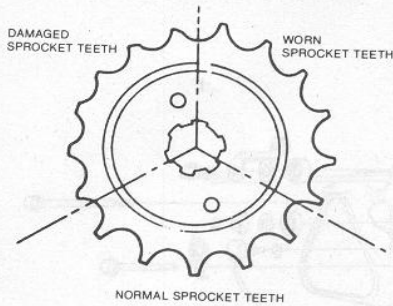
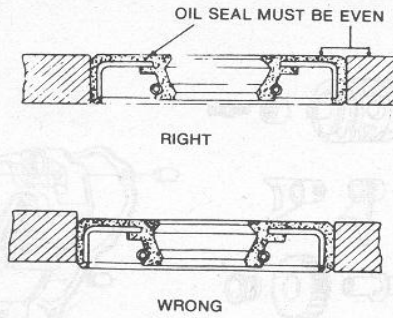


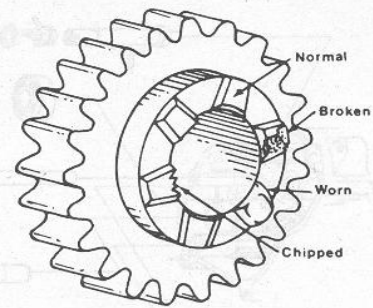
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Sprocket wear patterns



Correct oil seal installation



Gear wear patterns

25. Install the inner thrust washer, starter idler gear, shaft and outer thrust washer.
26. Fit the reduction gear thrust washer.
27. Clean the inside mounting surface of the magneto rotor. Lubricate the mounting hole and the crankshaft taper with motor oil. Check that the locating key is in place in the crankshaft. Push the rotor into place. Do not strike the rotor. It will be driven home when the pulley is installed.
28. Install the left crankcase cover.
29. Grease the oil seal lips and install the pulley, aligning the flats with the groove in the rotor.
30. Install the pulley bolt, washer and O-ring.
31. Tighten the pulley bolt to 29-36 ft. lbs.
32. Install the recoil starter assembly.
33. Install the sub-transmission components.
34. Check that the two locating dowel pins are in place on the cover mating surface.
35. Fit a new cover gasket.
36. Install the sub-transmission cover.
37. Install the neutral indicator washer, indicator and E-clip.
38. The remainder of the procedure is the reverse of disassembly. Do not forget to fill the crankcase with oil before starting the engine.

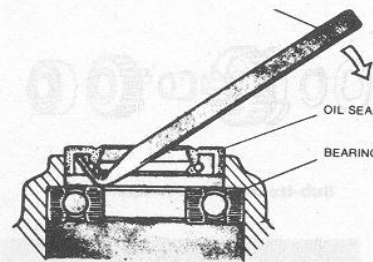
Component Inspection

RECOIL STARTER

1. Remove the nut (ATC 125) or E-ring (other models) and remove the ratchet cover.
 2. Remove the components.
 3. Remove the handle cover.
 4. Undo the rope knot. Remove the handle.
 5. Remove the starter pulley.
- CAUTION:** Wear eye protection and use care when removing the pulley. The coil spring may pop out when it is removed.
6. Check the rope for a frayed or worn condition and replace it if necessary.
 7. Check the condition of the coil spring.
 8. Check the ratchet components for damage.

MAGNETO

1. Do not drop the rotor as the magnetic properties may be affected. Place it where it will not pick up stray bits of metal.
2. Be sure that the rotor is perfectly clean before installation.
3. For electrical tests, refer to the "Electrical System" section.
4. Check the inside of the rotor and the stator coil core ends for scoring which would



Correct oil seal removal

indicate that they have been in contact. This condition must be rectified.

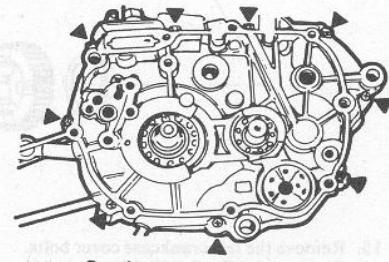
5. Check that the stator is secure on its mount.
6. If stator and rotor have been in contact, check the crankshaft bearings. This condition is sometimes caused by bad bearings which allow play in the crankshaft.
7. Check the rotor for cracks, especially around the mounting taper.
8. Check the stator for burned insulation, broken wires or other obvious signs of damage.

ENGINE SPROCKET

1. Check the teeth of the sprocket and ensure that they are not hook-shaped, broken or worn. If wear is evident, the sprocket should be replaced and the chain and rear sprocket checked for similar defects.
2. Check the outside diameters of the bushings and the inside diameters of the sprocket and compare the measurements against the specifications.
3. Check the condition of the sprocket bushing splines and the splines on the sprocket shaft.

CRANKCASE COVERS

1. Always use new gaskets and O-rings.
2. Remove any knicks or imperfections from the mating surfaces with an oilstone or silicon carbide paper.
3. Oil seals can be pried out with a small screwdriver. When installing new seals, press them straight in with a block of wood or the like which will cover the entire seal. Lubricate seal lips before installation.
4. Bearings can be checked for condition in place. Remove bearings by taking off any retaining plates. Heat the cover slightly and drive the old bearing(s) out. Installation is the reverse of removal.



Crankcase screws (ATC 125)

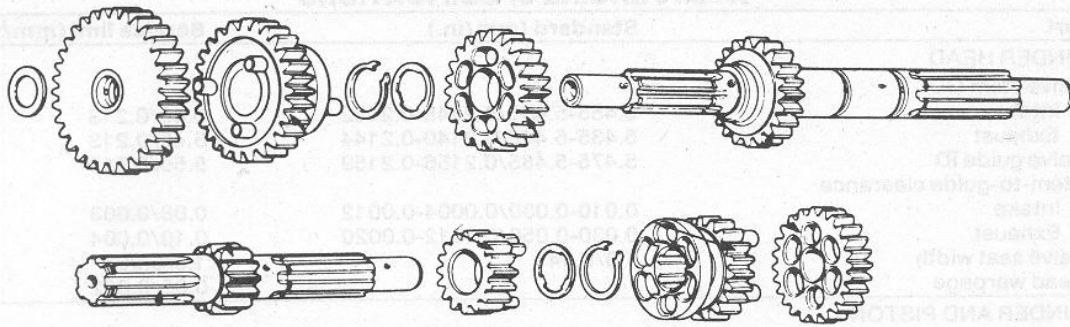
GEAR ASSEMBLIES

1. Check the condition of all gear teeth for wear, pitting or cracks. Pay close attention to the base of each tooth since this is where most damage shows up.
2. Check the engaging dogs on sub-transmission gears.
3. Check dimensions of gears, shafts and shift forks against the specifications given.
4. Check the shaft splines.
5. Check the condition of the shift fork fingers. They should be straight and the tips must be undamaged.
6. Check that the shift fork shaft is not bent.
7. Check all components for heat damage.

LOWER END AND TRANSMISSION

Splitting The Crankcase

1. Remove the engine from the frame.
2. Remove the cylinder head, cylinder and piston.
3. Remove the clutch and gearshift linkage.
4. Remove the recoil starter assembly.
5. Remove the magneto.
6. Remove the cam chain tensioner assembly.
7. Remove the sub-transmission, if equipped.
8. Remove the crankcase screws.
9. Place the engine with the left crankcase down and tap upwards on the right crankcase half with a plastic mallet to separate the case halves.
10. Remove the dowel pins and the gasket.
11. Remove the crankshaft assembly.
12. Remove the gear clusters.



Transmission assembly (ATC 125)

Inspection

CRANKSHAFT

The crankshaft is a pressed-together unit. The connecting rod big end bearing is the caged-needle type. In the event of damage to the con rod, bearing or crankpin, the crankshaft must be replaced as an assembly.

1. Lubricate the big end bearing with oil, and rotate the rod slowly around the crankpin. The movement must be smooth and silent.

2. With a dial gauge, check the up-and-down (radial) movement of the con rod. Compare the reading with the specification given. If rod movement is in excess of the specifications, the big end bearing is worn and the crankshaft must be replaced.

3. With a feeler gauge, check the clearance between the con rod big end and the crankshaft flywheel. Compare the measurement with the specification given for axial clearance.

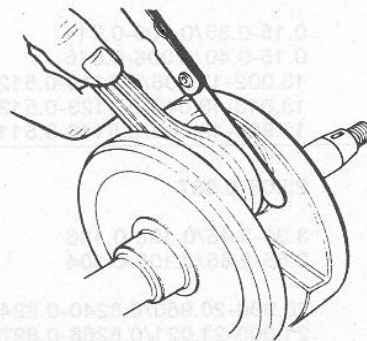
4. Place the crankshaft on a set of V-blocks, and check the crankshaft run-out with a dial gauge. Check both ends of the crank. Compare the run-out reading with the specification given. If excessive, the crank must be replaced.

Crankshaft run-out will be one half of the true indicated reading of the gauge.

CRANKCASES

1. Check for damage to the bearing bosses, especially for stress cracks around the bearing boss.

2. Be sure that both case half mating surfaces are free of any traces of old gasket or gasket material.



Checking big end side clearance

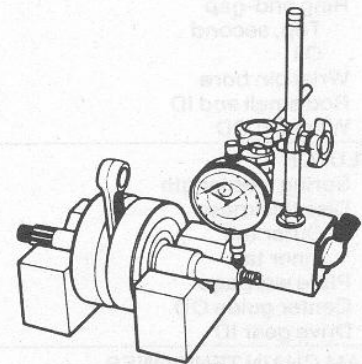
3. Place each case half on a flat surface and check for warpage by probing around the mating surface with a feeler gauge. Maximum acceptable case warpage is 0.05 mm (0.002 in.). If warped, cases should be replaced.

4. Minor scratches on the mating surfaces can be removed with an oilstone, although it is not permissible to remove much metal.

5. Case halves must be scrupulously clean before assembly. Be sure that all oil passages are clear and that the two dowel pins fitted between the case halves are installed.

