

## CHAPTER SEVEN

# TRANSMISSION AND SHIFT MECHANISM

This chapter covers procedures for the transmission and shift mechanism for all models. Specifications are in **Tables 1-5** at the end of this chapter. Required tools are listed in the procedures and in **Table 11** of Chapter One

All models are equipped with a six-speed transmission, which is separate from the engine. The transmission shaft assemblies and the shift assemblies can be serviced with the transmission case mounted in the frame.

### NOTE

*On models with a security system, disarm the system before disconnecting the battery or pulling the main fuse so the siren will not sound. Refer to **Security System** in Chapter Nine.*

### SHIFT ASSEMBLY

The shift assembly (**Figure 1** and **Figure 2**) consists of the external shift linkage, internal shift cam and shift arm components.

If a shift problem is encountered, refer to the troubleshooting procedures in Chapter Two and eliminate all clutch and shift mechanism possibilities *before* considering transmission repairs. Improper clutch adjustment (Chapter Three) is often a cause of poor shifting.

### Shift Linkage Adjustment

The shift linkage assembly connects the rear shift lever (at the transmission) to the foot-operated forward shift lever. The shift linkage does not require adjustment unless

linkage is replaced or the transmission gears do not engage properly.

1. Pull the Main-Fuse as described in Chapter Nine.
2. Loosen the two shift rod locknuts (A, **Figure 3**).
3. Remove the acorn nut (B, **Figure 3**), lockwasher and washer securing the shift rod to the forward shift lever.
4. Turn the shift rod (C, **Figure 3**) as necessary to change the linkage adjustment.
5. Reconnect the shift rod to the forward shift lever. Tighten the acorn nut (B, **Figure 3**) securely.
6. Tighten the shift rod locknuts (A, **Figure 3**) to 80-120 in.-lb. (9-13.6 N•m), and recheck the shifting. Readjust if necessary.
7. If this adjustment does not correct the shifting problem, check shift linkage assembly for interference. Also check the shift linkage assembly for worn or damaged parts.
8. Install the Main-Fuse (Chapter Nine).

