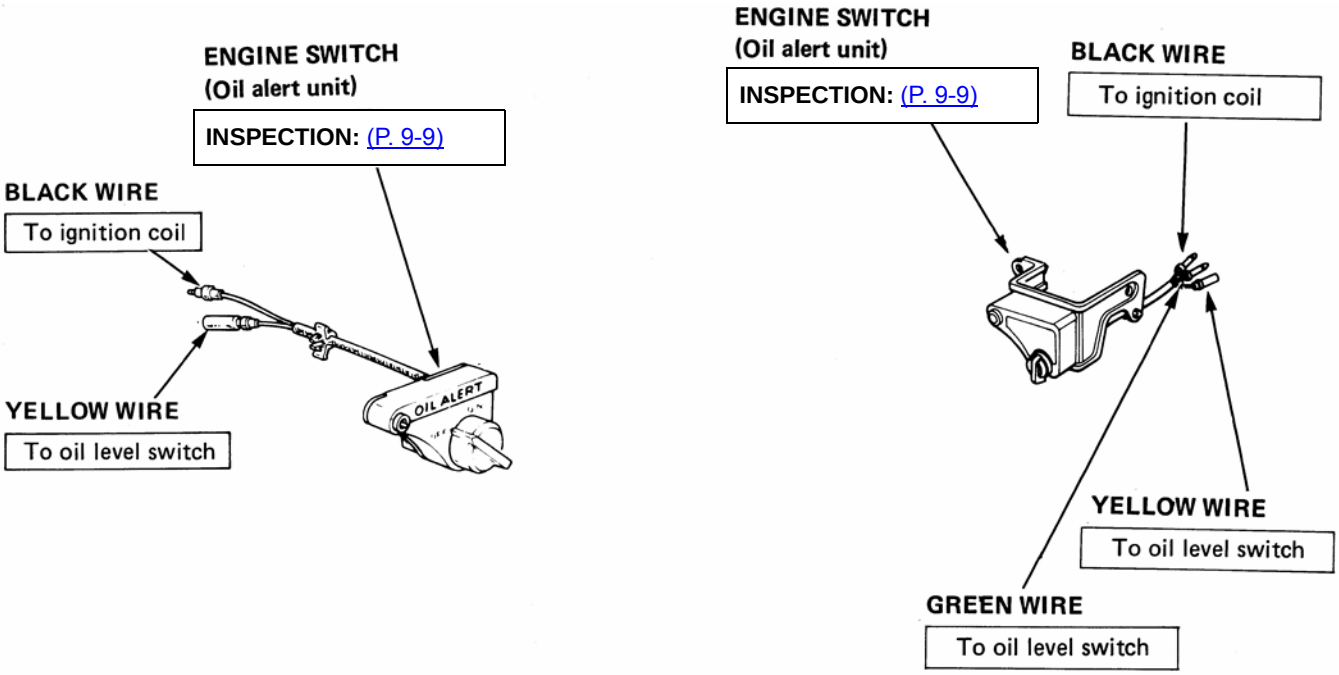
6. Check the operation of the ratchet by pulling the starter rope out several times.



2. FAN COVER



3. ENGINE SWITCH

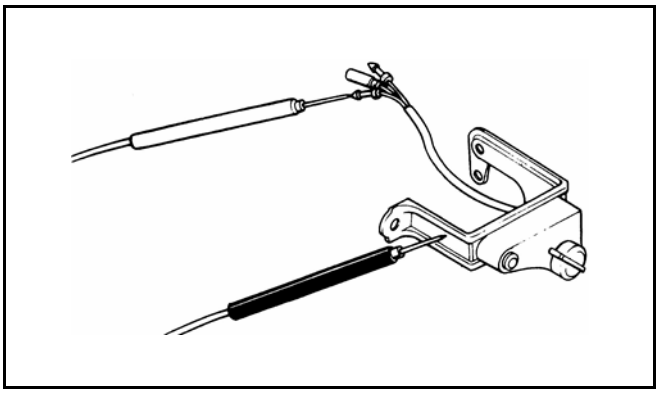


INSPECTION

ENGINE SWITCH

Check the continuity between the engine switch black wire and the switch body with an ohmmeter.

Switch position	Continuity
ON	No
OFF	Yes

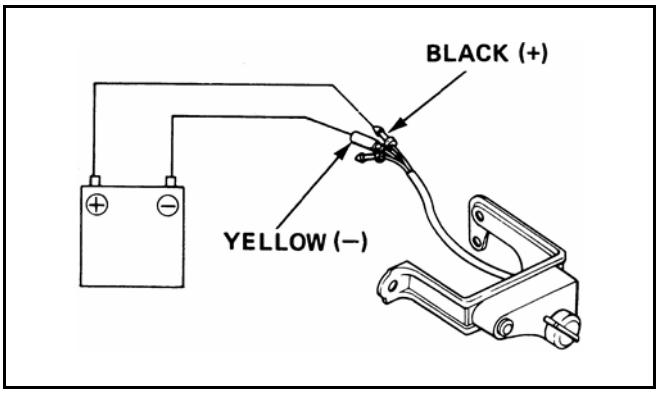


Connect a 6V battery to the black and yellow wires of the engine switch, and check that the warning lamp lights up.

Black- Battery (+)
Yellow- Battery (-)

⚠ CAUTION

Never use a battery over 6V. It will cause the lamp to burn out.



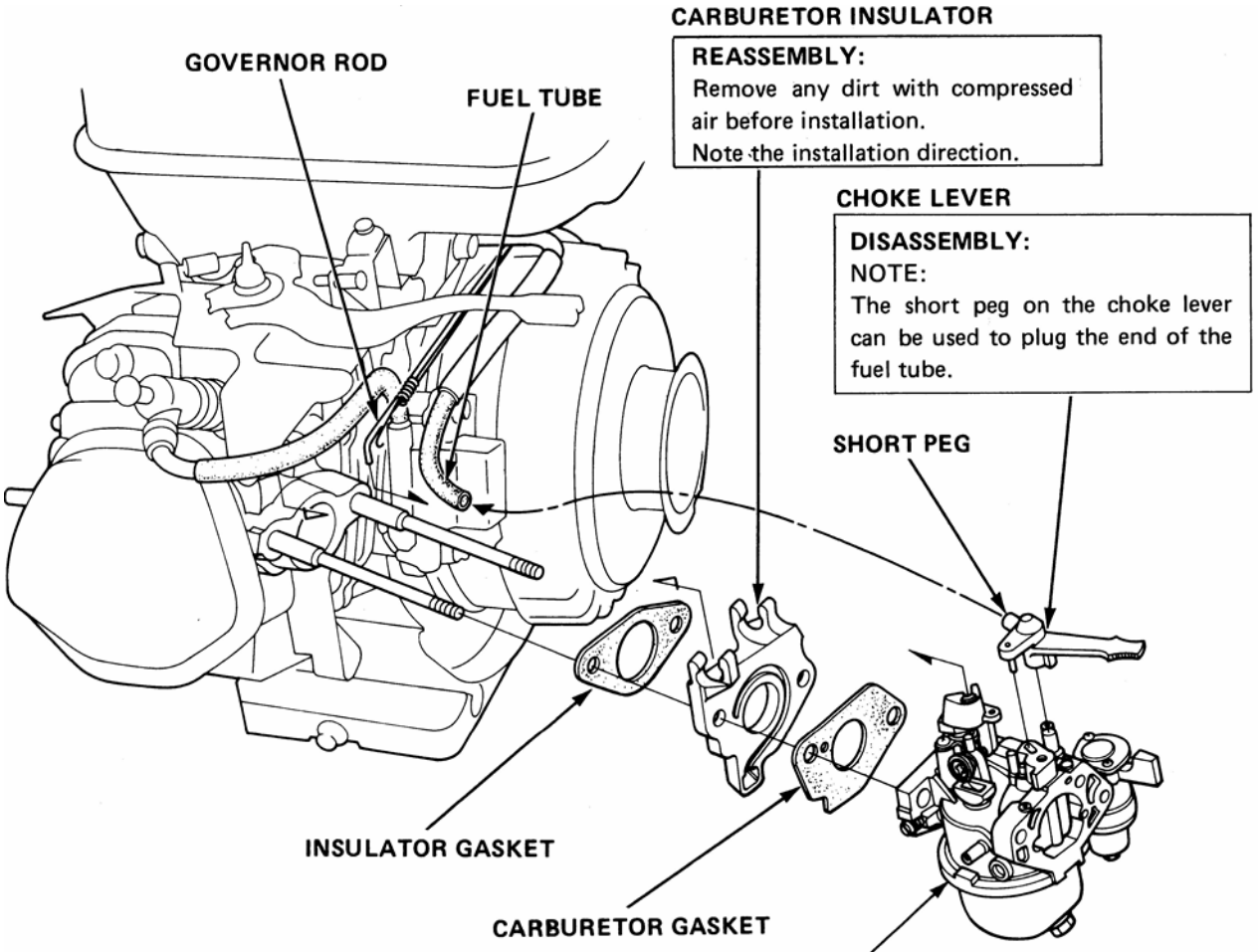
10. CARBURETOR

1. REMOVAL/INSTALLATION

⚠ WARNING

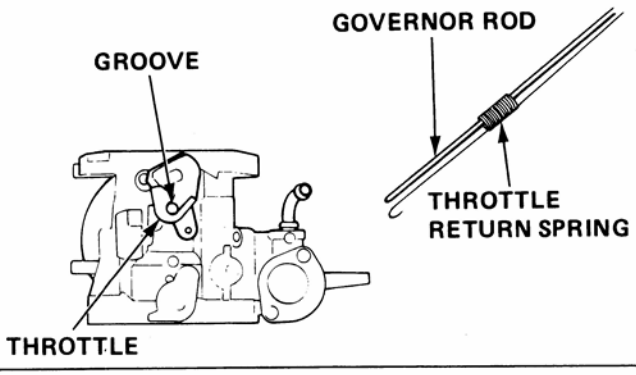
Remove the fuel drain bolt and drain the carburetor before removing it from the engine.
Fuel vapor or spilled fuel may ignite.

WT20X
WT30X
WT40X



CARBURETOR

REMOVAL:
Unhook the throttle return spring. Pull the carburetor forward to a point where the groove in the throttle arm lines up with the road, and lift the rod of its hole.