TRANSMISSION

1. Check gears, shafts and shift linkage



Measuring crankshaft run-out

as outlined in the "Engine Rebuilding" section of "General Information."

2. Compare measurements with the specifications in the charts.

NOTE: Mark shift forks for position before disassembly.

Crankcase Assembly

1. Reverse the disassembly procedure.

2. Lubricate all components before putting the case halves together.

3. Be sure the crankcase dowel pins and the gasket are properly positioned.

4. Tighten the crankcase screws gradually and evenly.

5. Crankcase screw torque is 5-8 ft. lbs.

ATC 70 ENGINE SPECIFICATIONS

Part	Standard (mm/in.)	Service limi (mm/in.)
CYLINDER HEAD		
Cam lobe height	26.07/1.026	25.69/1.01
Cam bearing clearance	0.010-0.025/0.0004-0.0010	0.05/0.002
Cam side clearance	0.004-0.036/0.0002-0.0014	0.10/0.004
Rocker arm shaft OD	9.978-9.989/0.3928-0.3933	9.91/0.004
Rocker arm ID	10.000-10.015/0.3937-0.3943	10.10/0.398
Valve spring free length		
Inner	25.1/0.99	23.9/0.94
Outer	28.1/1.11	26.9/1.06

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ATC 70 ENGINE SPECIFICATIONS

Part	Standard (mm/in.)	Service limit (mm/in.)
CYLINDER HEAD		
Valve stem OD		
Intake	5.455-5.465/0.2148-0.2152	5.40/0.213
Exhaust	5.435-5.445/0.2140-0.2144	5.40/0.213
Valve guide ID	5.475-5.485/0.2156-0.2159	5.50/0.217
Stem-to-guide clearance		
Intake	0.010-0.030/0.0004-0.0012	0.08/0.003
Exhaust	0.030-0.050/0.0012-0.0020	0.10/0.004
Valve seat width	1.0/0.04	1.6/0.06
Head warpage		0.05/0.002
CYLINDER AND PISTON		
Cylinder ID	47.005-47.015/1.8506-1.8510	47.05/1.852
Piston OD	46.98-47.00/1.850-1.8504	46.90/1.847
Ring-to-groove clearance	0.015-0.045/0.0006-0.0018	0.12/0.005
Ring end-gap		
Top, second	0.15-0.35/0.006-0.014	0.5/0.02
Oil	0.15-0.40/0.006-0.016	—
Wrist pin bore	13.002-13.008/0.5119-0.5121	13.06/0.51
Rod small end ID	13.013-13.043/0.5123-0.5135	13.1/0.52
Wrist pin OD	12.994-13.000/0.5116-0.5118	12.98/0.511
CLUTCH		
Spring free length	25.08/0.987	23.1/0.91
Disc thickness		
Outer tab	3.35-3.45/0.132-0.136	3.0/0.12
Inner tab	2.55-2.65/0.100-0.104	2.3/0.09
Plate warpage	—	0.2/0.01
Center guide OD	20.930-20.950/0.8240-0.8248	20.90/0.823
Drive gear ID	21.000-21.021/0.8268-0.8276	21.05/0.829
CAM CHAIN TENSIONER		
Spring free-length	82.8/3.26	77.0/3.0
Pushrod OD	11.985-12.000/0.4718-0.4724	11.94/0.47
OIL PUMP		
Body clearance	0.10-0.15/0.004-0.006	0.20/0.008
Rotor tip clearance	0.15/0.006	0.25/0.010
End clearance	0.02-0.07/0.001-0.003	0.12/0.005
TRANSMISSION		
Gear IDs		
M2, M4, C3	17.016-17.043/0.6699-0.6710	17.10/0.673
C1	17.006-17.018/0.6695-0.6700	17.07/0.672
Mainshaft OD	16.983-16.994/0.6686-0.6691	16.95/0.667
Countershaft OD	16.966-16.984/0.6680-0.6687	16.95/0.667
Shift drum OD	33.950-33.975/1.3366-1.3376	33.93/1.336
Shift fork ID	34.000-34.025/1.3386-1.3396	34.07/1.341
Fork finger thickness	4.86-4.94/0.191-0.195	4.6/0.18
CRANKSHAFT		
Big end side clearance	0.10-0.35/0.004-0.014	0.6/0.02
Big end radial clearance	0-0.012/0-0.0005	0.05/0.002
Run-out	0-0.012/0-0.0005	0.10/0.004

ATC 90 ENGINE SPECIFICATIONS

Part	Standard (mm/in.)	Service limit (mm/in.)
CYLINDER HEAD		
Rocker arm ID	10.00-10.02/0.3937-0.3943	10.1/0.3976
Rocker arm shaft OD	9.972-9.987/0.3926-0.3932	9.92/0.3906
Valve stem OD		
Intake	5.455-5.465/2.148-0.2152	5.435/0.2140
Exhaust	5.435-5.445/0.2140-0.2144	5.415/0.2133

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ATC 90 ENGINE SPECIFICATIONS

Part	Standard (mm/in.)	Service limit (mm/in.)
CYLINDER HEAD		
Stem-to-guide clearance		
Intake	0.010-0.030/0.0004-0.0012	0.06/0.0024
Exhaust	0.030-0.050/0.0012-0.0020	0.08/0.0032
Valve seat width	0.70-1.20/0.0276-0.0472	1.50/0.059
Valve guide ID	5.475-5.485/0.2156-0.2160	5.525/0.2175
Valve spring free-length		
Inner	26.5/1.043	25.5/1.004
Outer	31.8/1.252	30.6/1.205
CYLINDER AND PISTON		
Cylinder ID	50.00-50.01/1.9685-1.9689	50.1/1.9724
Piston OD	49.97-49.99/1.9674-1.9681	49.9/1.9646
Piston-cylinder clearance	0.025-0.050/0.001-0.002	0.1/0.004
Wrist pin clearance	0.002-0.004/0.0008-0.0016	0.05/0.002
Piston ring-to-groove clearance	0.010-0.045/0.0004-0.0018	0.12/0.0047
Ring end-gap		
Compression	0.15-0.35/0.0059-0.0139	0.5/0.020
Oil	0.15-0.40/0.0059-0.0158	0.50/0.020
CRANKSHAFT		
Big end radial play	0-0.01/0-0.0004	0.05/0.002
Big end side clearance	0.10-0.35/0.0039-0.0138	0.80/0.0315
Run-out	0.03/0.0012	0.10/0.0039
CLUTCH		
Friction disc thickness	2.65-2.75/0.104-0.108	2.25/0.087
Plate warp	0.10/0.004	0.2/0.008
Spring free-length	27.0/1.063	26.0/1.024
TRANSMISSION		
Shift fork ID	42.00-42.03/1.654-1.655	42.07/1.656
Shift drum OD	41.95-41.98/1.652-1.653	41.93/1.651
Shift fork finger width	5.96-6.04/0.2347-0.2378	5.70/0.2244
Gear backlash	0.084-0.170/0.0033-0.0067	0.25/0.0098
CAM CHAIN TENSIONER		
Spring free-length	82.8/3.26	77.0/3.0
Pushrod OD	11.985-12.000/0.4718-0.4724	11.94/0.47
OIL PUMP		
Body clearance	0.10-0.15/0.004-0.006	0.20/0.008
Rotor tip clearance	0.15/0.006	0.25/0.010
End clearance	0.02-0.07/0.001-0.003	0.12/0.005

ATC 110 ENGINE SPECIFICATIONS ①

Part	Standard (mm/in.)	Service limit (mm/in.)
CYLINDER HEAD		
Cam journals		
R	17.927-17.938/0.7058-0.7062	17.90/0.705
L	25.917-25.930/1.0204-1.0209	25.88/1.019
Cam lobe height	24.90-24.98/0.980-0.983	24.6/0.97
Valve spring free-length		
Inner	26.5/1.04	24.0/0.94
Outer	31.8/1.25	28.5/1.12
CYLINDER AND PISTON		
Cylinder ID	52.020-52.030/2.0480-2.0484	52.07/2.050
Piston OD	51.970-51.990/2.0461-2.0468	51.80/2.039
CLUTCH		
Spring free-length	24.5/0.965	23.5/0.925

① Other specifications are the same as the ATC 125

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ATC 125 ENGINE SPECIFICATIONS

Part	Standard (mm/in.)	Service limit (mm/in.)
CYLINDER HEAD		
Cam journals		
R	17.934-17.945/0.7060-0.7065	17.90/0.705
L	25.932-25.945/1.0210-1.0215	25.90/1.020
Cam lobe height	24.118-24.278/0.9495-0.9558	23.8/0.94
Rocker arm ID	10.000-10.015/0.3937-0.3943	10.10/0.398
Rocker arm shaft OD	9.972-9.987/0.3926-0.3932	9.92/0.391
Rocker arm-to-shaft clearance	—	0.08/0.003
Cylinder warpage	—	0.10/0.004
Valve spring free length		
Inner	31.1/1.22	29.9/1.18
Outer	35.0/1.38	33.7/1.32
Valve stem OD		
Intake	5.450-5.465/0.2146-0.2152	5.435/0.2139
Exhaust	5.430-5.445/0.2138-0.2144	5.415/0.2132
Valve guide ID	5.475-5.485/0.2157-0.2161	5.525/0.2175
Stem-to-guide clearance		
Intake	0.010-0.035/0.0004-0.0014	0.08/0.003
Exhaust	0.030-0.055/0.0012/0.0022	0.10/0.004
Valve face width	1.2-1.5/0.05-0.06	1.8/0.07
Valve seat width	1.0/0.04	1.6/0.06
Cam bearing ID		
R	18.000-18.018/0.7087-0.7094	18.05/0.711
L	26.000-26.020/1.0236-1.0244	26.05/1.026
Cam journal clearance		
R	—	0.12/0.005
L	—	0.16/0.006
CYLINDER AND PISTON		
Cylinder ID	55.000-55.010/2.1654-2.1657	55.10/2.169
Taper/out-of-round	—	0.05/0.002
Warpage (head mating surface)	—	0.10/0.004
Piston OD	54.955-54.985/2.1636-2.1648	54.90/2.161
Wrist pin bore	15.002-15.008/0.5906-0.5909	15.04/0.592
Wrist pin OD	14.994-15.000/0.5903-0.5906	14.96/0.589
Piston-to-pin clearance	0.002-0.014/0.0001-0.0006	0.02/0.001
Ring-to-groove clearance		
Top	0.015-0.050/0.0006-0.0020	0.12/0.005
Second	0.010-0.045/0.0004-0.0018	0.12/0.005
Ring end-gap		
Top, second	0.10-0.25/0.004-0.010	0.50/0.020
Oil	0.3-0.9/0.01-0.04	—
Rod small end bore	15.016-15.034/0.5912-0.5919	15.05/0.593
CLUTCH		
Spring free-length	21.1/0.83	20.2/0.80
Warpage	—	0.20/0.008
Disc thickness	2.65-2.75/0.104-0.108	2.5/0.10
Drive gear ID	24.000-24.021/0.9449-0.9457	24.10/0.949
Center guide OD	22.00-22.10/0.866-0.870	21.85/0.860
OIL PUMP		
Body clearance	0.15-0.20/0.006-0.008	0.25/0.010
Rotor tip clearance	0.15/0.006	0.20/0.008
CAM CHAIN TENSIONER		
Spring free-length	82.8/3.3	77.0/3.0
Pushrod OD	11.985-12.000/0.4718-0.4724	11.94/0.94
ENGINE SPROCKET		
Bushing OD	21.960-21.993/0.8657-0.8659	21.90/0.862
Sprocket ID	19.992-20.008/0.7870-0.7877	19.94/0.785

