



INSTRUCTIONS

-J03482

REV. 04-04-2005

Kit Number 33101-03A

6 SPEED SUPER KIT

General

This kit fits 1990-2000 Touring model motorcycles. Requires separate purchase of Cable Sidecover Release Kit or Hydraulic Sidecover Release Kit. Hydraulic Side Cover Release Kit is not compatible with 1990-1998 Touring models. See retail catalog for part numbers.

In addition to the above kits, the 2005 Touring Model Service Manual (Part Number 99483-05) and Main Drive Gear Remover & Installer Kit (Part Number 35316-B) must be purchased. See your Harley-Davidson dealer.

For a list of items contained in this kit, see the Service Parts illustration.

GEAR	STOCK 5-SPEED	SE 6-SPEED
First	3.210	3.210
Second	2.209	2.209
Third	1.572	1.572
Fourth	1.226	1.226
Fifth	1.000	1.000
Sixth	N/A	0.885

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 at any Harley-Davidson Dealer.

Removal

NOTE

Leave the transmission case in the frame unless the case itself requires replacement. For ease of illustration, photographs show the case removed.

1. Using the appropriate service manual, proceed as follows:
 - a. Drain the primary chaincase and transmission lubricants.

WARNING

To prevent accidental vehicle start-up, which could cause death or serious injury, disconnect negative (-) battery cable before proceeding. (00048a)

- b. Unthread bolt and remove battery negative cable (black) from battery negative (-) terminal.



Figure 1. Install Drill Plate to Transmission Case

- c. Remove the primary chaincase cover. Remove the clutch assembly, primary chain, and compensating sprocket components. Remove the starter jackshaft assembly and primary chaincase.
- d. Remove the exhaust system as necessary to gain complete access to the transmission side door.
- e. Remove the oil filler spout and starter.
- f. Remove the clutch release cover. Remove the clutch cable from the clutch release cover.
- g. Remove the vehicle speed sensor.
- h. Remove the transmission top cover.
- i. Remove neutral switch from transmission top cover.
- j. Remove the drum support blocks and shift drum. Remove the drum support block dowels from deck of transmission case.
- k. Remove the fork shaft and shifter fork assemblies.
- l. Remove the bearing inner race from the transmission mainshaft.
- m. Remove the transmission side door and the mainshaft/countershaft assembly.

NOTE

The front dowel pin may be stuck in the side door after removal. If this occurs, remove the dowel pin from the side door and install it back into the transmission case.

- n. Remove the shifter shaft assembly and shifter seal.
- o. Remove the main drive gear and bearing.

NOTE

Detailed instructions on removing the main drive gear and bearing can be found in the 2005 Touring Model Service Manual (Part No. 99483-05), **Section 7.7 MAIN DRIVE GEAR/BEARING.**

- p. Remove the countershaft needle bearing.
2. Using masking tape, cover all the side door flange holes in the transmission case with the exception of the top three.

NOTE

While the two threaded holes at the top of the flange are used for mounting of the drill plate, the fork shaft hole (center thru hole) is used as the pilot for the drill bits.

3. From inside the transmission case, tape over all bores as follows:
 - Vehicle speed sensor and mounting screw bores
 - Transmission top cover and shift drum support block screw bores
 - Transmission drain hole bore
 - Main drive gear bearing bore
 - Countershaft needle bearing bore
 - Fork shaft bore
 - Shifter shaft bore

CAUTION

Be sure drill plate is properly oriented. Improper orientation will result in damage that requires replacement of the transmission case.