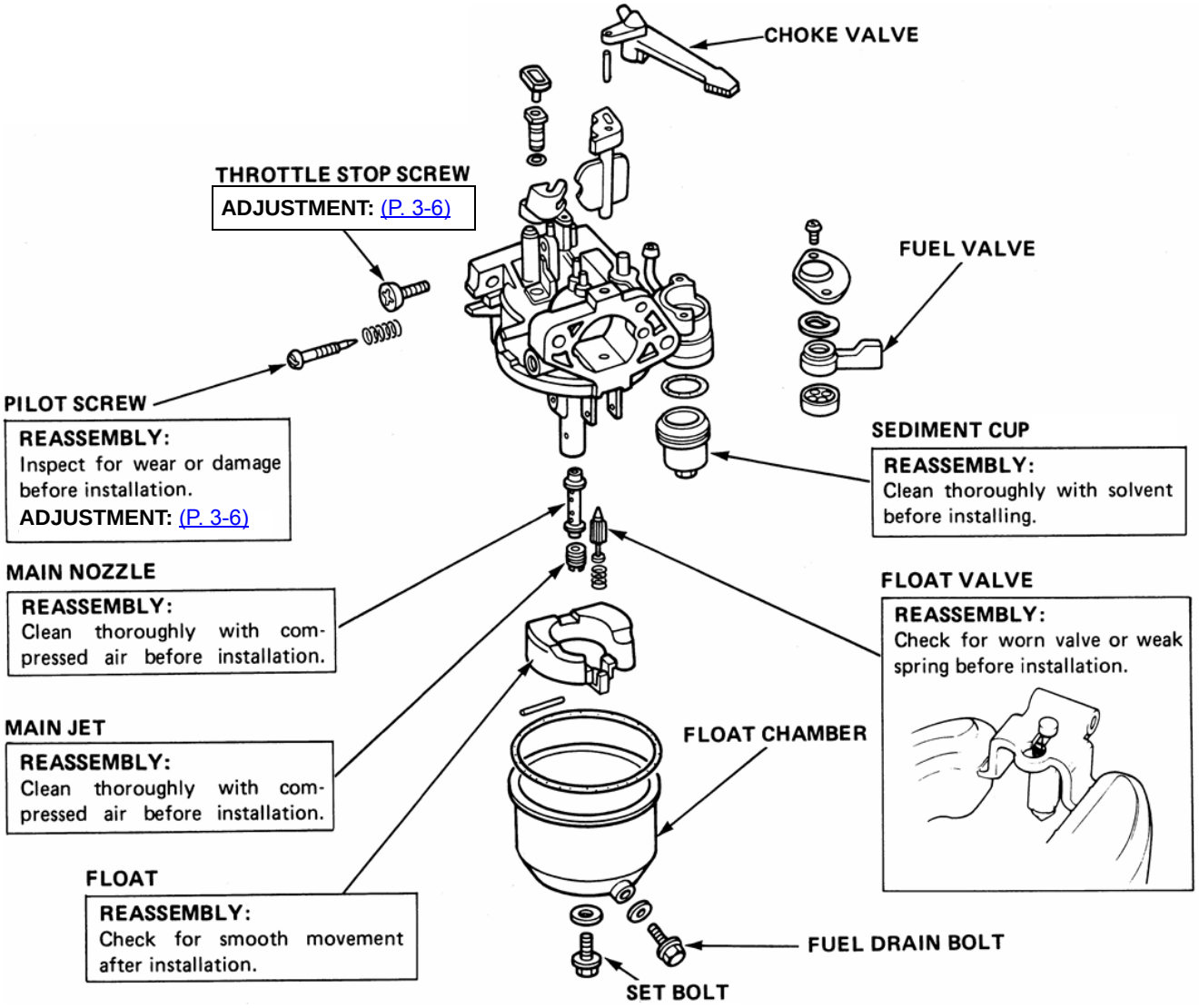


2. DISASSEMBLY/REASSEMBLY

WT20XK1
WT30XK1
WT40XK0

⚠ WARNING

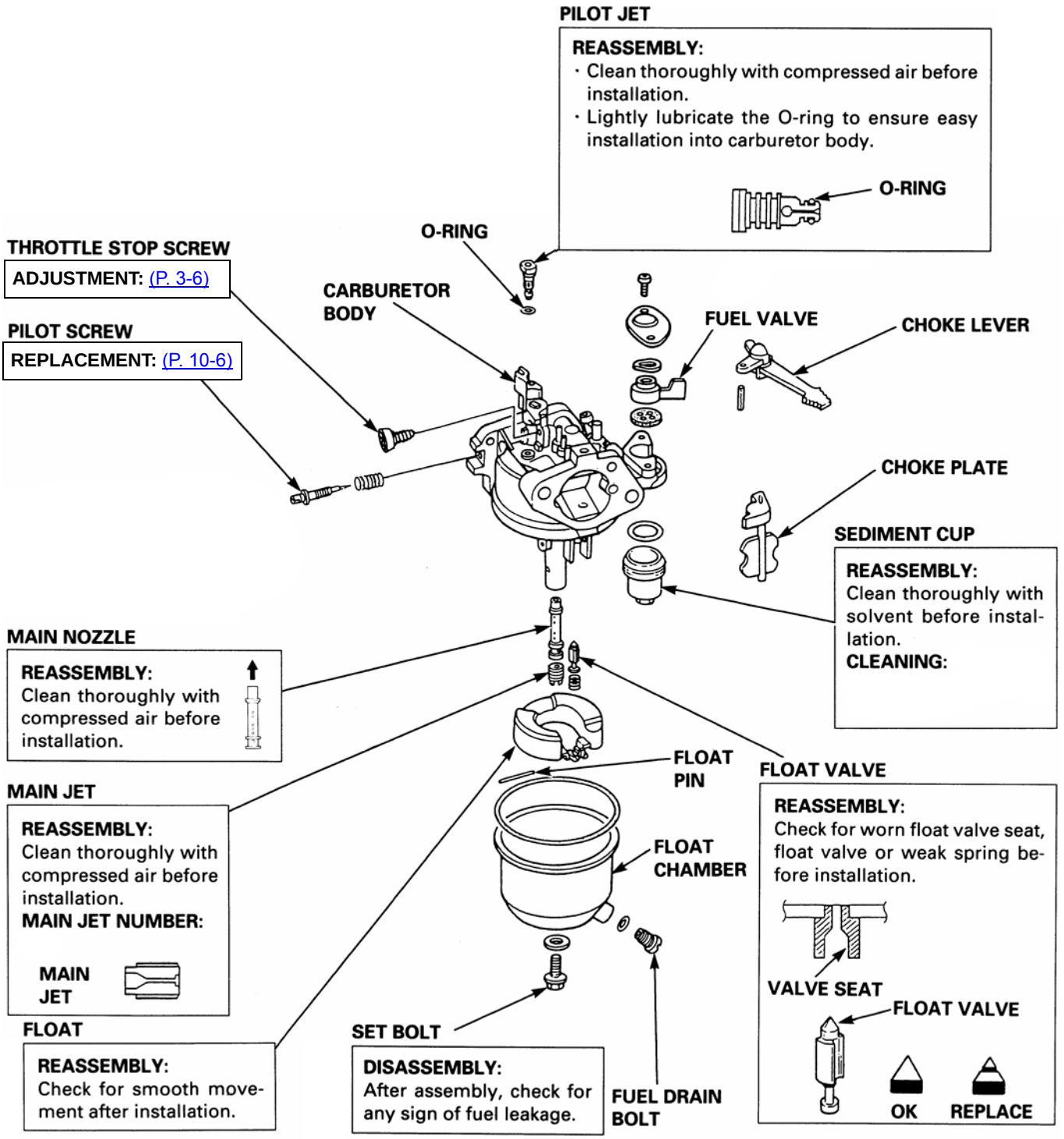
Remove the fuel drain bolt and drain the carburetor before removing it from the engine.
Fuel vapor or spilled fuel may ignite.



⚠ WARNING

After assembly check for any sign of fuel leakage.

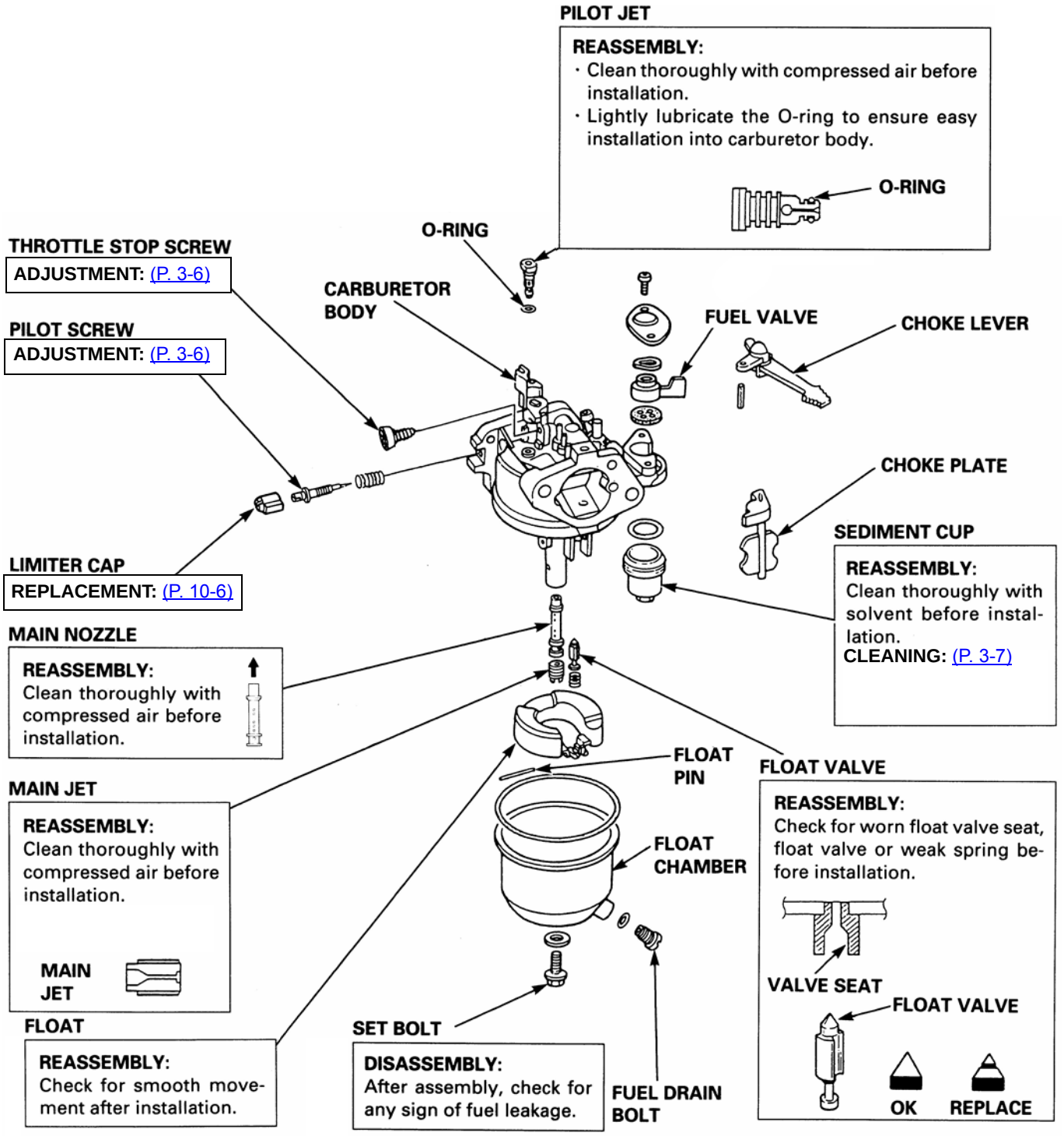
WT20XK2/K3/K4
WT30XK2/K3
WT40XK1/K2



LIMITER CAP MODELS ONLY

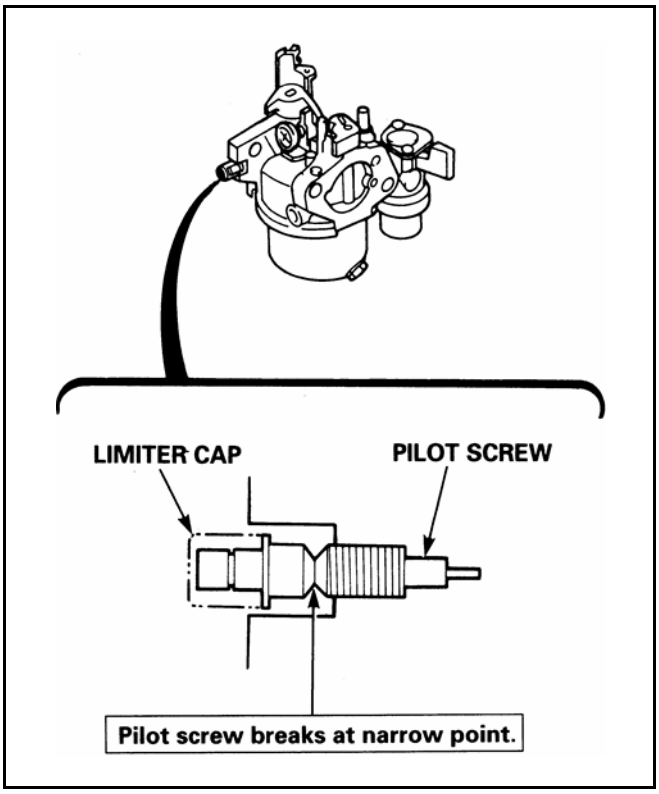
NOTICE

Tampering is violation of Federal and California Law.



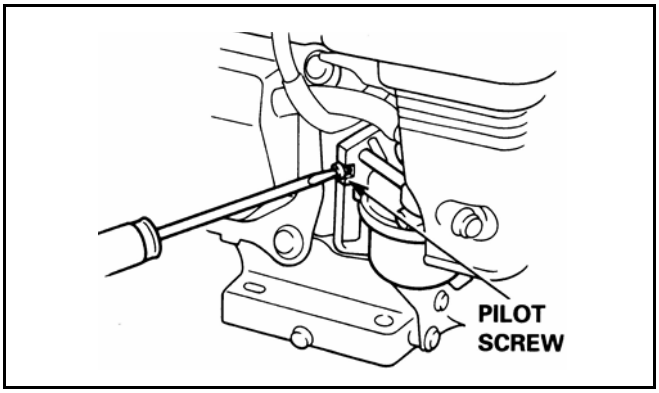
PILOT SCREW WITH LIMITER CAP

The limiter cap is an emission-related part. Leave the pilot screw and limiter cap in place during carburetor cleaning. Remove only if necessary for carburetor repair. Removal of the limiter cap requires breaking the pilot screw. A new pilot screw and limiter cap must be installed.



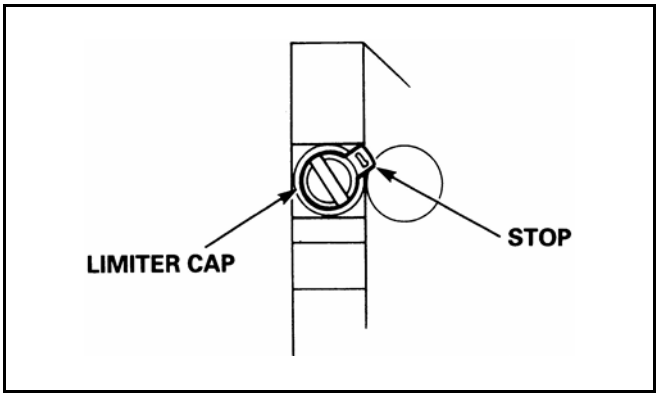
1. When the limiter cap has been broken off, remove the broken pilot screw.
2. Place the spring on the replacement pilot screw, and install it on the carburetor.
3. Turn the pilot screw in until it is lightly seated, then turn the screw out the required number of turns.

Pilot screw opening	WT20XK2 WT20XK3 WT20XK4	2 turns out
	WT30XK2 WT30XK3	1-5/8 turns out
	WT40XK1 WT40XK2	1-1/2 turns out



4. Apply LOCTITE® 638 to the inside of the limiter cap, then install the cap so its stop prevents the pilot screw from being turned counterclockwise.

   Be careful to avoid turning the pilot screw while installing the limiter cap. The pilot screw must stay at its required setting.