Honda ATC 70-125

ATC 125 ENGINE SPECIFICATIONS

Part	Standard (mm/in.)	Service limit (mm/in.)
CRANKSHAFT		
Run-out	—	0.10/0.004
Big end side clearance	0.15-0.55/0.006-0.022	0.65/0.03
Radial clearance	0.0-0.008/0.0-0.0003	0.05/0.002
Small end ID	15.106-15.034/0.5912-0.5919	15.05/0.593
Crankshaft bearing play		
Axial	0.10-0.35/0.004-0.014	0.8/0.03
Radial	0.003-0.015/0.0001-0.0006	0.05/0.002
TRANSMISSION		
Shift fork ID	42.075-42.100/1.6565-1.6575	42.15/1.659
Shift drum OD	41.950-41.975/1.6516-1.6526	41.8/1.65
Fork/drum clearance	0.118-0.150/0.0046-0.0059	0.155/0.006
Drum groove width	6.10-6.20/0.240-0.244	6.4/0.25
Shift fork finger thickness	5.96-6.04/0.234-0.238	5.70/0.224
Gear ID		
C1	14.000-14.027/0.5512-0.5522	14.10/0.555
M2	18.000-18.018/0.7087-0.7094	18.08/0.712
M4	20.000-20.021/0.7874-0.7882	20.10/0.791
C3	14.000-14.027/0.5512-0.5522	14.10/0.555
Shaft OD		
C1	13.966-13.984/0.5498-0.5506	13.93/0.548
M2	17.966-17.984/0.7073-0.7080	17.93/0.706
C3	19.966-19.984/0.7861-0.7868	19.93/0.785
M4	13.966-13.984/0.5498-0.5506	13.93/0.548

ENGINE TORQUE SPECIFICATIONS

Part	ATC 70	Torque (ft lbs)
Crankcase screws		5.8-8.0
Cylinder head stud nut		6.5-8.7
Cylinder side bolt		5.8-8.0
Cylinder head side bolt		7.4-10.8
Camshaft sprocket bolts		3.6-6.5
Cylinder head right-side cover		5.1-6.5
Cylinder head left-side cover		5.8-8.7
Valve adjuster locknut		5.1-7.2
Cam chain tensioner pushrod		10.8-18.1
Oil pump		5.8-8.7
Shift drum bolt		6.5-10.8
Shift drum stopper plate		6.5-9.4
Shift drum stopper		7.2-11.6
Clutch hub nut		27.5-32.5
Right crankcase cover		5.8-8.7
Left crankcase cover		5.8-8.0
Alternator/magneto rotor		23.9-27.5
Engine sprocket		6.5-10.8
Oil drain bolt		18.1-25.3
Carburetor		6.5-10.1
Spark plug		9-14
	ATC 90/110/125	
Cylinder head nuts		14-16
Cam sprocket bolts		6-9
Cam chain guide roller bolt		7-10
Pulse rotor		6-9
Clutch nut		29-36
Starter driven pulley (125)		29-36
Drum stopper plate bolt		17-20
Carburetor-to-manifold nuts		5-7
Driven sprocket nuts		17-22
Gearshift pedal pinch bolt		9-10
Crankcase screws		5-8

Honda ATC 70-125

GENERAL TORQUE SPECIFICATIONS ①

Part	Torque (ft lbs.)
5 mm screws	2.5-3.6
6 mm screws	5-8
5 mm bolts, nuts	3.5-4.5
6 mm bolts, nuts	6-9
8 mm bolts, nuts	13-18
10 mm bolts, nuts	22-29
12 mm bolts, nuts	36-43
6 mm bolt w/8 mm head	5-8
6 mm flange bolts, nuts	7-10
8 mm flange bolts, nuts	17-22
10 mm flange bolts, nuts	25-33

① Unless otherwise noted

FUEL SYSTEM

GAS TANK

Removal

1. Remove the seat and rear fender.
2. Set the petcock to "Off."
3. Remove the carburetor float bowl drain screw and allow the gas to empty into a suitable container. Dispose of it properly.
4. On models with the petcock on the gas tank, disconnect the fuel line(s) from the carburetor.
5. On models with the petcock on the carburetor, remove the screws which secure the petcock to the carburetor.
6. Detach the rubber band from the rear of the gas tank, or remove the mounting bolt depending on which is fitted.
7. Remove the tank.

Installation

1. Reverse the removal procedure.
2. When installing the tank, be sure to engage the rubber cushions at the front with the seats on the tank.
3. Be sure all fuel line connections are tight.
4. Be certain the petcock is secured.
5. Check for leaks before operating the machine.

CARBURETOR

NOTE: Removal and installation procedures may vary slightly depending on model and year.

Removal (All Models)

1. Set the fuel petcock "OFF."
2. Unscrew the carburetor top and pull the throttle slide assembly out. Wrap the assembly in a clean rag and place it out of the way to avoid damage.
3. Remove the choke cable clamp screw, if fitted.
4. Disconnect the choke cable from the carburetor if a cable-operated choke is fitted.
5. Detach the carburetor air vent tube from the clamp on the frame.
6. Loosen the air cleaner clamp screw at the carb intake.

7. Disconnect the overflow line from the carburetor.
8. Remove the manifold bolts from the cylinder head and remove the carburetor complete with manifold.

Disassembly

ATC 70/90

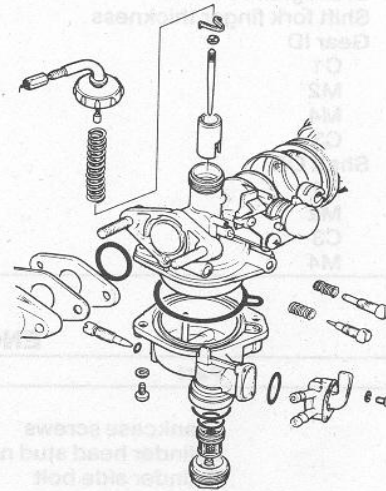
1. If disassembly of the throttle slide components is desired, compress the return spring against the carburetor cap, disengage the cable from the slide, take out the spring clip, needle, and clip.
2. Remove the float bowl petcock filter (if so equipped) by removing the filter plate, O-ring, and filter screen.
3. Remove the float bowl screws or flip up the retainer and separate the float bowl from the carburetor body. Do so carefully, to avoid damage to the floats. Remove and discard the float bowl gasket.

NOTE: If the bowl is stuck, tap carefully with a plastic mallet to break the seal.

4. Push out the float pivot pin with a small dowel, and take out the floats. Remove the float needle from its seat. Unscrew the seat itself.
5. Unscrew the main jet.
6. Several types of needle jet (located directly above the main jet) are fitted. Some models have only the jet itself, while others have a jet holder or nozzle with the needle jet located above it. Unscrew the needle jet or jet holder if a means is provided (such as a hex head), or simply push the jet holder and/or jet out of the carburetor body with a wooden dowel.
7. Unscrew and remove the pilot jet.
8. Remove the pilot air and throttle stop screws and springs, and the drain knob (if fitted).

ATC 110/125

1. Remove the nuts securing the manifold to the carburetor and separate the components.
2. Unscrew and remove the fuel filter bolt from the float bowl.
3. Remove the fuel filter.
4. Remove the O-ring.
5. Disconnect the air vent tube.
6. Remove the two screws which secure the float bowl. Remove the float bowl carefully. If it is stuck, hold it in place and wrap it with the plastic screwdriver handle to break it free.



Carburetor assembly (ATC 110/125)

7. Remove the float bowl O-ring.
8. Pull out the float pivot pin.
9. Lift off the float and needle.
10. Unscrew and remove the pilot jet.
11. Remove the main jet from the needle jet holder. Unscrew and remove the needle jet holder. Shake the needle jet out of the carburetor body. If it will not come out, push it out from the top of the carb with a wooden dowel.
12. Turn the pilot screw clockwise while counting the number of turns until it bottoms. Then unscrew and remove it. Be sure to return it to the original setting when assembling.
13. Unscrew and remove the throttle stop screw.
14. Compress the throttle slide spring and disengage the throttle cable from the slide.
15. Remove the needle clip retainer and shake the needle out of the slide. Do not remove the needle clip from the needle.

Inspection (All Models)

NOTE: Refer to the "General Information" section for carburetor rebuilding techniques.