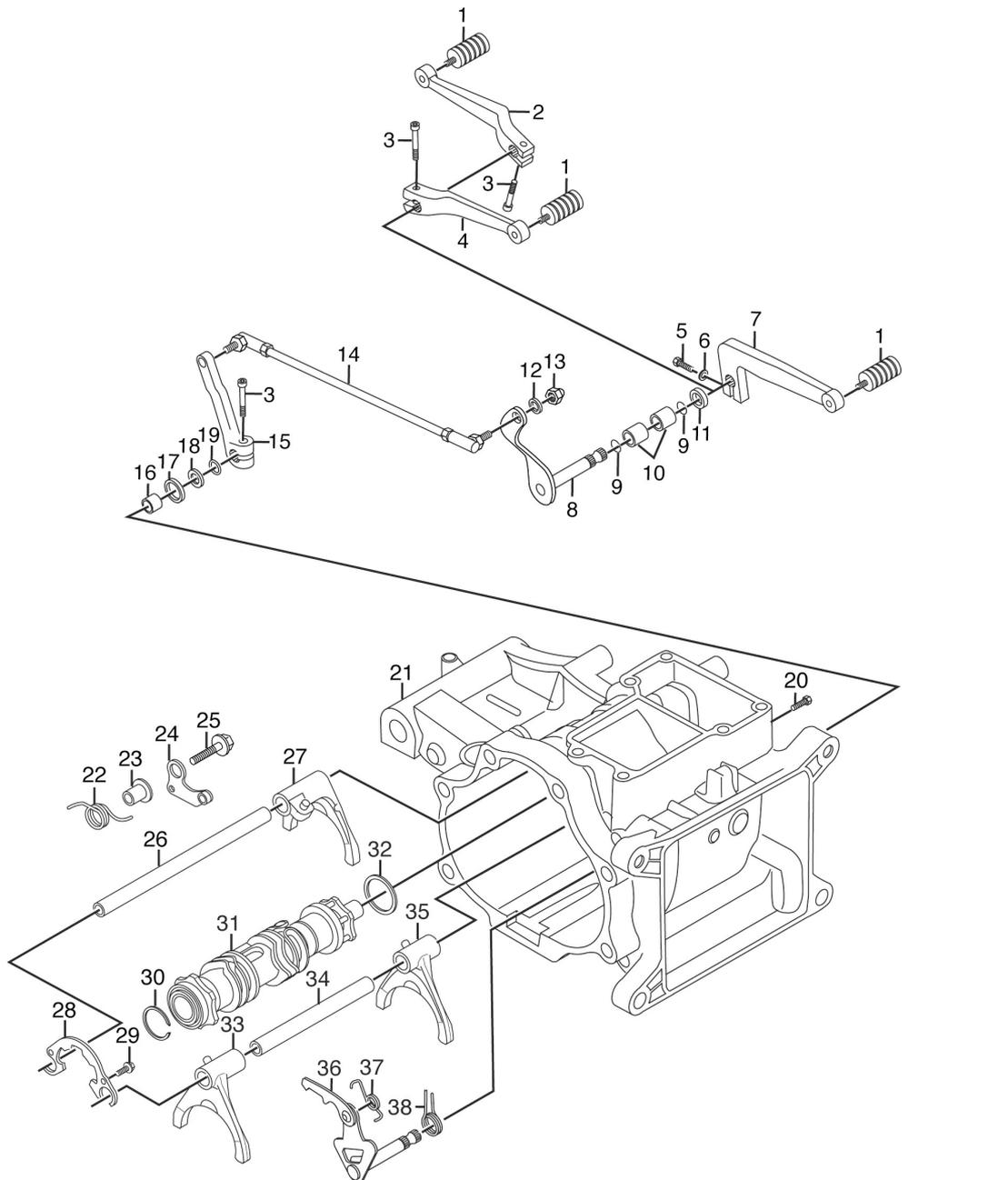
### EXTERNAL SHIFT MECHANISM

#### Removal/Installation

Refer to **Figure 1** or **Figure 2**.

1. Pull the Main-Fuse as described in Chapter Nine.
2. On models so equipped, remove the front left footboard (Chapter Fifteen).
- 3A. On models with a heel-toe shifter, perform the following:
  - a. Make an indexing mark on the heel shift pedal and a corresponding mark on the shaft of the forward shift lever.