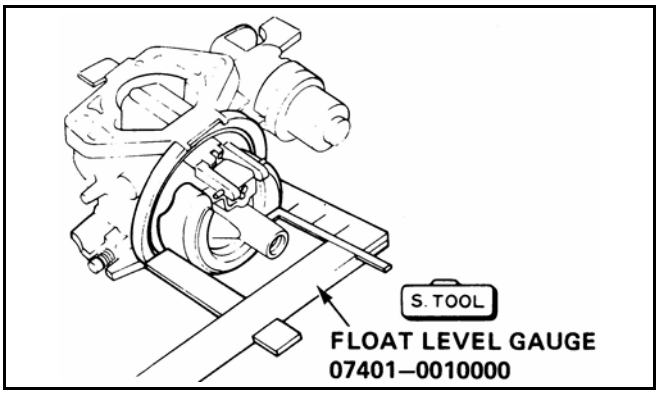


3. FLOAT LEVEL HEIGHT

Place the carburetor in an upright position and measure the distance between the top of the float and the carburetor body when the float just contacts the seat without compressing the valve spring.

If the height is out of specification, replace the float.

Standard float height	WT20XK1	12.2-15.2 mm (0.48-0.60 in)
	WT20XK2 WT20XK3 WT20XK4	13.7 mm (0.54 in)
	WT30XK1	11.9-14.5 mm (0.47-0.57 in)
	WT30XK2 WT30XK3	13.2 mm (0.52 in)
	WT40XK0	11.9-14.5 mm (0.47-0.57in)
	WT40XK1 WT40XK2	13.2 mm (0.52 in)



11. FUEL TANK

1. DISASSEMBLY/REASSEMBLY

WT20X

⚠ WARNING

- Before disassembly, drain the tank and fuel line completely.
- Fuel vapor or spilled fuel may ignite.

REASSEMBLY:
Make sure that the air vent hole is clean and unclogged. Blow with compressed air if necessary.

FUEL STRAINER

REASSEMBLY:
Check to be sure the strainer is clean and undamaged before installing.

FUEL TUBE

Replace every 3 years.
REASSEMBLY:
Inspect for cracks or deterioration before installation and replace if necessary.

WING NUT

REASSEMBLY:
Adjust control lever friction with the wing nut.

CONTROL LEVER WASHER

LEVER SPRING

REASSEMBLY:
Install with the concave side toward the control lever.

FUEL TANK

Fuel tank capacity:	
WT20XK1 WT20XK2 WT20XK3	3.6 L (0.95 US gal)
WT20XK4	3.1 L (0.82 US gal)

REASSEMBLY:
Wash the tank to remove sediment, and dry it throughly before installing.

FUEL FILTER

WT20X:
1.0 - 2.0 N•m (0.7 - 1.4 lb-ft)

REASSEMBLY:
Check to be sure the filter is clean and undamaged.

CONTROL LEVER

CONTROL BASE

6 x 12 (2)

THROTTLE CONTROL ASSEMBLY

FUEL TANK MOUNT NUT (2)

WT20X:
8 - 12 N•m (5.8 - 8.7 ft-lb)

GOVERNOR ARM

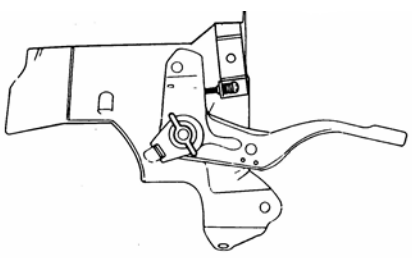
REASSEMBLY:
Adjust the governor after installation

WT20X:
6 x 25 mm

5 x 20 mm SCREW

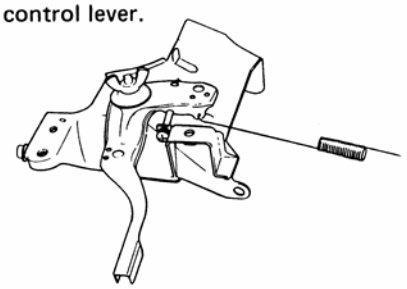
REASSEMBLY:
After assembling, start the engine and adjust the maximum speed.

WT20X:	3,900 rpm ± 100 rpm



GOVERNOR SPRING

REASSEMBLY:
Always use genuine Honda parts. Install with the long end toward the control lever.



ANTI-SURGE SPRING

REASSEMBLY:
Install with the long end toward the governor.

WT30X
WT40X

⚠ WARNING

- Before disassembly, drain the tank and fuel line completely.
- Fuel vapor or spilled fuel may ignite.

REASSEMBLY:
Make sure that the air vent hole is clean and unclogged. Blow with compressed air if necessary.

FUEL STRAINER

REASSEMBLY:
Check to be sure the strainer is clean and undamaged before installing.

FUEL TUBE

Replace every 3 years.
REASSEMBLY:
Inspect for cracks or deterioration before installation and replace if necessary.

FUEL TANK

Fuel tank capacity:	
WT30X	6.0 L (1.59 US gal)
WT40X	6.5 L (1.72 US gal)

REASSEMBLY:
Wash the tank to remove sediment, and dry it throughly before installing.

WING NUT

REASSEMBLY:
Adjust control lever friction with the wing nut.

CONTROL LEVER WASHER

LEVER SPRING

REASSEMBLY:
Install with the concave side toward the control lever.

FUEL FILTER

WT30X:
WT40X:
1.0 - 2.0 N•m (0.7 - 1.4 lb-ft)

REASSEMBLY:
Check to be sure the filter is clean and undamaged.

CONTROL LEVER

CONTROL BASE

FUEL TANK MOUNT NUT (2)

WT30X:
WT40X:
24 N•m (17.4 ft-lb)

6 x 12 (2)

THROTTLE CONTROL ASSEMBLY

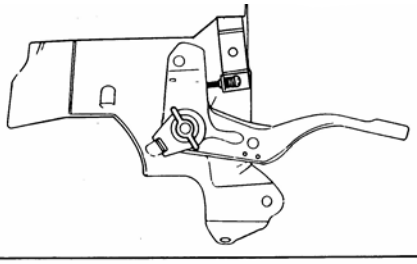
GOVERNOR ARM

REASSEMBLY:
Adjust the governor after installation

5 x 20 mm SCREW

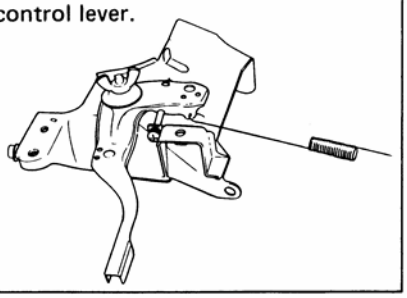
REASSEMBLY:
After assembling, start the engine and adjust the maximum speed.

WT30X WT40X	4,000 rpm ± 100 rpm



GOVERNOR SPRING

REASSEMBLY:
Always use genuine Honda parts. Install with the long end toward the control lever.



WT30X:
WT40X:
8 x 25 mm

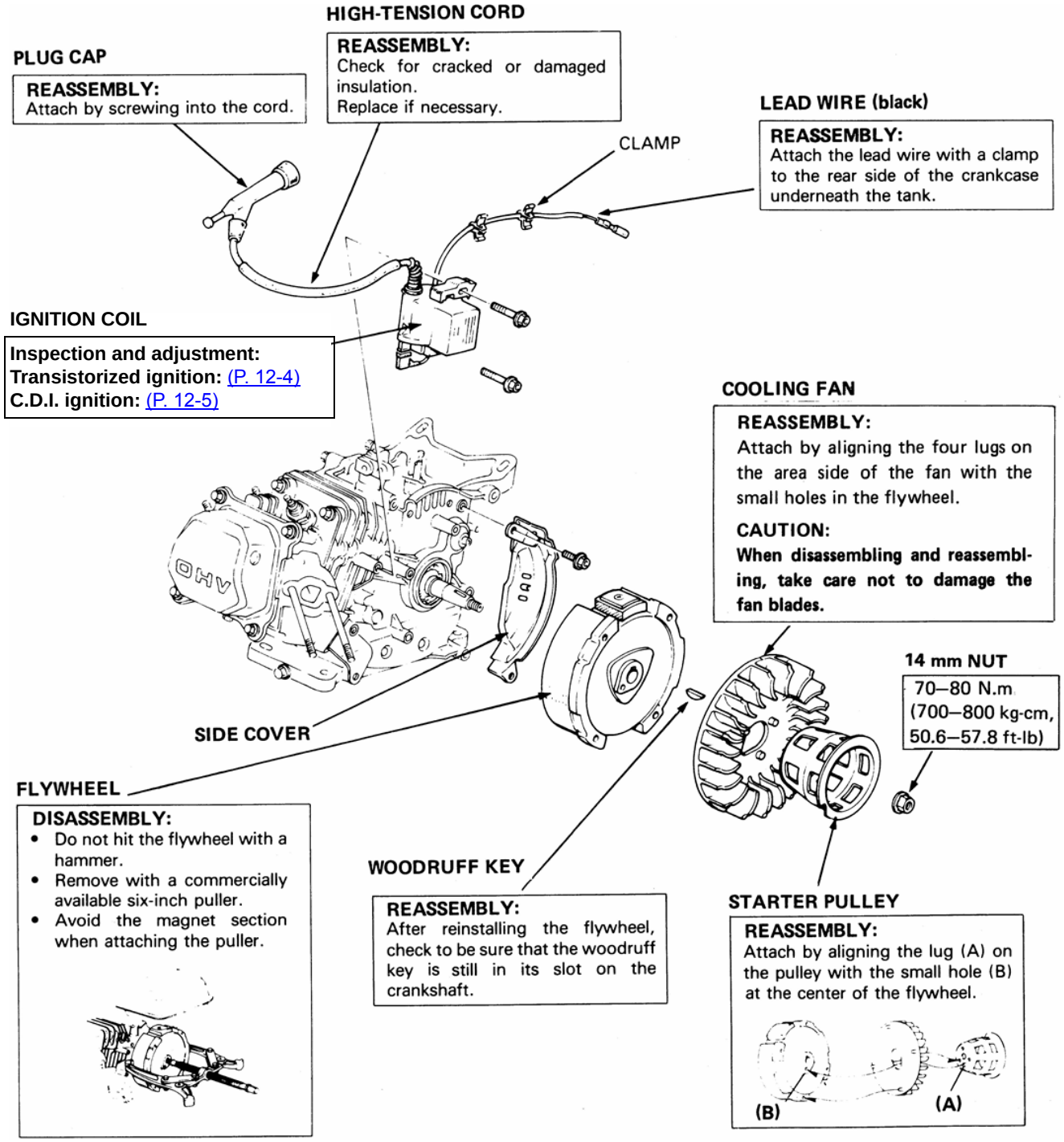
ANTI-SURGE SPRING

REASSEMBLY:
Install with the long end toward the governor.