1. Clean all metal parts in a clean, safe solvent.
2. Blow air and fuel passages in the carburetor body clear with compressed air.
3. Check the condition of the needle and replace it if it is knicked or scored.
4. Clean all jets with solvent and com-

ELECTRICAL SYSTEM

pressed air. Do not attempt to clean fuel passages with wire or the like, since the calibrated bores may be damaged.

5. Check the float for fuel leakage. Replace it if it is punctured or gas-logged.

6. Check the float needle and needle seat for wear or corrosion. Replace the needle if damage is noted.

7. Clean the fuel filter screen in solvent. If foreign matter cannot be removed, or if the filter is crushed, deformed or punctured, replace it.

Assembly and Installation (All Models)

1. Use new O-rings and gaskets.
2. Install jets carefully and do not over-tighten them when installing.
3. Be sure the needle clip is set to the original groove in the needle.
4. Be sure the pilot screw is set to the position it was originally.
5. Tighten manifold bolts to 5-7 ft. lbs.
6. Be sure that all fuel lines are secure before operating the machine. After the carburetor is installed, turn on the fuel petcock and check for leaks.

FUEL PETCOCK

Tank-Mounted

1. On early models, the petcock is mounted on the fuel tank.
2. Set the petcock lever off and disconnect the line(s) from the carburetor.
3. Put the end(s) of the line(s) in a small container and check fuel flow in the "On" and "Reserve" positions.
4. If fuel flow is sluggish, remove the gas cap. If flow increases, the cap vent is clogged. If it does not, the petcock filter is clogged.

Carburetor-Mounted

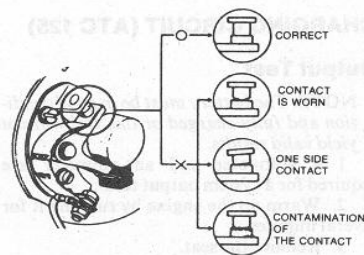
1. The petcock is mounted on the carburetor float bowl by two screws.
2. To check petcock operation, set it to the "OFF" position, remove the mounting screws and pull it off the float bowl.
3. Place a suitable receptacle beneath the petcock and turn it to the "ON" and "RESERVE" positions. If there is no fuel flow, determine the cause.
4. If removing the fuel tank cap increases fuel flow, the problem is a clogged cap vent.
5. If fuel flow is sluggish, remove and clean the gas tank.
6. If fuel flow is questionable, remove the petcock from the lines, being prepared for the gasoline which will come out. If flow from the lines seems normal, replace the petcock.

FUEL LINES

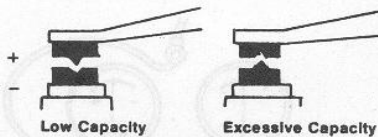
1. Fuel lines should be checked for condition every year.
2. Replace lines that are damaged by abrasion, hardened, cracked or otherwise defective.
3. Be sure that safety clips are fitted to both sides of gas lines.
4. Whenever lines are disconnected or replaced, check for leaks before operating the machine.

Hard starting or misfiring are often caused by ignition system troubles, but since electrical malfunctions are often trickier to pin down than carburetor faults, it is wise to ensure that systems other than the ignition circuit are in serviceable condition before beginning any work.

1. In the event of hard starting, misfiring or cutting out, first check that all electrical connections are clean, dry and tight.
2. Check the ignition and kill switches for continuity.
3. Check ignition timing accuracy. See "Maintenance."
4. Remove the spark plug. Clean and gap it to 0.6-0.7mm (0.024-0.028 in.).



Breaker point condition



Defective condensers often cause pitting

5. Connect the plug to the cap and ground it against the cylinder head. Turn the engine over with the electric starter. The spark produced should be thick and blue.

6. If there is no spark, or if the spark appears weak and yellow, repeat the test using a piece of metal, such as a nail, inserted into the cap and held about 1/8 in. away from the head. If the spark appears healthy, the plug was the problem.

7. If there is still no spark, or spark is weak, remove the spark plug cap and repeat the test.

8. If there is still no improvement, check the condition of the plug lead. Check for dirt or grease, cracks in the insulation, moisture, etc. If the lead is damaged, it should be replaced. This involves replacing the ignition coil as well.

9. On breaker point-equipped machines, check the point contact surfaces for pitting or wear. Severe pitting is often caused by a defective condenser. Clean and gap the points as outlined in "Maintenance." If this does not solve the problem, inspect main ignition circuit components as outlined below.

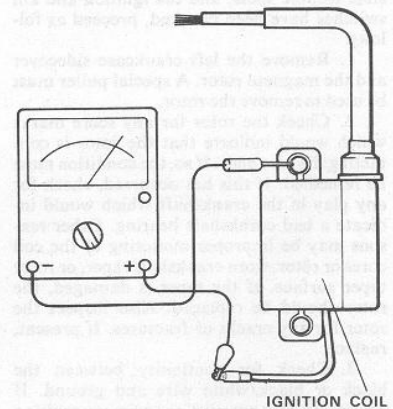
Ignition Coil

ATC 70

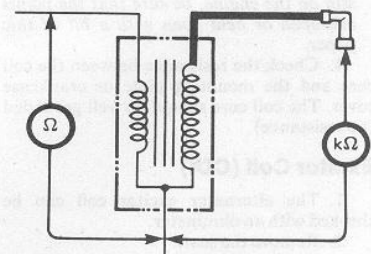
1. An ohmmeter is required to test the ignition coil.
2. Disconnect the plug lead.
3. Disconnect the primary wire from the coil and check the resistance between the coil's primary wire terminal and ground. It should be about 1.5 ohms.
4. Check resistance between the spark plug cap and the ignition coil's primary wire terminal. It should be 8-9 Ω ohms.
5. If either of the measurements are not within specification, replace the ignition coil.
6. Replace the coil if the meter indicates open or shorted coils in either case.

ATC 110/125

1. An ohmmeter is required to test the ignition coil.
2. Disconnect the spark plug lead.
3. Disconnect the primary wire from the coil (black/yellow).
4. Disconnect the green wire from the coil.
5. Remove the coil from the frame.
6. Remove the spark plug cap from the high tension lead.



Checking primary winding resistance (ATC 70)



Checking primary and secondary winding resistance (ATC 90-125)

7. Check the resistance across the two low tension leads. It should be about 1.8 ohms or less. If the resistance is not in this range, replace the coil.

8. Check the resistance across the coil terminal to which the green lead was connected and the high tension cable. Resistance should be 4.1 Ω ohms. If the reading is not

Honda ATC 70-125

within this range, the secondary winding is defective and the coil must be replaced.

9. Static resistance tests provide a general clue to coil condition, but cannot detect high voltage insulation leaks. Therefore, even if the resistance readings are acceptable, there is a chance that the coil is defective. Replacing the coil temporarily with one which is known to be good is the only sure check.

Breaker Point Ignition

CONDENSER

1. The condenser can be checked if a capacitance tester is available. Condensers should have a capacitance of approximately 0.25mf. Checking with a "megger" (high-voltage ohmmeter) should yield a resistance of 10M ohms at 1,000v.

2. As noted above, sparking at the points, or points which pit or burn rapidly would indicate a defective condenser. Bad condensers will cause mounds and matching depressions on the points, as illustrated.

MAGNETO

Assuming that all other ignition circuit components have been eliminated as the possible trouble spots, and the ignition and kill switches have been checked, proceed as follows:

1. Remove the left crankcase sidecover and the magneto rotor. A special puller must be used to remove the rotor.

2. Check the rotor for any score marks which would indicate that the rotor is contacting the core ends. If so, the condition must be remedied. If this has occurred, check for any play in the crankshaft which would indicate a bad crankshaft bearing. Other reasons may be improper mounting of the coil cores or rotor, worn crankshaft taper, or rotor taper surface. If the taper is damaged, the rotor should be replaced. Also inspect the rotor for any cracks or fractures. If present, replace.

3. Check for continuity between the black or black/white wire and ground. If continuity does not exist, the primary exciting coil is either broken internally, or is poorly grounded.

NOTE: If this test is made with the coils still on the engine, be sure that the points are open or held open with a bit of this paper.

4. Check the resistance between the coil core and the mounting plate or crankcase cover. The coil core should be well grounded (no resistance).

Excitor Coil (CDI)

1. The alternator excitor coil can be checked with an ohmmeter.

2. Remove the seat.

3. Disconnect the black/red lead at the connector.

4. Check the resistance between the black/red lead and a good ground on the engine. Resistance should be 110-400 ohms.

5. If the reading is not within this range, the alternator stator must be replaced.

Pulse Generator (CDI)

1. The pulse generator is located on the end of the camshaft. The unit can be checked with an ohmmeter.

2. Disconnect the pulse generator wires at the plastic connector. Leads are green and blue/yellow.

3. Resistance across the leads should be 90 ohms.

4. If the reading obtained is not within 10% of the specification, replace the pulse generator.

5. The pulse generator is located beneath the "CDI" cap. It can be removed after the two mounting screws are taken off.

6. If a new pulse generator is fitted, check that the air gap between the pulse rotor and the generator is set at 0.3-0.4mm (0.01-0.02 in.).

CDI Unit

A special tester is needed to check the CDI unit. If all other components in the circuit are found to be serviceable, the CDI unit can be checked most easily by replacing it with one which is known to be in working order.

CHARGING CIRCUIT (ATC 125)

Output Test

NOTE: The battery must be in good condition and fully charged or this test will not yield valid results.

1. A voltmeter and an ammeter are required for a system output test.

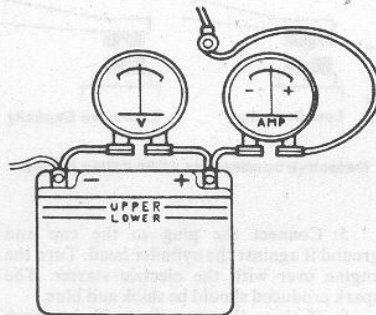
2. Warm up the engine by running it for several minutes.

