

2007-2010



SERVICE MANUAL

**TRX420
FE/FM/TE/TM/FPE/FPM
FourTrax Rancher®**

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 or others. It could also damage the vehicle 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 specially designed tools and dedicated equipment. 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 the vehicle.

If you need to replace a part, use genuine Honda 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 the vehicle. Any error or oversight while servicing a vehicle can result in faulty operation, damage to the vehicle, or injury to others.

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 practice, we recommended 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.

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 any time you hammer, drill, grind, pry or work around pressurized air or liquids, and 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 the vehicle up in the air. Any time you lift the vehicle, either with a hoist or a jack, make sure that it is always securely supported. Use jack stands.

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 or coolant. 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 gases 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 drain or store gasoline in an open container.
- Keep all cigarettes, sparks and flames away from the battery and all fuel-related parts.

⚠ 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.

⚠ 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.

HOW TO USE THIS MANUAL

This service manual describes the service procedures for the TRX420TM/TE/FM/FE/FPM/FPE.

Follow the Maintenance Schedule (Section 4) recommendations to ensure that the vehicle is in peak operating condition and the emission levels are within the standards set by the U.S. Environmental Protection Agency (EPA), California Air Resources Board (CARB) and Environment Canada (EC).

Performing the first scheduled maintenance is very important. It compensates for the initial wear that occurs during the break-in period.

Sections 1 and 4 apply to the whole vehicle. Section 3 illustrates procedures for removal/installation of components that may be required to perform service described in the following sections. Sections 5 through 24 describe parts of the vehicle, grouped according to location.


Find the section you want on this page; then turn to the table of contents on the first page of the section.

Most sections start with an assembly or system illustration, service information and troubleshooting for the section. The subsequent pages give detailed procedure.

If you are not familiar with this vehicle, read Technical Features in Section 2.

If you don't know the source of the trouble, go to section 26 Troubleshooting.

Your safety, and the safety of others, is very important. To help you make informed decisions we have provided safety messages and other information throughout this manual. Of course, it is not practical or possible to warn you about all the hazards associated with servicing this vehicle. You must use your own good judgement. You will find important safety information in a variety of forms including:

- Safety Labels – on the vehicle
- 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 this vehicle correctly and safely.












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 your vehicle, other property, or the environment.

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SYMBOLS

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

	<p>Replace the part(s) with new one(s) before assembly.</p>
	<p>Use the recommended engine oil, unless otherwise specified.</p>
	<p>Use molybdenum oil solution (mixture of the engine oil and molybdenum grease in a ratio of 1:1).</p>
	<p>Use multi-purpose grease (lithium based multi-purpose grease NLGI #2 or equivalent).</p>
	<p>Use molybdenum disulfide grease (containing more than 3% molybdenum disulfide, NLGI #2 or equivalent). Example: Molykote® BR-2 plus manufactured by Dow Corning U.S.A. Multi-purpose M-2 manufactured by Mitsubishi Oil, Japan</p>
	<p>Use molybdenum disulfide paste (containing more than 40% molybdenum disulfide, NLGI #2 or equivalent). Example: Molykote® G-n Paste manufactured by Dow Corning U.S.A. Honda Moly 60 (U.S.A. only) Rocol ASP manufactured by Rocol Limited, U.K. Rocol Paste manufactured by Sumico Lubricant, Japan</p>
	<p>Use silicone grease.</p>
	<p>Apply a locking agent. Use a medium strength locking agent unless otherwise specified.</p>
	<p>Apply sealant.</p>
	<p>Use DOT 4 brake fluid. Use the recommended brake fluid unless otherwise specified.</p>
	<p>Use fork or suspension fluid.</p>

1. GENERAL INFORMATION

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GENERAL INFORMATION

SERVICE RULES

1. Use genuine Honda or Honda-recommended parts and lubricants or their equivalents. Parts that don't meet Honda's design specifications may cause damage to the vehicle.
2. Use the special tools designed for this product to avoid damage and incorrect assembly.
3. Use only metric tools when servicing the vehicle. Metric bolts, nuts and screws are not interchangeable with English fasteners.
4. Install new gaskets, O-rings, cotter pins, and lock plates when reassembling.
5. When tightening bolts or nuts, begin with the larger diameter or inner bolt first. Then tighten to the specified torque diagonally in incremental steps unless a particular sequence is specified.
6. Clean parts in cleaning solvent upon disassembly. Lubricate any sliding surfaces before reassembly.
7. After reassembly, check all parts for proper installation and operation.
8. Route all electrical wires as shown in the Cable & Harness routing (page 1-28).

ABBREVIATION

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

Abbrev. term	Full term
CKP sensor	Crankshaft Position sensor
LCD	Liquid Crystal Display
DLC	Data Link Connector
DTC	Diagnostic Trouble Code
PCM (TE/FE/FPE models)	Powertrain Control Module
ECM (TM/FM/FPM models)	Engine Control Module
ECT sensor	Engine Coolant Temperature sensor
EEPROM	Electrically Erasable Programmable Read Only Memory
EPS	Electric Power Steering
ESP	Electric Shift Program
FP	Fuel Pump
HDS	Honda Diagnostic System
IACV	Idle Air Control Valve
IAT sensor	Intake Air Temperature sensor
MAP sensor	Manifold Absolute Pressure sensor
MIL	Malfunction Indicator Lamp
PGM-FI	Programmed Fuel Injection
SCS connector	Service Check Short connector
TP sensor	Throttle Position sensor
VS sensor	Vehicle Speed sensor
4WD	4 Wheel Drive