4. Obtain the drill plate (Part No. 35155-03) provided in kit and fasten to top of side door flange using old and new vehicle speed sensor mounting screws.
5. Spread one or two clean shop cloths inside the transmission case to catch the metal shavings and debris.
6. Starting with a 3/8 inch drill bit, alternately use progressively larger bits to enlarge the fork shaft hole. Finish the drilling operation with a 3/4 inch drill bit.
7. Remove all remaining material up to the edge of the drill plate with a die grinder or similar tool. Remove the drill plate.
8. Using emery cloth, steel wool, or a fine tooth file, remove any burrs or ridges that may exist from the drilling or cutting operation.
9. Remove sleeve from shifter shaft bore. Proceed as follows:
 - a. Obtain shifter shaft sleeve remover/installer tool provided in kit (Part No. 35156-03).
 - b. From the outside of the transmission case (left side), insert smaller diameter end of remover into shifter shaft sleeve (knurled side out). Using a 30 ounce brass hammer (minimum), tap the end of the remover with light blows until the shifter shaft sleeve is free of the transmission case.

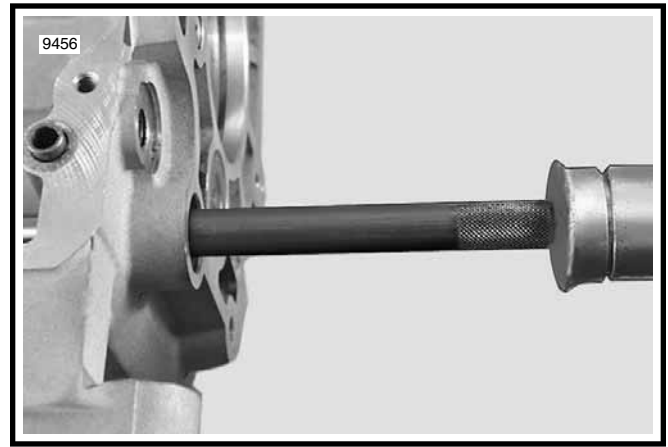


Figure 2. Remove Shifter Shaft Sleeve

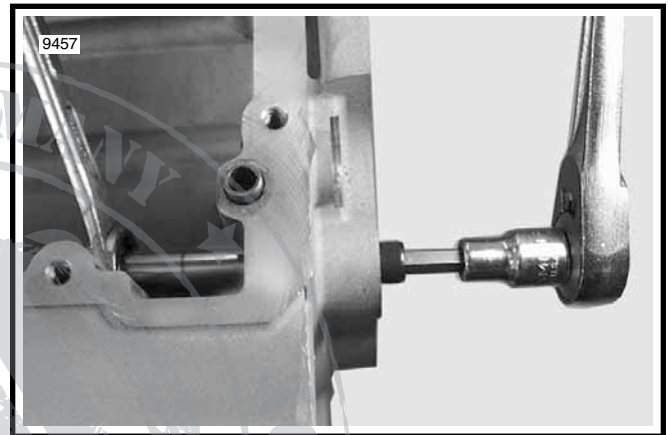


Figure 3. Install Shifter Shaft Sleeve

- c. Carefully remove any burrs from in or around the sleeve bore.

CAUTION

Abrasive particles can damage machined surfaces and result in premature failure.

10. Carefully pull out shop cloths from inside the transmission case. Exercise care to keep any debris captured by the cloths from falling into the transmission case.
11. Place drain pan beneath transmission case and remove tape from drain hole. Thoroughly flush the transmission case with a non-volatile cleaning solution or solvent to remove any metal shavings, dust or debris that might remain. For best results, use a squirt bottle to direct a stream of solvent through the transmission top cover opening. Repeat procedure as necessary draining excess solvent through the drain hole.
12. Using low pressure compressed air, thoroughly blow out all solvent.
13. Using a clean lightly oiled cloth, thoroughly wipe the inside of the transmission case. Repeat this step with a new cloth until the cloth comes out clean.
14. Carefully inspect the transmission case for any metal shavings or debris. Repeat steps 11 through 13 if any debris is found.

15. Remove the masking tape to uncover remaining holes and bores.
16. Thoroughly inspect each bore for any metal shavings, dust or debris. Alternately direct compressed air into each bore to be certain that it is clean and dry.