3. Remove the seat.

4. Remove the battery holder and cover.

5. Disconnect the red lead at the fuse. Connect the ammeter between the red leads.

6. Connect the voltmeter across the battery terminals.



Output test set-up

7. Start the engine and note the readings.

8. The voltmeter should read 14 VDC.

9. The ammeter should read 2.4 a 2,000 rpm and 7.5 a 10,000 rpm.

10. If the readings obtained are not within specification, check the voltage regulator and the alternator charging coil as outlined below.

Voltage Regulator

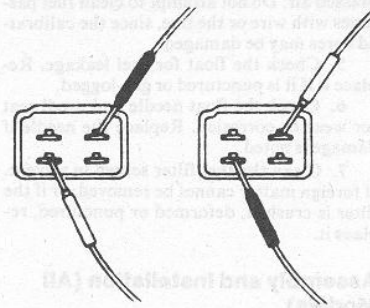
1. The voltage regulator can be checked either with an ohmmeter or with a self-powered continuity light.

2. Remove the seat.

3. Disconnect the regulator wires at the connector.

4. Regulator leads are yellow, yellow, green, red and black.

5. The check is carried out by testing



Reversing probe polarity

continuity across each pair of leads, and then reversing the polarity of the meter probes to check for continuity in the opposite direction. (Continuity will be indicated by a reading of 0.2 to 100 ohms depending on the lead involved. "No continuity" will be indicated by an infinite resistance reading.) For each pair of leads there must be continuity in one direction only.

Example: Yellow-green: 1-20 ohms

Green-yellow: Infinity

6. Resistance should be 0.1-1.0 ohms.

7. If the reading is not within this range, replace the alternator stator.

8. Check resistance between each lead and ground on the engine. Resistance must be infinite. Replace the stator if the meter shows any continuity between the wiring and ground.

STARTING SYSTEM (ATC 125)

Testing

1. If, when the starter button is pressed, the starter spins, but the engine does not, the problem is either the starter clutch or the starter motor gears in the left crankcase cover.

2. If the engine turns over very slowly, check the battery for a low state of charge. Check that the engine oil is not too heavy for conditions. If these items are not the problem, suspect a defective starter motor.

3. If nothing at all happens when the starter button is pushed, check all electrical connections in the circuit. Check that the battery is properly charged. Check the ignition switch, starter button switch, neutral switch. Check the starter solenoid. If all of these items are in proper operating condition, check the starter motor.

Starter Solenoid

1. Remove the starter solenoid cover.

2. When the starter button is pressed, there should be an audible "Click" at the solenoid.

3. Disconnect the solenoid high tension leads and the low tension wires at the plastic connector.

4. With an ohmmeter or continuity light, check the resistance of the low tension primary coil (yellow/red and green/red wires). There should be only a few ohms resistance. If this circuit shows an open condition, the solenoid must be replaced.

5. Put 12 VDC across the low tension wires. Check for continuity across the high

tension terminals. There should be no resistance. If the high tension terminals do not show continuity, the solenoid is defective and must be replaced.

Starter Motor

Removal

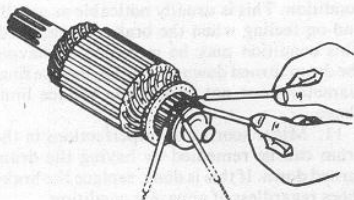
1. Be certain the ignition switch is "OFF".
2. Disconnect the ground cable at the battery.
3. Remove the exhaust pipe nuts at the cylinder head.
4. Remove the muffler mounting bolts. Remove the exhaust system.
5. Disconnect the high tension lead at the starter motor.
6. Remove the starter motor bracket bolts and the mounting screws and bolts. Remove the starter motor.

DISASSEMBLY

1. Remove the starter motor gear snap-ring.
2. Remove the gear. Remove the inner snap-ring and the thrust washers, if any, behind it. Note the number of washers. They must all be installed when the unit is assembled.
3. Remove the starter motor screws and take off the case end to expose the brushes.
4. Note the number and location of shims on the armature shaft when the cover is taken off.

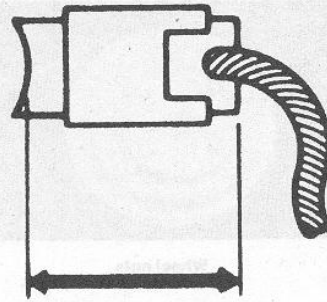
INSPECTION

1. Electrical tests can be carried out with an ohmmeter or a self-powered test light.
2. Check that continuity exists between each of the commutator segments. If one or more of them is "dead," the motor must be replaced.



Checking commutator segment continuity

3. Check that there is no continuity between the commutator segments and the armature core. Anything less than infinite resistance here will require replacement of the motor.
4. Check that there is no continuity between the commutator segments and the armature bars.
5. Check that there is no continuity between the brush which is wired to the stator (field) coil and the high tension cable terminal. Lack of continuity here indicates that the field coil is open and the motor must be replaced.
6. Check the commutator segments for signs of wear, scoring or other contact damage.
7. Clean the commutator with a rag and a safe solvent to remove carbon dust and other foreign matter.
8. Check the condition of the carbon



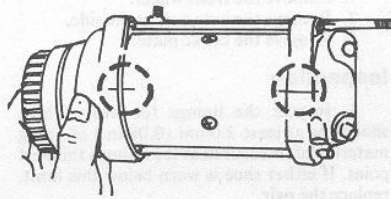
Measure brush length

brushes. Brushes with cracked or oddly worn contact surfaces should be replaced.

9. Measure brush length. Replace them as a set if either measures under 6.5mm (0.26 in.).
10. Check brush spring tension. It should be 410 gr. (14.5 oz.).
11. Check the armature for contact damage as might occur if the armature bars touch the field coils. If any is evident, replace the motor.
12. Discoloration of the commutator segments occurring on two adjacent segments indicates grounded coils. This requires replacement of the motor.
13. Check the condition of the bushings in the end caps. If they are cracked or otherwise damaged, or the armature shows signs of contact damage, the unit must be replaced.

ASSEMBLY

1. Clean all parts thoroughly.
2. Use a small amount of light duty grease to lubricate the bushings in the end caps.



When assembling the starter, align the case marks

3. Be sure that all shims are in place on the brush side of the armature.
4. Be sure that the brush springs are in place and that the brushes are in good contact with the commutator.
5. Check that the brush side end cap O-ring is in good condition.
6. Insert the armature into the case.
7. Install the brush holder with brushes.
8. When assembling the starter motor, align the pin on the brush holder with the notch in the case.
9. Install the rear cover, aligning the slot with the brush holder pin.
10. Align the marks on the motor case and the end covers before tightening the screws.

INSTALLATION

1. Reverse the removal procedure.
2. Lubricate the O-ring before fitting the motor.

ELECTRICAL SWITCHES (ATC 110,125)

Ignition Switch

1. The ignition switch can be checked with an ohmmeter or a self-powered test light.
2. Remove the headlight.
3. Disconnect the ignition switch wires at the connectors (black/white, green, red, black).
4. When the ignition switch is in the "OFF" position, there should be continuity between the black/white and the green leads only.
5. When the ignition switch is in the "ON" position, there should be continuity between the red and the black leads only.
6. If the switch fails either test, replace it.

Engine Stop Switch

1. The switch can be checked with an ohmmeter or self-powered test light.
2. Remove the headlight.
3. Disconnect the stop switch leads at the connectors (green and black/white).
4. When in the "RUN" position, there should be no continuity.
5. In both "OFF" positions, there should be continuity between the green and black/white leads.
6. The switch is a part of the left switch housing which is replaced as an assembly.

Lighting Switch

1. The switch can be checked with an ohmmeter or a self-powered test light.
2. Remove the headlight.
3. Disconnect the switch wires at the plastic connectors (brown, black/brown, white and blue).
4. When the lighting switch is "OFF" there must be no continuity between any of the wires.
5. When the lighting switch is in the "LO" position, there must be continuity between the brown, black/brown and white leads.
6. When the lighting switch is in the "N" position, there must be continuity across all four wires.
7. When the lighting switch is in the "HI" position, there must be continuity between the brown, black/brown and blue leads.
8. If the switch fails any one of these tests, it must be replaced. The switch is a part of the left switch housing which is replaced as an assembly.

Starter Button

1. The button can be checked with an ohmmeter or a self-powered test light.
2. Remove the headlight.
3. Disconnect the green/red and the light green/red button wires at the connectors.
4. There must be continuity across these wires only when the starter button is pushed.
5. If there is always continuity, or if no continuity is indicated when the button is pressed, the switch assembly must be replaced.

Neutral Switch

1. The neutral switch is a part of the starting circuit which will work only if the

Honda ATC 70-125

switch is closed, indicating that the transmission is in Neutral.

2. The switch can be checked with an ohmmeter or a self-powered test light.

3. Remove the seat.

4. Remove the air cleaner tube.

5. Disconnect the neutral switch wire at the connector (light green/red).

6. Check for continuity between the lead and ground on the engine case. When the transmission is in Neutral, there must be continuity.

7. When the transmission is in any other gear, the switch must be open (no continuity).

8. The switch can be replaced after removing the E-clip which secured it to the sub-transmission cover.

CHASSIS

WHEEL REMOVAL AND INSTALLATION

Front

ATC 70/90

1. Park the machine on a level surface.
2. Apply the parking brake.
3. Remove the axle nut cotter pin. Loosen the axle nut.

4. Raise the front wheel off the ground by placing a sturdy, safe support beneath the frame.

5. Remove the axle nut.
6. Remove the axle. Take out the wheel. Note the spacers on both sides.

7. Installation is the reverse of removal. Be sure the spacers are in place on both sides of the wheel. Tighten the axle nut to 43-58 ft. lbs. Use a new cotter pin.

ATC 110

1. Park the machine on a level surface.
2. Engage the parking brake.
3. Remove the axle nut cotter pins.
4. Loosen the axle nuts.
5. Raise the front of the machine by placing a sturdy, safe support beneath the frame and the front wheel will come out of the forks.