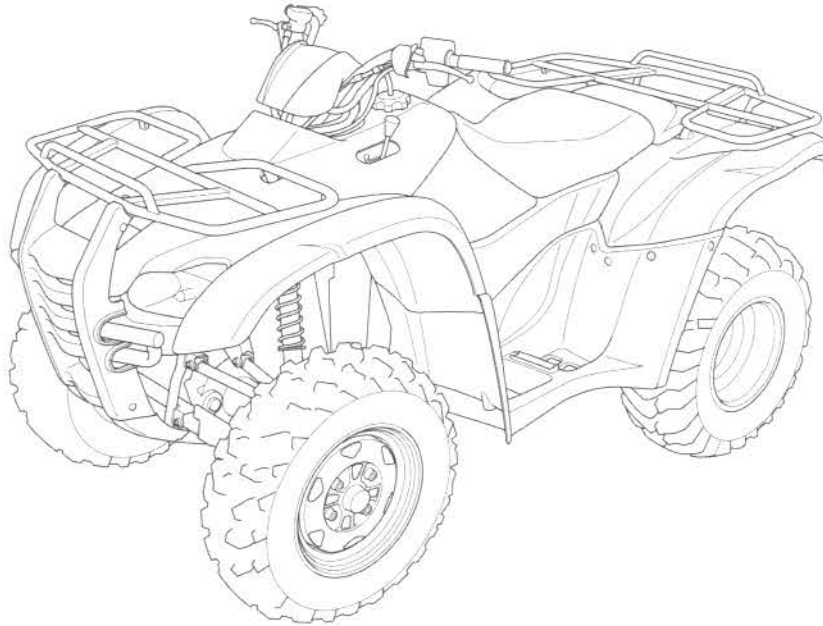
MODEL IDENTIFICATION

This manual covers 4 types of TRX420 models:

- TM – 2WD/Left foot operated gearshift
- TE – 2WD/Electric shift program (ESP)
- FM – 4WD/Left foot operated gearshift
- FE – 4WD/Electric shift program (ESP)
- FPM – 4WD/Left foot operated gearshift/Electric Power Steering (EPS)
- FPE – 4WD/Electric shift program (ESP)/Electric Power Steering (EPS)

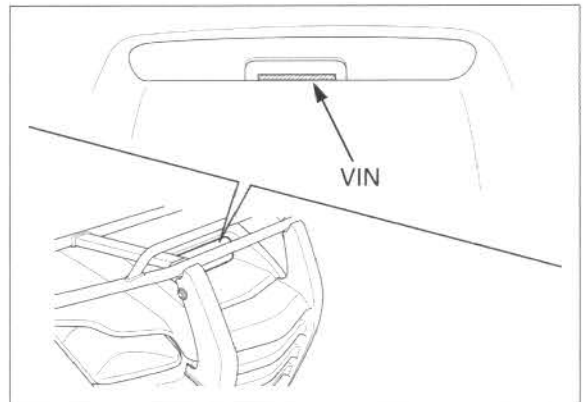
Be sure to refer to the procedure that pertains to the appropriate version of the TRX420.

TRX420FE model shown:



SERIAL NUMBERS

The Vehicle Identification Number (VIN) is stamped on the front side of the frame through the front fender.



GENERAL INFORMATION

The engine serial number is stamped on the left side of the rear crankcase.



The throttle body identification number is stamped on the upper side of the throttle body.

THROTTLE BODY IDENTIFICATION NUMBER

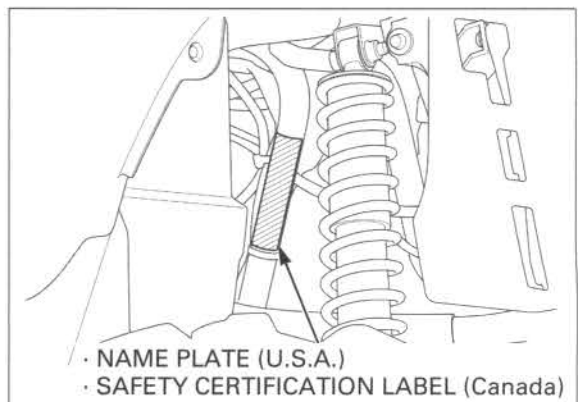


LABELS

'07: The name plate (U.S.A. type) or safety certification label (Canada type) is attached on the left front frame down pipe.

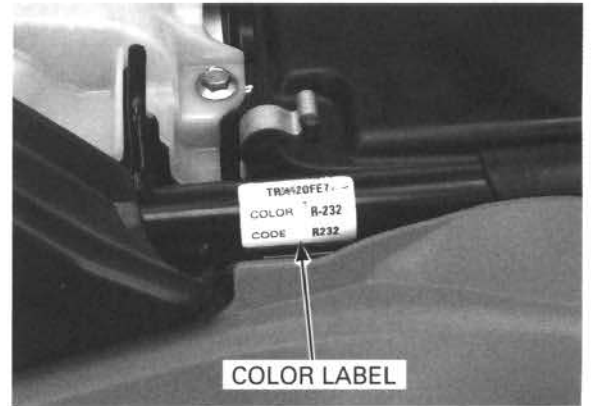


After '07: The name plate (U.S.A. type) or safety certification label (Canada type) is attached on the right front frame down pipe.



