



# INSTRUCTIONS

-J03005

REV. 01-14-2004

Kit Numbers 33104-03, 33105-03

## SOFTAIL 6 SPEED TRANSMISSION - COMPLETE

### General

These kits fit 1990 to 1999 Softail model motorcycles. The chrome side door included in this kit is machined to accept the speedometer sensor.

**Kit number 33104-03** is a complete 6 speed black and chrome transmission.

**Kit number 33105-03** is a complete 6 speed silver and chrome transmission.

	STOCK 5 - SPEED	SE 6 - SPEED
1st	3.210	3.210
2 nd	2.209	2.209
3 rd	1.572	1.572
4 th	1.226	1.226
5 th	1.000	1.000
6 th	NA	0.885

Transmission Ratio Comparison

### ⚠ WARNING

The rider's safety depends upon the correct installation of this kit. If the procedure is not within your capabilities or you do not have the correct tools, have your Harley-Davidson dealer perform the installation. Improper installation of this kit could result in death or serious injury. (00308a)

### NOTE

A Service Manual for your model motorcycle is available from any Harley-Davidson dealer.

### Removal of Original Transmission

1. Position motorcycle on a suitable lift.

### ⚠ WARNING

To prevent accidental vehicle start-up, which could cause death or serious injury, disconnect battery cables (negative (-) cable first) before proceeding. (00307a)

### ⚠ WARNING

Disconnect negative (-) battery cable first. If positive (+) cable should contact ground with negative (-) cable connected, the resulting sparks can cause a battery explosion, which could result in death or serious injury. (00049a)

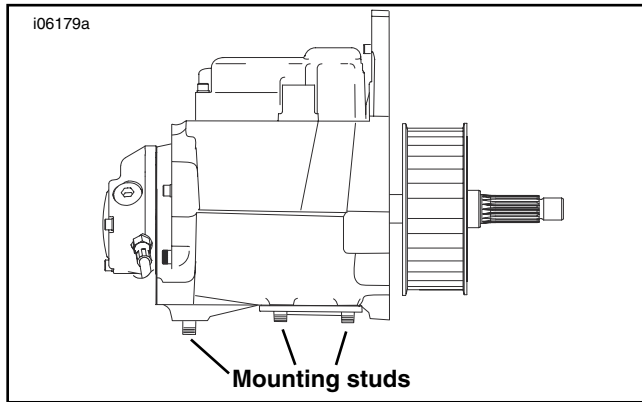
2. Refer to SEAT and BATTERY CABLES in the Service Manual and follow the instructions given to remove the seat and disconnect the battery cables, negative cable first.
3. See the TRANSMISSION CASE REMOVAL in the Service Manual and follow the instructions given to remove of the transmission case.

4. Refer to the PRIMARY CHAINCASE REMOVAL section in the Service Manual and follow the instructions given to remove the primary chaincase cover.

### ⚠ WARNING

Always wear proper eye protection when removing or installing retaining rings. Use the correct retaining ring pliers. Verify that the tips of the pliers are not excessively worn or damaged. Slippage may propel the ring with enough force to cause an accident. This could result in death or serious injury.

5. Refer to PRIMARY CHAINCASE REMOVAL in the Service Manual and follow the instructions given to remove the primary drive assembly.
6. See the STARTER REMOVAL section in the Service Manual and follow the instructions given to remove the the starter, neutral switch connection and speedometer sensor.
7. See the VEHICLE SPEED SENSOR section and unplug the vehicle speedometer sensor connection and remove the mounting bolt. Lift sensor from the transmission case (if equipped) and set aside.
8. Refer to NEUTRAL SWITCH in Service Manual and disconnect the connectors from the neutral switch.
9. Refer to PRIMARY CHAINCASE in the Service Manual and follow the instructions given to remove the primary chaincase housing.
10. Refer to the EXHAUST SYSTEM section in the Service Manual and follow the instructions given to remove the exhaust.
11. Loosen but, do not remove rear axle to relieve drive belt tension.
12. Refer to OIL TANK REMOVAL in the Service Manual and follow the instructions given to drain, and remove the oil tank, and detach the vent, feed and return lines.
13. Refer to CLUTCH CONTROL in the Service Manual and follow the instructions given to remove the clutch cover and disconnect the clutch cable end from the cover. Set the cable aside for later re-installation.
14. Remove transmission mounting hardware from the transmission mounting plate on the frame.
15. The transmission is now loose from the frame and engine and resting on a support.
16. Slide the transmission out the right side of the motorcycle frame.



