

2004-2006



SERVICE MANUAL

TRX350TE/TM/FE/FM

FourTrax® Rancher

HOW TO USE THIS MANUAL

This service manual describes the service procedures for the TRX350.

Follow the Maintenance Schedule (Section 4) recommendations to ensure that the vehicle is in peak operating condition and emission levels are within the standards set by the California Air Resources Board (CARB).

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 motorcycle. Section 3 illustrates procedures for removal/installation of components that may be required to perform service described in the following sections.

Sections 5 through 23 describe parts of the motorcycle, 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 procedures.

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

If you don't know the source of the trouble, go to Section 24, 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.








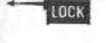



- Instructions – how to service this vehicle correctly and safely.

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.

	Replace the part(s) with new one(s) before assembly.
	Use recommended 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 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
	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
	Use silicone grease.
	Apply a locking agent. Use a medium strength locking agent unless otherwise specified.
	Use sealant.
	Use DOT 3 or DOT 4 brake fluid. Use the recommended brake fluid unless otherwise specified.
	Use fork or suspension fluid.

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 motorcycle.
2. Use the special tools designed for this product to avoid damage and incorrect assembly.
3. Use only metric tools when servicing the motorcycle. 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 on pages 1-21 through 1-29, Cable & Harness routing.

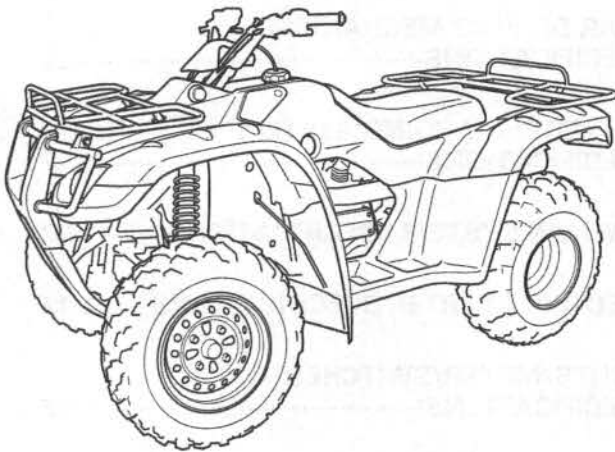
MODEL IDENTIFICATION

This manual covers 4 types of TRX350 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)

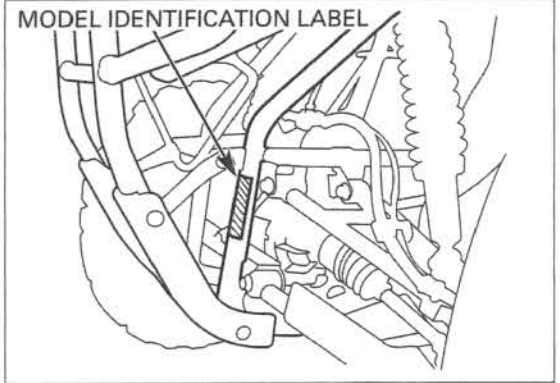
Be sure to refer to the procedure that pertains to the appropriate version of the TRX350.

TRX350 TM/FM (U.S.A. type shown):

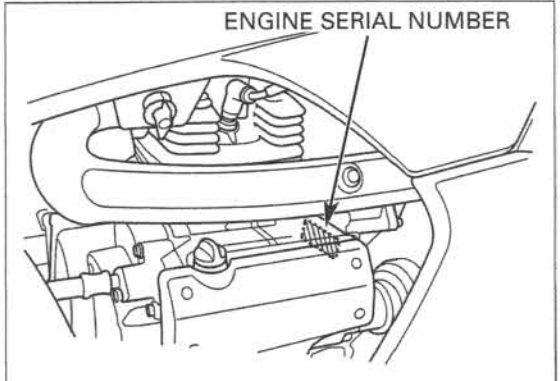


GENERAL INFORMATION

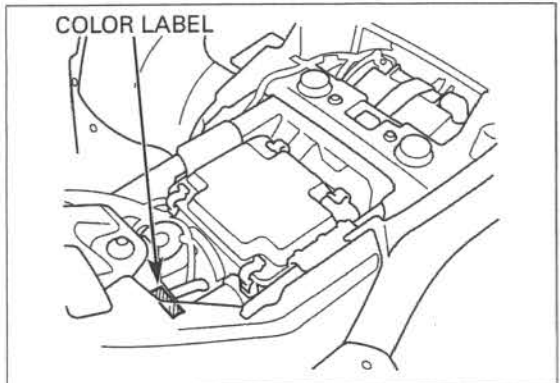
The Model Identification Label is located on the left side frame down tube.



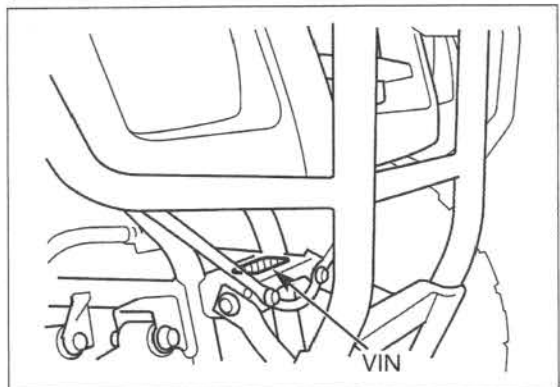
The engine serial number is stamped on the left side of the rear crankcase.



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

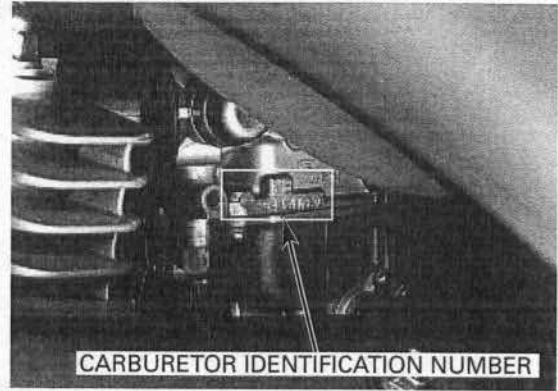


The vehicle identification number (VIN) is stamped on the front side of the frame.



GENERAL INFORMATION

The carburetor identification number is stamped on the left side of the carburetor body.



GENERAL SPECIFICATIONS

TRX350TM/TE

DIMENSIONS	ITEM	SPECIFICATIONS
	Overall length Overall width Overall height Wheelbase Front tread Rear tread Seat height Footpeg height Ground clearance Dry weight Curb weight Maximum weight capacity	2,031 mm (80 in) 1,114 mm (43.9 in) 1,129 mm (44.4 in) 1,253 mm (49.3 in) 851 mm (33.5 in) 840 mm (33.1 in) 812 mm (32.0 in) TM: 337 mm (13.3 in)/TE: 327 mm (12.9 in) 186 mm (7.3 in) TM: 227 kg (500 lbs) TE: 232 kg (511 lbs) TM: 238 kg (525 lbs) TE: 242 kg (534 lbs) 210 kg (463 lbs)
	Frame type Front suspension Front wheel travel Front damper Rear suspension Rear wheel travel Rear damper Front tire size Rear tire size Front rim size Rear rim size Front tire brand Rear tire brand Front brake Rear brake Caster angle Trail length Camber angle Fuel tank capacity Fuel tank reserve capacity	Double cradle Double wish-bone 150 mm (5.9 in) Double tube Swingarm 150 mm (5.9 in) Double tube AT24 x 8-12 ** AT25 x 11-10 ** 12 x 6.0 AT 10 x 8.5 AT TRACKER CL (Goodyear) TRACKER CL (Goodyear) Hydraulic drum brake (Dual leading) Mechanical drum brake (Leading-trailing) 7° 31 mm (1.2 in) 0° 13.9 liters (3.67 US gal, 3.06 Imp gal) 3.1 liters (0.82 US gal, 0.68 Imp gal)
	Cylinder arrangement Bore and stroke Displacement Compression ratio Valve train Intake valve opens closes Exhaust valve opens closes Lubrication system Oil pump type Cooling system Air filtration Engine dry weight	Single cylinder, longitudinally installed 78.5 x 68.0 mm (3.09 x 2.68 in) 329.1 cm ³ (20.08 cu-in) 8.8 : 1 OHV 8° BTDC (at 1 mm lift) 38° ABDC (at 1 mm lift) 40° BBDC (at 1 mm lift) 7° ATDC (at 1 mm lift) Forced pressure (dry sump) Trochoid Air cooled (with cooling fan [TE only] and oil cooler) Oiled urethane foam TM: 43.4 kg (95.7 lbs)/TE: 44.9 kg (99.0 lbs)
	Carburetor type Throttle bore	Constant Vacuum (VE type) 32 mm (1.3 in)

GENERAL INFORMATION

	ITEM	SPECIFICATIONS
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 2.188 (70/32) 1.933 (29/15) 3.692 (48/13) 3.455 (38/11) 1.933 (29/15) 1.333 (28/21) 0.966 (28/29) 0.720 (18/25) 4.600 (39/13 23/15) R - N - 1 - 2 - 3 - 4 - 5 Left foot operated return system (TM) Electric shift (left hand operated) return system (TE)
ELECTRICAL	Ignition system Starting system Charging system Regulator/rectifier Lighting system	DC-CDI Electric starter motor and emergency recoil starter Triple phase output alternator SCR shorted, triple phase full wave rectification Battery

TRX350FM/FE

	ITEM	SPECIFICATIONS
DIMENSIONS	Overall length Overall width Overall height Wheelbase Front tread Rear tread Seat height Footpeg height Ground clearance Dry weight Curb weight Maximum weight capacity	2,031 mm (80 in) 1,114 mm (43.9 in) 1,141 mm (44.9 in) 1,246 mm (49.1 in) 844 mm (33.2 in) 860 mm (33.9 in) 819 mm (32.3 in) FM: 344 mm (13.5 in)/FE: 334 mm (13.1 in) FM: 238 kg (525 lbs) FE: 241 kg (531 lbs) FM: 249 kg (549 lbs) FE: 252 kg (556 lbs) 220 kg (485 lbs)

GENERAL INFORMATION

	ITEM	SPECIFICATIONS
FRAME	Frame type	Double cradle
	Front suspension	Double wish-bone
	Front wheel travel	150 mm (5.9 in)
	Front damper	Double tube
	Rear suspension	Swingarm
	Rear wheel travel	150 mm (5.9 in)
	Rear damper	Double tube
	Front tire size	AT24 x 8-12 **
	Rear tire size	AT24 x 9-11 **
	Front rim size	12 x 6.0 AT
	Rear rim size	11 x 7.0 AT
	Front tire brand	DIRT HOOKS 15 (Bridgestone)
	Rear tire brand	DIRT HOOKS 14 (Bridgestone)
	Front brake	Hydraulic drum brake (Dual leading)
	Rear brake	Mechanical drum brake (Leading-trailing)
	Caster angle	4°
	Trail length	17 mm (0.7 in)
	Camber angle	0° 06'
Fuel tank capacity	13.9 liters (3.67 US gal, 3.06 Imp gal)	
Fuel tank reserve capacity	3.1 liters (0.82 US gal, 0.68 Imp gal)	
ENGINE	Cylinder arrangement	Single cylinder, longitudinally installed
	Bore and stroke	78.5 x 68.0 mm (3.09 x 2.68 in)
	Displacement	329.1 cm ³ (20.08 cu-in)
	Compression ratio	8.8 : 1
	Valve train	OHV
	Intake valve	8°BTDC (at 1 mm lift)
		38°ABDC (at 1 mm lift)
	Exhaust valve	40°BBDC (at 1 mm lift)
		7°ATDC (at 1 mm lift)
	Lubrication system	Forced pressure (dry sump)
	Oil pump type	Trochoid
Cooling system	Air cooled (with cooling fan and oil cooler)	
Air filtration	Oiled urethane foam	
Engine dry weight	FM: 43.8 kg (96.6 lbs)/FE: 45.3 kg (99.9 lbs)	
CARBURETOR	Carburetor type	Constant Vacuum (VE type)
	Throttle bore	32 mm (1.3 in)
DRIVE TRAIN	Clutch system	Centrifugal and Multi-plate, wet
	Clutch operation system	Automatic
	Transmission	Constant mesh, 5-speeds with reverse
	Primary reduction	2.188 (70/32)
	Secondary reduction	1.933 (29/15)
	Final reduction	3.769 (49/13)
		3.692 (48/13)
	Gear ratio	3.455 (38/11)
		1.933 (29/15)
		1.333 (28/21)
	0.966 (28/29)	
	0.720 (18/25)	
	4.600 (39/13 x 23/15)	
Gearshift pattern	R - N - 1 - 2 - 3 - 4 - 5 Left foot operated return system (FM) Electric shift (left hand operated) return system (FE)	
ELECTRICAL	Ignition system	DC-CDI
	Starting system	Electric starter motor and emergency recoil starter
	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	1.95 liters (2.06 US qt, 1.72 Imp qt)	-
	After draining/filter change	2.0 liters (2.1 US qt, 1.8 Imp qt)	-
	After disassembly	2.5 liters (2.6 US qt, 2.2 Imp qt)	-
Recommended engine oil		Pro Honda GN4 or HP4 (without molybdenum additives) 4-stroke oil or equivalent motor oil API service classification: SG or Higher JASO T 903 standard: MA Viscosity: SAE 10W-40	-
Oil pump	Tip clearance	0.15 (0.006)	0.20 (0.008)
	Body clearance	0.15 - 0.22 (0.00 - 0.009)	0.25 (0.010)
	Side clearance	0.02 - 0.09 (0.001 - 0.004)	0.12 (0.005)