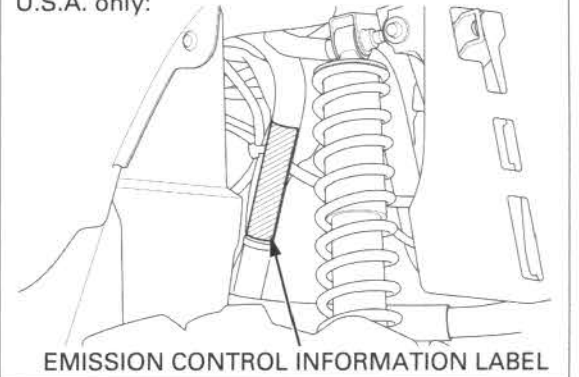
GENERAL INFORMATION

The color label is attached on the left frame pipe under the seat. When ordering color-coded parts, always specify the designated color code.

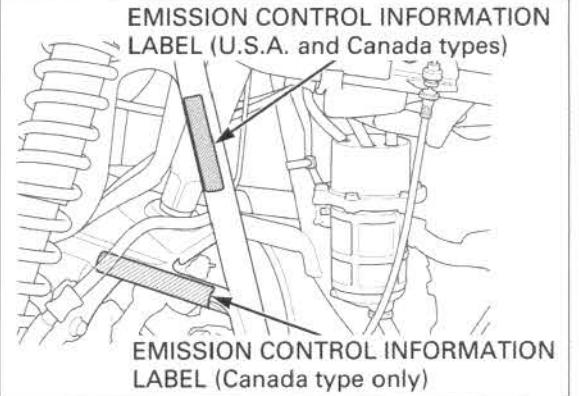


'07: The vehicle emission control information label is attached on the right front frame pipe.

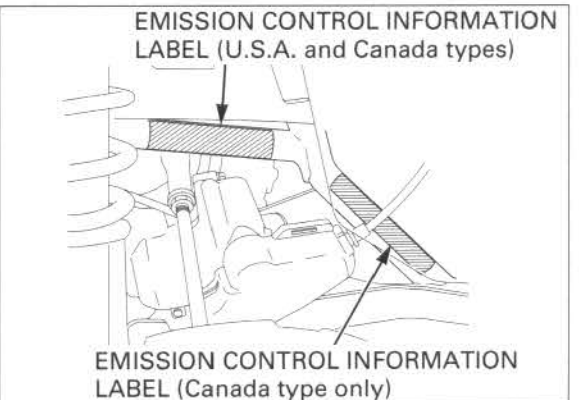
U.S.A. only:



'08: The vehicle emission control information label is attached on the left front frame pipe.



After '08: The vehicle emission control information label is attached on the left front frame pipe.



GENERAL INFORMATION

GENERAL SPECIFICATIONS

TRX420TM/TE

	ITEM	SPECIFICATIONS
DIMENSIONS	Overall length	2,055 mm (80.9 in)
	Overall width	1,172 mm (46.1 in)
	Overall height	1,148 mm (45.2 in)
	Wheelbase	1,256 mm (49.4 in)
	Front tread	847 mm (33.3 in)
	Rear tread	880 mm (34.6 in)
	Seat height	823 mm (32.4 in)
	Footpeg height	TM: 346 mm (13.6 in) TE: 336 mm (13.2 in)
	Ground clearance	165 mm (6.5 in)
	Curb weight	TM: 248 kg (547 lbs) TE: 249 kg (549 lbs)
	Maximum weight capacity	220 kg (485 lbs)
FRAME	Frame type	Double cradle
	Front suspension	Double wishbone
	Front wheel travel	160 mm (6.3 in)
	Front damper	Double tube
	Rear suspension	Swingarm (trailing type)
	Rear wheel travel	160 mm (6.3 in)
	Rear damper	Double tube
	Front tire size	AT24 x 8-12 ★★
	Rear tire size	AT24 x 10-11 ★★
	Front rim size	12 x 6.0 AT
	Rear rim size	11 x 7.5 AT
	Front tire brand	M977 (Maxxis)
	Rear tire brand	M978 (Maxxis)
	Front brake	Hydraulic disc brake
	Rear brake	Mechanical drum brake
	Caster angle	6.34°
	Trail length	25.1 mm (0.99 in)
	Camber angle	0°
	Fuel tank capacity	'07: 13.7 liters (3.62 US gal, 3.01 Imp gal) After '07: 13.3 liters (3.51 US gal, 2.93 Imp gal)
	Fuel tank reserve capacity	'07: 2.8 liters (0.74 US gal, 0.62 Imp gal) After '07: 2.6 liters (0.69 US gal, 0.57 Imp gal)
ENGINE	Cylinder arrangement	Single cylinder, longitudinally installed
	Bore and stroke	86.5 x 71.5 mm (3.41 x 2.81 in)
	Displacement	420 cm ³ (25.6 cu-in)
	Compression ratio	'07 - '08: 9.8 : 1 After '08: 9.9 : 1
	Valve train	OHV
	Intake valve opens	'07 - '08: 6° BTDC (at 1 mm lift) After '08: 7° BTDC (at 1 mm lift)
	Intake valve closes	'07 - '08: 45° ABDC (at 1 mm lift) After '08: 32° ABDC (at 1 mm lift)
	Exhaust valve opens	'07 - '08: 45° BBDC (at 1 mm lift) After '08: 35° ABDC (at 1 mm lift)
	Exhaust valve closes	'07 - '08: 2° ATDC (at 1 mm lift) After '08: 4° ATDC (at 1 mm lift)
	Lubrication system	Forced pressure and wet sump
	Oil pump type	Trochoid
	Cooling system	Liquid cooled
	Air filtration	Oiled double urethane foam
	Engine dry weight	TM: '07 - '08: 48.6 kg (107.1 lbs) After '08: 48.5 kg (106.9 lbs) TE: '07 - '08: 49.6 kg (109.3 lbs) After '08: 49.5 kg (109.1 lbs)