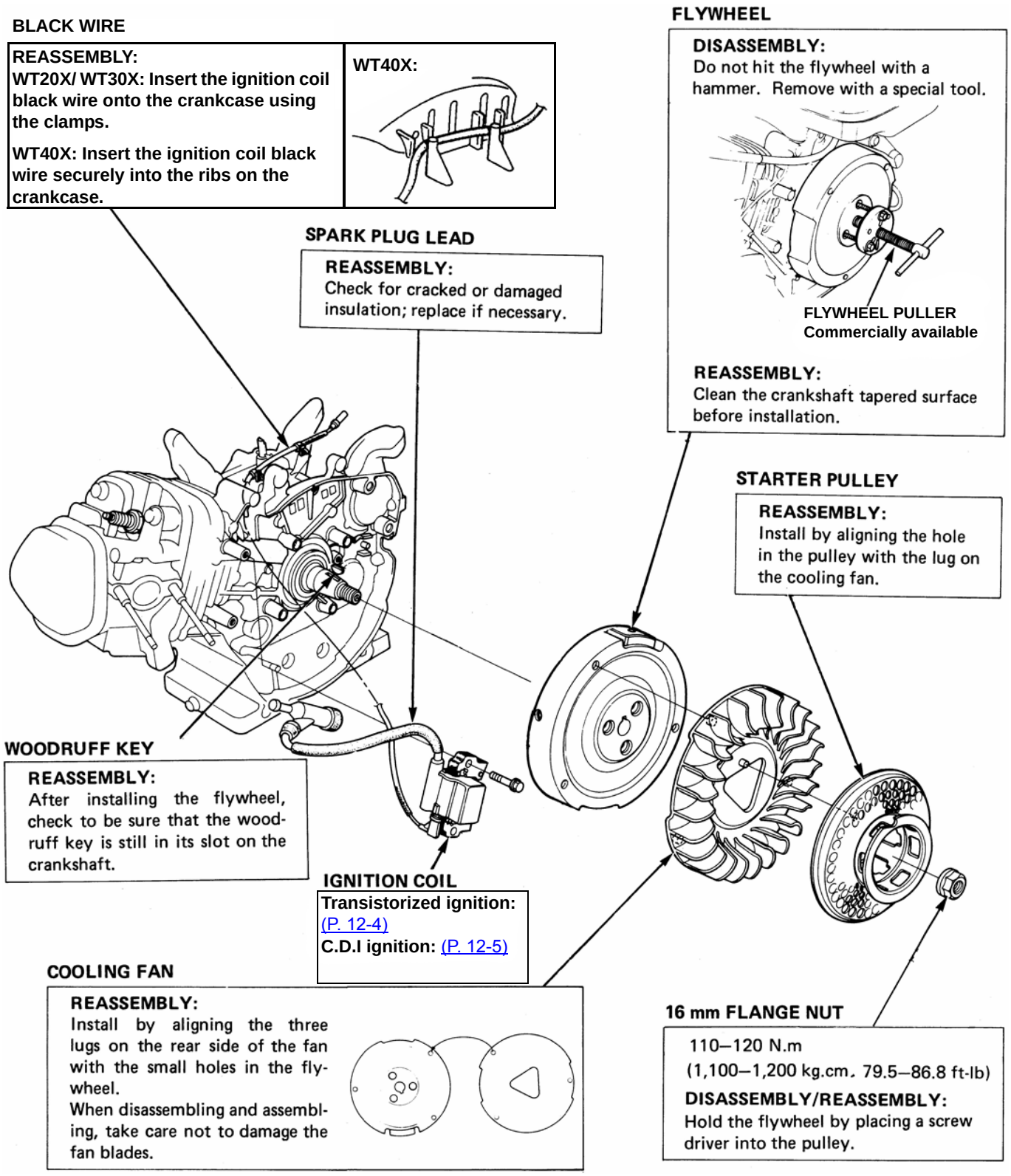
12. FLYWHEEL / IGNITION COIL

1. DISASSEMBLY/REASSEMBLY

WT20X



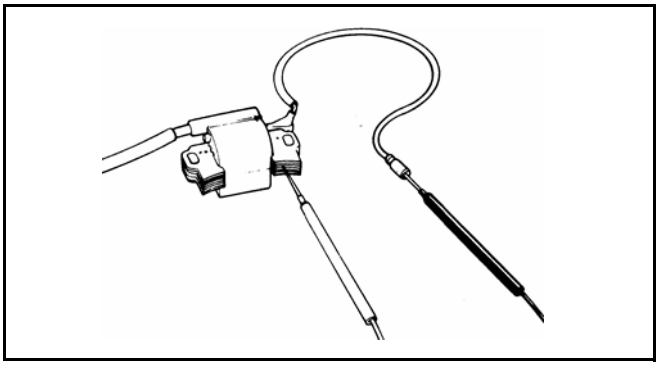
WT30X
WT40X


BLACK WIRE
REASSEMBLY:
WT20X/ WT30X: Insert the ignition coil black wire onto the crankcase using the clamps.
WT40X: Insert the ignition coil black wire securely into the ribs on the crankcase.
WT40X:
SPARK PLUG LEAD
REASSEMBLY:
Check for cracked or damaged insulation; replace if necessary.
FLYWHEEL
DISASSEMBLY:
Do not hit the flywheel with a hammer. Remove with a special tool.
FLYWHEEL PULLER
Commercially available
REASSEMBLY:
Clean the crankshaft tapered surface before installation.
STARTER PULLEY
REASSEMBLY:
Install by aligning the hole in the pulley with the lug on the cooling fan.
WOODRUFF KEY
REASSEMBLY:
After installing the flywheel, check to be sure that the woodruff key is still in its slot on the crankshaft.
IGNITION COIL
Transistorized ignition: (P. 12-4)
C.D.I ignition: (P. 12-5)
COOLING FAN
REASSEMBLY:
Install by aligning the three lugs on the rear side of the fan with the small holes in the flywheel.
When disassembling and assembling, take care not to damage the fan blades.
16 mm FLANGE NUT
110–120 N.m
(1,100–1,200 kg.cm, 79.5–86.8 ft-lb)
DISASSEMBLY/REASSEMBLY:
Hold the flywheel by placing a screw driver into the pulley.

2. TRANSISTORIZED IGNITION COIL

PRIMARY SIDE

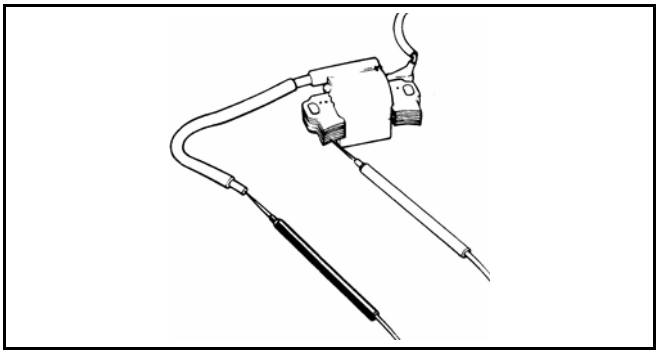
Measure the resistance of the primary coil by attaching one ohmmeter lead to the ignition coil's primary (black) lead while touching the other test lead to the iron core.



Primary side resistance value	WT20XK1 WT30XK1	0.7 - 0.9 Ω
	WT20XK2 WT20XK3 WT30XK2 WT30XK3 WT40XK1 WT40XK2	0.8 - 1.0 Ω

SECONDARY SIDE

Measure the resistance of the secondary side of the coil by removing the spark plug cap and touching one test lead to the spark plug lead wire while touching the other lead to the coil's iron core.



NOTICE

A false reading will result if the spark plug cap is not removed.

Secondary side resistance value	WT20XK1 WT30XK1	6.3 - 7.7 kΩ
	WT20XK2 WT20XK3 WT30XK2 WT30XK3 WT40XK1 WT40XK2	5.9 - 7.1 kΩ

3. C.D.I. IGNITION COIL

PRIMARY SIDE

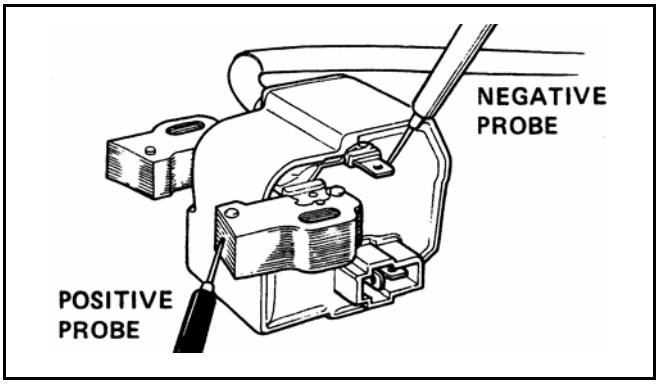
Remove the fan cover.

Disconnect the ignition coil connector.

Measure the resistance of the primary coil by attaching one ohmmeter probe to the ignition coil wire terminal and the other at the iron core.

Primary side resistance value	WT20XK4	0.6 - 0.9 Ω
	WT40X	230 - 290 Ω

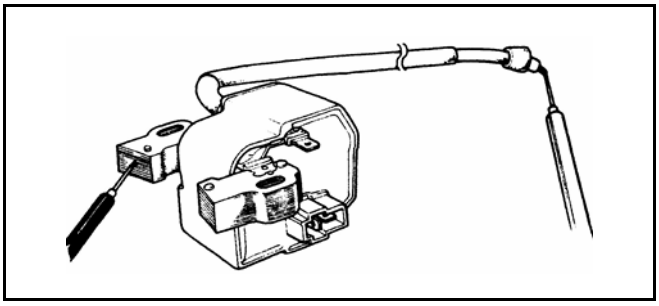
If the measured resistance is out of specification, replace the ignition coil.



SECONDARY SIDE

Remove the spark plug cap and measure the resistance of the secondary coil between the plug wire and coil body.

Secondary side resistance value	WT20XK4	5.6 - 6.9 kΩ
	WT40X	3.6 - 4.6Ω

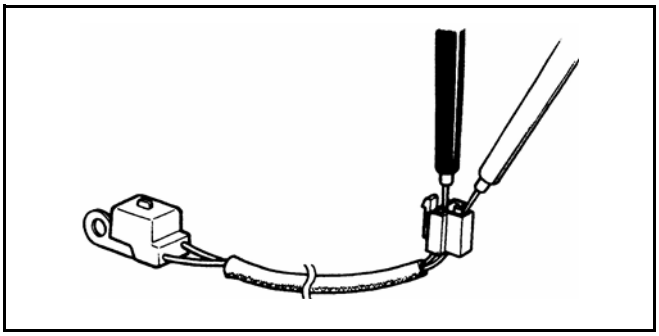


PULSER COIL

WT40XK0 ONLY

Disconnect the pulser coil from the ignition coil and measure the resistance between the terminals.

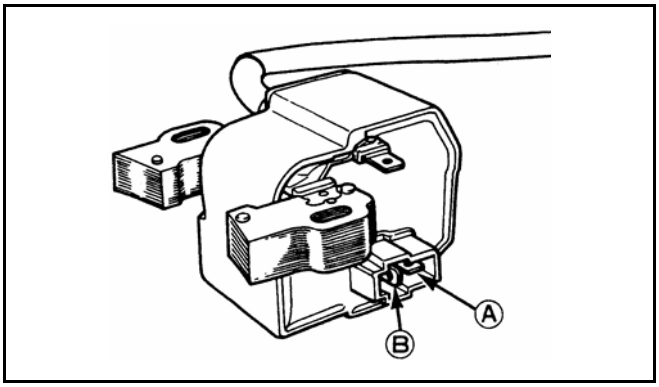
Resistance	30 - 36 Ω



RESISTANCE BETWEEN COUPLER TERMINALS

Measure the resistance between the 2-P coupler terminals.

(+) / (-)	A	B
A	-----	10 - 300 kΩ
B	20 - 500 kΩ	-----



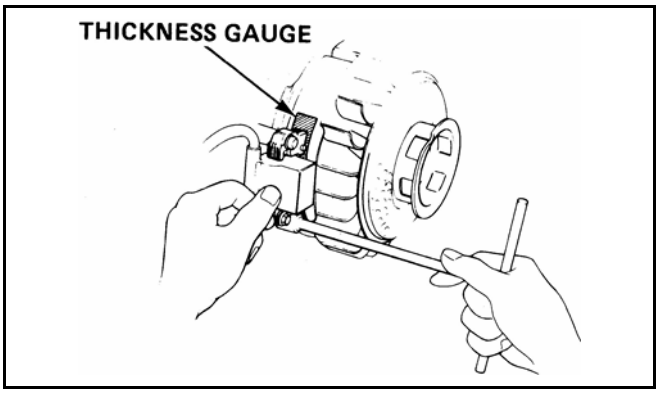
NOTICE

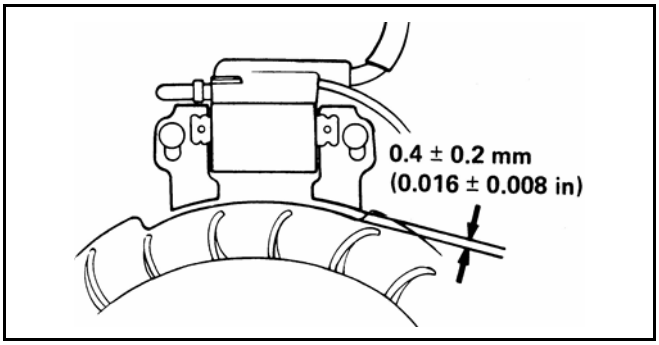
If all C.D.I. ignition coil resistance valves are normal, but there is no spark at the spark plug, then (if all other ignition system components are OK) replace the C.D.I. ignition coil anyway.

4. AIR GAP ADJUSTMENT

1. Loosen the ignition coil mounting bolts.
2. Insert a thickness gauge or a piece of paper of the proper thickness between the transistorized ignition coil and the flywheel. Avoid the magnet part of the flywheel when adjusting.
3. Push the ignition coil firmly against the flywheel; tighten the bolts, and then remove the gauge.

Specified air gap	0.4 ± 0.2 mm (0.016 ± 0.008 in)





13. CYLINDER HEAD / VALVES

1. DISASSEMBLY/REASSEMBLY

SERVICE BULLETIN #1

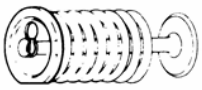
CYLINDER HEAD BOLT

WT20X:	WT30X/WT40X:
M8 x 1.25 mm 22 - 26 N•m (15.9 - 18.8 ft-lb)	M10 x 1.25 mm 35 N•m (25.3 ft-lb)

VALVE SPRING RETAINER

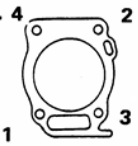
DISASSEMBLY:
Push down and slide the retainer to the side, so the valve stem slips through the hole at the side of the retainer.

REASSEMBLY:
NOTE: The exhaust valve retainer has a larger center recess than the intake valve retainer, so it can accept the valve rotator.



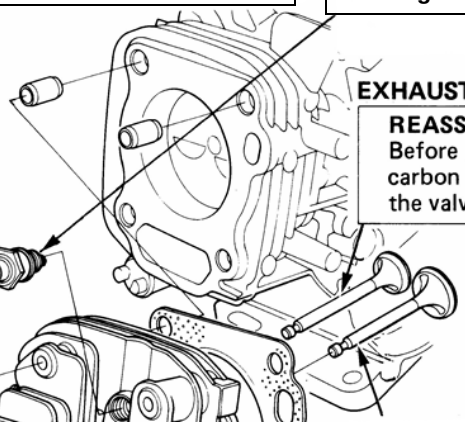
CAUTION: Do not remove the valve spring retainers while the cylinder head is installed, or the valves will drop into the cylinder.

Loosen and tighten the bolts, in the order shown.



SPARK PLUG

Cleaning and adjustment:(P. 3-4)



EXHAUST VALVE

REASSEMBLY:
Before installation, remove carbon deposits and inspect the valve.

VALVE ROTATOR
WT30X/WT40X ONLY: (Exhaust valve only)

REASSEMBLY:
CAUTION: If the valve rotator is not installed, the exhaust valve may drop into the cylinder when the engine is started.

VALVE SPRING

INTAKE VALVE

REASSEMBLY:
Do not interchange with the exhaust valve.

The intake valve is larger than the exhaust valve.

PIVOT LOCK NUT

8–12 N·m (80–120 kg-cm, 5.8–8.7 ft-lb)

CYLINDER HEAD

REASSEMBLY:
Before installation, remove carbon deposits from the combustion chamber and inspect the valve seats.