FUEL SYSTEM SPECIFICATIONS

ITEM	SPECIFICATIONS
Carburetor identification number	VE94EA
Main jet	# 128S
Slow jet	# 42S
Jet needle clip position	3rd groove from top
Pilot screw opening	See page 6-19
Float level	18.5 mm (0.73 in)
Idle speed	1,400 ± 100 rpm
Throttle lever free play	3 - 8 mm (1/8 - 5/16 in)

CYLINDER HEAD/VALVE/CAMSHAFT SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Cylinder compression at 450 rpm		667 kPa (6.8 kgf/cm ³ , 97 psi)	-
Valve clearance		0.15 (0.006)	-
Valve, valve guide	Valve stem O.D.	IN	5.475 - 5.490 (0.2156 - 0.2161)
		EX	5.455 - 5.470 (0.2148 - 0.2154)
	Valve guide I.D.	IN/EX	5.500 - 5.512 (0.2165 - 0.2170)
	Stem-to-guide clearance	IN	0.010 - 0.037 (0.0004 - 0.0015)
		EX	0.030 - 0.057 (0.0012 - 0.0022)
Valve seat width	IN/EX	1.2 (0.05)	
Valve spring	Free length	Inner	36.95 (1.455)
		Outer	41.67 (1.641)
Rocker arm	Arm I.D.	IN/EX	12.000 - 12.018 (0.4724 - 0.4731)
	Shaft O.D.	IN/EX	11.966 - 11.984 (0.4711 - 0.4718)
	Arm-to-shaft clearance	IN/EX	0.016 - 0.052 (0.0006 - 0.0020)
Camshaft and cam follower	Cam lobe height	IN/EX	35.2995 - 35.4595 (1.38974 - 1.39604)
	Cam follower O.D.	IN/EX	22.467 - 22.482 (0.8845 - 0.8851)
	Follower bore I.D.	IN/EX	22.510 - 22.526 (0.8862 - 0.8868)
	Follower-to-bore clearance	IN/EX	0.028 - 0.059 (0.0011 - 0.0023)
Cylinder head warpage		-	0.10 (0.004)

CYLINDER/PISTON SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT	
Cylinder	I.D.	78.500 – 78.510 (3.0905 – 3.0909)	78.60 (3.094)	
	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	78.465 – 78.485 (3.0892 – 3.0900)	78.43 (3.088)	
	Piston pin hole I.D.	17.002 – 17.008 (0.6694 – 0.6696)	17.04 (0.671)	
	Piston pin O.D.	16.994 – 17.000 (0.6691 – 0.6693)	16.96 (0.668)	
	Piston-to-piston pin clearance	0.002 – 0.014 (0.0001 – 0.0006)	0.02 (0.001)	
	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		0.015 – 0.045 (0.0006 – 0.0018)	0.09 (0.004)	
Cylinder-to-piston clearance		0.015 – 0.045 (0.0006 – 0.0018)	0.10 (0.004)	
Connecting rod small end I.D.		17.016 – 17.034 (0.6699 – 0.6706)	17.10 (0.673)	
Connecting rod-to-piston pin clearance		0.016 – 0.040 (0.0006 – 0.0016)	0.06 (0.002)	

CLUTCH/GEARSHIFT LINKAGE SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT	
Change clutch	Spring free length	TM/FM	28.0 (1.10)	
		TE/FE	31.3 (1.23)	
	Disc A thickness	2.62 – 2.78 (0.103 – 0.109)	2.3 (0.09)	
	Disc B thickness (TE/FE only)	2.92 – 3.08 (0.115 – 0.121)	2.69 (0.106)	
	Plate warpage	–	0.20 (0.008)	
	Outer I.D.	28.000 – 28.021 (1.1024 – 1.1032)	28.04 (1.104)	
	Outer guide	I.D.	22.000 – 22.021 (0.8661 – 0.8670)	22.05 (0.868)
		O.D.	27.959 – 27.980 (1.1007 – 1.1016)	27.92 (1.099)
Mainshaft O.D. at clutch outer guide		21.967 – 21.980 (0.8648 – 0.8654)	21.93 (0.863)	
Centrifugal clutch	Drum I.D.	126.0 – 126.2 (4.96 – 4.97)	126.4 (4.98)	
	Weight lining thickness	2.0 (0.08)	1.3 (0.05)	
	Clutch spring height	2.87 (0.113)	2.73 (0.107)	
	Clutch weight spring free length	25.8 (1.02)	26.9 (1.06)	
Primary drive gear	Gear I.D.	27.000 – 27.021 (1.0630 – 1.0638)	27.05 (1.065)	
	Crankshaft O.D. at drive gear	26.959 – 26.980 (1.0614 – 1.0622)	26.93 (1.060)	

ALTERNATORS/STARTER CLUTCH SPECIFICATIONS

Unit: mm (in)

ITEM	STANDARD	SERVICE LIMIT
Starter driven gear boss O.D.	45.660 – 45.673 (1.7976 – 1.7981)	45.65 (1.797)

GENERAL INFORMATION

CRANKCASE/AUTOMATIC TRANSMISSION SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Shift fork	I.D.	13.000 – 13.018 (0.5118 – 0.5125)	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.	M4	23.000 – 23.021 (0.9055 – 0.9063)
		M5	18.000 – 18.021 (0.7087 – 0.7095)
		C1, C2, C3, CR	25.000 – 25.021 (0.9843 – 0.9851)
		Reverse idle	13.000 – 13.018 (0.5118 – 0.5125)
	Gear bushing O.D.	M4	22.959 – 22.979 (0.9039 – 0.9047)
		M5	17.959 – 17.980 (0.7070 – 0.7079)
		C1, C2, C3, CR	24.959 – 24.980 (0.9826 – 0.9835)
	Gear-to-bushing clearance	M4	0.021 – 0.062 (0.0008 – 0.0024)
		M5, C1, C2, C3, CR	0.020 – 0.062 (0.0008 – 0.0024)
	Gear bushing I.D.	M4	20.000 – 20.021 (0.7874 – 0.7882)
		M5	15.000 – 15.018 (0.5906 – 0.5913)
		C3	22.000 – 22.021 (0.8661 – 0.8670)
	Mainshaft O.D.	at M4	19.959 – 19.980 (0.7858 – 0.7866)
		at M5	14.966 – 14.984 (0.5892 – 0.5899)
	Countershaft O.D.	at C3	21.959 – 21.980 (0.8645 – 0.8654)
Reverse idle shaft O.D.		12.966 – 12.984 (0.5105 – 0.5112)	
Bushing-to-shaft clearance	M4, C3	0.020 – 0.062 (0.0008 – 0.0024)	
	M5	0.016 – 0.052 (0.0006 – 0.0020)	
Reverse idle gear-to-shaft clearance		0.016 – 0.052 (0.0006 – 0.0020)	
Crankshaft	Runout	–	0.05 (0.002)
	Big end side clearance	0.05 – 0.65 (0.002 – 0.026)	0.8 (0.03)
	Big end radial clearance	0.006 – 0.018 (0.0002 – 0.0007)	0.05 (0.002)

FRONT WHEEL/SUSPENSION/STEERING SPECIFICATIONS (TM/TE model)

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Minimum tire tread depth		–	4.0 (0.16)
Cold tire pressure	Standard	20 kPa (0.20 kgf/cm ² , 2.8 psi)	–
	Minimum	17 kPa (0.17 kgf/cm ² , 2.4 psi)	–
	Maximum	23 kPa (0.23 kgf/cm ² , 3.2 psi)	–
	With cargo	20 kPa (0.20 kgf/cm ² , 2.8 psi)	–
Tie-rod distance between the ball joints		355 ± 1 (14.0 ± 0.04)	–
Toe		Toe-in: 3 ± 15 (1/8 ± 9/16)	–

FRONT WHEEL/SUSPENSION/STEERING SPECIFICATIONS (FM/FE model)

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)	–
	Minimum	22 kPa (0.22 kgf/cm ² , 3.2 psi)	–
	Maximum	28 kPa (0.28 kgf/cm ² , 4.0 psi)	–
	With cargo	25 kPa (0.25 kgf/cm ² , 3.6 psi)	–
Tie-rod distance between the ball joints		347.5 ± 1 (13.68 ± 0.04)	–
Toe		Toe-out: 18 ± 15 (3/4 ± 9/16)	–

REAR WHEEL/SUSPENSION SPECIFICATIONS (TM/TE model)

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Minimum tire tread depth		-	4.0 (0.16)
Cold tire pressure	Standard	20 kPa (0.20 kgf/cm ² , 2.8 psi)	-
	Minimum	17 kPa (0.17 kgf/cm ² , 2.4 psi)	-
	Maximum	23 kPa (0.23 kgf/cm ² , 3.2 psi)	-
	With cargo	20 kPa (0.20 kgf/cm ² , 2.8 psi)	-

REAR WHEEL/SUSPENSION SPECIFICATIONS (FM/FE model)

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)	-
	Minimum	22 kPa (0.22 kgf/cm ² , 3.2 psi)	-
	Maximum	28 kPa (0.28 kgf/cm ² , 4.0 psi)	-
	With cargo	25 kPa (0.25 kgf/cm ² , 3.6 psi)	-

BRAKE SYSTEM SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Front	Recommended brake fluid	Honda DOT 4 brake fluid	-
	Drum I.D.	160.0 – 160.3 (6.30 – 6.31)	161.0 (6.34)
	Shoe lining thickness	4.0 (0.16)	1.0 (0.04)
	Brake panel warpage	-	0.4 (0.02)
	Waterproof seal lip length	22 (0.9)	20 (0.8)
	Master cylinder I.D.	14.00 – 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)
	Wheel cylinder I.D.	19.050 – 19.102 (0.750 – 0.752)	19.12 (0.753)
	Wheel cylinder piston O.D.	18.997 – 19.030 (0.7479 – 0.7492)	18.81 (0.741)
Rear brake	Drum I.D.	160.0 – 160.2 (6.30 – 6.31)	161.0 (6.34)
	Shoe lining thickness	5.0 (0.20)	To index mark

FRONT DRIVING MECHANISM SPECIFICATIONS (FM/FE model)

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Front differential	Oil capacity	After draining	241 cm ³ (8.2 US oz, 8.5 Imp oz)
		After disassembly	275 cm ³ (9.3 US oz, 9.7 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	85 cm ³ (2.9 US oz, 3.0 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)	0.4 (0.02)
	Backlash difference		-	0.2 (0.01)
	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		1 mA max. (Equipped with digital meter) 0.1 mA max. (No digital meter)
	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	0.245 kW/5,000 rpm	
	Charging coil resistance (20°C/68°F)		0.1 - 1.0 Ω

IGNITION SYSTEM SPECIFICATIONS

ITEM			SPECIFICATIONS
Spark plug	Standard		DPR7EA-9 (NGK), X22EPR-U9 (DENSO)
	For cold climate (below 5°C/41°F)		DPR6EA-9 (NGK), X20EPR-U9 (DENSO)
Spark plug gap			0.8 - 0.9 mm (0.03 - 0.04 in)
Ignition coil primary peak voltage			100 V minimum
Ignition pulse generator peak voltage			0.7 V minimum
Ignition timing ("F" mark)			11° BTDC at idle

ELECTRIC STARTER SPECIFICATIONS

Unit: mm (in)

ITEM	STANDARD	SERVICE LIMIT
Starter motor brush length	12.5 (0.49)	9.0 (0.35)

LIGHTS/METER/SWITCHES SPECIFICATIONS

ITEM			SPECIFICATIONS
Bulbs	Headlight (high/low beam)		12 V-30/30 W x 2
	Taillight		12 V-5 W x 2
	Neutral indicator		12 V-1.7 W (No meter) LED (Equipped with digital meter)
	Reverse indicator		12 V-1.7 W (No meter) LED (Equipped with digital meter)
	Oil temperature indicator		12 V-1.7 W (No meter) LED (Equipped with digital meter)
	Meter light		LED x 12 (Equipped with digital meter)
	Fuse	Main fuse	TM/FM
TE/FE			30 A x 2
Sub-fuse		15 A x 2, 10 A x 2	

STANDARD TORQUE VALUES

FASTENER TYPE	TORQUE N·m (kgf·m, lbf·ft)	FASTENER TYPE	TORQUE N·m (kgf·m, lbf·ft)
5 mm bolt and nut	5 (0.5, 3.6)	5 mm screw	4 (0.4, 2.9)
6 mm bolt and nut	10 (1.0, 7)	6 mm screw	9 (0.9, 6.5)
8 mm bolt and nut	22 (2.2, 16)	6 mm flange bolt (8 mm head, small flange)	10 (1.0, 7)
10 mm bolt and nut	34 (3.5, 25)	6 mm flange bolt (8 mm head, large flange)	12 (1.2, 9)
12 mm bolt and nut	54 (5.5, 40)	6 mm flange bolt (10 mm head) and nut	12 (1.2, 9)
		8 mm flange bolt and nut	26 (2.7, 20)
		10 mm flange bolt and nut	39 (4.0, 29)

ENGINE & FRAME TORQUE VALUES

- Torque specifications listed below are for important fasteners.
- Others should be tightened to standard torque values listed above.