Installation

NOTE

Prelube all bearings and shafts with clean transmission lubricant prior to installation.

1. Using the appropriate service manual, proceed as follows:
 - a. Install the countershaft needle bearing.
 - b. Install the main drive gear and bearing.

NOTE

Detailed instructions on installing the main drive gear and bearing can be found in the 2005 Touring Model Service Manual (Part No. 99483-05), Section 7.7 MAIN DRIVE GEAR/BEARING.

2. Install sleeve into shifter shaft bore. Proceed as follows:
 - a. Obtain shifter shaft sleeve remover/installer tool provided in kit (Part No. 35156-03).
 - b. Place **new** sleeve over installer. Place thrust washer, thrust bearing and then the second thrust washer onto installer screw.
 - c. Apply a very thin film of HD 20W50 engine oil to OD of new sleeve, ID and OD installer threads and ID of sleeve bore. Also apply a very thin film of HD 20W50 engine oil to the thrust bearing and thrust washers.
 - d. From inside the transmission case, hold the sleeve and installer against the sleeve bore. From outside the transmission case, thread the installer screw assembly into the installer keeping the sleeve properly aligned.
 - e. Using a 3/4 inch box wrench, hold the hex on the installer inside the transmission case.
 - f. Using a 1/4 inch allen head, tighten the installer screw until the sleeve stops against the first thrust washer.
 - g. Remove the tool from the transmission case.
 - h. Apply a very thin film of HD 20W50 engine oil to sleeve ID and **new** shifter shaft. From outside the transmission case, slide shaft through sleeve and then rotate. Shaft must rotate freely a full 360 degrees. Remove shifter shaft assembly.
 - i. Install the **new** shifter seal. Install shifter shaft assembly from inside the transmission case. Install **new** shifter seal washer and **new** retaining ring.

