

Table 7-1. Transmission Data

ITEM		DATA
Type		5-speed forward - constant mesh
SYN3	Quart	Part No. 99824-03/00QT
Capacity (dry)		24 oz.
		710 ml
Capacity (wet)		Approximately 20-24 oz.
		590-710 ml

Table 7-2. Internal Gear Ratios

GEAR	RATIO
First	3.21
Second	2.21
Third	1.57
Fourth	1.23
Fifth	1.00

Table 7-3. Shifter Forks

ITEM	INCHES	MM
Shifter fork to cam groove end play	0.0017-0.0019	0.043-0.048
Shifter fork to gear groove end play	0.0010-0.0110	0.025-0.279

Table 7-4. Mainshaft

ITEM	INCHES	MM
Mainshaft runout	0.000-0.003	0.000-0.08
Mainshaft end play	none	none
1st gear clearance	0.0000-0.0080	0.000-0.203
2nd gear clearance	0.0000-0.0800	0.000-2.032
3rd gear end play	0.0050-0.0420	0.127-1.067
3rd gear clearance	0.0003-0.0019	0.008-0.048
4th gear end play	0.0050-0.0310	0.127-0.787
4th gear clearance	0.0003-0.0019	0.008-0.048

Table 7-5. Main Drive Gear (5th)

ITEM	INCHES	MM
Bearing fit in transmission case (loose)	0.0003-0.0017	0.008-0.043
Fit in bearing (tight)	0.0009	0.023
Fit in bearing (loose)	0.0001	0.0025
Fit on mainshaft	0.0001-0.0009	0.0025-0.023
End play	none	none
Fit in side door (tight)	0.0014-0.0001	0.036-0.0025
Fit on countershaft (tight)	0.0008	0.020
Fit on countershaft (loose)	0.00001	0.0003
Fit on mainshaft (tight)	0.0007	0.018
Fit on mainshaft (loose)	0.0001	0.0025

Table 7-6. Countershaft

ITEM	INCHES	MM
Countershaft runout	0.000-0.003	0.00-0.08
Countershaft end play	none	none
1st gear clearance	0.0003-0.0019	0.008-0.048
1st gear end play	0.0050-0.0039	0.127-0.099
2nd gear clearance	0.0003-0.0019	0.008-0.048
2nd gear end play	0.0050-0.0440	0.127-1.118
3rd gear clearance	0.0000-0.0080	0.000-0.203
4th gear clearance	0.0000-0.0080	0.000-0.203
4th gear end play	0.0050-0.0390	0.127-0.991
5th gear clearance	0.0000-0.0080	0.000-0.203
5th gear end play	0.0050-0.0040	0.127-0.102

Table 7-7. Shifter Dogs

ITEM	MINIMUM CLEARANCE	MAXIMUM CLEARANCE
2nd-5th	0.035 in.	0.139 in.
	0.89 mm	3.53 mm
2nd-3rd	0.035 in.	0.164 in.
	0.89 mm	4.17 mm
1st-4th	0.035 in.	0.152 in.
	0.89 mm	3.86 mm
1st-3rd	0.035 in.	0.157 in.
	0.89 mm	3.99 mm

ITEM	TORQUE		NOTES
Clutch fluid line flare nut	80-115 in-lbs	9.0-13.0 Nm	page 7-5
Clutch fluid reservoir cover screw	6-8 in-lbs	0.7-0.9 Nm	page 7-5
Clutch master cylinder banjo bolt	17-22 ft-lbs	23.1-29.9 Nm	page 7-5
Clutch release cover screw	120-144 in-lbs	13.5-16.3 Nm	page 7-5
Clutch secondary actuator bleeder valve	80-100 in-lbs	9.0-11.3 Nm	page 7-5
Filler plug/dipstick	25-75 in-lbs	2.8-8.5 Nm	page 7-5
Transmission drain plug	14-21 ft-lbs	19.0-28.5 Nm	page 7-5

REMOVAL

1. Remove filler plug/dipstick.
2. Place a suitable container under transmission. Remove magnetic drain plug at bottom right of oil pan and drain transmission lubricant.
3. Remove seat. See [2.12 SEAT](#).

⚠ WARNING

To prevent accidental vehicle start-up, which could cause death or serious injury, remove maxi-fuse before proceeding. (00251a).

4. Remove left saddlebag, left side cover and Maxi-Fuse.
5. Remove the right side of the exhaust system. See EXHAUST in the Touring Models Service Manual.
6. See [Figure 7-1](#). Place a suitable container under clutch release cover. Remove cap and open bleeder valve and loosen flare nut and allow clutch fluid to drain.
7. Remove flare nut on outside of the clutch release cover. Remove clutch fluid line and drain line.

NOTE

Dispose of clutch fluid in accordance with local regulations.