NOTE:

1. Apply locking agent to the threads.
2. Apply engine oil to the threads and seating surface.
3. Apply grease to the threads and seating surface.
4. ALOC bolt: replace with a new one.
5. Lock nut: replace with a new one.
6. Castle nut: tighten to the specified torque and further tighten until its grooves aligns with the cotter pin hole.
7. Special bolt: replace with a new one.
8. Stake.

ENGINE

MAINTENANCE

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Spark plug	1	-	22 (2.2, 16)	
Valve adjusting lock nut	2	6	17 (1.7, 12)	
Timing hole cap	1	14	10 (1.0, 7)	
Engine oil drain bolt	1	12	25 (2.5, 18)	
Engine oil filter cover	3	6	10 (1.0, 7)	
Clutch adjusting screw lock nut	1	8	22 (2.2, 16)	

FUEL SYSTEM

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Carburetor insulator band screw	1	5	4 (0.4, 2.9)	

CYLINDER HEAD/VALVE

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Rocker arm shaft retaining bolt	1	6	7 (0.7, 5.1)	
Cylinder head cap nut	4	10	39 (4.0, 29)	NOTE 2
Rocker arm holder bolt	1	8	30 (3.1, 22)	NOTE 2
Cam chain tensioner slider pivot bolt	1	6	12 (1.2, 9)	NOTE 1

CYLINDER/PISTON

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Cylinder stud bolt	4	8	12 (1.2, 9)	Page 9-7

GENERAL INFORMATION

CLUTCH/GEARSHIFT LINKAGE:

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Change clutch center lock nut	1	18	108 (11.0, 80)	NOTE 2, 8
Centrifugal clutch lock nut	1	20	118 (12.0, 87)	NOTE 2, 8
Clutch spring bolt	4	6	12 (1.2, 9)	
Gearshift cam bolt	1	8	23 (2.3, 17)	NOTE 1
Gearshift drum stopper arm pivot bolt	1	6	12 (1.2, 9)	NOTE 1
Gearshift spindle return spring pin	1	8	22 (2.2, 16)	NOTE 1
Gearshift spindle retaining bolt	1	6	12 (1.2, 9)	NOTE 1

ALTERNATOR/STARTER CLUTCH:

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Starter clutch bolt	6	6	23 (2.3, 17)	NOTE 1
Recoil starter driven pulley bolt	1	12	108 (11.0, 80)	NOTE 2
Alternator stator bolt	3	6	10 (1.0, 7)	
Ignition pulse generator bolt	2	5	6 (0.6, 4.3)	NOTE 1

LIGHTS/METER/SWITCHES

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Oil thermosensor	1	-	18 (1.8, 13)	

ELECTRIC SHIFT PROGRAM (ESP: TE/FE model):

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Angle sensor bolt	2	5	6 (0.6, 4.3)	NOTE 1
Reverse shift switch	1	-	13 (1.3, 9)	

FRAME

FRAME/BODY PANELS/EXHAUST SYSTEM

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Muffler band bolt	2	8	23 (2.3, 17)	
Muffler cover bolt	6	6	22 (2.2, 16)	
Exhaust pipe cover bolt	6	6	22 (2.2, 16)	
Footpeg bracket bolt	4	8	32 (3.3, 24)	

MAINTENANCE

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Front differential oil filler cap	1	30	12 (1.2, 9)	
Front differential oil drain bolt	1	8	12 (1.2, 9)	
Rear final gear case oil check bolt	1	8	12 (1.2, 9)	
Rear final gear case oil filler cap	1	30	12 (1.2, 9)	
Rear final gear case oil drain bolt	1	8	12 (1.2, 9)	
Tie-rod lock nut	4	12	54 (5.5, 40)	

LUBRICATION SYSTEM

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Cooling fan assembly mounting bolt (equipped model)	4	6	18 (1.8, 13)	

FUEL SYSTEM

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Starting enrichment (SE) valve nut	1	14	2 (0.2, 1.4)	
Fuel valve lever screw	1	6	12 (1.2, 9)	NOTE 1

GENERAL INFORMATION

ENGINE REMOVAL/INSTALLATION

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Lower engine hanger nut (left and right)	2	10	54 (5.5, 40)	
Upper engine hanger nut (frame side)	1	10	54 (5.5, 40)	
Upper engine hanger nut bolt (engine side)	2	8	32 (3.3, 24)	
Gearshift pedal pinch bolt (TM/FM only)	1	6	20 (2.0, 14)	

FRONT WHEEL/SUSPENSION/STEERING

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Handlebar lower holder nut	2	10	39 (4.0, 29)	NOTE 5
Throttle housing cover screw	3	4	2 (0.2, 1.4)	
Front wheel nut	8	10	64 (6.5, 47)	
Front wheel hub nut (TM/TE only)	2	18	78 (8.0, 58)	NOTE 3, 6
Front wheel hub nut (FM/FE only)	2	16	78 (8.0, 58)	NOTE 6
Shock absorber mounting nut	4	10	30 (3.1, 22)	NOTE 5
Upper and lower arm pivot nut	8	10	44 (4.5, 33)	NOTE 5
Upper and lower arm ball joint nut	4	12	29 (3.0, 22)	NOTE 6
Brake hose clamp bolt	4	6	12 (1.2, 9)	
Tie-rod stud joint nut	4	12	54 (5.5, 40)	NOTE 5
Steering shaft end nut	1	14	108 (11.0, 80)	NOTE 5
Steering shaft holder bolt	2	8	32 (3.3, 24)	

REAR WHEEL/SUSPENSION

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Rear wheel nut	8	10	64 (6.5, 47)	
Shock absorber mounting nut (upper)	1	10	44 (4.5, 33)	NOTE 5
Shock absorber mounting bolt (lower)	1	10	44 (4.5, 33)	
Swingarm pivot bolt (left)	1	30	118 (12.0, 87)	
Swingarm pivot bolt (right)	1	30	4 (0.4, 2.9)	
Swingarm right pivot lock nut	1	30	118 (12.0, 87)	
Trailer hitch nut	2	10	44 (4.5, 33)	NOTE 5

BRAKE SYSTEM

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Brake hose oil bolt	3	10	34 (3.5, 25)	
Wheel cylinder bleed valve	2	8	6 (0.6, 4.3)	
Front master cylinder reservoir cap screw	2	4	2 (0.2, 1.4)	
Front brake light switch screw	1	4	1 (0.1, 0.7)	
Front brake lever pivot bolt	1	6	1 (0.1, 0.7)	
Front brake lever pivot nut	1	6	6 (0.6, 4.3)	
Front master cylinder holder bolt	2	6	12 (1.2, 9)	
Wheel cylinder bolt	4	6	8 (0.8, 5.8)	
Wheel cylinder nut	4	8	17 (1.7, 12)	
Wheel cylinder oil pipe joint nut	4	10	16 (1.6, 12)	
Front brake panel bolt	8	8	29 (3.0, 22)	NOTE 7
Brake oil pipe joint nut	2	10	17 (1.7, 12)	
Rear brake arm pinch bolt	1	8	20 (2.0, 14)	
Rear wheel hub nut	2	20	137 (14.0, 101)	NOTE 6
Rear brake panel nut	4	10	44 (4.5, 33)	NOTE 5
Rear brake panel drain bolt	1	8	12 (1.2, 9)	

GENERAL INFORMATION

FRONT DRIVING MECHANISM (FM/FE)

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Differential ring gear bolt	6	8	49 (5.0, 36)	NOTE 7
Differential pinion bearing lock nut	1	60	98 (10.0, 72)	NOTE 5, 8
Differential case cover bolt	2	10	49 (5.0, 36)	NOTE 1
	6	8	25 (2.6, 19)	
Differential mounting bolt	1	10	44 (4.5, 33)	
Differential mounting nut	1	10	44 (4.5, 33)	NOTE 5
	1	8	22 (2.2, 16)	

REAR DRIVING MECHANISM

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Final gear case pinion bearing lock nut	1	64	98 (10.0, 72)	NOTE 5, 8
Final gear case cover bolt	2	10	49 (5.0, 36)	NOTE 1
	6	8	25 (2.6, 19)	
Final gear case mounting bolt	8	10	54 (5.5, 40)	
Left axle housing nut	4	10	44 (4.5, 33)	NOTE 5
Skid plate bolt	3	8	32 (3.3, 24)	

LUBRICATION & SEAL POINTS**ENGINE**

LOCATION	MATERIAL	REMARKS
Camshaft cam lobes Rocker arm shaft sliding surface Valve stem (valve guide sliding surface) Change clutch outer guide inner and outer surfaces Piston pin outer surface Starter driven gear bearing Starter reduction gear shaft journals Starter reduction gear teeth Starter motor pinion	Molybdenum oil solution (a mixture of 1/2 engine oil and 1/2 molybdenum disulfide grease)	
Rocker arm followers and adjusting screw tips Cam chain Cam follower whole surfaces Cylinder head cap nut threads Rocker arm holder bolt threads Cam chain tensioner slider pivot Connecting rod small end inner surface Piston outer surface and piston pin hole Piston rings Cylinder bore Clutch adjusting plate boss outer surface Change clutch disc lining Change clutch center lock nut threads Centrifugal sprag clutch whole surface Centrifugal clutch drum sprag clutch contacting surface Centrifugal clutch drive plate sprag clutch contacting surface Centrifugal clutch lock nut threads Reverse stopper shaft journal Recoil starter driven pulley bolt threads Starter one-way clutch whole surface Transmission gear teeth and rotating surfaces Mainshaft and countershaft journals Shift fork shaft Shift drum grooves Each bearing rotating area Each O-ring whole surface Each oil seal lip	Engine oil	
Recoil starter driven pulley oil seal lips Recoil starter drive pulley pivot pin and ratchet sliding surfaces	Multi-purpose grease	
Electric shift reduction gear teeth and journals (front crankcase cover)	Unirex N2 grease (EXXON) or Templex N3 grease (EXXON)	TE/FE only: Apply 3 – 5 g; Coating area (page 22-20)

GENERAL INFORMATION

LOCATION	MATERIAL	REMARKS
Oil pipe retaining bolt threads Gear position switch special bolt threads Cam chain tensioner slider pivot bolt threads Cam chain tensioner lifter bolt threads Camshaft bearing retainer bolt threads Gearshift drum stopper arm pivot bolt threads Gearshift cam plate bolt threads Gearshift spindle return spring pin threads Gearshift spindle retaining bolt threads Starter clutch bolt threads Recoil starter mounting bolt threads Ignition pulse generator bolt threads Mainshaft bearing setting plate bolt threads Shift drum bearing setting plate bolt threads Angle sensor bolt threads	Locking agent	TE/FE only
Alternator/ignition pulse generator wire grommet seating groove Gear position switch wire grommet seating groove Front crankcase cover mating surface Rear crankcase cover mating surface Crankcase mating surface	Liquid sealant	Coating area (page 10-25) Coating area (page 11-14) Coating area (12-23)