GENERAL INFORMATION

ITEM		SPECIFICATIONS
FUEL DELIVERY SYSTEM	Type Throttle bore	PGM-FI (Programmed Fuel Injection) 34 mm (1.3 in)
DRIVE TRAIN	Clutch system Clutch operation system Transmission Primary reduction Secondary reduction Final reduction Gear ratio 1st 2nd 3rd 4th 5th Reverse Gearshift pattern	Centrifugal and multi-plate, wet Automatic Constant mesh, 5-speeds with reverse 2.103 (61/29) 1.818 (40/22) 3.153 (41/13) 3.857 (54/14) 2.235 (38/17) 1.571 (33/21) 1.178 (33/28) 0.848 (28/33) 4.831 (46/14 x 25/17) R - N - 1 - 2 - 3 - 4 - 5 TM: Left foot operated return system TE: Electric shift (left hand operated) return system
ELECTRICAL	Ignition system Starting system Charging system Regulator/rectifier Lighting system	Full transistorized ignition Electric starter motor Triple phase output alternator SCR shorted, triple phase full wave rectification Battery

GENERAL INFORMATION

TRX420FM/FE

ITEM		SPECIFICATIONS
DIMENSIONS	Overall length	2,055 mm (80.9 in)
	Overall width	1,172 mm (46.1 in)
	Overall height	1,146 mm (45.1 in)
	Wheelbase	1,249 mm (49.2 in)
	Front tread	840 mm (33.1 in)
	Rear tread	880 mm (34.6 in)
	Seat height	822 mm (32.4 in)
	Footpeg height	FM: 345 mm (13.6 in) FE: 335 mm (13.2 in)
	Ground clearance	165 mm (6.5 in)
	Curb weight	FM: '07 - '08 U.S.A. and Canada: 266 kg (586 lbs) After '08 U.S.A.: 265 kg (584 lbs) FE: '07 - '08: 267 kg (589 lbs) After '08: 266 kg (586 lbs)
	Maximum weight capacity	220 kg (485 lbs)
FRAME	Frame type	Double cradle
	Front suspension	Double wishbone
	Front wheel travel	160 mm (6.3 in)
	Front damper	Double tube
	Rear suspension	Swingarm (trailing type)
	Rear wheel travel	160 mm (6.3 in)
	Rear damper	Double tube
	Front tire size	AT24 x 8-12 ★★
	Rear tire size	AT24 x 10-11 ★★
	Front rim size	12 x 6.0 AT
	Rear rim size	11 x 7.5 AT
	Front tire brand	M977 (Maxxis)
	Rear tire brand	M978 (Maxxis)
	Front brake	Hydraulic disc brake
	Rear brake	Mechanical drum brake
	Caster angle	3°
	Trail length	'07 - '08: 9.5 mm (0.37 in) After '08: 9 mm (11/32 in)
Camber angle	0°	
Fuel tank capacity	'07: 13.7 liters (3.62 US gal, 3.01 Imp gal) After '07: 13.3 liters (3.51 US gal, 2.93 Imp gal)	
Fuel tank reserve capacity	'07: 2.8 liters (0.74 US gal, 0.62 Imp gal) After '07: 2.6 liters (0.69 US gal, 0.57 Imp gal)	
ENGINE	Cylinder arrangement	Single cylinder, longitudinally installed
	Bore and stroke	86.5 x 71.5 mm (3.41 x 2.81 in)
	Displacement	420 cm ³ (25.6 cu-in)
	Compression ratio	'07 - '08: 9.8 : 1 After '08: 9.9 : 1
	Valve train	OHV
	Intake valve	opens '07 - '08: 6° BTDC (at 1 mm lift) After '08: 7° BTDC (at 1 mm lift)
		closes '07 - '08: 45° ABDC (at 1 mm lift) After '08: 32° ABDC (at 1 mm lift)
	Exhaust valve	opens '07 - '08: 45° BBDC (at 1 mm lift) After '08: 35° BBDC (at 1 mm lift)
		closes '07 - '08: 2° ATDC (at 1 mm lift) After '08: 4° ATDC (at 1 mm lift)
	Lubrication system	Forced pressure and wet sump
	Oil pump type	Trochoid
	Cooling system	Liquid cooled
	Air filtration	Oiled double urethane foam
Engine dry weight	FM: '07 - '08: 49.0 kg (108.0 lbs) After '08: 48.9 kg (107.8 lbs) FE: '07 - '08: 49.9 kg (110.0 lbs) After '08: 49.8 kg (109.8 lbs)	

GENERAL INFORMATION

ITEM		SPECIFICATIONS
FUEL DELIVERY SYSTEM	Type Throttle bore	PGM-FI (Programmed Fuel Injection) 34 mm (1.3 in)
DRIVE TRAIN	Clutch system Clutch operation system Transmission Primary reduction Secondary reduction Final reduction Gear ratio Gearshift pattern	Centrifugal and multi-plate, wet Automatic Constant mesh, 5-speeds with reverse 2.103 (61/29) 1.818 (40/22) 3.230 (42/13) 3.153 (41/13) 3.857 (54/14) 2.235 (38/17) 1.571 (33/21) 1.178 (33/28) 0.848 (28/33) 4.831 (46/14 x 25/17) R - N - 1 - 2 - 3 - 4 - 5 FM: Left foot operated return system FE: Electric shift (left hand operated) return system
ELECTRICAL	Ignition system Starting system Charging system Regulator/rectifier Lighting system	Full transistorized ignition Electric starter motor Triple phase output alternator SCR shorted, triple phase full wave rectification Battery