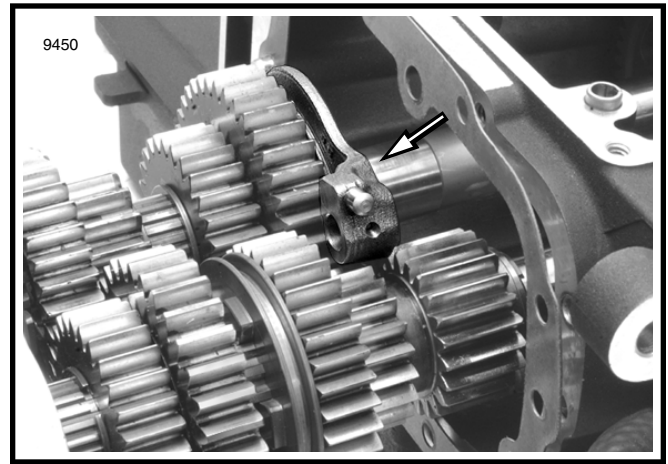


Figure 4. Install 5-6 Shifter Fork Onto Shift Ring

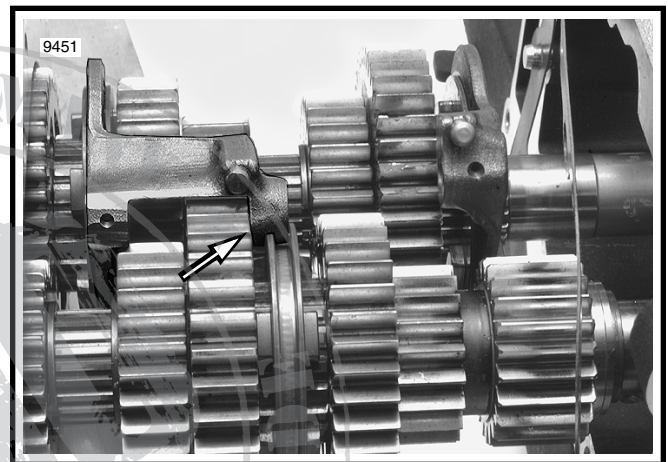


Figure 5. Install 3-4 Shifter Fork Onto Shift Ring

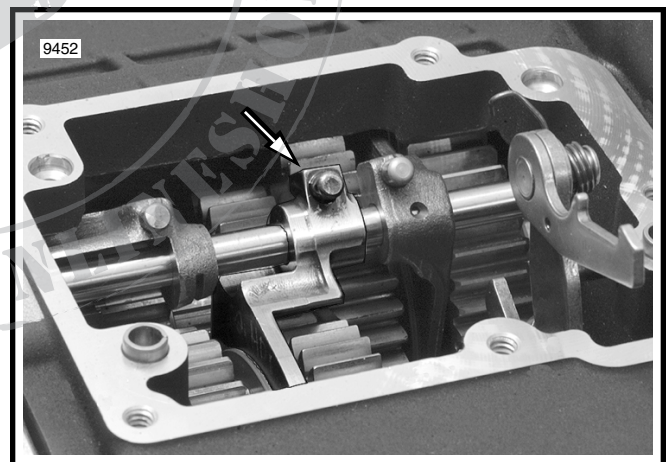


Figure 6. Install 1-2 Shifter Fork Onto Shift Ring

3. Install the transmission side door and mainshaft/countershaft assembly as follows:

CAUTION

Leave the shrink wrap on the mainshaft until side door installation is complete. Installation of the side door with the shrink wrap removed may result in damage to the main drive gear seal.

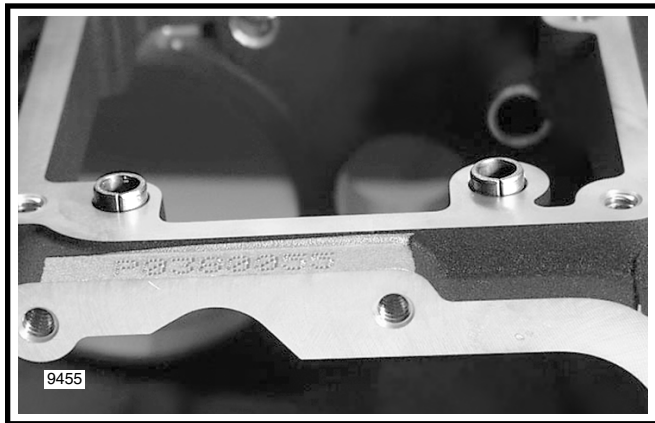


Figure 7. Orient Shift Drum Support Block Dowels

CAUTION

Be sure to remove the plastic cap and cable strap from the mainshaft before side door installation. Blow away any styrofoam bits or other packaging material that might be clinging to gears or splines.

- a. Hang **new** side door gasket on dowels in side door flange of transmission case.
- b. Start side door and mainshaft/countershaft assembly into transmission case, but stop so that all gears remain on the outboard side.
- c. Note that there are three shifter forks, each of which are stamped for easy identification. Set aside the 5-6 shifter fork, the 3-4 shifter fork and the 1-2 shifter fork in that order.
- d. Install the 5-6 shifter fork into the shift ring outboard of the 6th gear on the mainshaft (shift ring closest to the main drive gear).
- e. Install the 3-4 shifter fork into the shift ring between the 4th and 3rd gears on the mainshaft (shift ring closest to the side door). Be sure the dogs on the shift ring are engaged with mainshaft 3rd gear and then rotate shifter fork toward the countershaft until the slot in the fork engages the edge of the shift ring between 1st and 2nd gears on the countershaft. This engagement is necessary to obtain the proper clearance for side door installation.
- f. Slide side door assembly further into transmission case stopping about one inch before mating flanges make contact.
- g. Start fork shaft through hole in side door.
- h. Through the transmission top cover opening, install the 1-2 shifter fork into the shift ring between 1st and 2nd gears on the countershaft. For proper clearance, be sure the dogs on the 3-4 shift ring (closest to side door on the mainshaft) are fully engaged with mainshaft 4th gear.
- i. Slide fork shaft through holes in shifter forks and then fully install side door. Be sure that end of fork shaft engages blind hole on left side of transmission case.