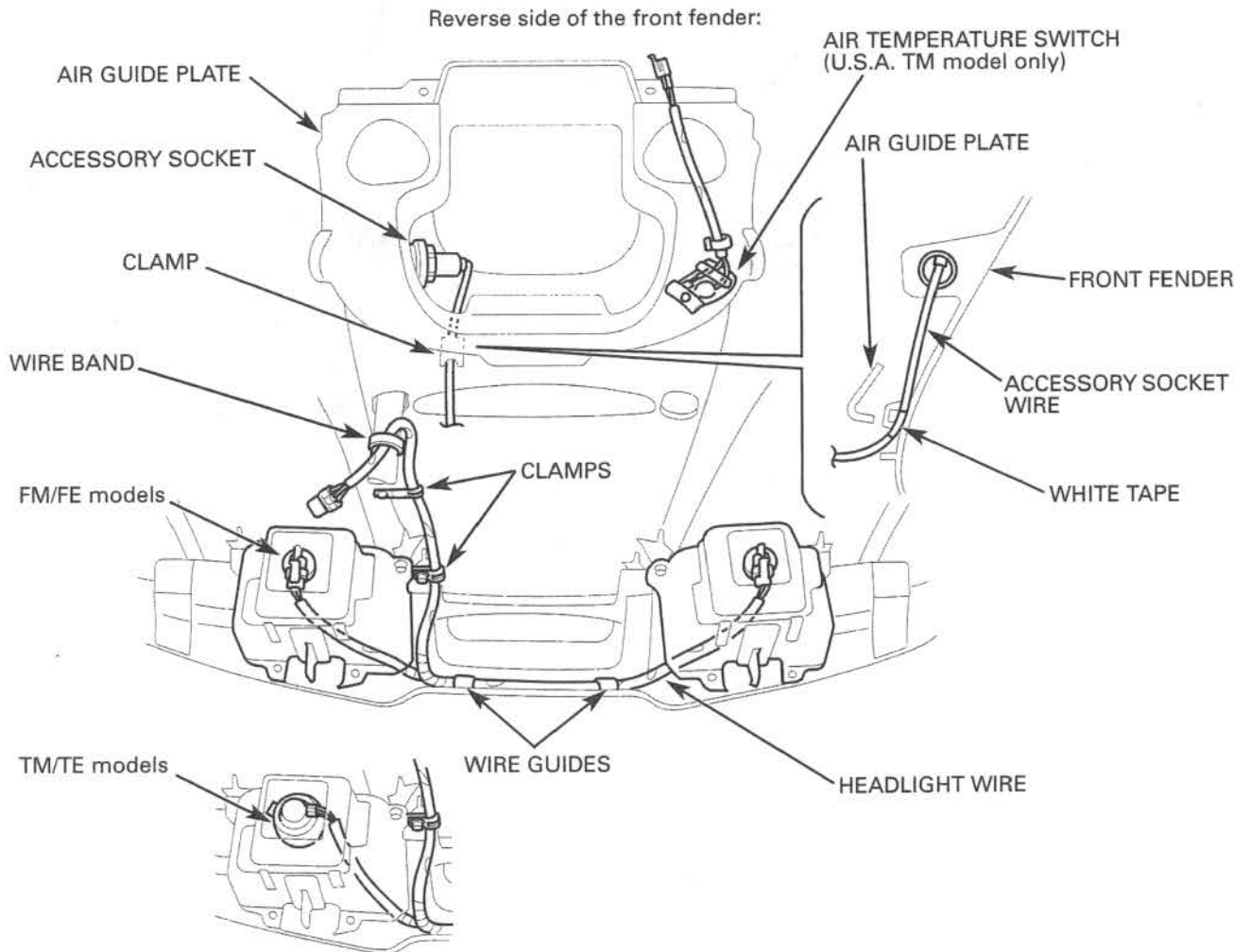
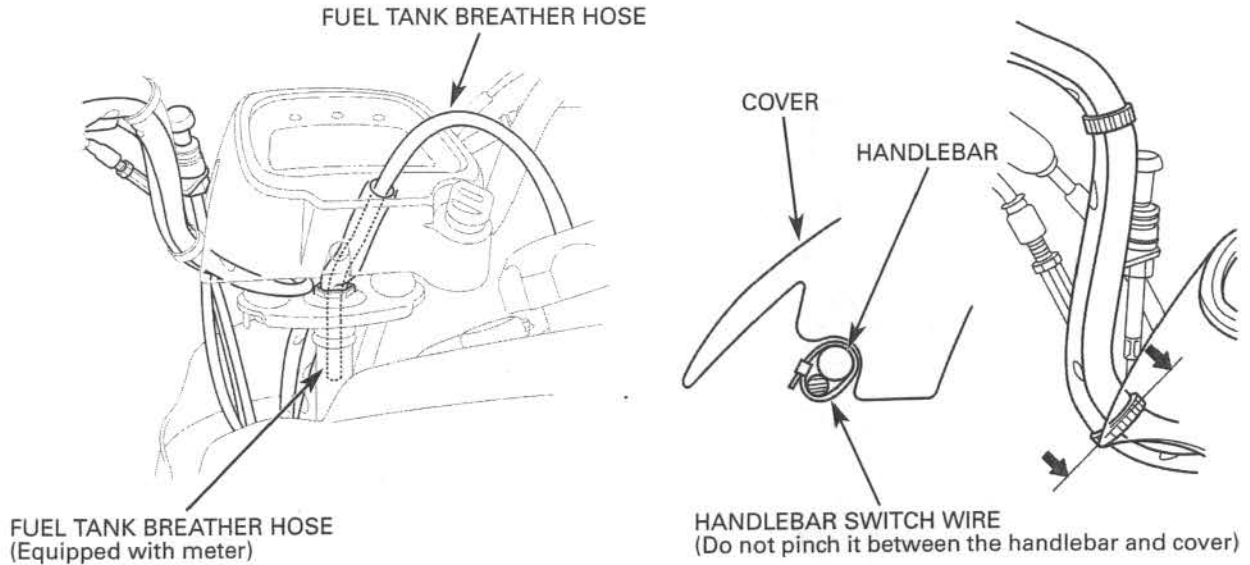
FRAME

LOCATION	MATERIAL	REMARKS
Throttle cable end Throttle lever pivot and dust seal lip Rear (parking) brake lever pivot Parking lock arm pivot (screw) Front brake drum (wheel hub) dust seal lips Front axle O-ring Front brake drum (wheel hub) nut threads and seating surface Steering shaft bushing inner surface Steering shaft dust seal lips Knuckle outer dust seal lips Knuckle inner dust seal lips and side seal Rear shock absorber lower bearing and dust seal lips Swingarm pivot bearing Swingarm pivot dust seal lips Rear brake cam dust seal lips Rear brake anchor pin sliding surface Rear brake cam spindle and sliding surface Rear brake drum cover dust seal lips and side seal Rear brake pedal pivot Rear brake pedal pivot dust seal lips Rear brake panel dust seal and O-ring Rear brake cable (pedal) and parking brake cable (lever) ends Front differential case oil seal lips (drive shafts and pinion joint) and O-ring (pinion gear and filler cap) Left rear axle housing dust seal lips and O-ring (final gear case) Rear final gear case oil seal lips (ring gear and pinion joint) and O-ring (filler cap and swingarm)	Multi-purpose grease (NLGI # 2)	TM/TE only TM/TE only TM/TE only FM/FE only FM/FE only Apply 3 g per each bearing FM/FE only
Front brake drum water proof seal lips and outside lip inside	Multi-purpose grease (NLGI # 3)	Fill up 14 – 16 g per each seal
Steering shaft spline Rear wheel hub dust seal lips Front propeller shaft seal Front propeller shaft splines (pinion joint and output joint shaft) Front differential pinion gear spline (pinion joint) Output joint shaft spline (propeller shaft joint) Front drive shaft spline (wheel side) Front drive shaft inboard joint inside Front drive shaft outboard joint inside Rear axle splines (left, right and center) Output shaft spline (universal joint) Rear final drive shaft splines (universal joint and pinion gear)	Molybdenum disulfide grease	FM/FE only FM/FE only Fill up 5 – 8 g per each spline FM/FE only FM/FE only Fill up 5 – 8 g FM/FE only FM/FE only Fill up 40 – 60 g per each joint FM/FE only Fill up 30 – 50 g per each joint
Front shock absorber lower bushing and dust seal lips	Molybdenum disulfide paste	

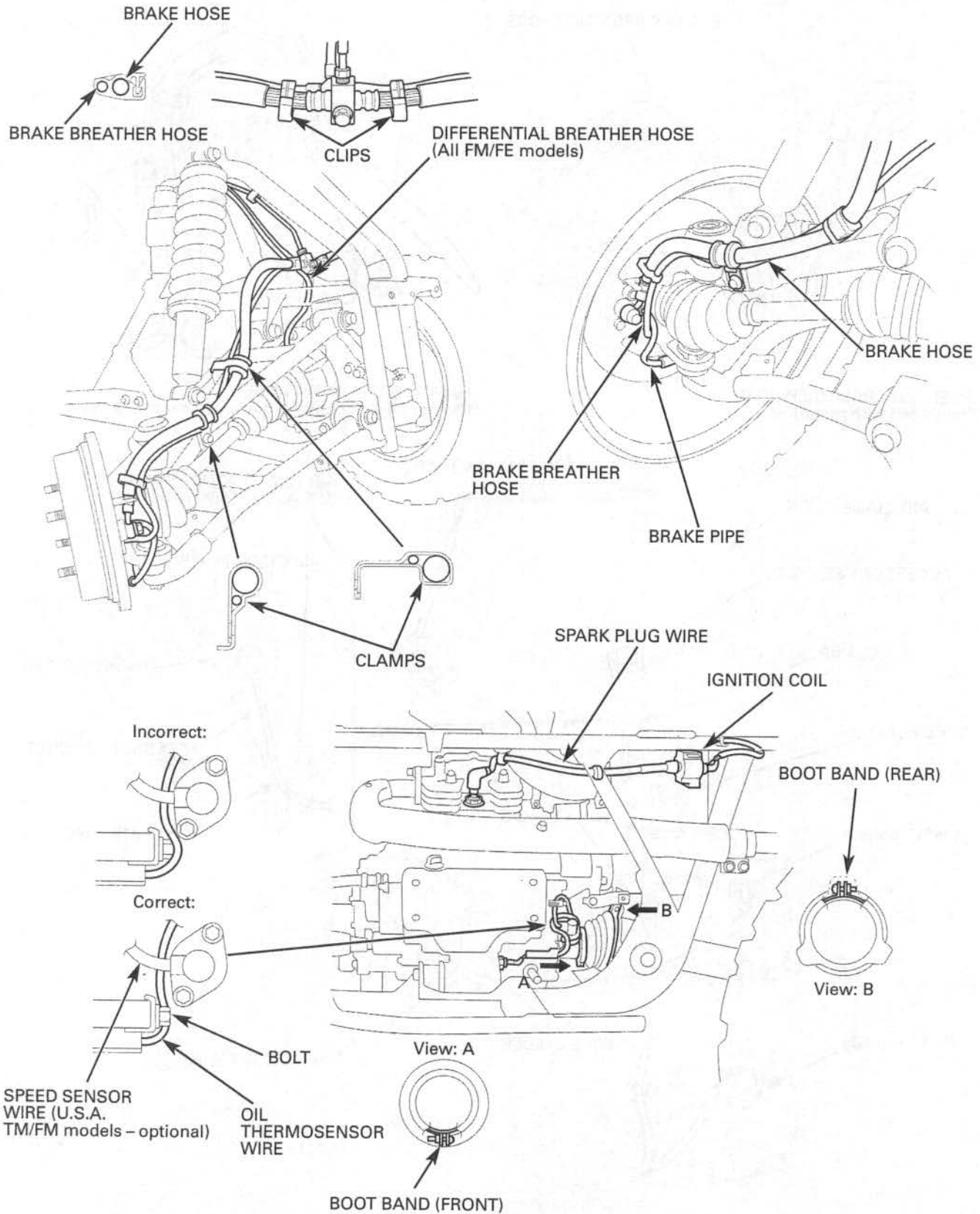
GENERAL INFORMATION

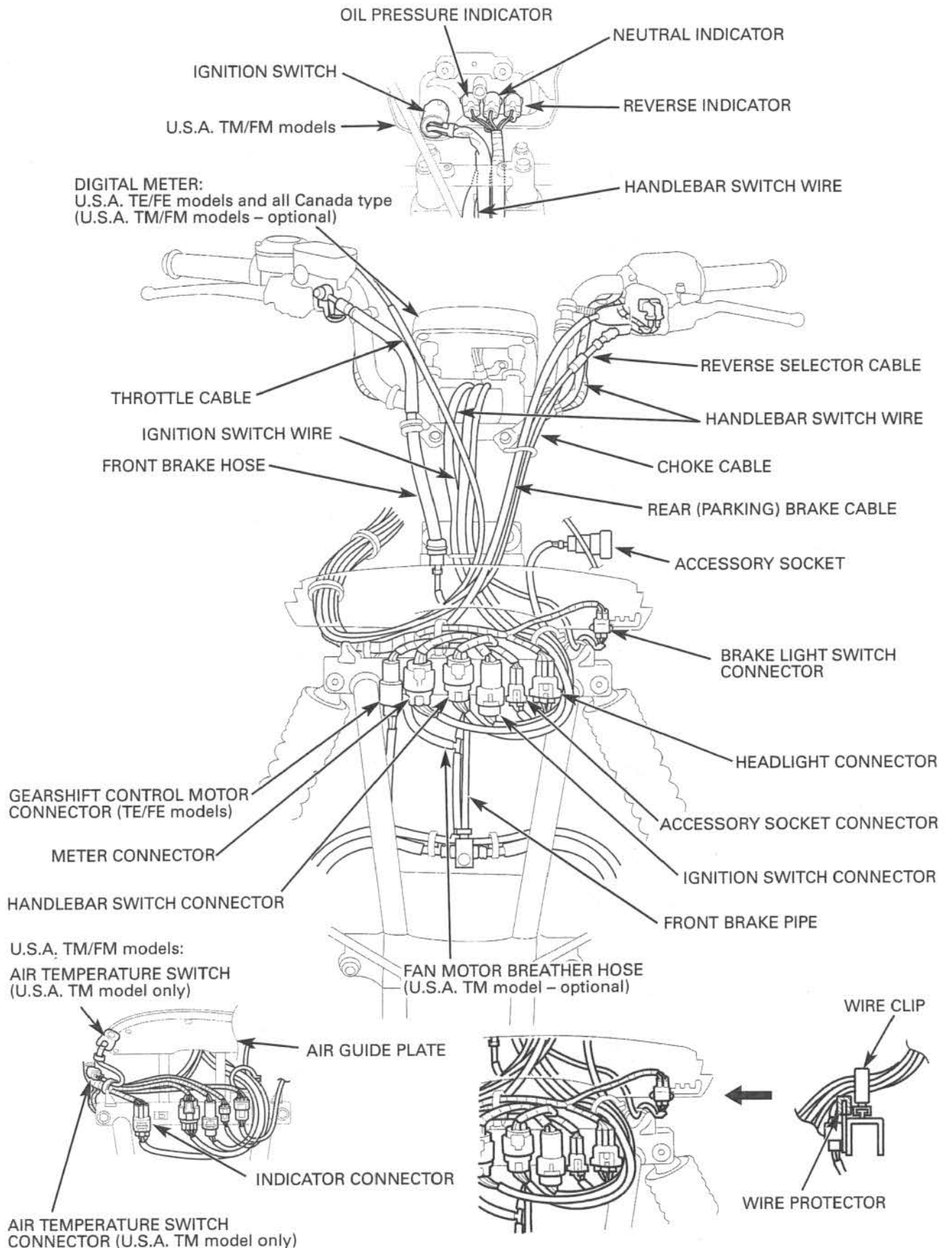
LOCATION	MATERIAL	REMARKS
Rear brake cam felt seal Oil cooler hose O-ring	Engine oil	
Handlebar grip rubber inside Air cleaner case-to-connecting tube (carburetor and air intake duct) mating groove Air cleaner case-to-crankcase breather tube grommet mating groove	Honda Bond A or Honda Hand Grip Cement (U.S.A. only) or equivalent	
Front brake lever-to-master piston contacting area Front brake lever pivot Wheel cylinder adjuster screw threads and adjuster nut spindle outer surface Wheel cylinder body boot groove and piston boot groove Brake panel shoe metal contacting areas Wheel cylinder adjuster groove and piston groove (shoe contacting grooves)	Silicone grease	
Master cylinder piston and cups Wheel cylinder piston and cup	DOT 4 brake fluid	
Wheel cylinder-to-brake panel mating surface Front differential case cover mating surface Rear final gear case cover mating surface	Liquid sealant	FM/FE only
Cooling fan motor shaft nut threads	Locking agent	Except U.S.A. TM