**Figure 1. Transmission Housing to Frame Mounting Plate Sequence**

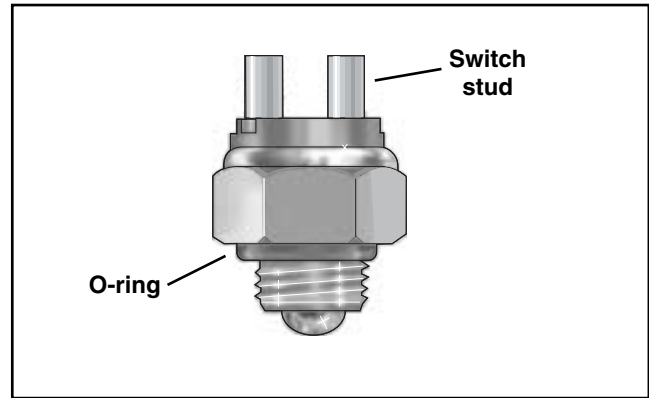
## Installation of New Transmission

1. Refer to the Service Manual and install the new transmission into the motorcycle. Slide the transmission from the right and align the mounting bolt holes on the transmission with the mounting plate holes on the frame.
2. See Figure 1. Install the five nuts and washers hardware removed in step 12. Tighten the five transmission mounting nuts to 33-38 ft-lbs (45-52 Nm).
3. Refer to the Service Manual TRANSMISSION ADJUSTMENT and follow the instructions given to adjust transmission.
4. Refer to Service Manual REAR BELT and SPROCKETS and follow the instructions given to install the belt on the transmission.
5. Refer to PRIMARY CHAINCASE HOUSING in the Service Manual to install the chaincase housing.
6. See the DRIVE COMPONENTS section in the Service Manual and install the clutch assembly, primary chain and compensating sprocket as a single assembly.
7. Refer to VEHICLE SPEED SENSOR in the Service Manual and install the vehicle speed sensor, with the new o-ring (89) included in the kit.

### NOTE

*If the vehicle is not equipped with a Vehicle Speed Sensor, install the speed sensor plug (108) with the o-ring (89) and screw (90).*

8. Refer to NEUTRAL SWITCH section in the Service Manual and connect the neutral switch. See Figure 2. For 1990 thru 1997 model years, refer to the wiring diagram. The wiring harness for these years will have a single cap connector (H-D part number 9905) connected to the Neutral Switch. Replacement of the single cap connector will need to be performed as follows:
  - a. Cut the single wire cap off the stock wire.
  - b. Connect the supplied wire part number 72405-98T (59) to the cut wire, with the supplied connector part number 70585-93 (87) and attach onto either pole of the Neutral Switch.
  - c. Attach the other supplied new wire part number 72405-98BK (100) to the remaining pole.
  - d. Attach the supplied eyelet part number 72241-94A (86) to the other end of the new wire and attach to a convenient grounding location.



**Figure 2. Neutral Switch**

7. Refer to the STARTER INSTALLATION section in the Service Manual and follow instruction given to install the starter from the right side of the motorcycle.
8. See the OIL TANK section in the Service Manual and follow the instructions given to install the oil tank and attach the vent, feed and return lines.