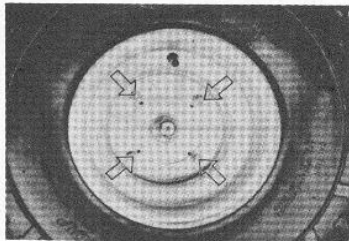
6. Installation is the reverse of removal. Be sure that all spacers are in place on the sides of the wheel. Be sure the axle collars enter the forks. Tighten the two axle nuts evenly until the proper torque of 36-51 ft. lbs. is reached. Use new axle nut cotter pins.

ATC 125

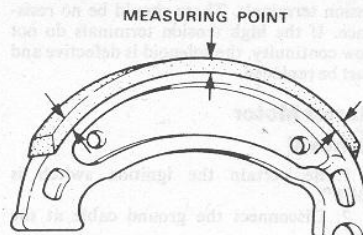
1. Park the machine on a level surface.
2. Engage the parking brake.
3. Disconnect the front brake cable.
4. Remove the axle nut cotter pins.
5. Loosen the axle nuts.
6. Raise the front of the machine by placing a suitable safe support beneath the frame and the front wheel will come out of the forks. Note the spacer on the left side.

7. Installation is the reverse of removal. Note the following:

- Be sure the spacer is in place on the left side of the wheel.
- Be sure to engage the brake plate with the anchor on the fork leg.
- Be sure the axle collars enter the forks on both sides.



Wheel nuts

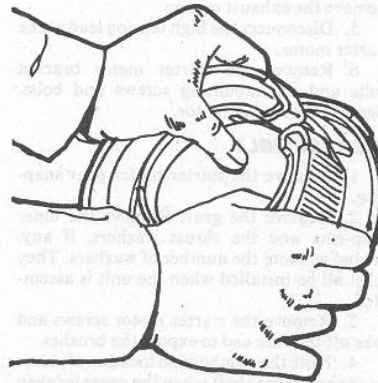


Checking brake lining thickness

- Tighten the axle nuts evenly until a torque of 36-51 ft. lbs. is reached.
- Use new axle nut cotter pins.

Rear (All Models)

- Park the machine on a level surface.
- Engage the parking brake.
- Loosen each of the wheel nuts or bolts on the wheel you wish to remove.
- Support the rear wheel(s) off the ground by placing a jack or suitable safety stand beneath the frame.
- Remove the wheel nuts or bolts.
- Remove the wheel.
- To install the wheel, be sure to put it on the hub with the tire valve facing out.
- Install the wheel nuts or bolts and tighten them in an "X" pattern a bit at a time until the proper torque of 14-18 ft. lbs. is reached.



Removing brake shoes from the brake plate

FRONT BRAKE

Removal

- Remove the front wheel.
- Remove the axle nut, brake side.
- Remove the brake plate.

Inspection

1. Inspect the linings for wear. There should be at least 2.0mm (0.08 in.) of lining material left measured at the lining's thinnest point. If either shoe is worn below this limit, replace the pair.

2. Inspect the linings for scoring or grooves. These may be caused by particles of dirt which enter the drum. If badly scored, the linings should be replaced and the drum inspected closely for the same type of damage.

3. Be sure that the linings are free of any oil or grease. Lubricant-impregnated linings must be replaced.

4. If the linings are in usable condition, rough up the surfaces with coarse sandpaper to break the glaze. Clean them thoroughly afterwards with alcohol or laquer thinner.

5. Clean foreign matter from the brake plate with a rag.

CAUTION: Brake dust may present a health hazard. Do not blow the brake assemblies clear with a high pressure compressed air source or the particulates may be inhaled.

6. Inspect the brake drum surface for condition. The drum must be free of scoring or rust.

7. Rust can be removed from the brake drum surface with sandpaper. Polish the surface until it is shiny, then clean it thoroughly.

8. Alcohol or laquer thinner can be used to remove dirt or deposits from the drum.

9. Measure the inside diameter of the brake drum. If it measures more than 111mm (4.4 in.), replace it.

10. Measure the diameter of the drum in two directions to check for an out-of-round condition. This is usually noticeable as an off-and-on feeling when the brakes are applied. This condition may be remedied by having the drum turned down on a lathe, but the final diameter must not exceed the service limit above.

11. Minor scoring or imperfections in the drum can be remedied by having the drum turned down. If this is done, replace the brake shoes regardless of apparent condition.

12. Check the brake drum rubber seal for condition and replace it if it is cracked or otherwise damaged.

13. Check the brake drum for cracks or other critical defects.

14. The brake drum is a part of the front wheel hub. To remove it, remove the four mounting nuts. Nuts should be tightened to 14-18 ft. lbs. when installing.

15. Check the wheel bearings in the brake drum. See "Front Wheel Bearings," below.

Disassembly

- Disconnect the brake cable from the brake lever by removing the adjuster wing nut.
- Remove the brake lever pinch bolt.
- Carefully pry the brake lever off the splined cam shaft.
- Expand the brake shoes by hand and pull them and the return springs off the brake plate by folding them together.
- Tap the brake cam out of the brake plate taking care not to lose the seals and wear

indicator plate. Note the spring on the inside of the brake plate as well.

6. Clean dirt, brake dust and other foreign matter from the brake plate with a solvent-soaked rag.

7. Check the plate closely for stress cracks or other damage.

8. Check the condition of the brake shoe springs. Replace them if they are rusted, broken, deformed or weakened.

9. Check the brake cam spring and replace it if it is damaged.

10. Check that the brake cam is not bent.

11. Check that the splines on the cam are in good condition.

12. Clean the cam in solvent. Remove rust or corrosion with sandpaper.

13. The cam must turn freely in the brake plate hole. If it does not, determine the cause and remedy it.

14. Check the condition of the grease seals in the brake plate and replace them if damaged. They can be pried out.

Assembly

1. Install the grease seals and spacer in the brake plate if they were removed.

2. Lubricate the brake cam with a good grade of medium-weight chassis grease.

3. Fit the washer and the cam spring on the cam.

4. Insert the cam into the plate. Be sure that the spring end is fitted into the hole in the cam and the other end is hooked over the anchor on the plate.

5. Lubricate the brake shoe pivot with chassis grease.

6. Fit the outer cam grease seal if it is not already in place. Install the wear indicator plate. The tab aligns with the cam cut-out.

7. Install the brake lever, aligning the punch mark on the lever with the punch mark on the end of the cam.

8. Install and tighten the lever pinch bolt.

9. Clean hands thoroughly to avoid contaminating the brake linings.

10. Assemble the shoes and return springs and spread them by hand to fit over the pivot and the cam. Be sure they are properly seated.

11. Work the brake lever by hand and observe operation.

Installation

1. Installation is the reverse of removal.

2. If the brake drum/hub was removed from the wheel, install it and tighten the four nuts in an "X" pattern until a torque of 14-18 ft. lbs. is reached.

3. Grease the wheel bearing seal lips before inserting the axle.

4. Be certain that the axle spacer is in place on the left side of the wheel and that the axle collars are properly positioned when inserting the wheel into the forks.

5. Tighten the axle nuts to 36-51 ft. lbs. and use new cotter pins.

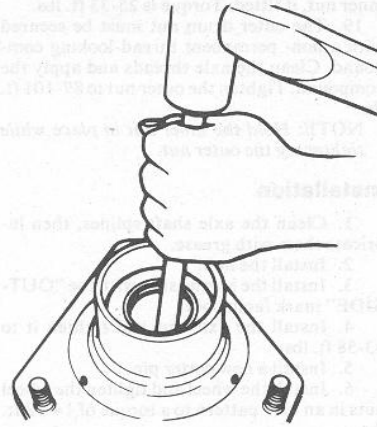
6. Adjust the brake as described in "Maintenance."

FRONT WHEEL BEARINGS

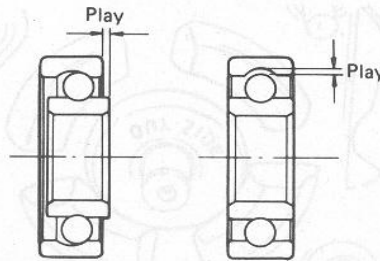
The front wheel bearings are pressed into the wheel hub and can be removed or serviced after the hub is removed from the wheel.

1. Remove the front wheel.

2. Remove the brake plate (ATC 125).



Removing bearings from the hub



Bearing axial and radial play

3. Remove the hub nuts and take off the hub.

4. Pry out the grease seals on either side.

5. Bearings should be inspected in place, since removal usually damages them.

6. Check each bearing for play of the inner race relative to the outer. Maximum allowable radial (up- and-down) play is 0.05mm (0.002 in.). Maximum axial (in-and-out) play is 0.10mm (0.004 in.). If either bearing exceeds these limits, replace the pair.

7. Check the bearing rotation. If any roughness, binding or noise is noted, replace the set.

8. Remove the bearings by reaching into the hub with a suitable drift and driving out one of them. Remove the spacer. Remove the remaining bearing in the same manner.

9. Lubricate new bearings with a good quality, medium-weight bearing grease. Put a quantity of the lubricant inside the hub as well.

10. Bearings should be driven into the drum until fully seated. A driver large enough to cover the whole bearing should be used so that it can be driven straight in.

11. After the first bearing is installed, fit the spacer, then the other bearing.

12. Press grease seals in carefully.

13. When installing the hub on the wheel, tighten the fasteners in a cross pattern to a torque of 14-18 ft. lbs.

REAR BRAKE

Removal

1. Remove the skid plate.

2. Remove the right rear wheel.

3. Remove the axle nut cotter pin.

4. Remove the axle nut.

5. Remove the hub.

6. On larger models, remove the two brake drum nuts from the axle. Remove the washer if fitted.

7. Remove the brakedrum cover bolts. Remove the cover.

8. Remove the O-ring from the axle, if fitted.

9. Pull off the brake drum.

10. Brake components are now exposed for inspection and service.

Inspection

1. Inspect the linings for wear. There should be at least 2.0mm (0.08 in.) of lining material left at the thinnest point. If either shoe is worn below this limit, replace the pair.