CABLE & HARNESS ROUTING

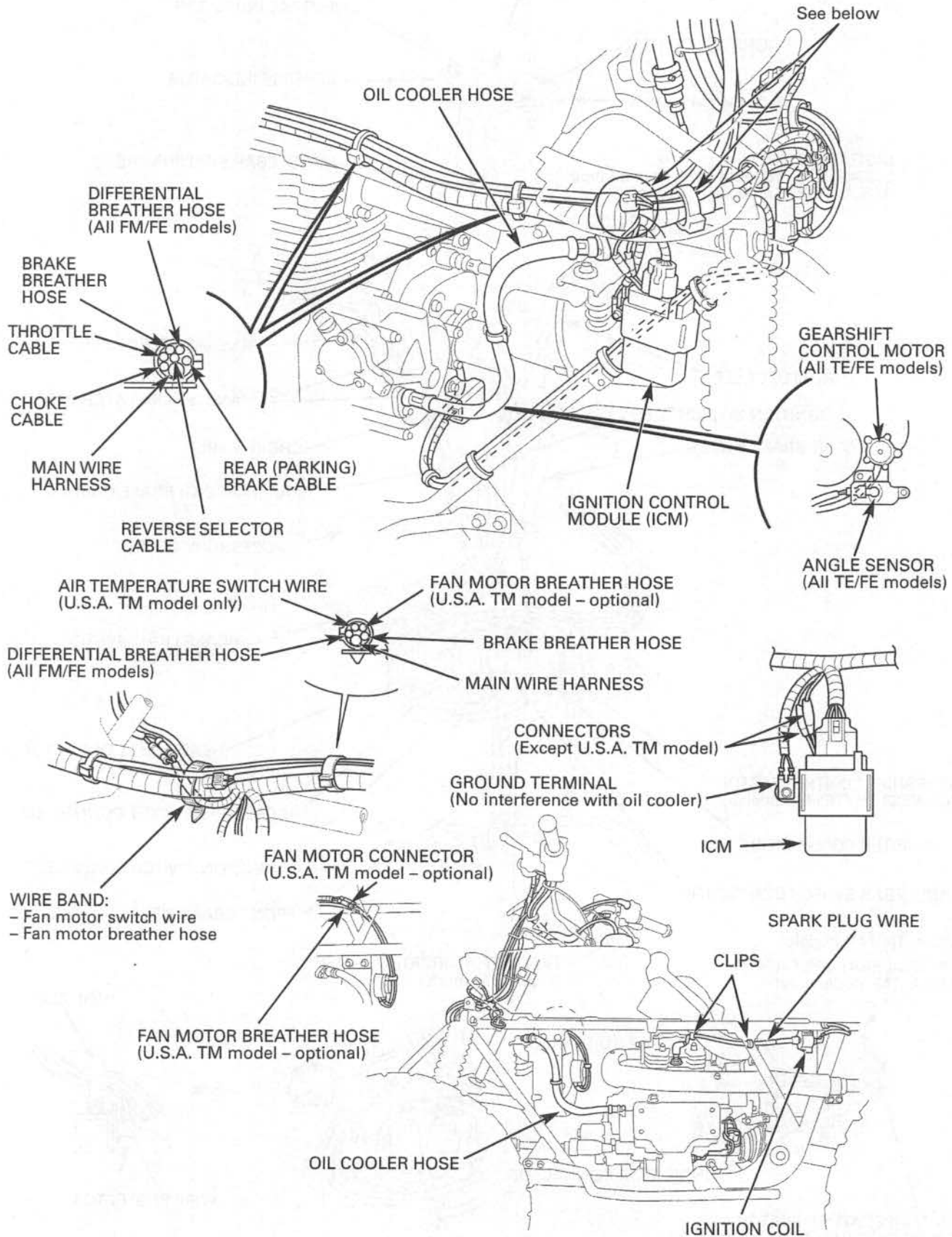


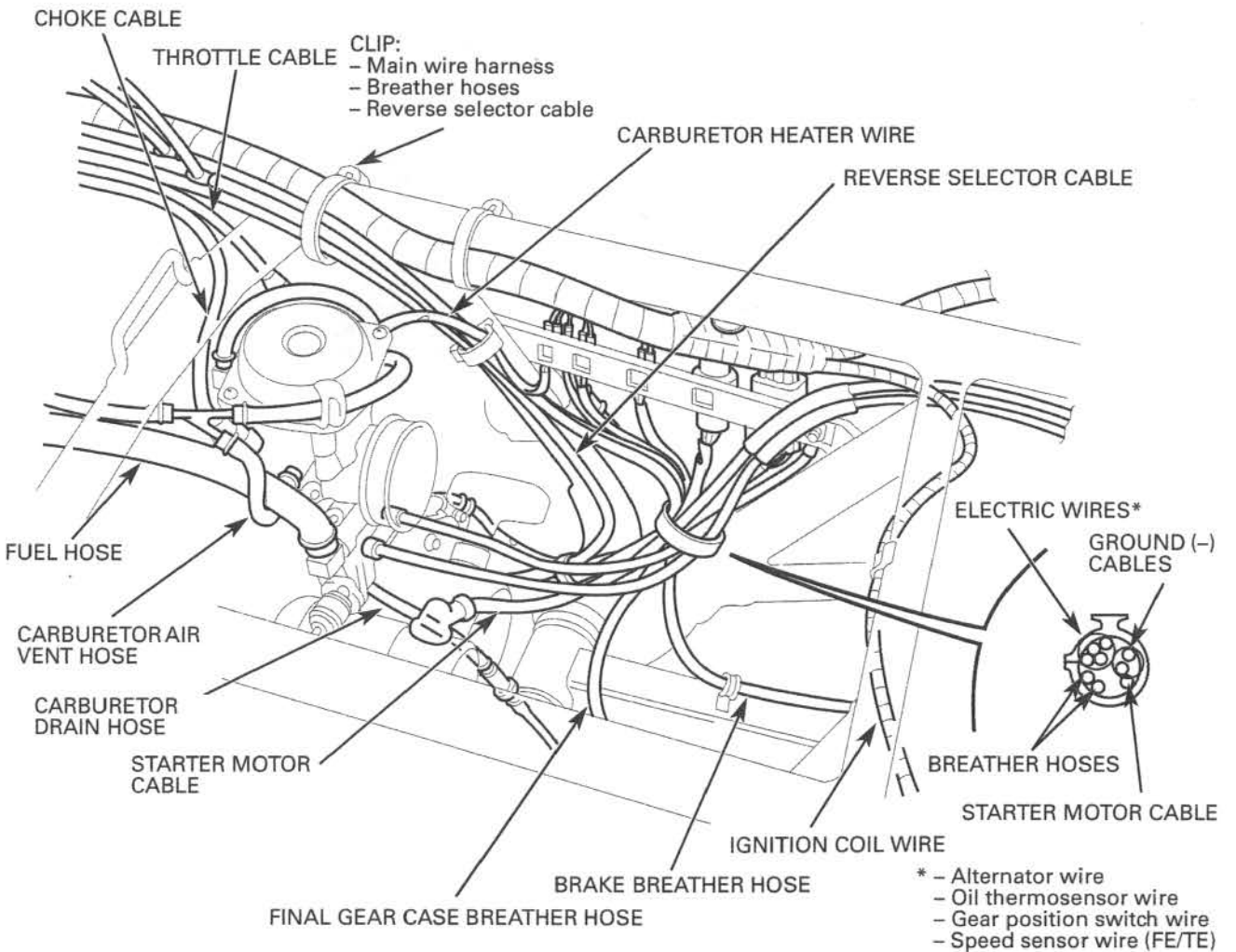
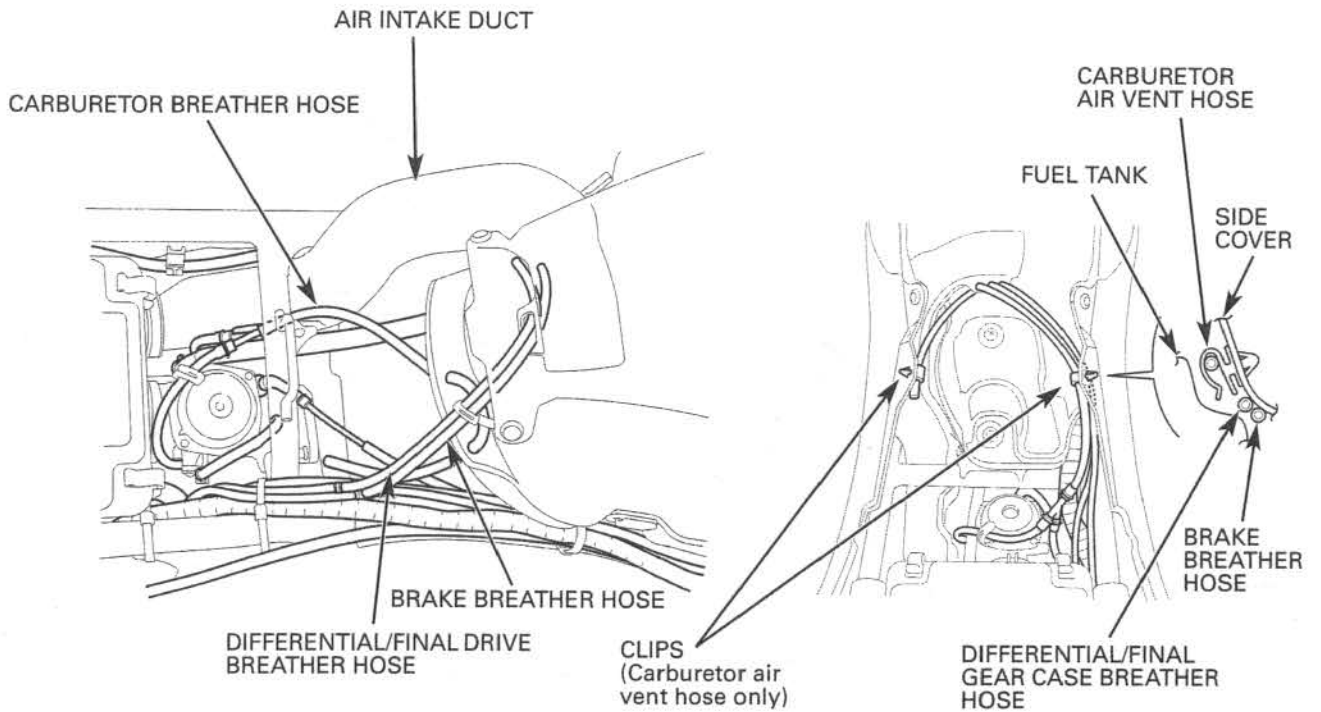
GENERAL INFORMATION