## CLUTCH RELEASE COVER ASSEMBLY

9. Refer to TRANSMISSION CLUTCH RELEASE COVER in the Service Manual and remove and disassemble the new clutch release cover to reconnect the clutch cable.
10. Refer to CLUTCH CONTROL INSTALLATION in the Service Manual and follow the instructions given to assemble the clutch release cover with the cable reconnected.
11. See the EXHAUST SYSTEM section in the Service Manual and follow the instructions given to install the complete exhaust with heat shields.
12. Add Harley-Davidson lubricants to the transmission, oil tank and primary. See the oil grades and capacities listed in the service manual for your motorcycle model.

### **⚠ WARNING**

**Connect positive (+) battery cable first. If positive (+) cable should contact ground with negative (-) cable connected, the resulting sparks can cause a battery explosion, which could result in death or serious injury. (00068a)**

13. Refer to the Service Manual, and follow instructions given to reconnect the battery cables, positive cable first and install the seat.

### **⚠ WARNING**

**After installing seat, pull upward on front of seat to be sure it is in locked position. While riding, a loose seat can shift causing loss of control, which could result in death or serious injury. (00070a)**

## TRANSMISSION SERVICE

14. Replace Transmission fluid after the first 500 miles. Refer to the Service Manual and follow the instructions for the proper subsequent service intervals.



# Service Parts

Part No. 33104-03, 33105-03

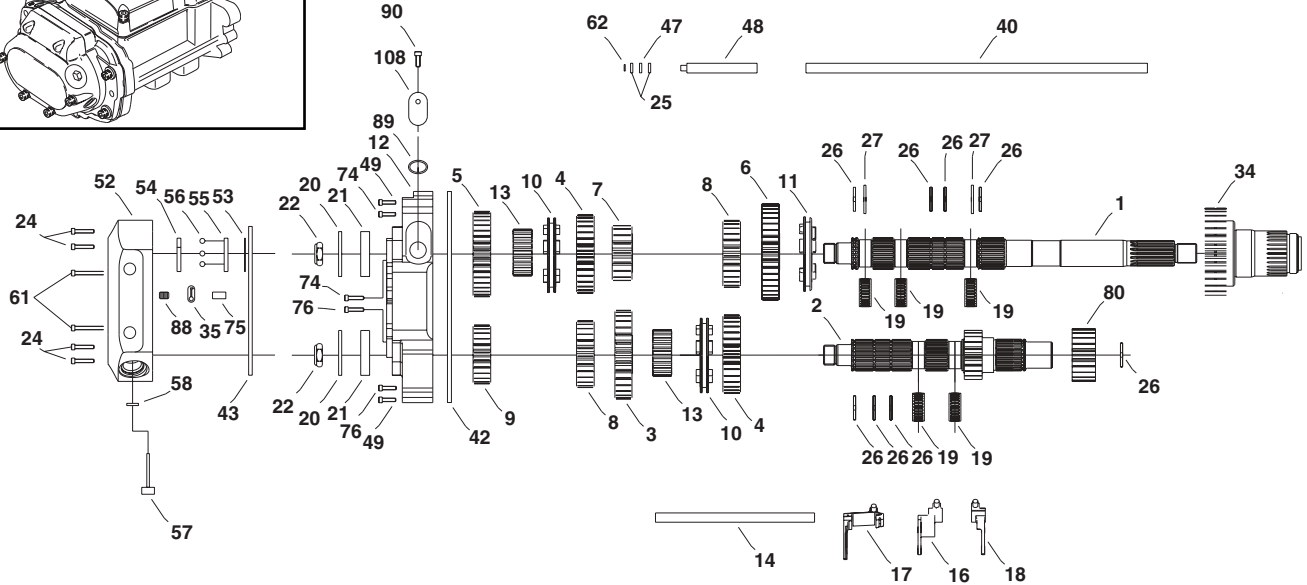
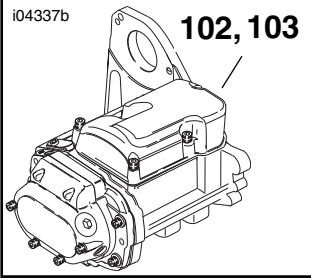
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Softail 6 Speed Transmission - Complete