ROCKER ARM PIVOT

VALVE ROCKER ARM

HEAD COVER BOLT

PIVOT BOLT

22–26 N.m (220–260 kg-cm, 15.9–18.8 ft-lb)

6 x 12

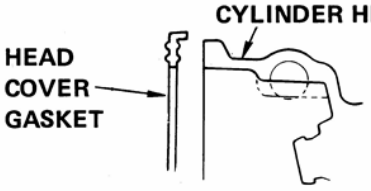
VALVE GUIDE

CYLINDER HEAD COVER

PUSH ROD GUIDE

CYLINDER HEAD COVER GASKET

REASSEMBLY:
Note the installation direction.

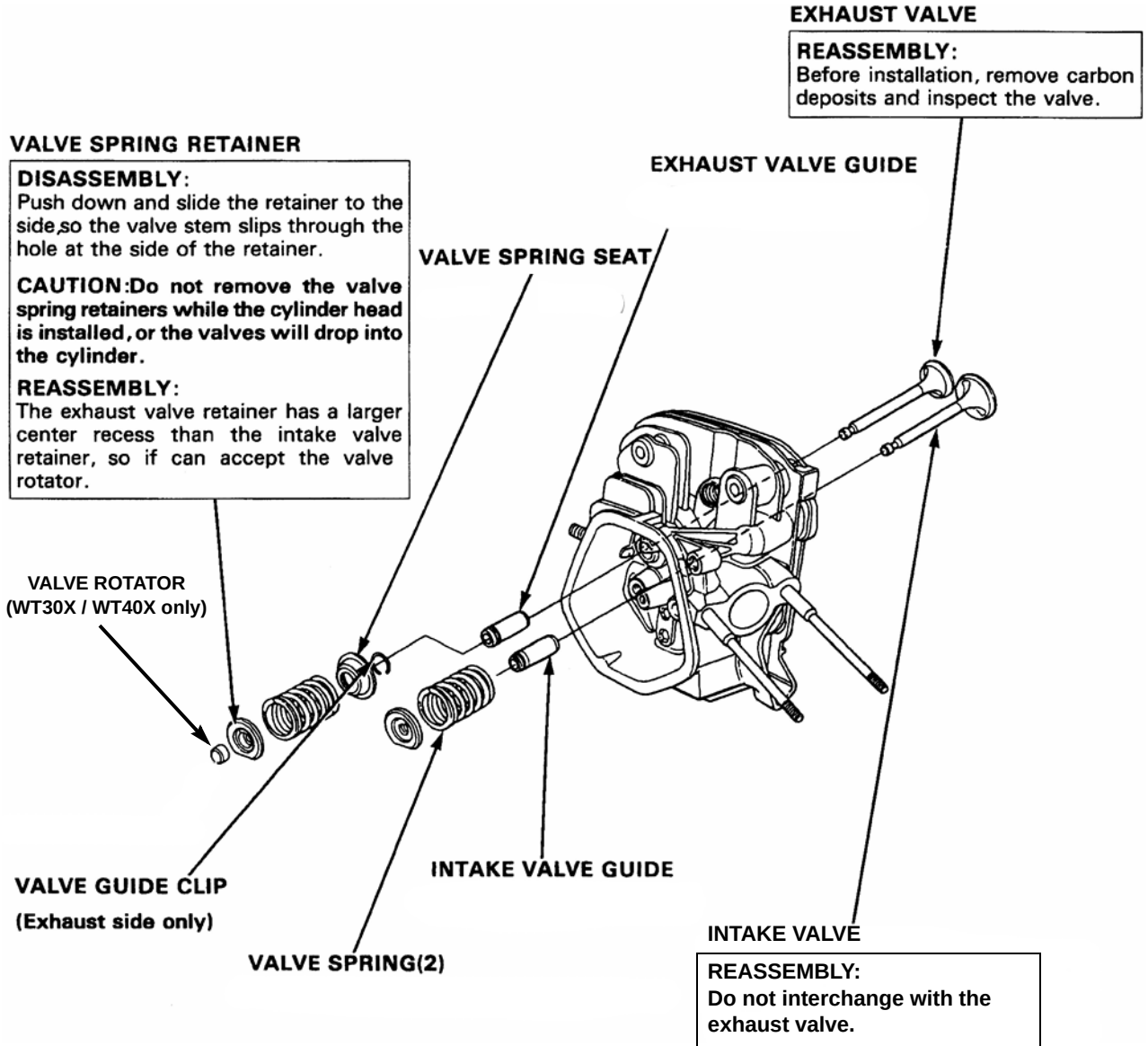


HEAD COVER WASHER

PUSH ROD

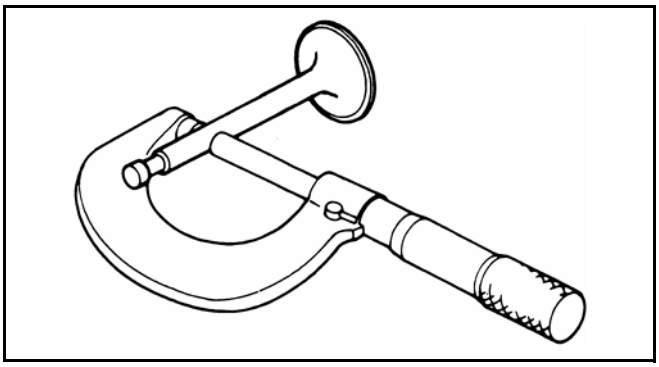
REASSEMBLY:
Check both ends for wear and check the rod for straightness. Be sure the rod ends are firmly seated in the lifters.

WT20XK4
WT30XK2/K3
WT40XK1/K2



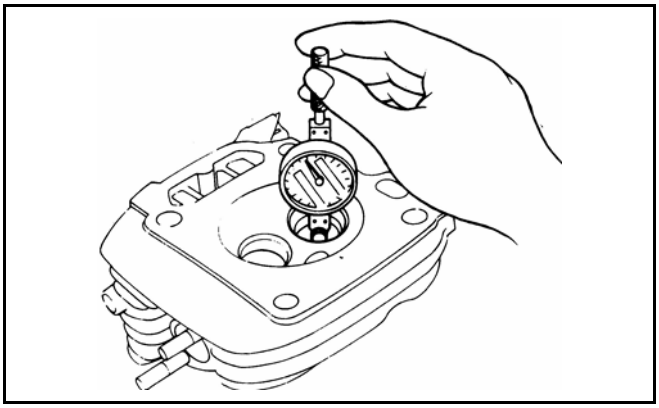
2. INSPECTION

Replace any parts that exceed their service limit.



VALVE STEM O.D.

		Standard	Service limit
WT20X	IN	5.468-5.480 mm (0.215-0.216 in)	5.318 mm (0.209 in)
	EX	5.425-5.440 mm (0.2136-0.214 in)	5.275 mm (0.208 in)
WT30X WT40X	IN	6.59 mm (0.259 in)	6.44 mm (0.254 in)
	EX	6.55 mm (0.258 in)	6.40 mm (0.252 in)

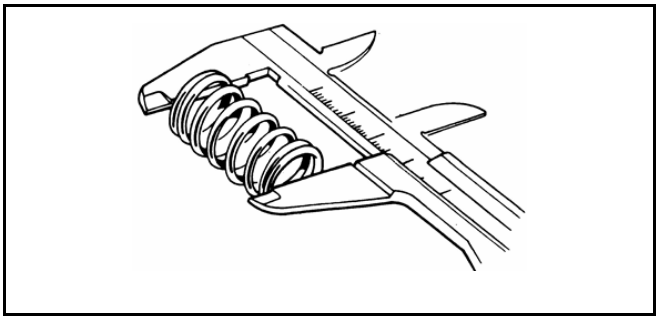


VALVE GUIDE I.D. (IN/EX)

	Standard	Service limit
WT20X	5.50-5.512 mm (0.2165-0.217 in)	5.562 mm (0.219 in)
WT30X WT40X	6.60 mm (0.260 in)	6.66 mm (0.262 in)

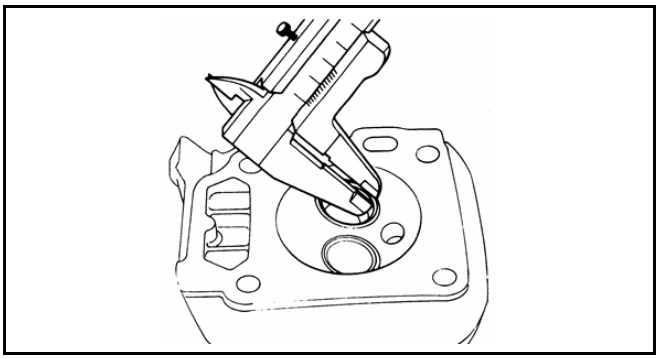
GUIDE-TO-STEM CLEARANCE

		Standard	Service limit
WT20X WT30X WT40X	IN	0.02-0.04 mm (0.0008-0.0016 in)	0.10 mm (0.039 in)
	EX	0.06-0.087 mm (0.0024-0.0034 in)	0.12 mm (0.047 in)



VALVE SPRING FREE LENGTH

	Standard	Service limit
WT20XK1	34.0 mm (1.339 in)	32.5 mm (1.28 in)
WT20XK2 WT20XK3 WT20XK4	30.5 mm (1.20 in)	29.5 mm (1.16 in)
WT30X WT40X	39.0 mm (1.54 in)	37.5 mm (1.48 in)



VALVE SEAT WIDTH

		Standard	Service limit
WT20XK1 WT20XK2 WT20XK3		0.8 mm (0.032 in)	2.0 mm (0.08 in)
WT20XK4	IN	0.7 - 0.9 mm (0.028 - 0.032 in)	2.0 mm (0.08 in)
	EX	0.90 - 1.10 mm (0.035 - 0.043 in)	2.0 mm (0.08 in)
WT30X WT40X		1.1 mm (0.043 in)	2.0 mm (0.08 in)

3. VALVE GUIDE REPLACEMENT

1. Chill the replacement valve guides in the freezer for about an hour.
2. Use a hot plate or oven to heat the cylinder head evenly to 150°C (300°F).

⚠ WARNING

- To avoid burns, use heavy gloves when handling the heated cylinder head.

NOTICE

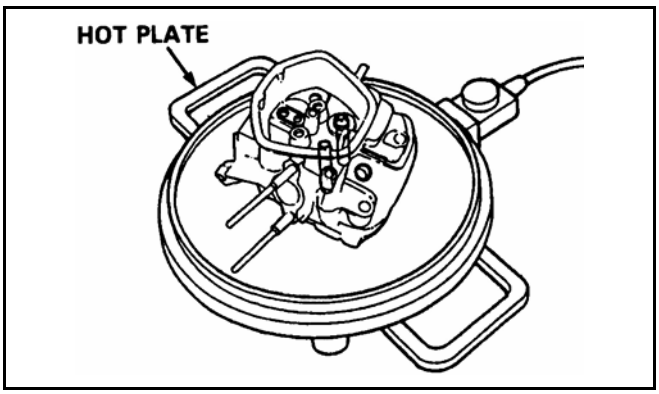
Do not use a torch to heat the cylinder head; warpage of the cylinder head may result.
Do not get the head hotter than 150°C (300°F); excessive heat may loosen the valve seats.

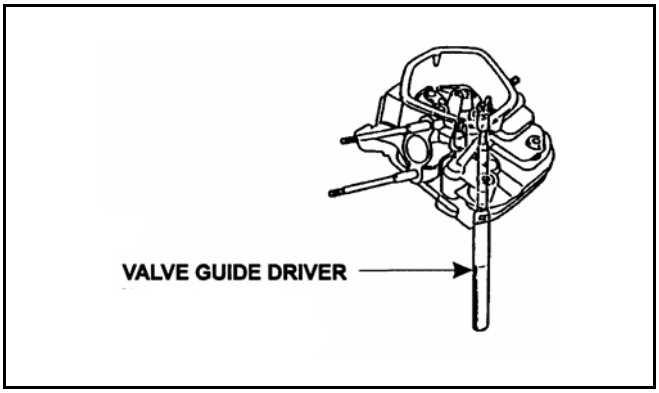
3. Remove the heated cylinder head from the hot plate and support it with wooden blocks. Drive the valve guides out of the head from the combustion chamber side.

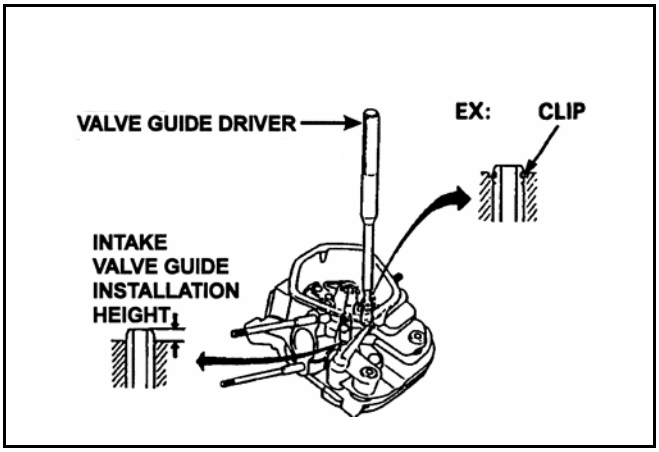
TOOLS:
VALVE GUIDE DRIVER
WT20XK1/K2/K3: 07942-8920000
WT30XK1, WT40XK0: 07942-6570100
WT20XK4, WT30XK2/K3, WT40XK1/K2: 07742-0010200

4. Remove the new valve guides from the freezer one at a time as needed.
5. Install the new valve guides from the valve spring side of the cylinder head.
6. Drive the valve guides to the specified height (measured from the top of the valve guide, to the cylinder casting) as shown.