8. See [Figure 7-3](#). Remove o-ring on end of clutch fluid line. Discard o-ring.

NOTE

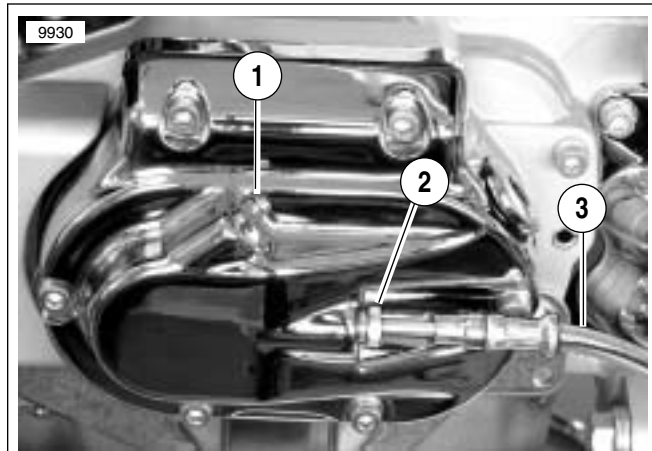
Clutch fluid line o-ring may stick to inside of clutch release cover. Use a pick to remove old o-ring and other debris.

9. Remove clutch release cover fasteners, cover and gasket.
10. Clean and inspect clutch release cover. Clean with denatured alcohol or D.O.T. 4 HYDRAULIC BRAKE FLUID (Part No. 99953-99A) only.

NOTE

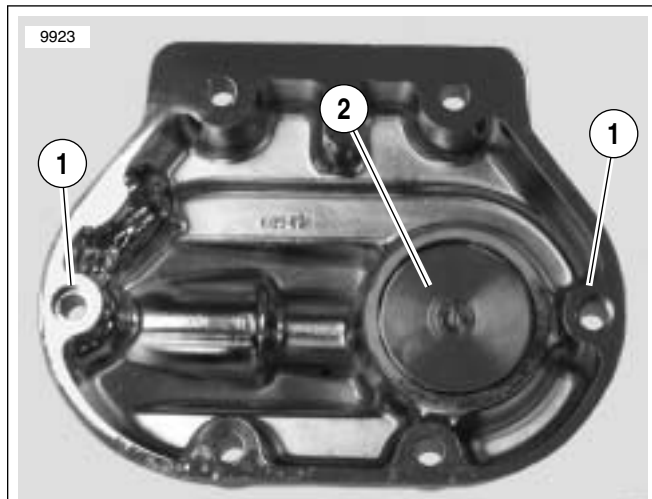
If required, replace locating dowels in transmission side door.

11. See [Figure 7-2](#). Disassemble and inspect secondary clutch actuator. Rebuild if required. See [7.5 SECONDARY CLUTCH ACTUATOR](#).



1. Bleeder valve (cap removed)
2. Flare nut
3. Clutch fluid line

**Figure 7-1. Clutch Release Cover
(exhaust system removed)**



1. Hole for locating dowel
2. Secondary clutch actuator

Figure 7-2. Inside Clutch Release Cover

INSTALLATION

1. Place a **new** clutch release gasket on locating dowels and position clutch release cover on transmission side door.
2. Install fasteners with the two short fasteners at the top of the release cover. Tighten fasteners to 120-144 **in-lbs** (13.5-16.3 Nm).
3. See [Figure 7-3](#). Install a **new** clutch fluid line o-ring on the end of the clutch fluid line.
4. Install clutch fluid line flare nut to clutch release cover. Tighten to 80-115 **in-lbs** (9.0-13.0 Nm).
5. Loosen bleeder valve.

⚠ WARNING

Be sure no clutch fluid gets on tires, wheels or brakes when adding fluid. Traction can be adversely affected, which could result in loss of control and death or serious injury. (00294a)

⚠ WARNING

Do NOT allow dirt or debris to enter the clutch master cylinder reservoir. Dirt or debris in the reservoir can cause improper operation of the clutch and equipment damage. (00205a)

⚠ WARNING

Direct contact of D.O.T. 4 brake fluid with eyes can cause irritation. Avoid eye contact. In case of eye contact flush with large amounts of water and get medical attention. Swallowing large amounts of D.O.T. 4 brake fluid can cause digestive discomfort. If swallowed, obtain medical attention. Use in well ventilated area. KEEP OUT OF REACH OF CHILDREN. (00240a)

⚠ WARNING

The piston in the secondary clutch actuator is under pressure. Squeezing the clutch hand lever could force the piston out of its housing with sufficient force to cause death or serious injury.

CAUTION

D.O.T. 4 hydraulic brake fluid is used in the hydraulic clutch. Do not use other types of fluids as they are not compatible and could cause equipment damage. (00353a)

6. Remove clutch fluid reservoir cover and fill with D.O.T. 4 HYDRAULIC BRAKE FLUID (Part No. 99953-99A). Allow fluid to fill clutch line until a steady flow of clutch fluid flows from bleeder valve. Tighten bleeder valve.