GENERAL INFORMATION

TRX420FPM/FPE

	ITEM	SPECIFICATIONS
DIMENSIONS	Overall length	2,055 mm (80.9 in)
	Overall width	1,172 mm (46.1 in)
	Overall height	1,146 mm (45.1 in)
	Wheelbase	1,249 mm (49.2 in)
	Front tread	840 mm (33.1 in)
	Rear tread	880 mm (34.6 in)
	Seat height	822 mm (32.4 in)
	Footpeg height	FPM: 345 mm (13.6 in) FPE: 335 mm (13.2 in)
	Ground clearance	165 mm (6.5 in)
	Curb weight	FPM U.S.A.: 274 kg (604 lbs) FPE and FPM Canada: 275 kg (606 lbs)
	Maximum weight capacity	220 kg (485 lbs)
FRAME	Frame type	Double cradle
	Front suspension	Double wishbone
	Front wheel travel	160 mm (6.3 in)
	Front damper	Double tube
	Rear suspension	Swingarm (trailing type)
	Rear wheel travel	160 mm (6.3 in)
	Rear damper	Double tube
	Front tire size	AT24 x 8-12 ★★
	Rear tire size	AT24 x 10-11 ★★
	Front rim size	12 x 6.0 AT
	Rear rim size	11 x 7.5 AT
	Front tire brand	M977 (Maxxis)
	Rear tire brand	M978 (Maxxis)
	Front brake	Hydraulic disc brake
	Rear brake	Mechanical drum brake
	Caster angle	3°
	Trail length	9 mm (11/32 in)
Camber angle	0°	
Fuel tank capacity	13.3 liters (3.51 US gal, 2.93 Imp gal)	
Fuel tank reserve capacity	2.6 liters (0.69 US gal, 0.57 Imp gal)	
ENGINE	Cylinder arrangement	Single cylinder, longitudinally installed
	Bore and stroke	86.5 x 71.5 mm (3.41 x 2.81 in)
	Displacement	420 cm ³ (25.6 cu-in)
	Compression ratio	9.9 : 1
	Valve train	OHV
	Intake valve	7° BTDC (at 1 mm lift)
		32° ABDC (at 1 mm lift)
	Exhaust valve	35° BBDC (at 1 mm lift)
		4° ATDC (at 1 mm lift)
	Lubrication system	Forced pressure and wet sump
	Oil pump type	Trochoid
Cooling system	Liquid cooled	
Air filtration	Oiled double urethane foam	
Engine dry weight	FPM: 48.9 kg (107.8 lbs) FPE: 49.8 kg (109.8 lbs)	
FUEL DELIVERY SYSTEM	Type	PGM-FI (Programmed Fuel Injection)
	Throttle bore	34 mm (1.3 in)

GENERAL INFORMATION

ITEM		SPECIFICATIONS	
DRIVE TRAIN	Clutch system	Centrifugal and multi-plate, wet	
	Clutch operation system	Automatic	
	Transmission	Constant mesh, 5-speeds with reverse	
	Primary reduction	2.103 (61/29)	
	Secondary reduction	1.818 (40/22)	
	Final reduction	3.230 (42/13)	
		Front	3.153 (41/13)
		Rear	3.857 (54/14)
	Gear ratio	1st	2.235 (38/17)
		2nd	1.571 (33/21)
	3rd	1.178 (33/28)	
	4th	0.848 (28/33)	
	5th	4.831 (46/14 x 25/17)	
	Reverse	R - N - 1 - 2 - 3 - 4 - 5	
	Gearshift pattern	FPM: Left foot operated return system FPE: Electric shift (left hand operated) return system	
ELECTRICAL	Ignition system	Full transistorized ignition	
	Starting system	Electric starter motor	
	Charging system	Triple phase output alternator	
	Regulator/rectifier	SCR shorted, triple phase full wave rectification	
	Lighting system	Battery	

GENERAL INFORMATION

LUBRICATION SYSTEM SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Engine oil capacity	After draining	2.7 liters (2.9 US qt, 2.4 Imp qt)	–
	After draining/filter change	2.8 liters (3.0 US qt, 2.5 Imp qt)	–
	After disassembly	3.1 liters (3.3 US qt, 2.7 Imp qt)	–
Recommended engine oil		Pro Honda GN4 4-stroke oil (U.S.A. and Canada) or equivalent motor oil API service classification: SG or higher JASO T 903 standard: MA Viscosity: SAE 10W-30	–
Oil pump	Tip clearance	0.15 (0.006)	0.20 (0.008)
	Body clearance	0.15 – 0.21 (0.00 – 0.008)	0.25 (0.010)
	Side clearance	0.02 – 0.09 (0.001 – 0.004)	0.11 (0.004)