Model		Valve Guide Installation Height
WT20XK1	IN	1.0 mm (0.04 in)
	EX	
WT20XK2 WT20XK3	IN	3.0 mm (0.12 in)
	EX	Until valve guide clip is fully seated
WT20XK4	IN	4.8 - 5.21 mm (0.19 - 0.20 in)
	EX	Until valve guide clip is fully seated
WT30XK1 WT40XK0	IN	9.0 mm (0.35 in)
	EX	Until valve guide clip is fully seated
WT30XK2 WT30XK3 WT40XK1 WT40XK2	IN	3.0 mm (0.12 in)
	EX	Until valve guide clip is fully seated

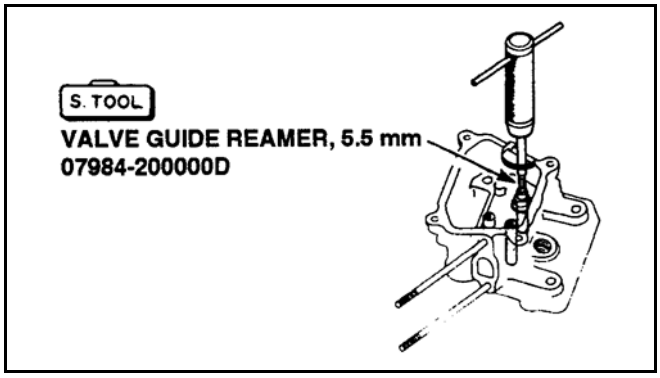




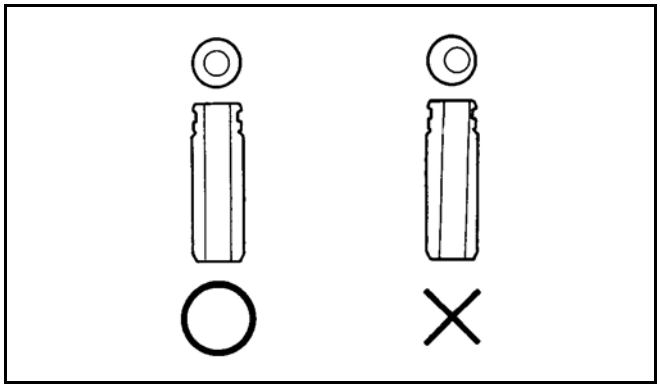


VALVE SEAT REAMING

For best results, be sure the cylinder head is at room temperature before reaming the valve guides.

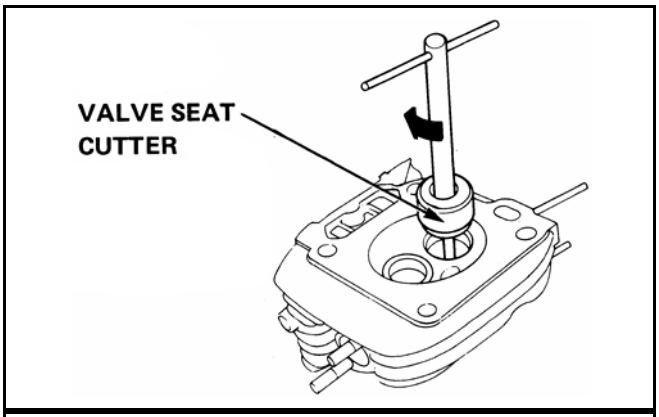


1. Coat the reamer and valve guide with cutting oil.
2. Rotate the reamer clockwise through the valve guide the full length of the reamer.
3. Continue to rotate the reamer clockwise while removing it from the valve guide.
4. Thoroughly clean the cylinder head to remove any cutting residue.
5. Check the valve guide bore; it should be straight, round, and centered in the valve guide. Insert the valve and check operation. If the valve does not operate smoothly, the guide may have been bent during installation. Replace the valve guide if it is bent or damaged.
6. Check the valve guide-to-stem clearance.

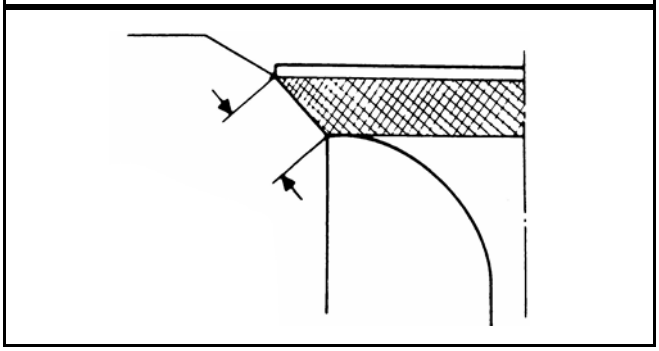


4. VALVE SEAT RECONDITIONING

1. Thoroughly clean the combustion chamber and valve seats to remove carbon deposits
   Apply a light coat of Prussian Blue or erasable felt-tipped marker ink to the valve face.



2. Insert the valve, and snap it closed against its seat several times. Be sure the valve does not rotate on the seat. The transferred marking compound will show any area of the seat that is not concentric.



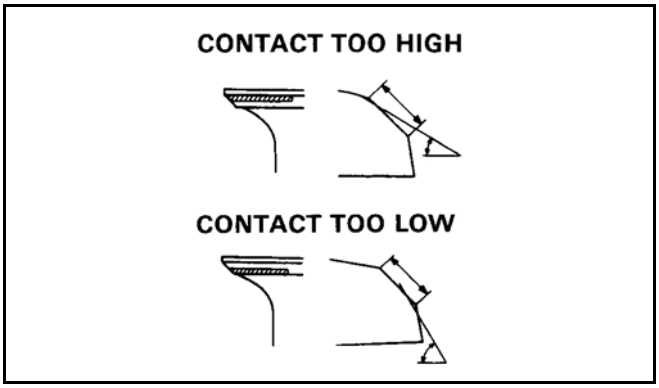
NOTICE

Only the WT30X and WT40X models use 6.60 mm solid pilot bars. These pilot bars are available in 6.60 mm, 6.62 mm, and 6.65 mm diameters to compensate for valve guide wear. Select the one that provides the closest fit in the valve guide.

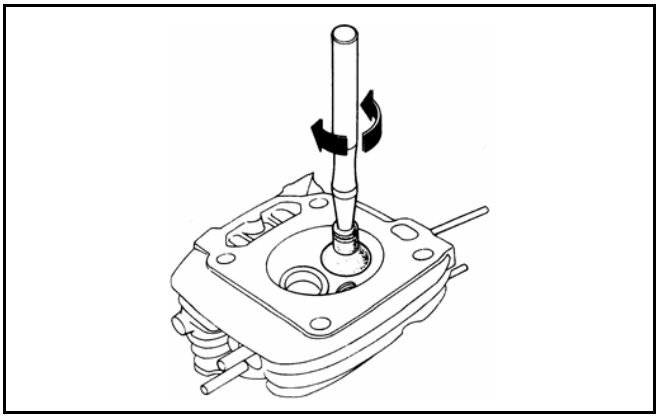
TOOLS:

SOLID PILOT BARS (Commercially available)	
6.60 mm	**NWY100-6.60**
6.62 mm	**NWY100-6.62**
6.65 mm	**NWY100-6.65**

3. Using a 45° cutter, remove enough material to produce a smooth and concentric seat.
   Turn the cutter clockwise, never counterclockwise. Continue to turn the cutter as you lift it from the valve seat.
4. Use the 30°-32° and 60° cutters to narrow and adjust the valve seat so that it contacts the middle of the valve face.
   The 30°-32° cutter removes material from the top edge (contact too high).
   The 60° cutter removes material from the bottom edge (contact too low). Be sure that the width of the finished valve seat is within specification.

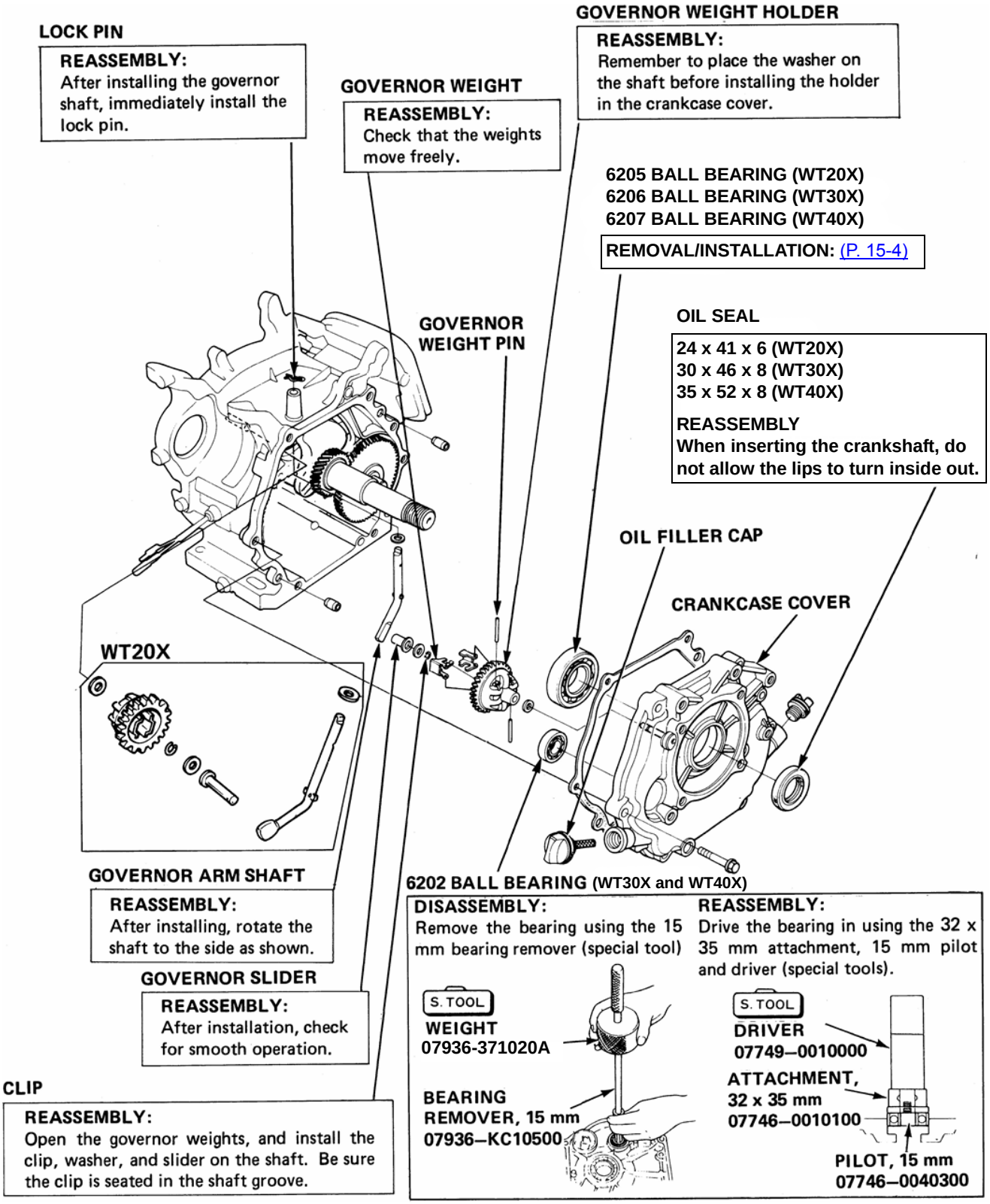


5. After resurfacing the seat, inspect it for even valve seating.
   Apply Prussian blue compound to the valve face, insert the valve, then lift it and snap it closed against the seat several times.
   The valve seating surface, as shown by the Prussian blue compound, should show good contact all the way around.
6. Lap the valves into their seats, using a hand valve lapper and lapping compound (commercially available).