- j. Install fork shaft set screw in transmission side door. Tighten screw until the shaft has minimum endplay, but still rotates freely.
 - k. Install **new** side door plug into side door.
 - l. Remove shrink wrap from the mainshaft.
4. Using the appropriate service manual, proceed as follows:
- a. Install four **new** drum support block dowels in deck of transmission case. Orient the dowels so that the split line is aligned left to right.
 - b. Install **new** drum support blocks with **new** shift drum.
 - c. Rotating output shaft by hand, shift through all six gears to verify proper operation. Input shaft may need to be rocked back and forth to get all gears to shift.
 - d. Install the mainshaft oil seal, quad seal, spacer sleeve/sprocket spacer, sprocket, and sprocket nut.

NOTE

*1990- mid 1994 models use a wider sprocket spacer Part Number 33334-85 and mainshaft oil seal Part Number 1250. These parts are not included with the kit and will need to be purchased separately. If a newer model sprocket is used 40250-94C, the mainshaft oil seal and the sprocket spacer in the kit may be used. The 2005 Touring models Service Manual (Part Number 99483-05) includes detailed instructions on installing the mainshaft oil seal, quad seal, spacer sleeve, sprocket and sprocket nut in **Section 7.7, MAIN DRIVE GEAR/BEARING.***

- e. Install the **new** bearing inner race onto the transmission mainshaft.
- f. Install the transmission top cover with **new** gasket. Verify that the shifter pawl does not contact the inside of the top cover during installation.
- g. Install **new** neutral switch into the transmission top cover. For 1998 **or** later models or if you are replacing your stock top cover with a 1998 or later model top cover, DO NOT remove the o-ring. For 1990-1997 model years, remove the o-ring from the neutral switch and install the aluminum washer Part Number 6288 with the chamfer side of washer away from the switch body followed by the nylon washer Part Number 33043-80 on the neutral switch. These parts are included in the bag with your neutral switch. Install the neutral switch into top cover and torque to 120-180 **in-lbs** (13.6-20.3 Nm).
- h. Install connectors on neutral switch studs. For 1990 thru 1997 model years, refer to the wiring diagram at the back of the service manual. The wiring harness for these years has a single cap connector (H-D part number 9905) connected to the neutral switch. Replace the single cap connector as follows:
 - Cut single cap connector off stock wire.
 - Connect the supplied wire part number 72405-98TN to the cut wire with the supplied connector part number 70585-93 and attach onto either pole of the neutral switch.
 - Attach the other supplied new wire part number 72405-98BK to the remaining pole.

- Attach the supplied eyelet part number 72241-94A to the other end of the new wire and attach to a convenient grounding location.
 - i. Install the starter and oil filler spout.
 - j. Install the exhaust system.
 - k. Install the primary chaincase and starter jackshaft assembly. Install the clutch assembly, primary chain, and compensating sprocket components. Install the primary chaincase cover.
 - l. Install drain plugs and fill the transmission and primary chaincase with the recommended lubricants.
5. Install plate with gasket over vehicle speed sensor bore in transmission case using existing hardware.
 6. Install vehicle speed sensor at top of transmission side door using **new** O-ring.
 7. Install side cover.
For **Cable Actuated Clutch**: Follow the instructions in the SE 6-Speed Cable Clutch Side Cover and Release Pushrod Kit (Part Number 38752-04).
For **Hydraulic Clutch**: Follow the instructions in the Hydraulic Cable Side Cover and Release Pushrod Kit (Part Number 38753-04), and in the Hydraulic Clutch Kit (Part Number 45033-03, Black or 45383-03, Chrome).
 8. Install battery negative cable (black) to battery negative (-) terminal.