FUEL SYSTEM (PGM-FI) SPECIFICATIONS

ITEM		SPECIFICATIONS
Throttle body identification number	'07 – '08 models	GQB1A
	After '08 models	GQB6A
Idle speed		1,400 ± 100 rpm
Throttle lever freeplay		3 – 8 mm (1/8 – 1/3 in)
IAT sensor resistance (20°C/68°F)		2.2 – 2.7 kΩ
ECT sensor resistance (20°C/68°F)		2.3 – 2.6 kΩ
Fuel injector resistance (20°C/68°F)		11.6 – 12.4 Ω
Fuel pressure at idle		336 – 350 kPa (3.43 – 3.57 kgf/cm ² , 49 – 51 psi)
Fuel pump flow (at 12 V)		50 cm ³ (1.7 US oz, 1.8 Imp oz) minimum/10 seconds

COOLING SYSTEM SPECIFICATIONS

ITEM		SPECIFICATIONS
Coolant capacity	Radiator and engine	1.5 liters (1.6 US qt, 1.3 Imp qt)
	Reserve tank	0.3 liter (0.3 US qt, 0.3 Imp qt)
Radiator cap relief pressure		108 – 137 kPa (1.1 – 1.4 kgf/cm ² , 16 – 20 psi)
Thermostat	Begin to open	80 – 84°C (176 – 183°F)
	Fully open	95°C (203°F)
	Valve lift	8 mm (0.3 in) minimum at 95°C (203°F)
Recommended antifreeze		Pro Honda HP Coolant or an equivalent high quality ethylene glycol antifreeze containing silicate-free corrosion inhibitors
Standard coolant concentration		1:1 mixture with distilled water

CYLINDER HEAD/VALVE SPECIFICATIONS

Unit: mm (in)

ITEM			STANDARD		SERVICE LIMIT
Cylinder compression at 400 rpm			500 kPa (5.1 kgf/cm ³ , 73 psi)		-
Valve clearance			IN	0.15 ± 0.02 (0.006 ± 0.001)	-
			EX	0.23 ± 0.02 (0.009 ± 0.001)	-
Valve, valve guide	Valve stem O.D.	'07 - '08 models	IN	5.475 - 5.490 (0.2156 - 0.2161)	5.45 (0.215)
			EX	5.455 - 5.470 (0.2148 - 0.2154)	5.43 (0.214)
		After '08 models	IN	5.975 - 5.990 (0.2352 - 0.2358)	5.95 (0.234)
			EX	5.955 - 5.970 (0.2344 - 0.2350)	5.93 (0.233)
	Valve guide I.D.	'07 - '08 models	IN/EX	5.500 - 5.512 (0.2165 - 0.2170)	5.53 (0.218)
		After '08 models	IN/EX	6.000 - 6.012 (0.2362 - 0.2366)	6.02 (0.237)
	Stem-to-guide clearance		IN	0.010 - 0.037 (0.0004 - 0.0015)	0.12 (0.005)
			EX	0.030 - 0.057 (0.0012 - 0.0022)	0.14 (0.006)
Valve guide projection above cylinder head		IN/EX	15.0 - 15.2 (0.59 - 0.60)	-	
Valve seat width		IN/EX	1.2 (0.05)	1.5 (0.06)	
Valve spring	Free length	'07 - '08 models	Inner	37.8 (1.49)	37.0 (1.46)
			Outer	42.7 (1.68)	41.8 (1.65)
		After '08 models	Inner	42.94 (1.691)	42.08 (1.657)
			Outer	43.63 (1.718)	42.76 (1.683)
Rocker arm	Arm I.D.		IN/EX	12.000 - 12.018 (0.4724 - 0.4731)	12.05 (0.474)
	Shaft O.D.		IN/EX	11.964 - 11.984 (0.4710 - 0.4718)	11.92 (0.469)
	Arm-to-shaft clearance		IN/EX	0.016 - 0.054 (0.0006 - 0.0021)	0.08 (0.003)
Camshaft and cam follower	Cam lobe height	'07 - '08 models	IN	35.9400 - 36.1800 (1.41496 - 1.42441)	35.74 (1.407)
			EX	35.6811 - 35.9211 (1.40476 - 1.41421)	35.48 (1.397)
		After '08 models	IN	35.4723 - 35.7123 (1.39654 - 1.40599)	35.27 (1.388)
			EX	35.3009 - 35.5409 (1.38980 - 1.39925)	35.10 (1.382)
	Cam follower O.D.		IN/EX	22.467 - 22.482 (0.8845 - 0.8851)	22.46 (0.884)
	Follower bore I.D.		IN/EX	22.510 - 22.526 (0.8862 - 0.8868)	22.54 (0.887)
Follower-to-bore clearance		IN/EX	0.028 - 0.059 (0.0011 - 0.0023)	0.07 (0.003)	
Cylinder head warpage			-		0.10 (0.004)

CYLINDER/PISTON SPECIFICATIONS

Unit: mm (in)