14. CRANKCASE / GOVERNOR

1. DISASSEMBLY/REASSEMBLY



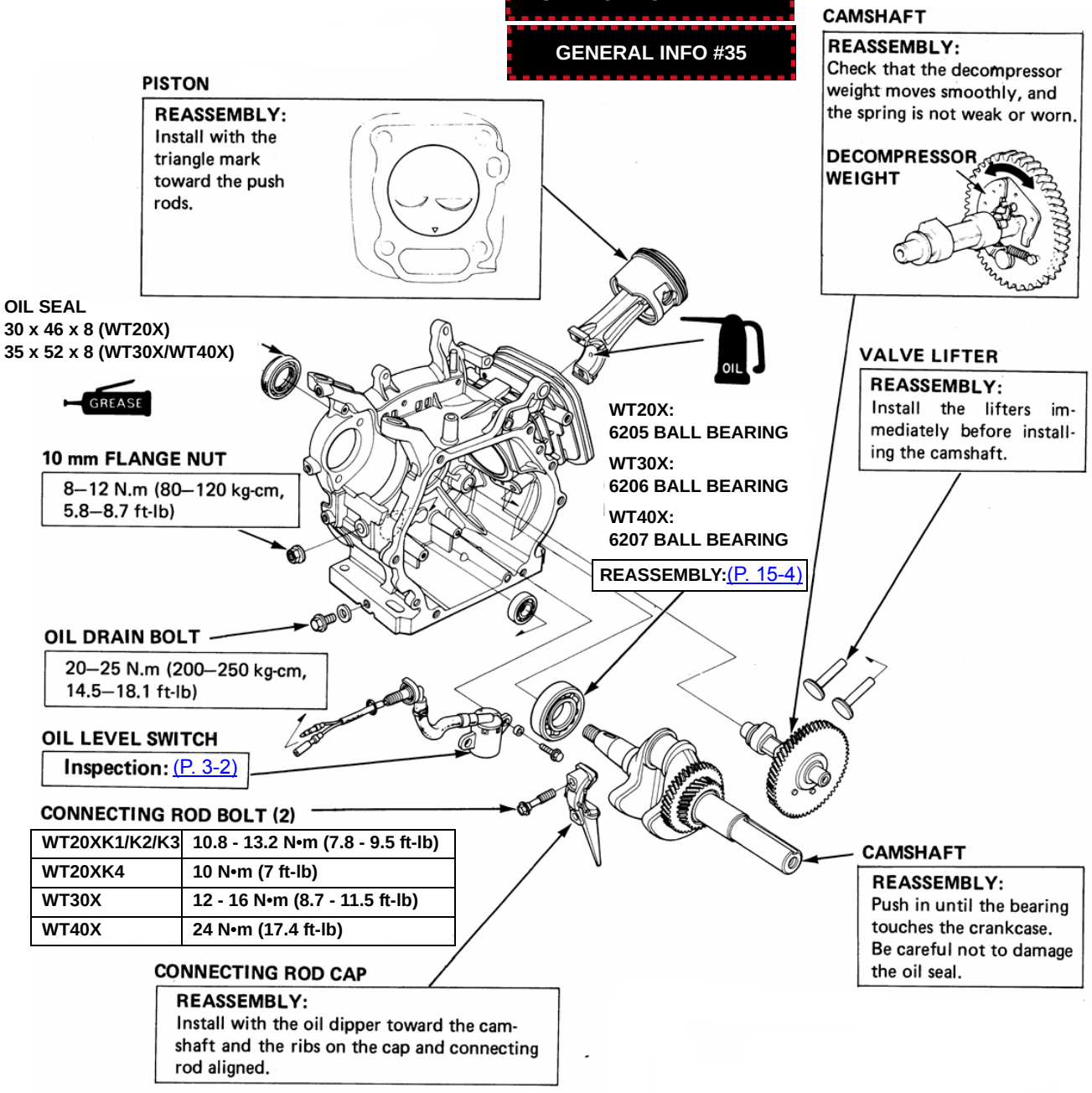
15. CRANKSHAFT / PISTON

1. DISASSEMBLY/REASSEMBLY

SERVICE BULLETIN #3

SERVICE BULLETIN #4

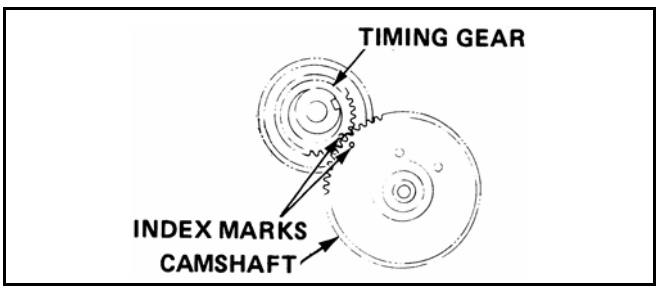
GENERAL INFO #35



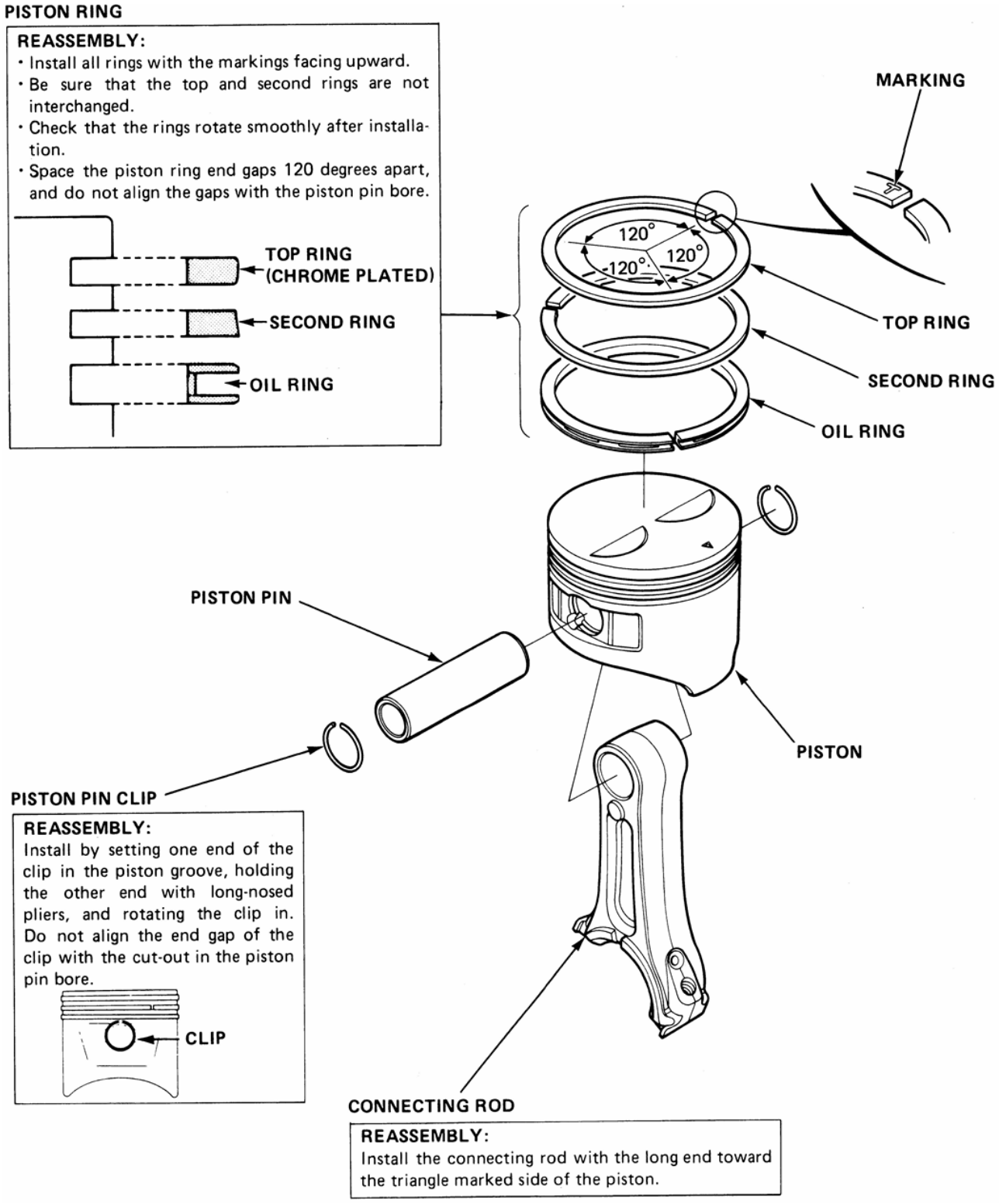
WT20XK1/K2/K3	10.8 - 13.2 N•m (7.8 - 9.5 ft-lb)
WT20XK4	10 N•m (7 ft-lb)
WT30X	12 - 16 N•m (8.7 - 11.5 ft-lb)
WT40X	24 N•m (17.4 ft-lb)

TIMING MARK ALIGNMENT

Align the index marks on the camshaft and timing gear.



CONNECTING ROD

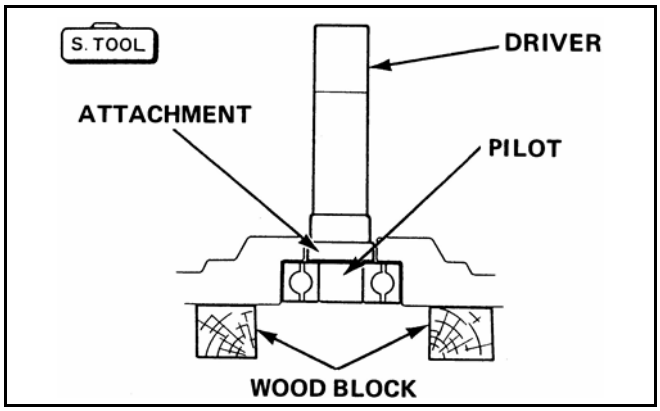


CRANKCASE COVER BEARING (6205/6206/6207)

REMOVAL:

1. Drive out the oil seal.
2. Support the crankcase cover with wood blocks. Drive out the bearing, using the following special tools:

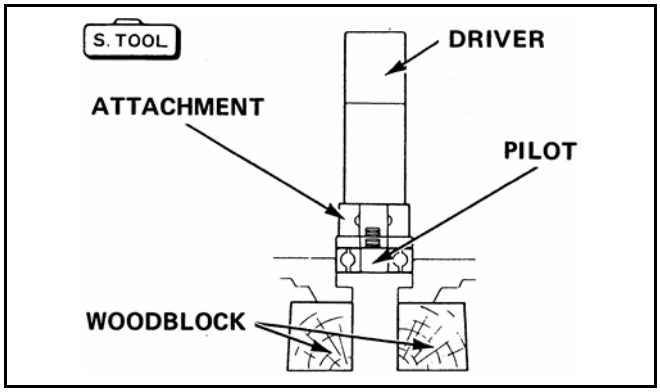
TOOLS:	
Driver	**07749-0010000**
Attachment, 37 x 40 mm	**07746-0010200**
Pilot, 25 mm (WT20X)	**07746-0040600**
Pilot, 30 mm (WT30X)	**07746-0040700**
Pilot, 35 mm (WT40X)	**07746-0040800**



INSTALLATION:

Support the crankcase cover with wood blocks. Oil the circumference of the bearing, and install with the bearing markings facing the driver. Use the following special tools:

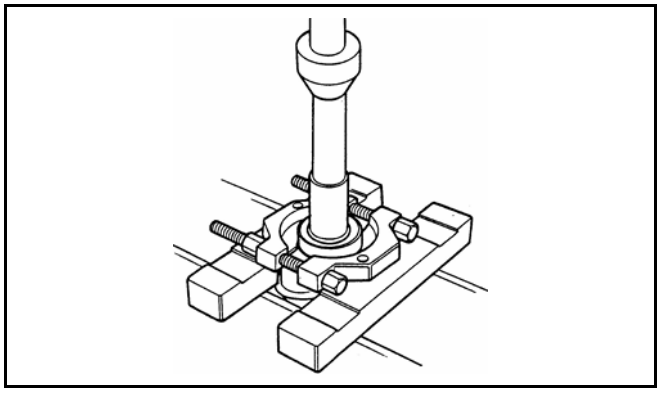
TOOLS:	
Driver	**07749-0010000**
WT20X:	
Attachment, 52 x 55 mm	**07746-0010400**
Pilot, 25 mm	**07746-0040600**
WT30X:	
Attachment, 62 x 68 mm	**07746-0010500**
Pilot, 30 mm	**07746-0040700**
WT40X:	
Attachment, 72 x 75 mm	**07746-0010600**
Pilot, 35 mm	**07746-0040800**



CRANKSHAFT BEARING (6205/6206/6207)

REMOVAL:

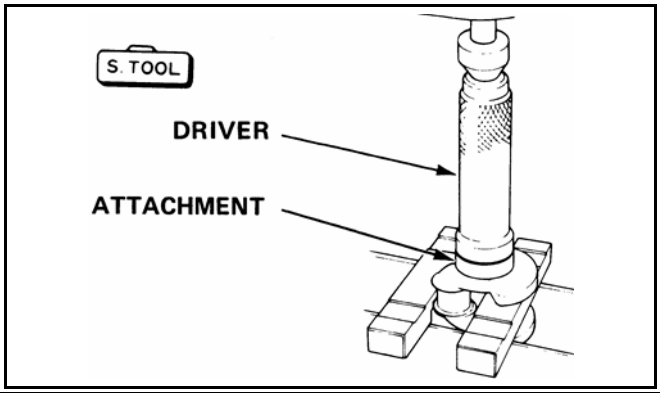
Press the bearing off the crankshaft, using a ' commercially available bearing puller and hydraulic press.



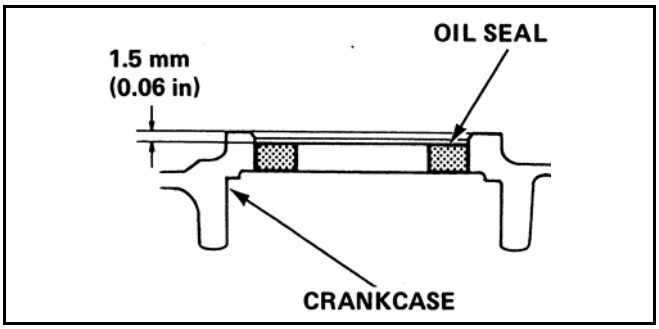
INSTALLATION:

Apply oil to the bearing and drive the bearing onto the crankshaft using the special tools.

TOOLS:	
Driver	**07748-0030100**
WT20X:	
Attachment, 25 mm ID	**07746-0030200**
WT30X:	
Attachment, 30 mm ID	**07746-0030300**
WT40X:	
Attachment, 35 mm ID	**07746-0030400**



CRANKSHAFT OIL SEALS (WT20X ONLY)



CRANKCASE:

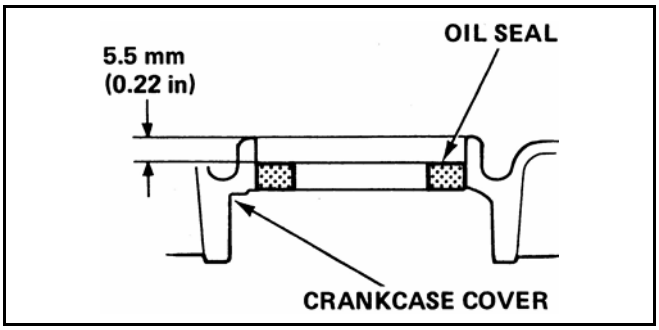
Support the crankcase with wood blocks. Oil the circumference of the seal, and drive in the seal to the specified seating depth.