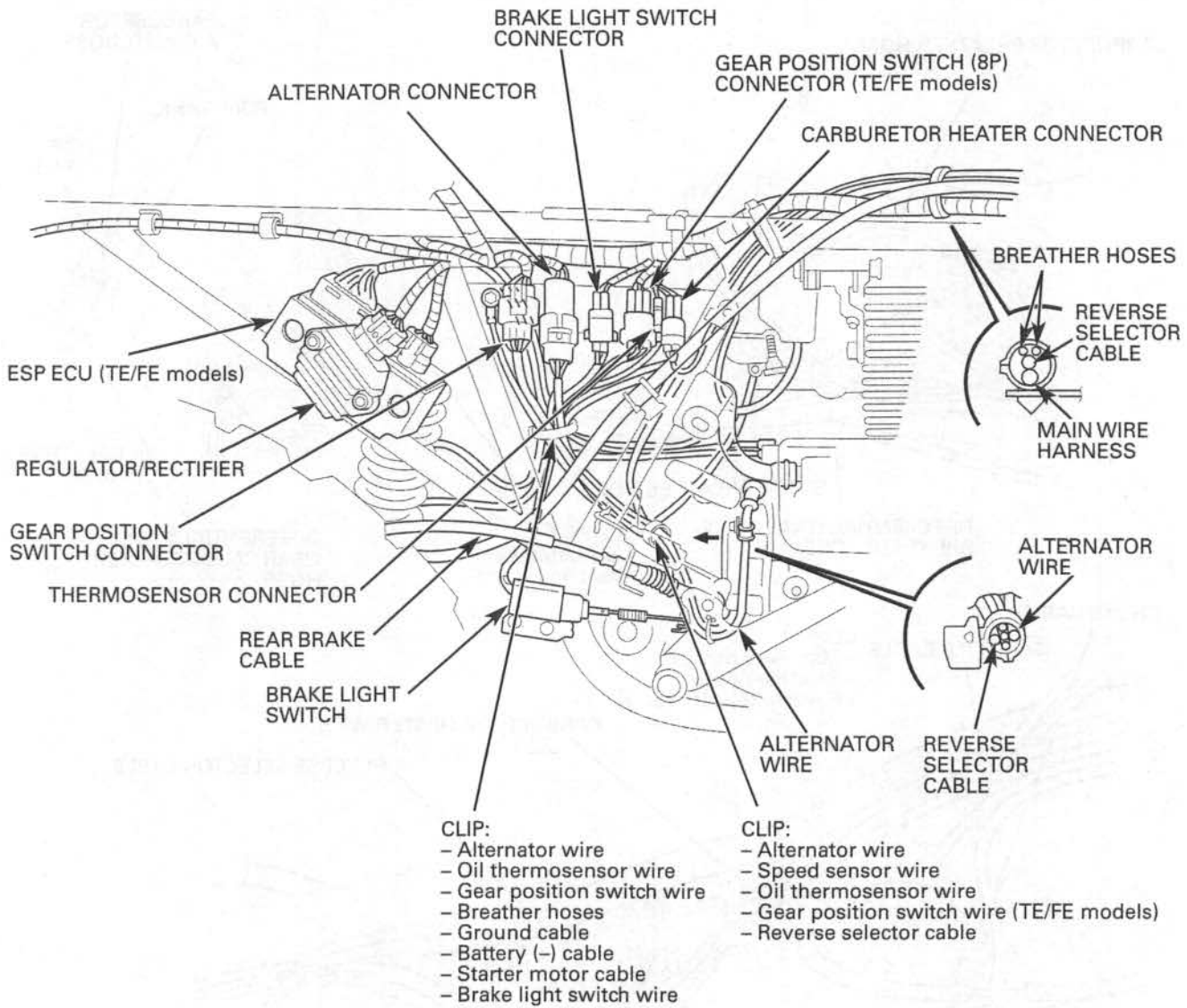
GENERAL INFORMATION

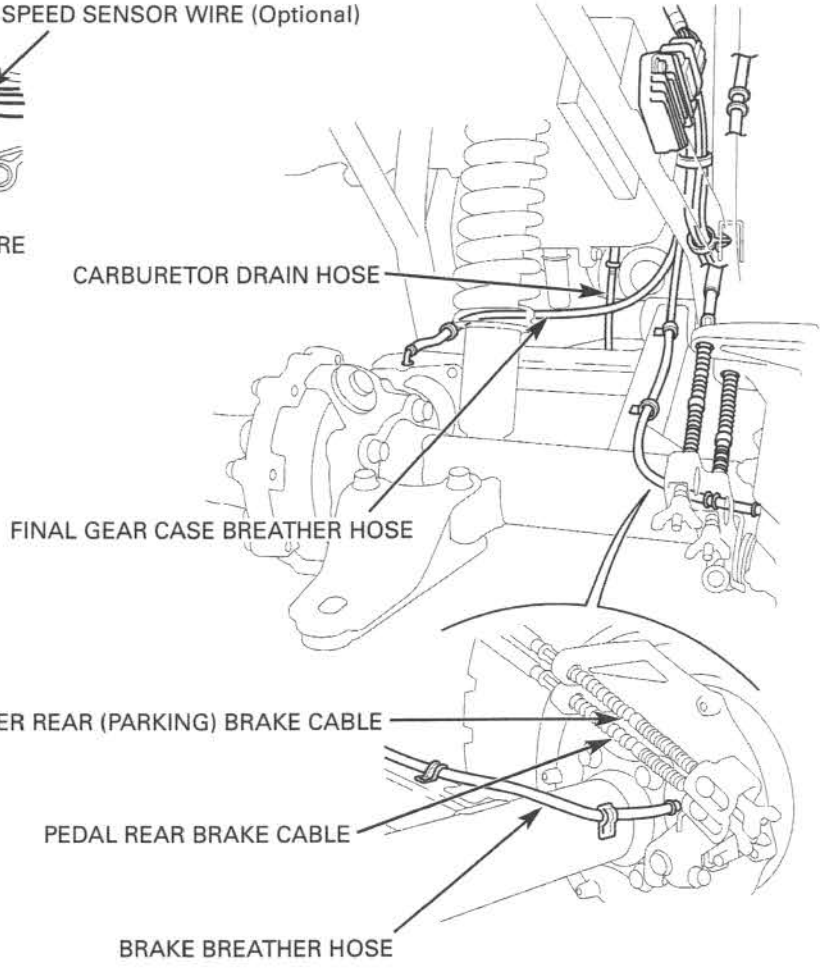
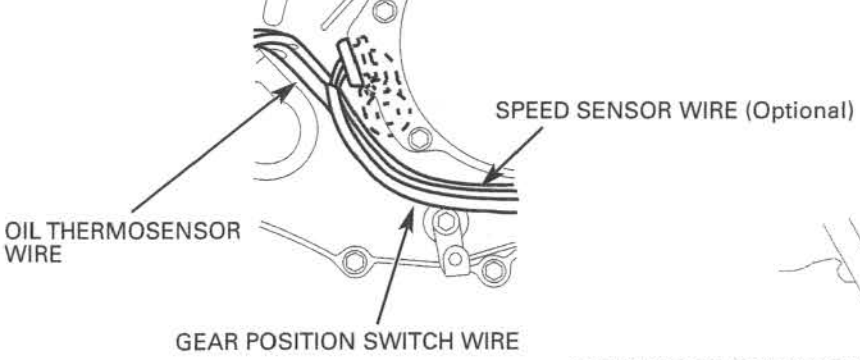
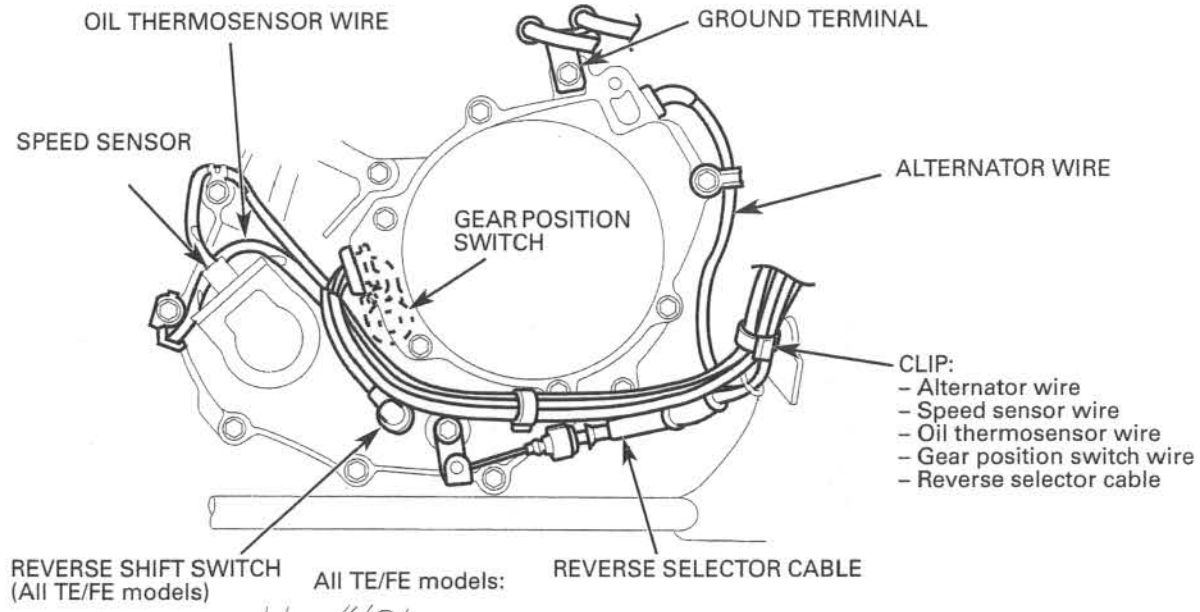




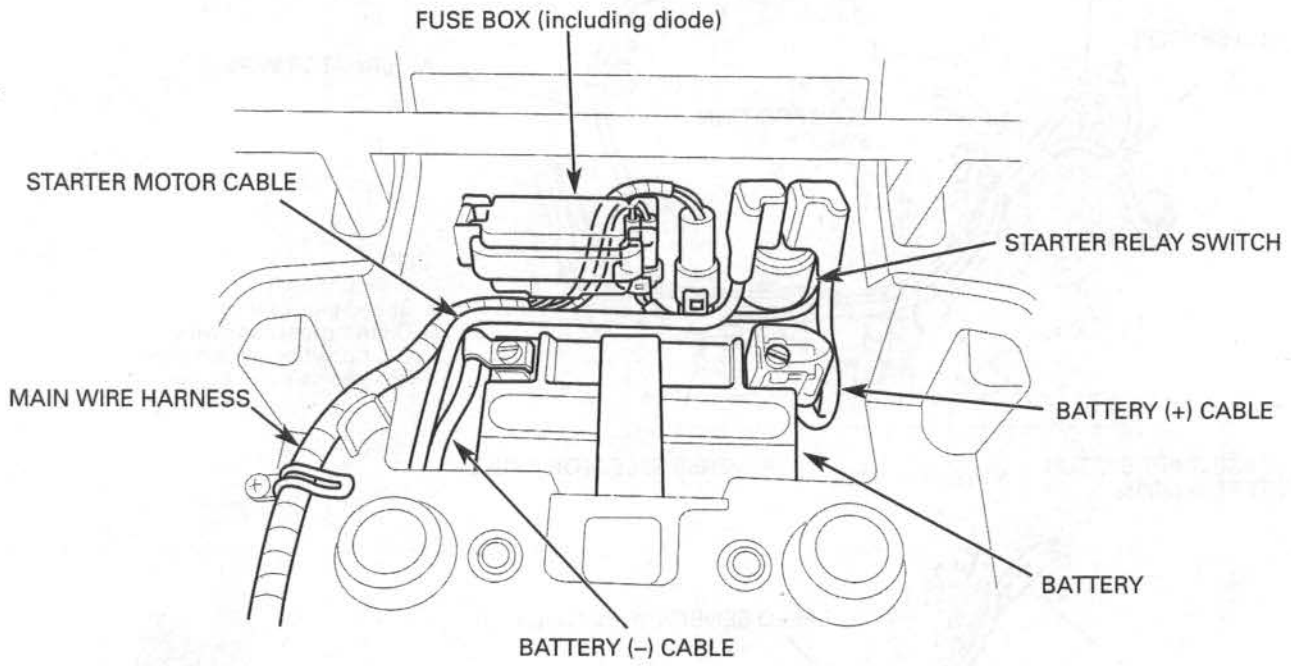
GENERAL INFORMATION

TE/FE model shown:





GENERAL INFORMATION



EMISSION CONTROL SYSTEMS

The California Air Resources Board (CARB) requires manufacturers to certify that their ATVs comply with applicable exhaust emissions standards during their useful life, when operated and maintained according to the instructions provided.

SOURCE OF EMISSIONS

The combustion process produces carbon monoxide, oxides of nitrogen and hydrocarbons. Control of oxides of nitrogen and hydrocarbon is very important because, under certain conditions, they react to form photochemical smog when subjected to sunlight. Carbon monoxide does not react in the same way, but it is toxic.

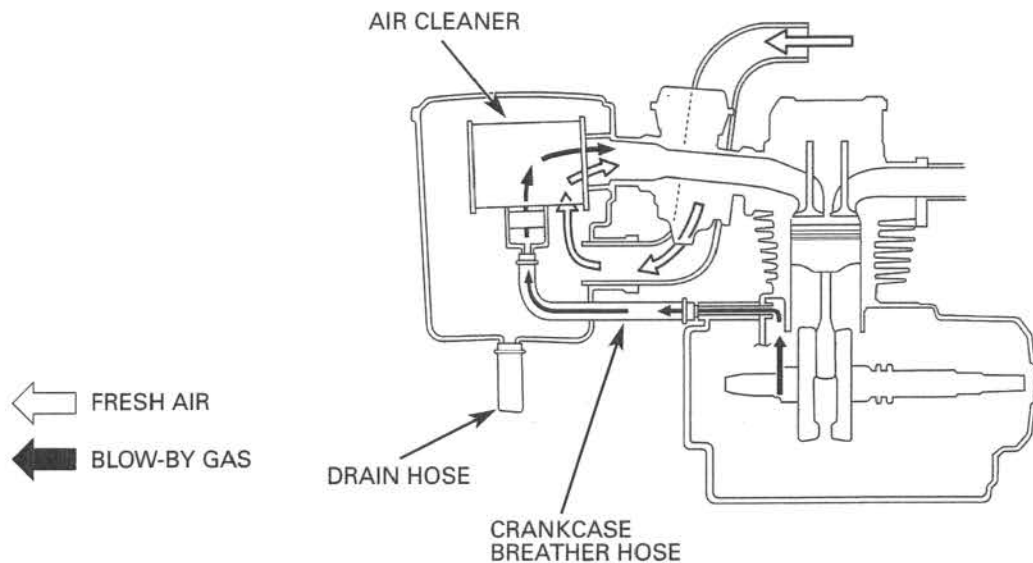
Honda Motor Co., Ltd. utilizes lean carburetor settings as well as other systems, to reduce carbon monoxide and hydrocarbons.

EXHAUST EMISSION CONTROL SYSTEM

The exhaust emission control system is composed of a lean carburetor setting, and no adjustments should be made except idle speed adjustment with the throttle stop screw. The exhaust emission control system is separate from the crankcase emission control system.

CRANKCASE EMISSION CONTROL SYSTEM

The engine is equipped with a closed crankcase system to prevent discharging crankcase emissions into the atmosphere. Blow-by gas is returned to the combustion chamber through the air cleaner and carburetor.