ITEM			STANDARD		SERVICE LIMIT
Cylinder	I.D.		86.500 - 86.510 (3.4055 - 3.4059)		86.60 (3.409)
	Out-of-round		-		0.10 (0.004)
	Taper		-		0.10 (0.004)
	Warpage		-		0.10 (0.004)
Piston, piston pin, piston ring	Piston O.D. at 15 (0.6) from bottom		86.470 - 86.490 (3.4043 - 3.4051)		86.42 (3.402)
	Piston pin hole I.D.		19.002 - 19.008 (0.7481 - 0.7483)		19.04 (0.750)
	Piston pin O.D.		18.994 - 19.000 (0.7478 - 0.7480)		18.96 (0.746)
	Piston-to-piston pin clearance		0.002 - 0.014 (0.0001 - 0.0006)		0.08 (0.003)
	Piston ring end gap	Top	0.15 - 0.30 (0.006 - 0.012)		0.5 (0.02)
		Second	0.30 - 0.45 (0.012 - 0.018)		0.6 (0.02)
		Oil (side rail)	0.20 - 0.70 (0.008 - 0.028)		0.9 (0.04)
	Piston ring-to-ring groove clearance	Top	0.030 - 0.060 (0.0012 - 0.0024)		0.09 (0.004)
Second		0.030 - 0.060 (0.0012 - 0.0024)		0.09 (0.004)	
Cylinder-to-piston clearance			0.010 - 0.040 (0.0004 - 0.0016)		0.10 (0.004)
Connecting rod small end I.D.			19.020 - 19.041 (0.7488 - 0.7496)		19.07 (0.751)
Connecting rod-to-piston pin clearance			0.020 - 0.047 (0.0008 - 0.0019)		0.10 (0.004)

GENERAL INFORMATION

CLUTCH/GEARSHIFT LINKAGE SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT	
Centrifugal clutch	Drum I.D.	140.0 – 140.2 (5.512 – 5.520)	140.4 (5.53)	
	Weight lining thickness	2.0 (0.08)	1.3 (0.05)	
	Clutch spring height	3.8 (0.15)	3.68 (0.145)	
	Clutch weight spring free length	24.65 (0.970)	25.6 (1.01)	
Change clutch	Spring free length	TM/FM/FPM	47.3 (1.86)	
		TE/FE/FPE	48.7 (1.92)	
	Disc thickness	2.62 – 2.78 (0.103 – 0.109)	2.3 (0.09)	
	Plate warpage	–	0.20 (0.008)	
	Outer I.D.	29.000 – 29.021 (1.1417 – 1.1426)	29.05 (1.144)	
	Outer guide	I.D.	22.000 – 22.021 (0.8661 – 0.8670)	22.05 (0.868)
		O.D.	28.959 – 28.980 (1.1401 – 1.1409)	28.93 (1.139)
	Mainshaft O.D. at clutch outer guide	21.967 – 21.980 (0.8648 – 0.8654)	21.93 (0.863)	
Primary drive gear	Gear I.D.	29.000 – 29.021 (1.1417 – 1.1426)	29.05 (1.144)	
	Crankshaft O.D. at drive gear	28.959 – 28.980 (1.1401 – 1.1409)	28.93 (1.139)	

ALTERNATOR/STARTER CLUTCH SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Starter driven gear boss	O.D.	51.705 – 51.718 (2.0356 – 2.0361)	51.69 (2.035)
	I.D.	31.946 – 31.962 (1.2577 – 1.2583)	31.90 (1.256)
Crankshaft O.D. at starter driven gear		31.884 – 31.900 (1.2553 – 1.2559)	31.85 (1.254)

CRANKCASE/TRANSMISSION/CRANKSHAFT/BALANCER SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Shift fork	I.D.	13.000 – 13.021 (0.5118 – 0.5126)	13.04 (0.513)
	Claw thickness	4.93 – 5.00 (0.194 – 0.197)	4.5 (0.18)
	Shaft O.D.	12.966 – 12.984 (0.5105 – 0.5112)	12.96 (0.510)
Transmission	Gear I.D.	M3	25.000 – 25.021 (0.9843 – 0.9851)
		M5	20.000 – 20.021 (0.7874 – 0.7882)
		C1, C2, C4, CR	28.020 – 28.041 (1.1031 – 1.1040)
		Reverse idle	13.000 – 13.021 (0.5118 – 0.5126)
	Gear bushing O.D.	M3	24.959 – 24.980 (0.9826 – 0.9835)
		M5	19.966 – 19.984 (0.7861 – 0.7868)
		C2	27.984 – 28.005 (1.1017 – 1.1026)
		C1, C4, CR	27.979 – 28.000 (1.1015 – 1.1024)
	Gear-to-bushing clearance	M3	0.020 – 0.062 (0.0008 – 0.0024)
		M5	0.016 – 0.055 (0.0006 – 0.0022)
		C2	0.015 – 0.057 (0.0006 – 0.0022)
		C1, C4, CR	0.020 – 0.062 (0.0008 – 0.0024)
	Gear bushing I.D.	M3	22.000 – 22.021 (0.8661 – 0.8670)
		M5	17.016 – 17.034 (0.6699 – 0.6706)
		C4	25.000 – 25.021 (0.9843 – 0.9851)
	Mainshaft O.D.	at M3	21.959 – 21.980 (0.8645 – 0.8654)
		at M5	16.976 – 16.987 (0.6683 – 0.6688)
	Countershaft O.D.	at C4	24.959 – 24.980 (0.9826 – 0.9835)
	Reverse idle shaft O.D.		12.966 – 12.984 (0.5105 – 0.5112)
	Bushing-to-shaft clearance	M3	0.020 – 0.062 (0.0008 – 0.0024)
M5		0.029 – 0.058 (0.0011 – 0.0023)	
C4		0.020 – 0.062 (0.0008 – 0.0024)	
Reverse idle gear-to-shaft clearance		0.016 – 0.055 (0.0006 – 0.0022)	
Crankshaft	Runout	–	
	Big end side clearance	0.05 – 0.65 (0.002 – 0.026)	
	Big end radial clearance	0.006 – 0.018 (0.0002 – 0.0007)	