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Item	Description (Qty)	Part No.	Item	Description (Qty)	Part No.
1	Mainshaft	35058-03	27	Mainshaft Thrust Washer (2)	6003
2	Countershaft	35059-03	32	Quad Seal	11165
3	Countershaft 1st Gear	35080-03	34	Main Drive Gear	35237-03
4	Mainshaft 3rd Gear/ Countershaft 2nd Gear (2)	35083-03	35	Clutch Cable Coupler	34920-86A
5	Mainshaft 4th Gear	35104-03	39	Shifter Seal Washer	6497HW
6	Mainshaft 6th Gear	35131-03	42	Side Door Gasket	35147-03
7	Mainshaft 1st Gear	35134-03	43	Clutch Release Cover Gasket	35148-03
8	Countershaft 3rd Gear/ Mainshaft 2nd Gear (2)	35135-03	44	Lid Gasket	34904-86D
9	Countershaft 4th Gear	35136-03	47	Pushrod Bearing	37312-75
10	Shift Ring, 1-2, 3-4 (2)	35137-03	48	Right Clutch Pushrod	35149-03
11	Shift Ring, 5-6	35138-03	49	Upper Side Door & Top Lid Screw (3)	4814A
12	Side Door	35139-03	52	Clutch Release Cover	35157-03
13	Splined Sleeve (2)	35140-03	53	Ramp Retaining Ring	10998
14	Shifter Fork Shaft	34088-87A	54	Inner Ramp	25604-00
16	Shifter Fork, 1-2 1	35143-03	55	Outer Ramp	25605-00
17	Shifter Fork, 3-4 1	35144-03	56	Ramp Ball Bearings (3)	8873
18	Shifter Fork, 5-6 1	35145-03	57	Dipstick	37075-87
19	Split Cage Bearing (5)	8876A	58	Dipstick O-Ring	11132
20	Side Door Bearing Retaining Ring (2)	35087-99	61	Clutch Release Cover Upper Screw & Lid (3)	4717A
21	Side Door Bearing (2)	8992A	62	Pushrod Retaining Ring	11096
22	Mainshaft/Countershaft Locknut (2)	35078-79	74	Bottom Door Bolts (2)	3300
24	Clutch Release Cover Lower Screw (4)	4718A	75	Shifter Fork Shaft Set Screw	3784
25	Thrust Washer (2)	37313-80	76	Lower Side Door Screw (2)	3249
26	Retaining Ring (8)	11067	80	Countershaft 5th Gear	35238-03
			88	Drain Plug, 1990-99 FXST	739A
			89	Speed Sensor O-Ring	11289A
			90	Speed Sensor Plate Screw (2)	3594
			108	Speed Sensor Plug	35239-03