NOISE EMISSION CONTROL SYSTEM

TAMPERING WITH THE NOISE CONTROL SYSTEM IS PROHIBITED: U.S. federal law prohibits or Canadian provincial laws may prohibit the following acts or the causing thereof: (1) The removal or rendering inoperative by any person, other than for purpose of maintenance, repair or replacement, of any device or element of design incorporated into any new vehicle for the purpose of noise control prior to its sale or delivery to the ultimate purchaser or while it is in use; (2) the use of the vehicle after such device or element of design has been removed or rendered inoperative by any person.

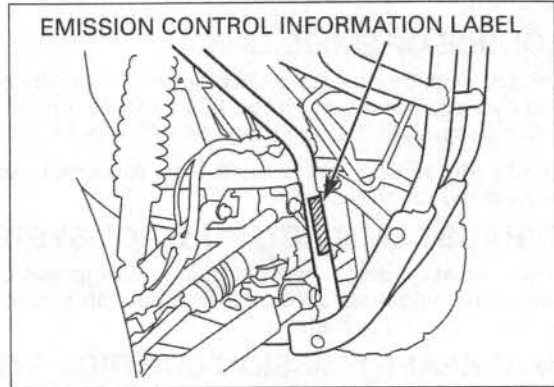
AMONG THOSE ACTS PRESUMED TO CONSTITUTE TAMPERING ARE THE ACTS LISTED BELOW:

1. Removal of or puncturing of the muffler, baffles, header pipes or any other component which conducts exhaust gases.
2. Removal of or puncturing of any part of the intake system.
3. Lack of proper maintenance.
4. Replacing any moving parts of the vehicle, or parts of the exhaust or intake system, with parts other than those specified by the manufacturer.

GENERAL INFORMATION

EMISSION CONTROL INFORMATION LABEL (U.S.A. only)

The Vehicle Emission Control Information Label is attached on the right side frame down tube.



2. TECHNICAL FEATURES

DRY SUMP MECHANISM OF INTEGRAL OIL
TANK IN CRANKCASE 2-2

ELECTRIC SHIFT PROGRAM
(ESP: TE/FE models).....2-7

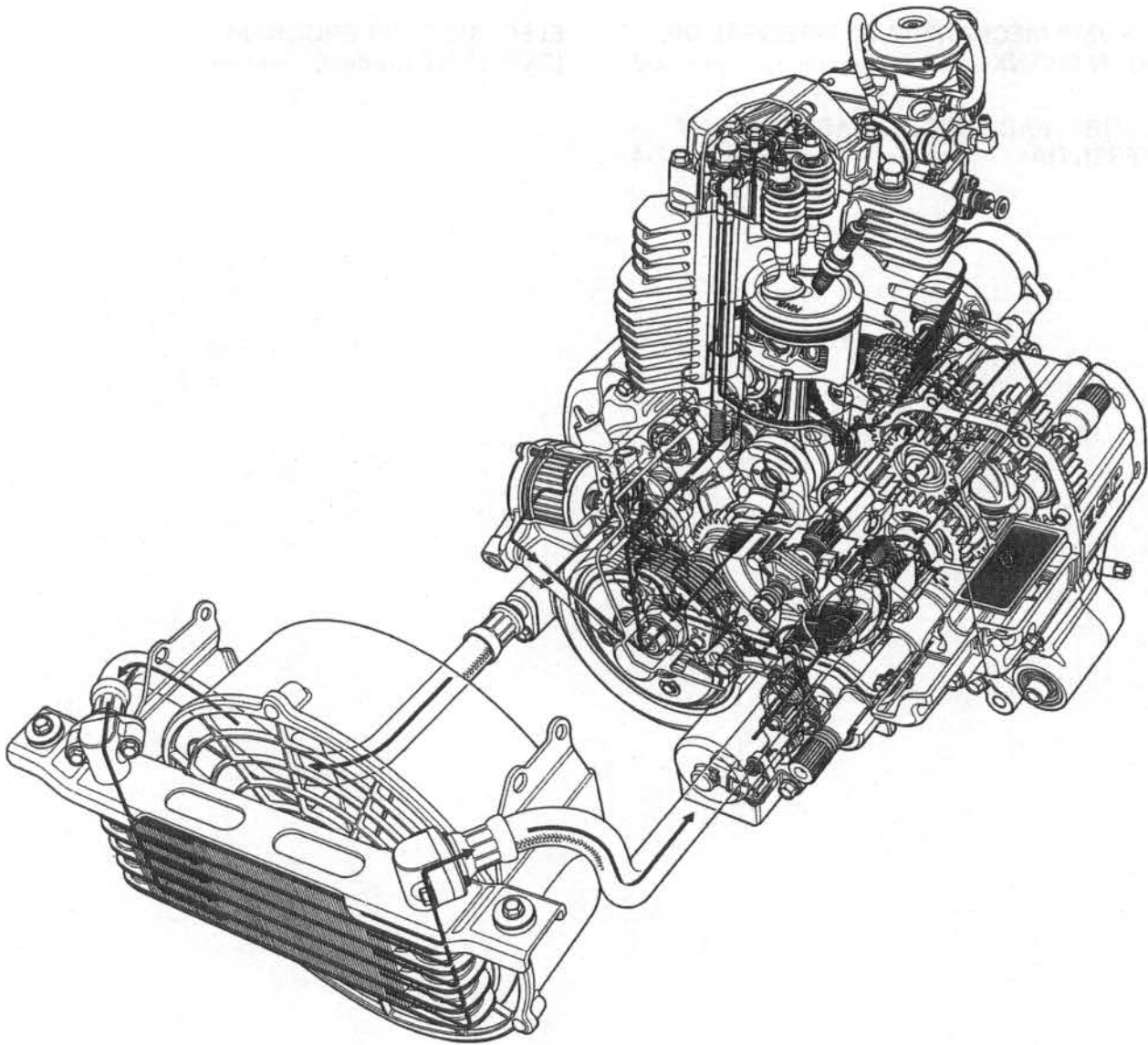
A.P. SURETRAC TORQUE BIASING FRONT
DIFFERENTIAL 2-4

TECHNICAL FEATURES

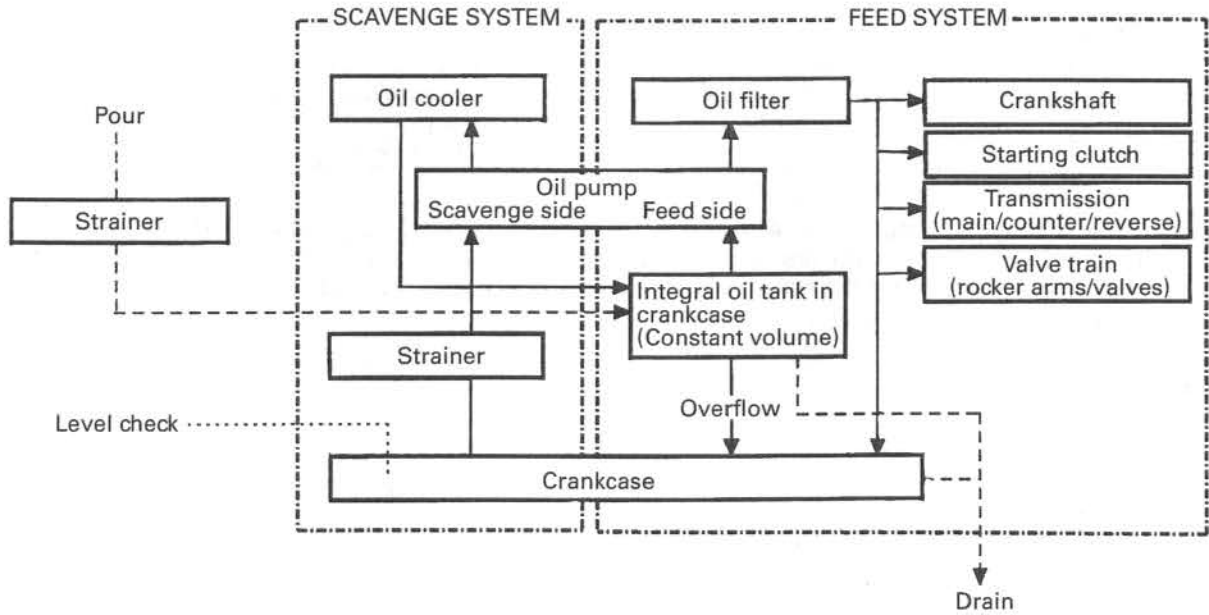
DRY SUMP MECHANISM OF INTEGRAL OIL TANK IN CRANKCASE

This engine was designed and manufactured to reduce the overall height of the engine body and to reduce the size of the entire lubrication system.

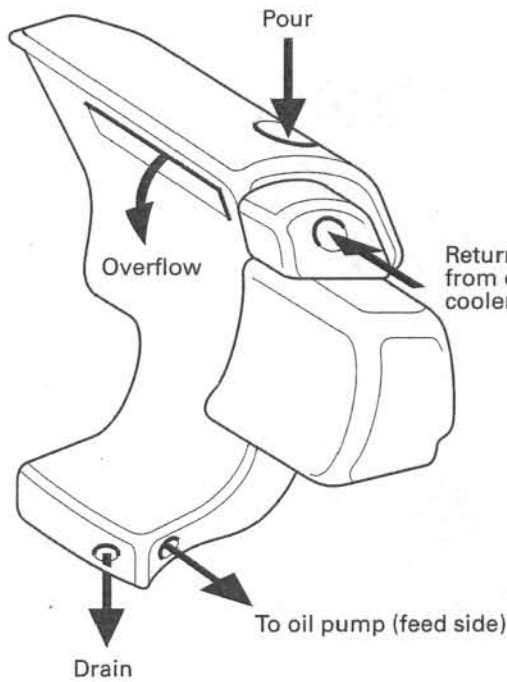
In a normal dry sump mechanism, the oil tank is separated from the engine and laid out as an independent unit. However, this TRX350 does not have an independent oil tank and uses a part of the crankcase as an oil tank, centralizing mass, and reducing the number of parts and overall weight.



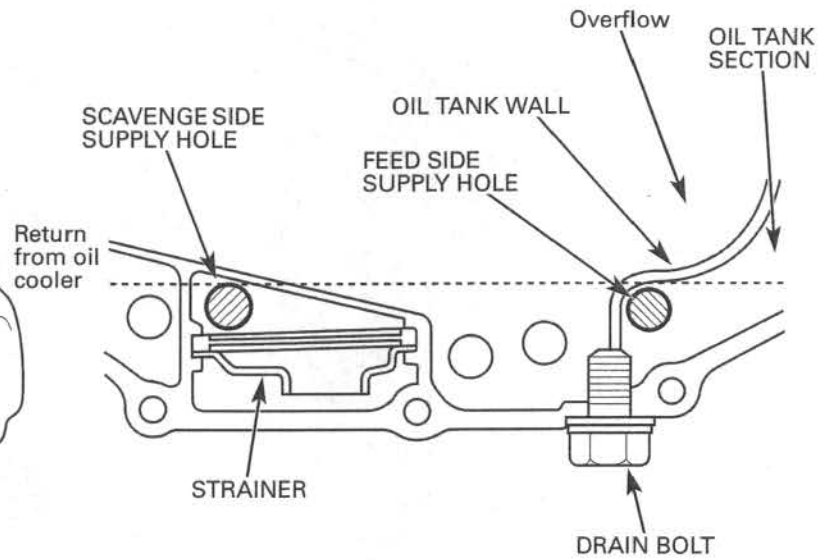
OIL MANAGEMENT SYSTEM DRAWING



OIL TANK:



OIL SUPPLY AND DRAIN PART DETAIL (FRONT CRANKCASE):



If the engine is not operated for a long time, the engine oil will drain to the bottom of the crankcase from the oil tank section through the crankcase mating surface. Always check the engine oil level after starting the engine and allowing the oil to circulate through the engine (page 4-12).