FRONT WHEEL/SUSPENSION/STEERING SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Minimum tire tread depth		–	4.0 (0.16)
Cold tire pressure	TM/TE/FM/FE	Standard	25 kPa (0.25 kgf/cm ² , 3.6 psi)
		With cargo	25 kPa (0.25 kgf/cm ² , 3.6 psi)
	FPM/FPE	Standard	30 kPa (0.30 kgf/cm ² , 4.4 psi)
		With cargo	30 kPa (0.30 kgf/cm ² , 4.4 psi)
Tie-rod distance between the ball joints		TM/TE	358.5 (14.11)
		FM/FE/FPM/FPE	342.9 (13.50)
Toe		TM/TE	Toe-in: 10 ± 15 (0.4 ± 0.6)
		FM/FE/FPM/FPE	Toe-out: 9 ± 15 (0.4 ± 0.6)

REAR WHEEL/SUSPENSION SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Minimum tire tread depth		–	4.0 (0.16)
Cold tire pressure	Standard	25 kPa (0.25 kgf/cm ² , 3.6 psi)	–
	With cargo	25 kPa (0.25 kgf/cm ² , 3.6 psi)	–

BRAKE SYSTEM SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Front brake	Recommended brake fluid	Honda DOT 4 brake fluid	–
	Disc thickness	3.8 – 4.2 (0.15 – 0.17)	3.0 (0.12)
	Disc runout	–	0.30 (0.012)
	Master cylinder I.D.	14.000 – 14.043 (0.5512 – 0.5529)	14.055 (0.5533)
	Master piston O.D.	13.957 – 13.984 (0.5495 – 0.5506)	13.945 (0.5490)
	Caliper cylinder I.D.	32.030 – 32.080 (1.2610 – 1.2630)	32.090 (1.2634)
	Caliper piston O.D.	31.984 – 31.998 (1.2578 – 1.2598)	31.94 (1.257)
Rear brake	Drum I.D.	160.0 – 160.2 (6.30 – 6.31)	161.0 (6.34)
	Shoe lining thickness	5.3 (0.21)	To index mark

FRONT DRIVING MECHANISM SPECIFICATIONS (FM/FE/FPM/FPE models)

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Front final drive	Oil capacity	After draining	230 cm ³ (7.8 US oz, 8.1 Imp oz)
		After disassembly	310 cm ³ (10.5 US oz, 10.9 Imp oz)
	Recommended oil	Hypoid gear oil, SAE # 80	–
	Gear backlash	0.05 – 0.25 (0.002 – 0.010)	0.4 (0.02)
	Backlash difference	–	0.2 (0.01)
	Slip torque	14 – 17 N·m (1.45 – 1.75 kgf·m, 10 – 13 lbf·ft)	12 N·m (1.2 kgf·m, 9 lbf·ft)
	Face cam-to-housing distance	3.3 – 3.7 (0.13 – 0.15)	3.3 (0.13)
	Differential ring gear depth	6.55 – 6.65 (0.258 – 0.262)	6.55 (0.258)
	Cone spring free height	2.8 (0.11)	2.6 (0.10)

GENERAL INFORMATION**REAR DRIVING MECHANISM SPECIFICATIONS**

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Axle runout		–	3.0 (0.12)
Rear final drive	Oil capacity	After draining	75 cm ³ (2.5 US oz, 2.6 Imp oz)
		After disassembly	100 cm ³ (3.4 US oz, 3.5 Imp oz)
	Recommended oil		Hypoid gear oil, SAE # 80
	Gear backlash		0.05 – 0.25 (0.002 – 0.010)
	Backlash difference		–
	Ring gear-to-stop pin clearance		0.3 – 0.6 (0.01 – 0.02)

BATTERY/CHARGING SYSTEM SPECIFICATIONS

ITEM		SPECIFICATIONS	
Battery	Capacity	12 V – 12 Ah	
	Current leakage	0.01 mA max.	
	Voltage (20°C/68°F)	Fully charged	13.0 – 13.2 V
		Needs charging	Below 12.3 V
	Charging current	Normal	1.4 A x 5 – 10 h
Quick		6.0 A x 1.0 h	
Alternator	Capacity	'07 – '08 models	0.343 kW/5,000 rpm
		After '08 models	0.359 kW/5,000 rpm
	Charging coil resistance (20°C/68°F)	0.1 – 1.0 Ω	

IGNITION SYSTEM SPECIFICATIONS

ITEM	SPECIFICATIONS
Spark plug	BKR5E-11 (NGK), K16PR-U11 (DENSO)
Spark plug gap	1.0 – 1.1 mm (0.039 – 0.043 in)
Ignition coil primary peak voltage	100 V minimum
Ignition pulse generator peak voltage	0.7 V minimum
Ignition timing ("F" mark)	10° BTDC at idle

ELECTRIC STARTER SPECIFICATIONS

Unit: mm (in)

ITEM	STANDARD	SERVICE LIMIT
Starter motor brush length	12.0 (0.47)	6.5 (0.26)

LIGHTS/METERS/SWITCHES SPECIFICATIONS

'07 TM/FM and After '07 U.S.A. TM/FM models

ITEM	SPECIFICATIONS	
Bulbs	Headlight (high/low beam)	12 V - 30/30 W x 2
	Brake/taillight	LED
	Neutral indicator	12 V-1.7 W
	Reverse indicator	12 V-1.7 W
	Coolant temperature indicator	12 V-1.7 W
	MIL	12 V-1.7 W
	4WD indicator (FM only)	12 V-1.7 W
Fuse	Main fuse	30 A
	Sub-fuse	15 A, 10 A x 3