TRANSMISSION SERVICE

9. Replace the transmission lubricant after the first 500 miles. Thereafter, refer to the Service Manual and change the lubricant at the recommended service intervals.





Service Parts

Part No. 33101-03A

Date 04/05

6 Speed Transmission Super Kit

Item	Quantity	Part No.
1. Mainshaft	1	35058-03
2. Countershaft	1	35059-03
3. Countershaft 1st Gear	1	35080-03
4. Mainshaft 3rd Gear/Countershaft 2nd Gear	2	35083-03
5. Mainshaft 4th Gear	1	35104-03
6. Mainshaft 6th Gear	1	35131-03
7. Mainshaft 1st Gear	1	35134-03
8. Countershaft 3rd Gear/ Mainshaft 2nd Gear	2	35135-03
9. Countershaft 4th Gear	1	35136-03
10. Shift Ring, 1-2, 3-4	2	35137-03
11. Shift Ring, 5-6	1	35138-03
12. Chrome Trap Door without Ear	1	35158-03
13. Shift Fork Shaft	1	34088-87A
14. Spline Sleeve	2	35140-03
15. Pillow Block Dowel	4	609
16. Shifter Fork, 1-2 Assembly	1	35143-03
17. Shifter Fork, 3-4 Assembly	1	35144-03
18. Shifter Fork, 5-6 Assembly	1	35145-03
19. Door Retaining Ring	2	35087-99
20. Trap Door Bearing	2	8992A
21. Mainshaft/Countershaft Locknut	2	35078-79
22. Speedo Sensor O-Ring	2	11289A
23. Split Cage Bearing	5	8876A
24. Mainshaft/Countershaft Retaining Ring	8	37088-85
25. Mainshaft Thrust Washer	2	6003
26. Sprocket Spacer	1	33344-94
27. Mainshaft Race	1	34091-85A
28. Main Case Seal	1	12067B
29. Case Bearing Retaining Ring	1	11161
30. Quad Seal	1	11165
31. Main Case Bearing	1	8996A
32. Mainshaft 5th Gear	1	35237-03
33. Right Pillow Block	1	33304-00
34. Detent Arm Screw	1	33376-00
35. Detent Sleeve	1	33375-00A
36. Detent Follower	1	33364-00A
37. Spring Detent Arm	1	33374-00
38. Shifter Shaft Assembly	1	33374-00
39. Clutch Release Cover Gasket	1	35148-03
40. Pillow Block Screw	4	3909
41. Centering Shifter Screw	1	34978-00A
42. Countershaft Bearing	1	8977
43. Lower Clutch Release Cover Screw	4	4718A
44. Upper Clutch Release Cover Screw	2	4717A
45. Trap Door Lower Screw	4	3249
46. Trap Door Upper Screw	2	4718A
47. Sleeve	1	34979-00
48. Drain Plug	1	45830-48
49. Shifter Seal Washer	1	6497HW
50. Shift Fork Shaft Screw	1	3784
51. Sensor Plate Gasket	1	35152-03
52. Countershaft Gear, 5th	1	35238-03
53. Speedo Sensor Plate Screw	2	3594
54. Plate Sensor	1	35153-03
55. Trap Door Gasket	1	35147-03
56. Clutch Cable Coupler	1	34920-86A
57. Switch (Neutral)	1	33904-00A