2. Inspect the linings for scoring or grooves. These may be caused by particles of dirt which enter the drum. If badly scored, the linings should be replaced and the drum inspected closely for the same type of damage.

3. Be sure the linings are free of oil and grease. Lubricant-impregnated linings must be replaced.

4. If the linings are in usable condition, rough up the surfaces with sandpaper to break the glaze. Clean them thoroughly afterwards with alcohol or laquer thinner.

5. Clean foreign matter from the brake plate with a rag.

CAUTION: Brake dust may present a health hazard. Do not blow the brake assembly clear with a high pressure compressed air source or the particulates may be inhaled.

6. Inspect the brake drum surface for condition. The drum must be free of rust or scoring.

7. Rust can be removed from the drum surface with sandpaper. Polish the surface until it is shiny, then clean it thoroughly.

8. Alcohol or laquer thinner can be used to remove dirt or deposits from the drum.

9. Measure the inside diameter of the drum. Service limits are 111mm (4.4 in.) for ATC 70s up to 1975 131mm (5.2 in.) for ATC 70s after 1975, and 141mm (5.6 in.) for other models.

10. Measure the diameter of the drum in two directions to check for an out-of-round condition. This is usually noticeable as an off-and-on feeling when the brakes are applied. This condition may be remedied by having the drum turned down on a lathe, but the final diameter must not exceed the service limit, above.

11. Minor scoring or imperfections in the drum can be remedied by having the drum turned down. If this is done, replace the brake shoes regardless of apparent condition.

12. Check the splines on the brake drum and those on the axle for condition. If they are worn or show other signs of damage, replace the components.

13. Check the brake drum cover seals and axle O-ring for condition and replace any unserviceable components. If there was evidence of foreign matter inside the brake, the seals should be replaced regardless of apparent condition.

14. Be sure that the drum is free of stress cracks, accident damage, etc.

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Disassembly

1. Disconnect the brake rod from the brake lever by removing the adjuster wing nut.
2. Remove the cotter pin and washer from the brake shoe pivot which are fitted to some models.
3. Expand the brake shoes by hand and pull them and the return springs off the brake plate by folding them together.
4. Remove the brake lever pinch bolt.
5. Carefully pry the brake lever off the splined shaft.
6. Remove the wear indicator plate.
7. Tap the brake cam out of the brake plate taking care not to lose any seals which may come out.
8. Clean dirt, brake dust and other foreign matter from the brake plate with a solvent-soaked rag.
9. Check the brake plate closely for stress cracks or other damage.
10. Check the condition of the brake shoe springs. Replace them if they are rusted, broken, deformed or weakened.
11. Check the brake cam spring and replace it if it is damaged.
12. Check that the brake cam is not bent.
13. Check that the splines on the cam are in good condition.
14. Clean the cam in solvent. Remove rust or corrosion with sandpaper.
15. The cam must turn freely in the brake plate hole. If it does not, determine the cause and remedy it.
16. Check the condition of the cam dust seal and the grease seals in the brake plate and replace them if damaged. Grease seals can be pried out.

Assembly

1. Install the grease seals in the brake plate if they were removed.
2. Lubricate the brake cam with a good grade of medium-weight chassis grease.
3. Fit the cam spring on the cam, inserting the end of the spring into the hole in the cam.
4. Install the brake cam. Fit the outer end of the spring over the anchor on the brake plate.
5. Install the dust seal on the outer side of the cam.
6. Lubricate the brake shoe pivot with chassis grease.
7. Install the wear indicator plate, aligning the tab with the cam cut-out.
8. Install the brake lever, aligning the punch mark on the lever with the punch mark on the cam.
9. Install and tighten the lever pinch bolt.
10. Clean hands thoroughly to avoid contaminating the brake linings.
11. Assemble the shoes and return springs and spread them by hand to fit over the pivot and the cam. Be sure they are properly seated. Install the washer and cotter pin, if fitted.
12. Work the brake lever by hand and observe operation.
13. Install the brake drum.
14. Lubricate the axle O-ring and install it, if fitted.
15. Lubricate the center seal of the brake drum cover with grease.
16. Install the cover.
17. Install the washer, if fitted.
18. Install and tighten the brake drum

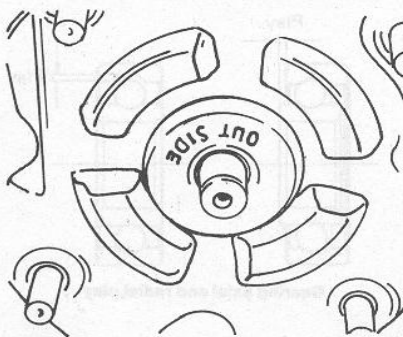
inner nut, if fitted. Torque is 25-33 ft. lbs.

19. The outer drum nut must be secured with a non-permanent thread-locking compound. Clean the axle threads and apply the compound. Tighten the outer nut to 87-101 ft. lbs.

NOTE: Hold the inner nut in place while tightening the outer nut.

Installation

1. Clean the axle shaft splines, then lubricate them with grease.
2. Install the hub.
3. Install the hub washer with the "OUTSIDE" mark facing out.
4. Install the axle nut and tighten it to 43-58 ft. lbs.
5. Install a new cotter pin.
6. Install the wheel and tighten the wheel nuts in an "X" pattern to a torque of 14-18 ft. lbs.
7. Connect the rear brake rod and adjust the brake as outlined in "Maintenance."

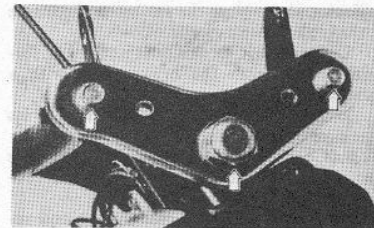


Install the hub washer with the "OUTSIDE" out

FRONT END

Bearing Adjustment

1. The steering stem bearings are uncaged steel balls. They are adjusted by means of a ring nut beneath the upper triple clamp.
2. To check the bearing adjustment, support the front wheel off the ground. Grasp the fork sliders with both hands.
3. Attempt to move the forks by pulling out on the sliders. If play or movement can be felt, the bearings are too loosely adjusted or worn.
4. Turn the forks slowly from the lock-to-lock. Movement should be smooth, silent, and effortless. If any binding or uneven movement is felt, the balls and the races are either too tightly adjusted, unlubricated, or are worn. If the steering feels uniformly stiff, the bearings are too tightly adjusted. If any noise is noted, the bearings are damaged, or some are missing.
5. With the front wheel off the ground, release the front forks from a few degrees off the centered position. The forks should fall freely to either side of their own weight. If they will not, the bearings are too tightly adjusted, the steering stem is bent, the races are extremely worn, or some of the bearings are missing.
6. Bearings can be adjusted with a hammer and punch or a pin wrench on the adjuster nut under the upper triple clamp after the



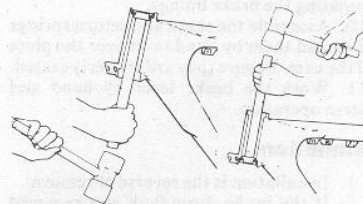
Upper triple clamp steering stem nut and fork tube bolts (arrows)

triple clamp is removed. To do this, remove the handlebars; remove the upper triple clamp fork tube bolts and the steering stem nut and washer. Tap upwards to remove the upper triple clamp.

7. Tighten or loosen the adjusting nut until operation is as described above.
8. If proper adjustment is not possible, the bearing and races will probably have to be replaced.
9. On the ATC 70, tighten the steering stem nut to 36-51 ft. lbs. and the fork tube bolts to 29-35 ft. lbs. On other models, tighten the steering stem nut and the fork tube bolts to 36-51 ft. lbs.

Removal

1. Park the machine on a level surface.
2. Apply the parking brake.
3. Support the front end off the ground by placing sturdy, safe supports beneath the frame.
4. Remove the front wheel.
5. Remove the front fender.
6. Remove the handlebars.
7. Remove the headlight, if fitted.
8. Remove the fork tube bolts and the steering stem nut and washer. Tap the upper triple clamp upwards with a mallet to free it if stuck.



Removing and installing steering stem races in the frame

9. Loosen the steering stem bearing adjuster nut with a pin wrench, then hold the steering stem up while unscrewing the adjuster nut the rest of the way off. Remove the steering stem top cone race and the balls from the top race.
10. Carefully pull the steering stem out from the bottom. Some of the ball bearings from the lower race will most likely fall out at this time so be prepared for this. Remove the rest of the balls from the lower race when the stem is removed.
11. Remove the bottom cone race, dust seal, dust seal, and dust seal washer from the steering stem if they are to be replaced. If the steering system has been damaged and is to be replaced, the upper and lower races and balls should also be replaced.

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NOTE: A chisel is usually necessary to remove the lower cone race from the steering stem.

12. The bearing races in the frame are a press-fit and should not be removed unless replacement is necessary. Inspect them first. If replacement is necessary, the old races can be removed by reaching through the frame lug with a suitable punch and tapping the races out from the inside of the lug.

New races are installed using a suitable sized bushing driver: i.e., one which will drive the race squarely into its seat. Be certain that the race goes straight in.

These races can also be installed using a block of hardwood, of sufficient size to cover the race, in place of a bushing driver.

Inspection

1. Wash the bearings in a suitable solvent.
2. Clean all of the old grease from the bearing race surfaces, the steering stem, and the frame lug.
3. Inspect the bearing race surfaces. They must be clean and smooth. That is, free from any cracks, scoring, indentations, or rust. Run your finger around the bearing race surfaces. Note any roughness or ripples on the race surfaces. If either is damaged, replace both races and balls.
4. Check the balls themselves for rust, pitting, or flat spots. Replace the bearings as a set if any such damage occurs.
5. Check the dust seal for condition and replace if necessary.
6. Check the steering stem for cracks or a bent condition; this is especially important if the bike has been involved in a spill.