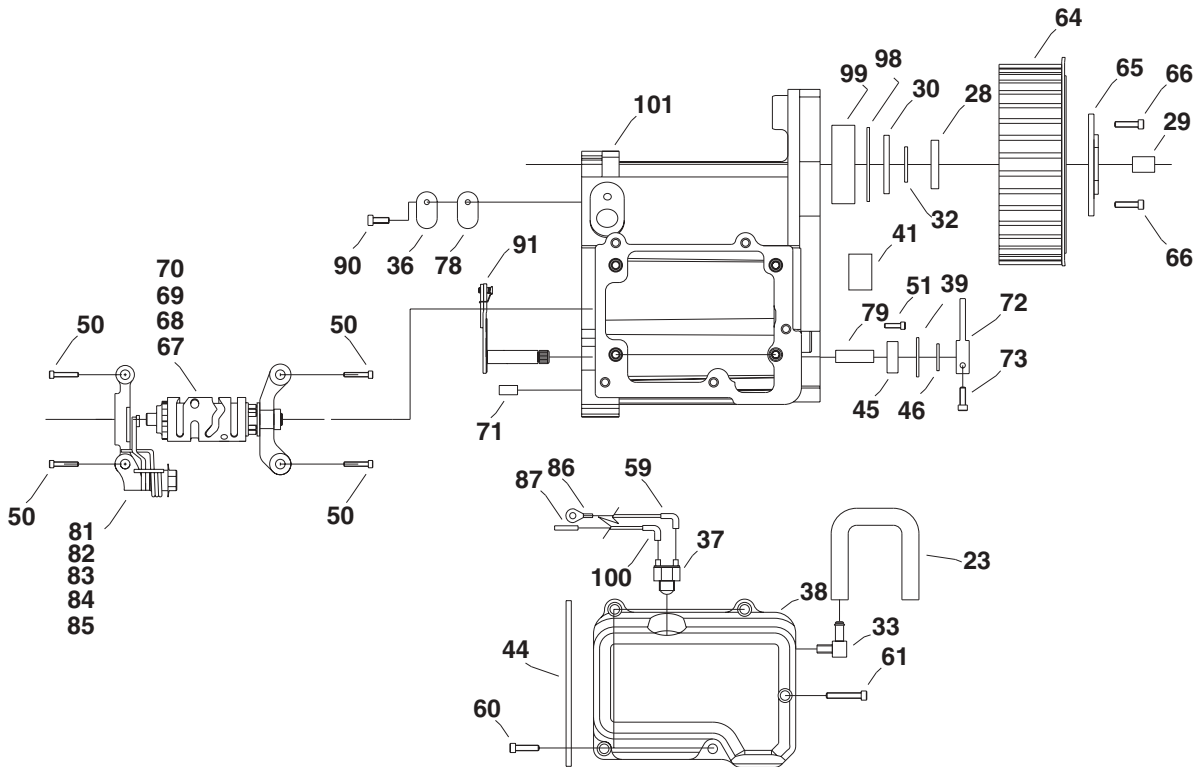
# Service Parts

Part No. 33104-03, 33105-03

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Softail 6 Speed Transmission - Complete

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Item	Description (Qty)	Part No.	Item	Description (Qty)	Part No.
23	Top Lid Vent Hose	42533-91A	70	Shift Drum Retainer	11342
28	Sprocket Spacer	33344-94	71	Door Roll Pin	634
29	Mainshaft Inner Race	34091-85A	72	Shifter Lever	33849-97
30	Large Oil Seal	12067B	73	Shifter Lever Screw	856A
33	Top Lid Vent Fitting	62375-57A	78	Speed Sensor Plate Gasket	35152-03
36	Speed Sensor Plate	35153-03	79	Sleeve	34979-00
37	Neutral Switch	33904-00	81	Right Pillow Block Assembly	33304-00
38	Top Lid, Chrome	34541-00	82	Detent Arm Screw	33376-00
40	Pushrod Center	37088-85	83	Detent Arm Spring	33374-00
41	Countershaft Bearing	8977	84	Detent Sleeve	33375-00A
45	Shifter Seal	12045	85	Detent Follower	33364-00A
46	Shifter Retaining Ring	11150	86	Terminal (1/4 inch ring)	72241-94A
50	Pillow Block Screw (4)	3909	87	Connector	70585-93
51	Shifter Centering Screw	34978-00A	91	Shifter Shaft Assembly	35146-03
59	Black Wire Assembly	72405-98BK	98	Bearing Retaining Ring	11161
60	Top Lid Screw (4)	4740A	99	Main Drive Gear Bearing	8996A
64	Transmission Pulley	40250-94C	100	Tan Wire Assembly	72405-98TN
65	Mega Nut	35236-03	101	Transmission Case, Black	35833-03
66	Mega Nut Screw (2)	4069A	101	Transmission Case, Silver	35835-03
67	Shift Drum w/ Pins	35142-03	102	Transmission Complete (Silver)	33104-03
68	Shift Drum Pin (6)	33385-02	103	Transmission Complete (Black)	33105-03
69	Left Pillow Block Assembly	33301-00A			