Service Parts

Part No. 33101-03A

Date 04/05

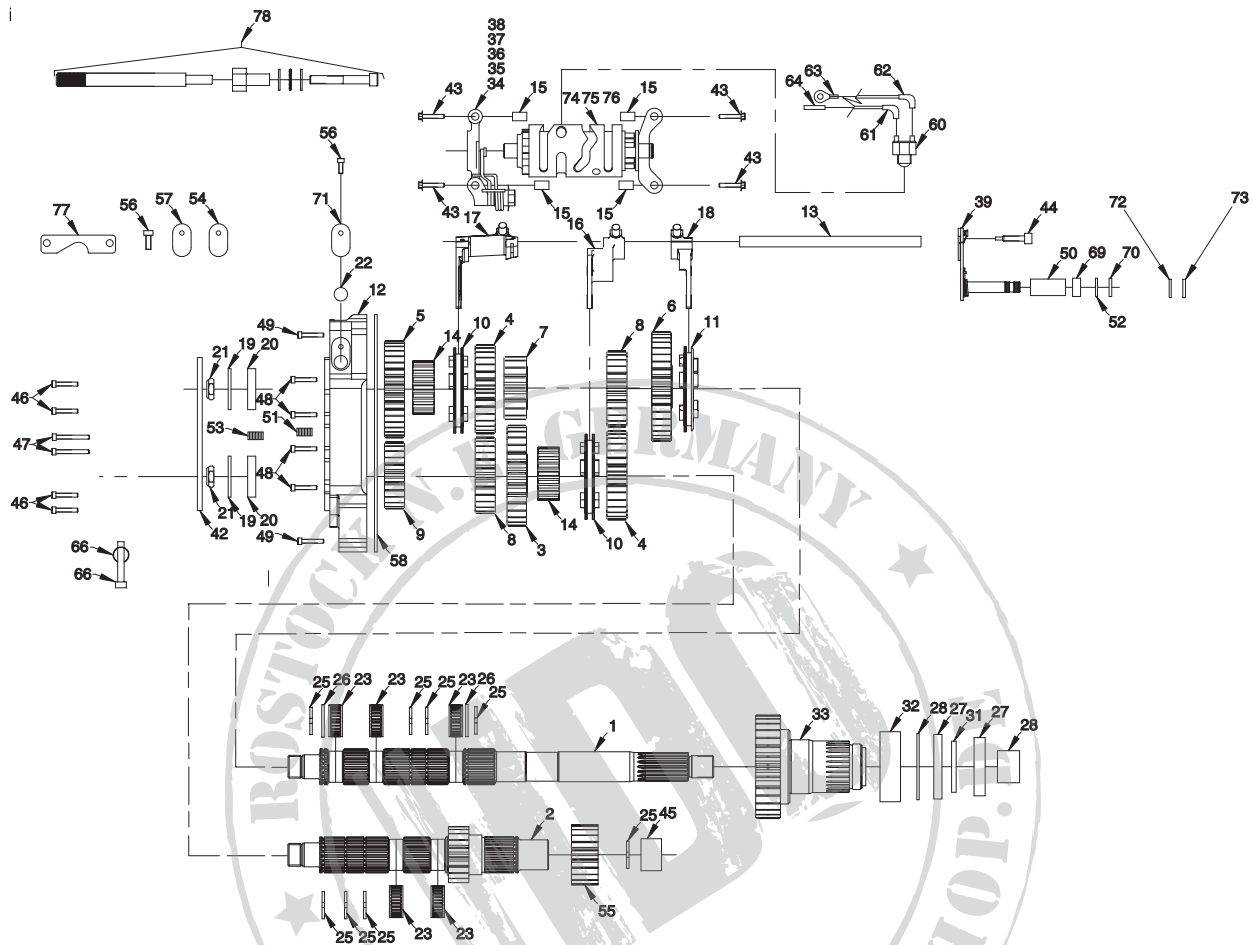
6 Speed Transmission Super Kit

Item	Quantity	Part No.
58. Wire Assembly (Black)	1	72405-988K3
59. Wire Assembly (Tan)	1	72405-98TN
60. Terminal (1/4 in. ring, 14-18 ga.)	1	72241-94A
61. Connector (18-20 ga.)	1	70585-93
62. Chrome Dipstick	1	37075-87
63. Dipstick O-Ring	1	11132
64. Shift Drum Assembly	1	35142-03
65. Left Pillow Block	1	33301-00A
66. Shift Drum Retainer	1	11342
67. Case Modification Tool	1	35155-03
68. Tool (Shifter Shaft Sleeve Removal/Install)	1	35156-03
69. Shifter Seal	1	12045
70. Shifter Retaining Ring	1	11150
71. Speedo Sensor Plug	1	35239-03
72. Nylon Washer	1	33043-80
73. Washer	1	6288
Items Not Shown:		
Top Cover Gasket	1	34904-86D
Oil Fill Spout Gasket, FLHT 1993 and Later	1	62432-90A





6 Speed Transmission Super Kit



- 1. Mainshaft
- 2. Countershaft
- 3. Countershaft 1st Gear
- 4. Mainshaft 3rd Gear/
Countershaft 2nd Gear (2)
- 5. Mainshaft 4th Gear
- 6. Mainshaft 6th Gear
- 7. Mainshaft 1st Gear
- 8. Countershaft 3rd Gear/
Mainshaft 2nd Gear (2)
- 9. Countershaft 4th Gear
- 10. Shift Ring, 1-2, 3-4 (2)
- 11. Shift Ring, 5-6
- 12. Chrome Trap Door W/O Ear
- 13. Shift Fork Shaft
- 14. Spline Sleeve (2)
- 15. Pillow Block Dowel (4)
- 16. Shift Fork, 1-2 Assembly
- 17. Shift Fork, 3-4 Assembly
- 18. Shift Fork, 5-6 Assembly
- 19. Door Retaining Ring (2)
- 20. Trap Door Bearing (2)
- 21. Mainshaft/Countershaft
Locknut (2)