TECHNICAL FEATURES

A.P. SURETRAC TORQUE BIASING FRONT DIFFERENTIAL

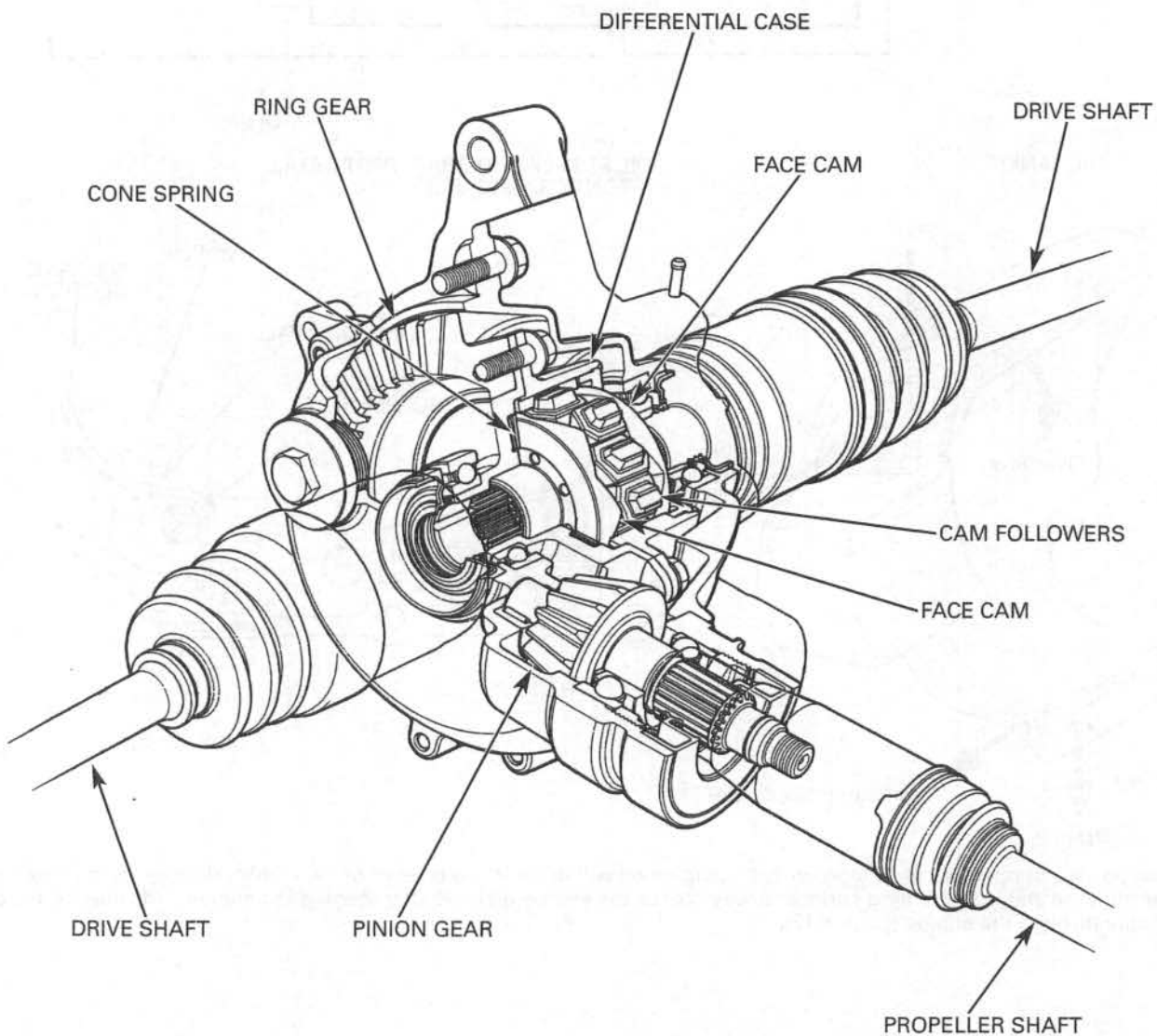
CONSTRUCTION

In this mechanism, torque is transmitted through the differential using a cam and follower principle. The differential is groove-fitted in the differential case (which receives torque from a ring gear) so that the cam followers can move to the left and right. Torque is transmitted by contact of the cam faces at the left and right ends of the cam followers with the cam faces of the both face cams (equivalent to the side gears in a conventional configuration). When the differential operates, the cam followers move to the left and right back and forth, transmitting torque to the face cams.

The performance of this type of differential differs from conventional types because the torque difference is established before any relative motion takes place. The tire dynamics dictate the torque generated so that the differential always provides the optimum torque balance. This maintains tire adhesion and enhances directional stability and safety.

This construction differs from a conventional differential in the following ways:

- Fewer number of structural parts
- Reduced steering load
- Greater durability



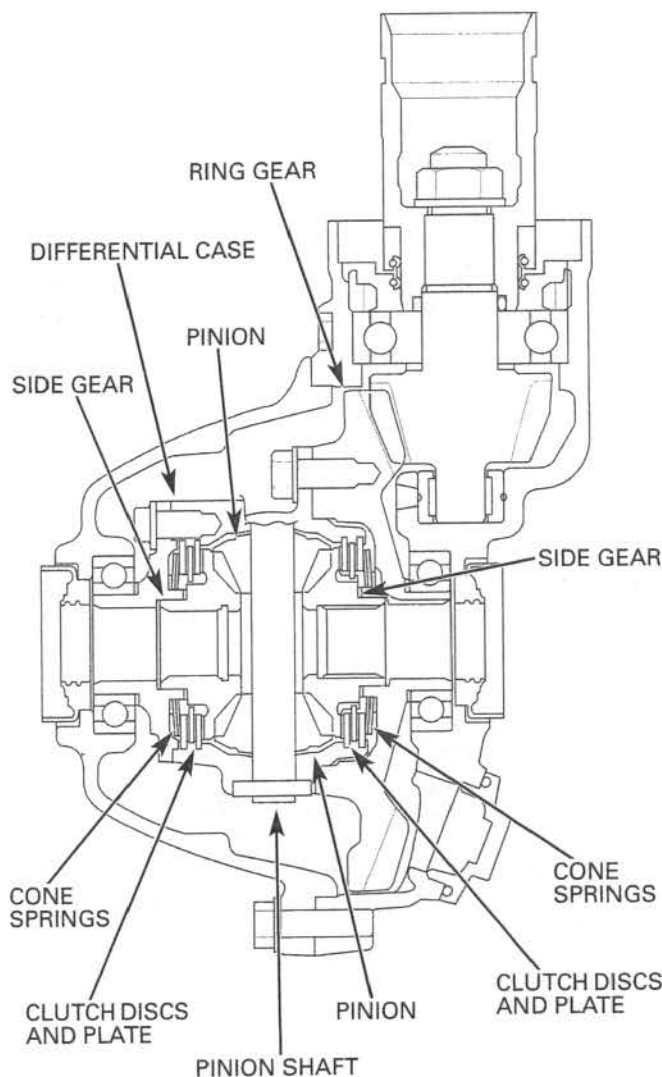
CONVENTIONAL TYPE

1. Torque transmission:
Ring Gear ⇨ Differential Case ⇨ Pinion Shaft ⇨ Pinions ⇨ Side Gears ⇨ Drive Shafts ⇨ Tires
2. Absorption of differential rotation:
Self-turning pinion absorb difference in rotation of the side gears (left and right tires).
3. Differential limit:
Initial torque – The cone springs in a multi-disc clutch imparts axial load in the thrust direction, producing initial torque.
Torque bias ratio – Distribution of torque (except initial torque) to the left and right tires when differential action occurs is 1 : 1.

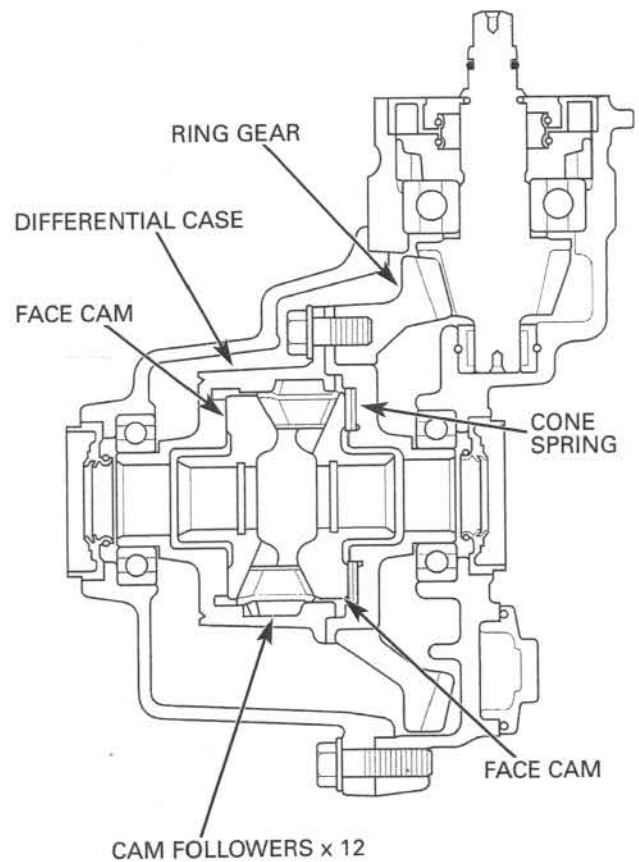
NEW TYPE (Suretrac differential)

1. Torque transmission:
Ring Gear ⇨ Differential Case ⇨ Cam Followers ⇨ Face Cams ⇨ Drive Shafts ⇨ Tires
2. Absorption of differential rotation:
Cam followers back-and-forth motion absorbs difference in rotation of the face cams (left and right tires).
3. Differential limit:
Initial torque – Pre-load is imparted to the sliding cam faces by action of the cone spring pressing the face cam against the cam followers, producing initial torque.
Torque bias ratio – Torque is distributed according to preset optimum bias ratio by frictional braking action created by the cam follower and face cam sliding faces when differential action occurs.

CONVENTIONAL DIFFERENTIAL



NEW DIFFERENTIAL



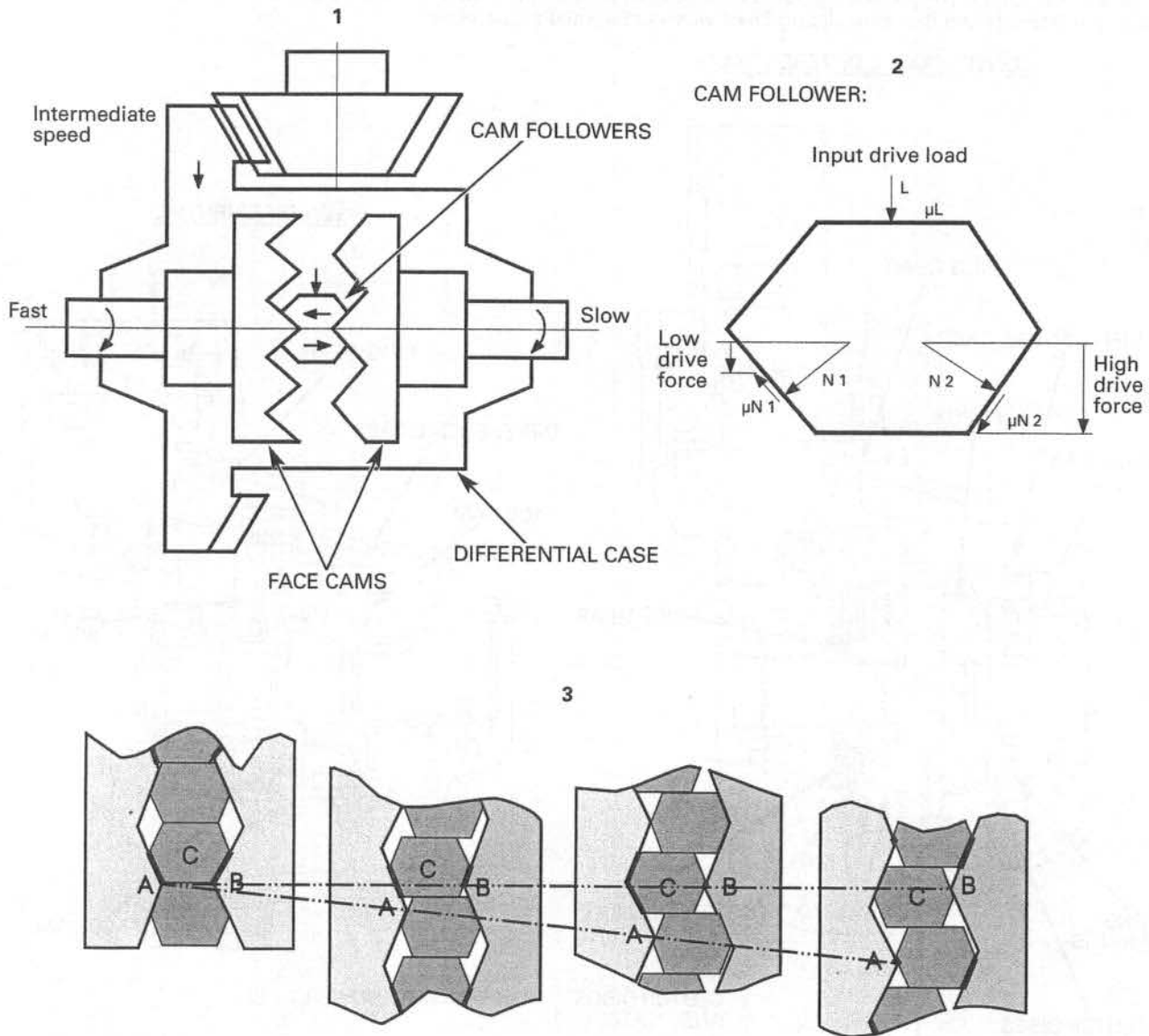
TECHNICAL FEATURES

DIFFERENTIAL OPERATION

Figure 1 shows the conditions when one wheel wants to spin, that is, tries to rotate faster than the differential case. The torque generates a force applied to the flank of the follower dog from the differential case spline, which is then shared between the two face cams by forces on the inclined faces.

Figure 2 shows the friction forces on the ends of the cam follower. Since the differential speed is intermediate between the two face cam speeds, the cam follower will move faster than the face cam at one end, and slower than the face cam at the other end. This generates friction forces that are in opposite directions, leading to total resultant forces that are large on the slow face cam and small on the fast face cam. If there is a relative speed, then the friction must be at its limiting value, but it can build up to this progressively before rotation occurs.

Figure 3 shows how the load is shared between the followers. Only those followers bearing on the forward faces of the face cam form transmit torque. The bold lines show the load bearing areas at any one time, and there is always just less than half the cam followers driving. The figure shows the situation at a number of discrete time steps, showing how the load carrying role is passed from follower to follower. The right hand face cam is drawn in the same position as a point of reference where the left hand face cam moves down with the cam followers (which are carried by the differential case moving down at about half speed).





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