Crankcase oil seal seating depth	1.5 mm (0.06 in)

Use the following special tools:

TOOLS:

Driver	**07749-0010000**
Attachment, 42 x 47 mm	**07746-0010300**
Pilot, 25 mm	**07746-0040600**



CRANKCASE COVER:

Support the cover with wood blocks. Oil the circumference of the seal, and drive the seal in to the specified seating depth.

Crankcase cover oil seal seating depth	5.5 mm (0.22 in)

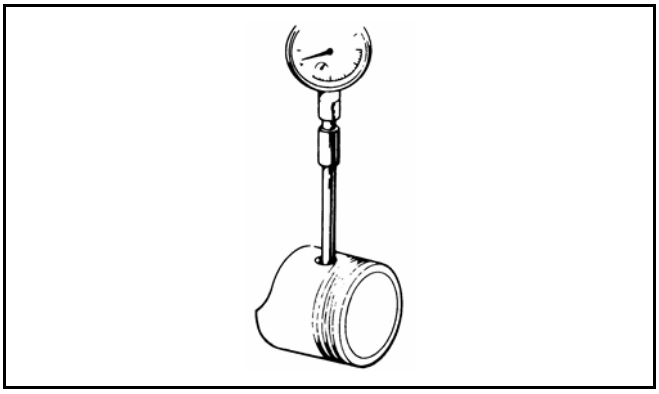
Use the following special tools:

TOOLS:

Driver	**07749-0010000**
Attachment, 42 x 47 mm	**07746-0010200**
Pilot, 25 mm	**07746-0040600**

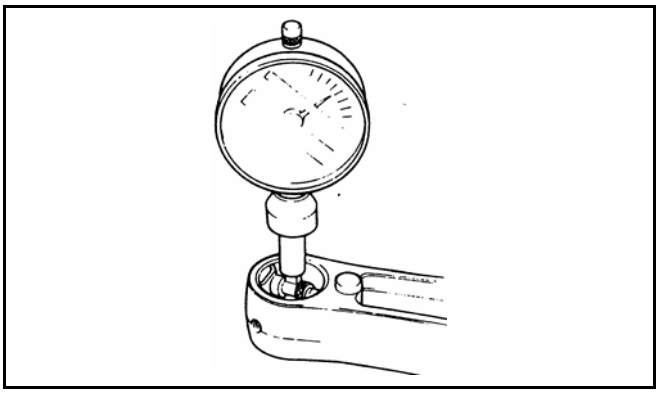
PISTON PIN BORE I.D.

	Standard	Service limit
WT20X	18.002 mm (0.7087 in)	18.048 mm (0.7106 in)
WT30X	18.002 mm (0.7087 in)	18.042 mm (0.7103 in)
WT40X	20.002 mm (0.7875 in)	20.042 mm (0.7891 in)



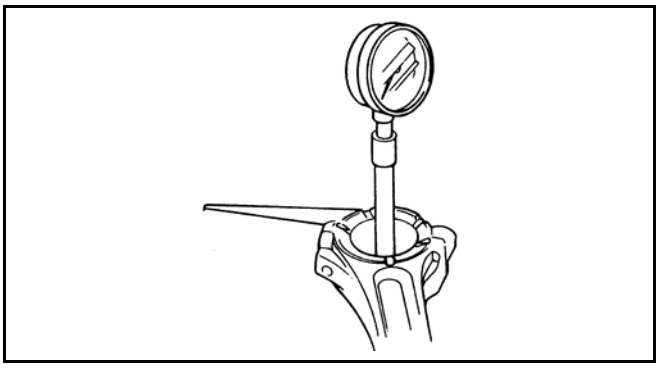
CONNECTING ROD SMALL END I.D.

	Standard	Service limit
WT20XK1 WT20XK2 WT20XK3	18.002 mm (0.7087 in)	18.07 mm (0.711 in)
WT20XK4	18.005-18.020 mm (0.7089-07094 in)	18.07 mm (0.711 in)
WT30X	18.005 mm (0.7089 in)	18.07 mm (0.711 in)
WT40X	20.005 mm (0.7876 in)	20.07 mm (0.7902 in)



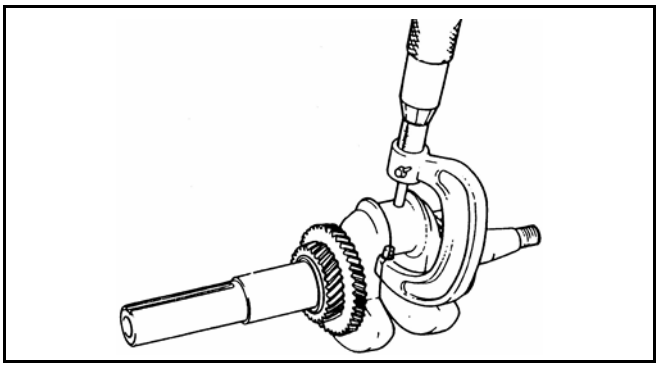
CONNECTING ROD BIG END I.D.

	Standard	Service limit
WT20XK1 WT20XK2 WT20XK3	30.02 mm (1.181in)	30.066 mm (1.184 in)
WT20XK4	30.02-30.033 mm (1.1819-1.1824 in)	30.066 mm (1.184 in)
WT30X	33.025 mm (1.3002 in)	30.07 mm (1.302 in)
WT40X	36.025 mm (1.4183 in)	36.07 mm (1.4201 in)



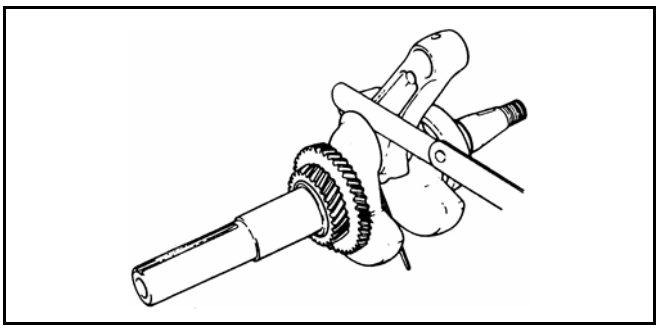
CRANKSHAFT O.D.

	Standard	Service limit
WT20XK1 WT20XK2 WT20XK3	29.98 mm (1.180in)	29.92 mm (1.178 in)
WT20XK4	29.97-29.98 mm (1.1799-1.180 in)	29.92 mm (1.178 in)
WT30X	32.985 mm (1.2986 in)	32.92 mm (1.196 in)
WT40X	35.985 mm (1.4167 in)	35.93 mm (1.4146 in)

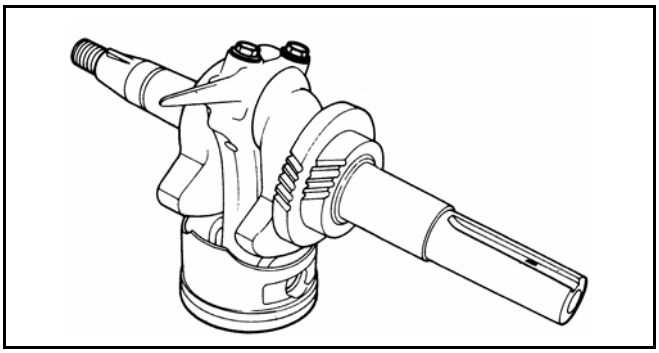


CONNECTING ROD BIG END SIDE CLEARANCE

Standard	Service limit
0.1-0.7 mm (0.004-0.028 in)	1.1 mm (0.043 in)



CONNECTING ROD BIG END OIL CLEARANCE



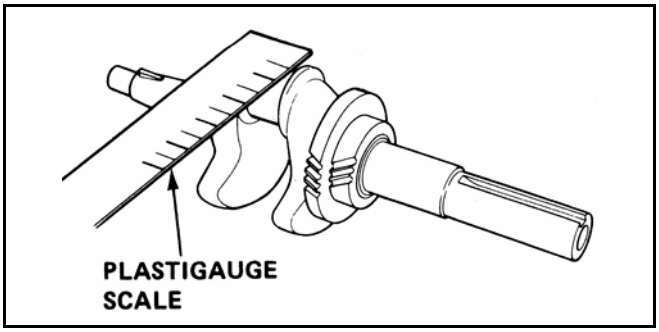
1. Clean all oil from the crank pin and connecting rod bearing surfaces.
2. Place a piece of plastigauge on the crank pin, install the connecting rod and cap, and tighten the bolts.

TORQUE:
WT20X 10.8-13.2 N•m (7.8-9.5 ft-lb)
WT30X 22-26 N•m (15.9-18.8 ft-lb)
WT40X 24 N•m (17.4 ft-lb)

NOTICE

Do not rotate the crankshaft while the plastigauge is in place.

3. Remove the connecting rod and measure the plastigauge.

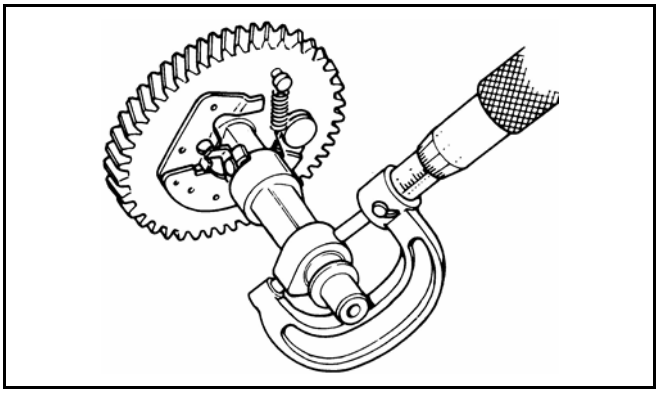


	Standard	Service limit
WT20X	0.040-0.063 mm (0.0016-0.0025 in)	0.12 mm (0.005 in)
WT30X WT40X	0.040-0.066 mm (0.0016-0.0026 in)	0.12 mm (0.005 in)

If the clearance exceeds the service limit, replace the connecting rod and recheck the clearance.

Replacement connecting rods are available with standard and undersized bearing surfaces.

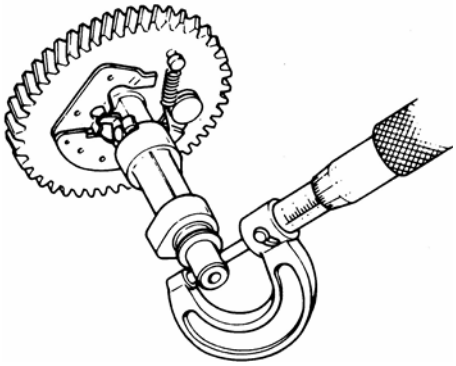
CAMSHAFT CAM LOBE HEIGHT



		Standard	Service limit
WT20XK1	IN	27.7 mm (1.091 in)	27.45 mm (1.081 in)
	EX	27.75 mm (1.093 in)	27.50 mm (1.083 in)
WT20XK2 WT20XK3	IN	31.85-32.25 mm (1.254-1.27 in)	31.10 mm (1.224in)
	EX	31.57-31.97 mm (1.243-1.259 in)	30.80 mm (1.213 in)
WT20XK4	IN	27.503-27.903 mm (1.0828-1.0985 in)	27.450 mm (1.0807in)
	EX		
WT30XK1	IN	31.2 mm (1.23 in)	30.95 mm (1.219 in)
	EX	31.1 mm (1.22 in)	30.85 mm (1.215 in)
WT30XK2 WT30XK3	IN	1.627-31.827 mm (1.2452-1.2530 in)	31.477 mm (1.2392 in)
	EX	31.507-31.707 mm (1.2404-1.2483 in)	31.357 mm (1.2345 in)
WT40X	IN	33.0 mm (1.299 in)	32.75 mm (1.289 in)
	EX	32.6 mm (1.283 in)	32.35 mm (1.274 in)

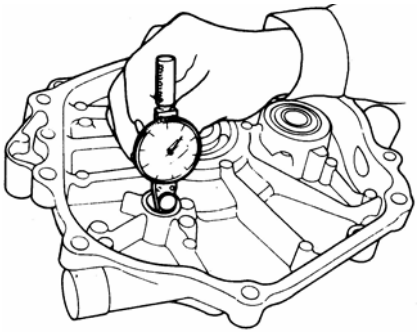
CAMSHAFT O.D.

	Standard	Service limit
WT20XK1 WT20XK2 WT20XK3	13.984 mm (0.551 in)	13.916 mm (0.548 in)
WT20XK4	13.966-13.984 mm (0.5498-0.5506 in)	13.916 mm (0.548 in)
WT30X WT40X	15.984 mm (0.6293 in)	15.92 mm (0.627 in)



CAMSHAFT HOLDER I.D.

	Standard	Service limit
WT20XK1 WT20XK2 WT20XK3	14.00 mm (0.551 in)	14.048 mm (0.553 in)
WT20XK4	14.00-14.018 mm (0.5512-0.5519 in)	14.048 mm (0.553 in)
WT30X WT40X	16.00 mm (0.630 in)	16.05 mm (0.632 in)



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