- 22. Speedo Sensor O-Ring (2)
- 23. Cage Bearing Split (5)
- 24. Mainshaft/Countershaft
Retaining Ring (8)
- 25. Mainshaft Thrust Washer
(2)
- 26. Sprocket Spacer
- 27. Mainshaft Race

- 28. Main Case Seal
- 29. Case Bearing Retaining Ring
- 30. Quad Seal
- 31. Main Case Bearing
- 32. Mainshaft, 5th Gear
- 33. Right Pillow Block
- 34. Detent Arm Screw
- 35. Detent Sleeve
- 36. Detent Follower
- 37. Detent Arm Spring
- 38. Shifter Shaft Assembly
- 39. Clutch Release Gasket Cover
- 40. Pillow Block Screw (4)
- 41. Centering Shifter Screw
- 42. Countershaft Bearing
- 43. Lower Clutch Release Cover,
(4)
- 44. Upper Clutch Release Cover,
(2)
- 45. Lower Trap Door Screw (4)
- 46. Upper Trap Door Screw (2)
- 47. Shifter Shaft Sleeve
- 48. Drain Plug
- 49. Shifter Seal Washer
- 50. Shift Fork Shaft Screw

- 51. Sensor Plate Gasket
- 52. Countershaft 5th Gear
- 53. Speedo Sensor Plate Screw (2)
- 54. Plate Sensor
- 55. Trap Door Gasket
- 56. Clutch Cable Coupler
- 57. Switch (Neutral)
- 58. Wire Assembly (Black)
- 59. Wire Assembly (Tan)
- 60. Terminal (1/4" ring 14-18 ga.)
- 61. Connector (18-20 ga.)
- 62. Chrome Dipstick
- 63. Dipstick O-Ring
- 64. Shift Drum Assembly
- 65. Left Pillow Block
- 66. Shift Drum Retainer
- 67. Case Modification Tool
- 68. Tool (Remove/Install Shifter
Shaft Sleeve)
- 69. Shifter Seal
- 70. Shifter Retaining Ring
- 71. Speedo Sensor Plug
- 72. Nylon Washer
- 73. Washer

Items Not Shown:
Top Cover Gasket
Oil Spout Gasket, (1993 and Later FLHT)