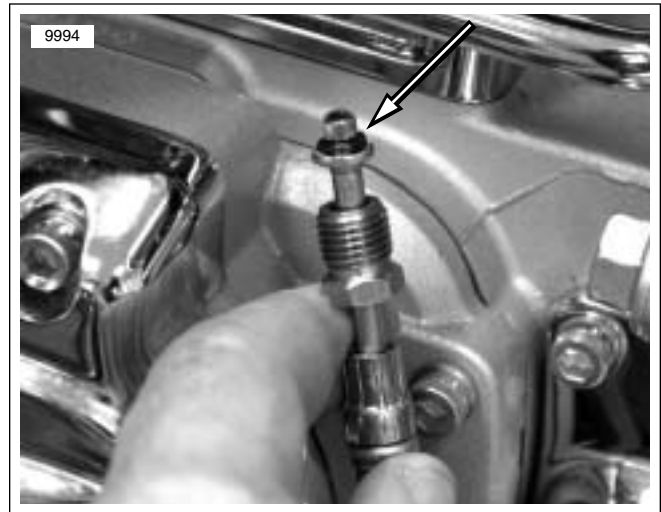


Figure 7-3. Clutch Fluid Line O-ring

NOTE

When filling an empty clutch fluid line, a Snap-on BASIC VACUUM BRAKE BLEEDER with a fitting that mates to the bleeder valve threads can be used to initially draw the fluid down the clutch line with little or no air in the line.

7. Bleed clutch fluid line. See [BLEEDING CLUTCH FLUID LINE](#).
8. Tighten fasteners as follows:
 - a. Master cylinder banjo bolt to 17-22 ft-lbs (23.1-29.9 Nm).
 - b. Bleeder valve to 80-100 **in-lbs** (9.0-11.3 Nm).
 - c. Reservoir cover screws to 6-8 **in-lbs** (0.7-0.9 Nm).
9. Install bleeder valve cap.
10. Inspect o-ring on transmission lubricant drain plug and replace as necessary. Install drain plug and tighten to 14-21 ft-lbs (19.0-28.5 Nm).
11. Fill the transmission with 20-24 oz. (590-710 ml) of transmission lubricant or until the lubricant level on the dipstick of the filler plug is at the F (full) mark with the motorcycle level and upright and the filler plug resting on the threads. Use only Harley-Davidson TRANSMISSION LUBRICANT, Part No. 98853-96 (case/quarts), or Part No. 98852-96 (case/gallons).
12. Inspect the filler plug/dipstick o-ring and install filler plug/dipstick. Tighten the plug to 25-75 **in-lbs** (2.8-8.5 Nm).
13. Install exhaust system. See EXHAUST in Touring Models Service Manual.
14. Install Maxi-Fuse, left side cover and left saddlebag.
15. Install seat. See [2.12 SEAT](#).

REBUILD

1. Remove the clutch release cover. See [7.4 CLUTCH RELEASE COVER](#).

WARNING

Compressed air can pierce the skin and flying debris from compressed air could cause serious eye injury. Wear safety glasses when working with compressed air. Never use your hand to check for air leaks or to determine air flow rates. (00061a)

2. Remove piston.
 - a. If the bleeder valve was removed, reinstall.
 - b. Support on a wooden block and apply low pressure compressed air to clutch fluid line hole to remove piston from cover bore.
3. See [Figure 7-4](#). If necessary, wiggle piston from actuator bore to completely remove.
4. Remove the spring. Discard spring and piston assembly.

CAUTION

Avoid leakage. Prevent damage to piston or piston bore. Use non-metallic tools when servicing clutch actuator. (00328a)

5. Lubricate **new** piston assembly and piston bore with the service kit lubricant.
6. Install **new** spring.
7. While pushing piston into actuator bore, use a wooden tooth pick or the end of a cable wrap to prevent primary cup from rolling over.
8. Install the clutch release cover. See [7.4 CLUTCH RELEASE COVER](#).

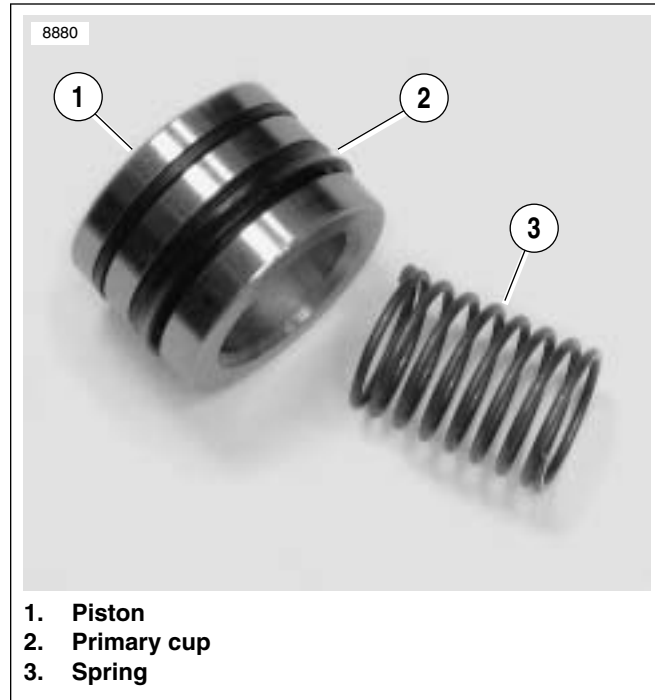


Figure 7-4. Secondary Clutch Actuator Components