Installation

1. Install the dust seal washer, dust seal, and bottom cone race onto the steering stem. Use a good grade of bearing grease to coat the bottom cone race and the top race in the frame lug.
2. Embed the balls into the grease of the top frame race and the bottom cone race. Place a coat of grease on the two remaining races.

NOTE: There are 21 balls in each race.

3. When the balls are in place, slip the steering stem through the frame lug and hold it in place, while refitting the top cone race and threading on the adjuster nut.
4. Tighten the adjuster nut, and move the steering stem back-and-forth to work the grease into the bearings, then back off the adjuster nut until the steering stem turns with ease, but has no play.
5. Install the upper triple clamp. Check that the stem moves freely of its own weight from 5°-10° off center; if not check for:
 - a. Steering bearings too tight;
 - b. Bent steering stem;
 - c. Worn races or balls.
6. Install the flat washer, and steering stem nut.
7. Tighten the steering stem nut to 36-51 ft. lbs.
8. Tighten the fork bolts to 29-35 ft. lbs. on the ATC 70 and 36-51 ft. lbs. on the other models.
9. The remainder of the procedure is the reverse of removal.

REAR AXLE

ATC 70

REMOVAL

1. Remove the seat/fender assembly.
2. Remove the skid plate.
3. Place a jack beneath the frame to support the rear wheel off the ground.
4. Remove the rear wheels.
5. Remove the wheel hubs.
6. Remove the chain case.
7. Loosen the tensioner. Disconnect the chain.
8. Remove the rear sprocket.
9. Remove the brake assembly as directed under "Rear Brake," above.
10. Remove the axle.

INSPECTION

1. Inspect components as directed under "Rear Axle" for ATC 90-125 machines, below. Procedures are similar.
2. The bearings can be driven out of their holder after the grease seals on either side are pried out.

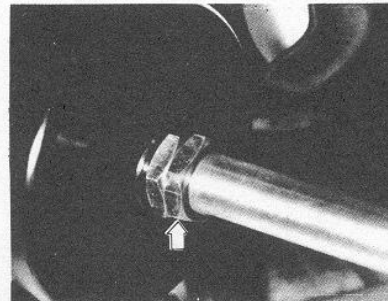
INSTALLATION

Reverse the removal procedure.

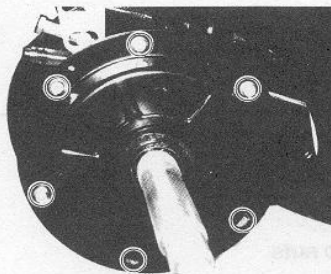
ATC 90/110/125

REMOVAL

1. Remove the seat.
2. Remove the five skid plate mounting bolts and the skid plate.



Brake drum nuts



Brake cover bolts

3. Support the rear end of the vehicle with safe, sturdy stands placed beneath the frame.
4. Remove the rear wheel nuts and take off the wheel.
5. Remove the axle nut dust caps, if fitted.

6. Remove the cotter pins.
7. Remove the axle nuts and washers.
8. Pull the hubs off the axle.
9. Disconnect the carburetor overflow tube from the clamps on the chain case.
10. Remove the three bolts securing the seal cover around the rear axle and take off the cover.
11. Remove the chain case mounting bolts.
12. Undo the clamps.
13. Remove the outer chain case half.
14. Back off the rear brake adjuster nut.
15. Loosen the drive chain adjuster nut.
16. Loosen the four bearing holder mounting bolts.
17. Disconnect the drive chain. Be sure to remove the masterlink spring clip with a pliers. Prying the clip off will make it unusable. Put the masterlink on one end of the chain to avoid loss.
18. Remove the two brake drum nuts from the axle.
19. Remove the washer.
20. Remove the brake drum cover bolts.
21. Remove the O-ring from the axle.
22. Pull off the brake drum.
23. Use a plastic mallet to drive the axle out from the right side.
24. Remove the chain case inner half bolts (four). Remove the case half.
25. Remove the rear brake adjuster nut and disconnect the brake rod from the brake lever.
26. Remove the trailer hitch upper mounting bolts.
27. Remove the bearing holder from the frame.

INSPECTION

Axle

1. Check sprocket condition.
2. To remove the sprocket, remove the four damper cover nuts, the damper cover and snap-ring.
3. Check the dampers for damage.
4. Check all axle splines for condition.
5. Check axle run-out. When measured in the middle of the axle, the serviceable limit for run-out is 3.0mm (0.12 in.). This is 1/2 of the Total Indicated Reading of the gauge.
6. Check the condition of the O-ring behind the axle flange and replace it if necessary.
7. Assembly is the reverse of disassembly. Grease axle splines before installation. Lubricate the O-ring before fitting it to the axle. Tighten the damper nuts to 17-22 ft. lbs.

Bearing Holder

1. Pry out the grease seals on either side.
2. Bearings should be checked in place, since removal will usually damage them.
3. Check for excessive play of the inner race relative to the outer. Maximum allowable radial (up- and-down) play is 0.05mm (0.002 in.). Maximum allowable axial (in-and-out) play is 0.10mm (0.004 in.).
4. Check the bearings for rough or binding rotation, excessive noise, etc.
5. Replace bearings in sets.
6. Bearings can be removed by driving them out with a hammer and suitable drift. Remove one bearing and take out the spacer and any shims. Drive out the remaining bearing.
7. Pack new bearings with a good grade of medium-weight bearing grease. Place a

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quantity of the lubricant in the bearing holder as well.

8. Install bearings with the marked side out.

9. Install the right side bearing first, driving it straight in with a suitably sized bearing driver until it is firmly seated.

10. Install the spacer along with any shims which may be fitted.

11. Install the remaining bearing.

12. Press grease seals straight into the holder.

13. Lubricate the seal lips before assembly.

INSTALLATION

1. Install the bearing holder and fit the four bolts, but do not tighten them yet since the chain must be readjusted.

2. Fit the chain adjuster nut.

3. Connect the brake rod.

4. Install the inner chain case half.

5. Install the axle from the left side of the machine.

6. Check that the brake shoe assemblies are in place.

7. Install the brake drum.

8. Lubricate and install the brake drum O-ring.

9. Lubricate the center seal of the brake drum cover. Install the cover and secure it with the six bolts.

10. Clean the axle threads thoroughly.

11. Fit the washer on the axle.

12. Install the brake drum inner nut and tighten it to 25-33 ft. lbs.

13. The brake drum outer nut must be secured with a non-permanent thread-locking compound. Apply the compound to the threads of the axle, then install the nut.

14. Hold the inner nut in place while the

outer is tightened to the proper torque of 87-101 ft. lbs.

15. Connect the drive chain. The closed end of the masterlink spring clip must face the direction of chain rotation.

16. Adjust the chain as outlined in "Maintenance" and tighten the four bearing holder bolts to 51-58 ft. lbs.

17. The remainder of the procedure is the reverse of removal. Note the following:

a. Grease the wheel hub splines before fitting the hubs.

b. Install the hub washers with the "OUTSIDE" mark facing out.

c. Tighten the axle nuts to 36-58 ft. lbs.

d. Use new axle nut cotter pins.

e. Tighten the wheel nuts gradually and in an "X" pattern until the final torque of 36-43 ft. lbs. is reached.

f. Adjust the rear brake after assembly.

CHASSIS TORQUE SPECIFICATIONS

Part	ATC 70	Torque (ft. lbs.)
Front axle nut		43-58
Fork tube bolts		29-35
Steering stem nut		36-51
Handlebar clamp bolts		14-18
Lower handlebar clamp nuts		29-35
Drive chain tensioner		18-24
Rear axle nuts		43-58
Rear wheel bolts		14-18
Brake cam holder		5-9
Brake anchor pin		5-9
Rear fender		11-15
Seat		4-7
Rear fender bracket		4-7
Footpeg guard		
8 mm		14-18
10 mm		29-35
Footpegs		14-18
Engine mounting bolts		14-18
Rear wheel hub nuts		14-18
Front wheel hub nuts		14-18
	ATC 90, 110, 125	
Front axle nuts		36-51
Fork tube bolts		36-51
Steering stem nut		36-51
Handlebar clamp bolts		13-22
Lower handlebar clamp nuts		29-35
Front wheel hub nuts		14-18
Rear axle nut		43-58
Rear wheel nuts		14-18
Rear wheel hub nuts		14-18
Sprocket damper holder nuts		15-20
Rear brake nuts		
Inner		25-33
Outer		87-101
Bearing holder bolts		36-51

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GENERAL TORQUE SPECIFICATIONS ①

Part	Torque (ft lbs.)
5 mm screws	2.5-3.6
6 mm screws	5-8
5 mm bolts, nuts	3.5-4.5
6 mm bolts, nuts	6-9
8 mm bolts, nuts	13-18
10 mm bolts, nuts	22-29
12 mm bolts, nuts	36-43
6 mm bolt w/8 mm head	5-8
6 mm flange bolts, nuts	7-10
8 mm flange bolts, nuts	17-22
10 mm flange bolts, nuts	25-33

① Unless otherwise noted

Part	Torque (ft lbs.)
ATC 500M (1984-85)	137
ATC 500 (1987-88)	137
ATC 1988 (1987-88)	137
ATC 1989 (1987-88)	137
ATC 1990 (1987-88)	137
ATC 1991 (1987-88)	137
ATC 1992 (1987-88)	137
ATC 1993 (1987-88)	137
ATC 1994 (1987-88)	137
ATC 1995 (1987-88)	137
ATC 1996 (1987-88)	137
ATC 1997 (1987-88)	137
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ATC 2001 (1987-88)	137
ATC 2002 (1987-88)	137
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ATC 2004 (1987-88)	137
ATC 2005 (1987-88)	137
ATC 2006 (1987-88)	137
ATC 2007 (1987-88)	137
ATC 2008 (1987-88)	137
ATC 2009 (1987-88)	137
ATC 2010 (1987-88)	137
ATC 2011 (1987-88)	137
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ATC 2100 (1987-88)	137