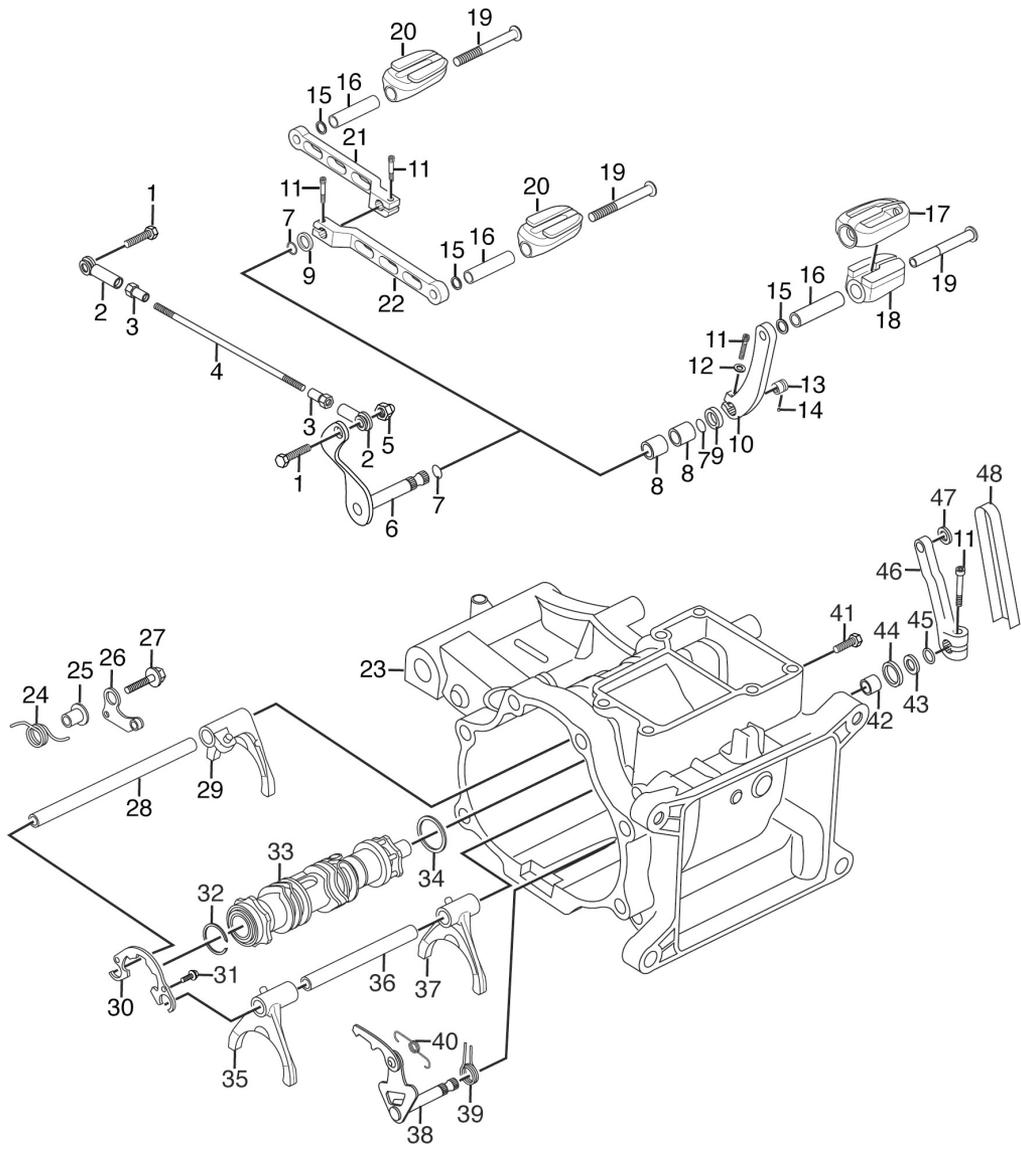
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**SHIFTER ASSEMBLY (ALL MODELS EXCEPT CVO)**

- |   |                       |                               |
|---|-----------------------|-------------------------------|
| 1. Shift peg  | 11. Nylon washer      | 26. Long shift fork shaft     |
| 2. Heel shift pedal (all models except FXCWC, FXSB, FXST and FXS) | 12. Washer            | 27. 5th/6th gear shift fork   |
| 3. Clamp bolt   | 13. Acorn nut         | 28. Shift cam lockplate       |
| 4. Toe shift pedal (all models except FXCWC, FXSB, FXST and FXS)  | 14. Shift rod         | 29. Lockplate bolt            |
| 5. Clamp bolt   | 15. Shift lever, rear | 30. Retaining ring            |
| 6. Lockwasher   | 16. Sleeve            | 31. Shift cam                 |
| 7. Shift pedal (FXCWC, FXSB, FXST and FXS models)                 | 17. Oil seal          | 32. Retaining ring            |
| 8. Shift lever, forward   | 18. Washer            | 33. 1st/2nd gear shift fork   |
| 9. O-ring   | 19. Snap ring         | 34. Short shift fork shaft    |
| 10. Bearing sleeve  | 20. Centering screw   | 35. 3rd/4th gear shift fork   |
|   | 21. Transmission case | 36. Shift shaft/pawl assembly |
|   | 22. Spring            | 37. Shift pawl spring         |
|   | 23. Sleeve            | 38. Shift shaft spring        |
|   | 24. Detent arm        |                               |
|   | 25. Detent arm bolt   |                               |

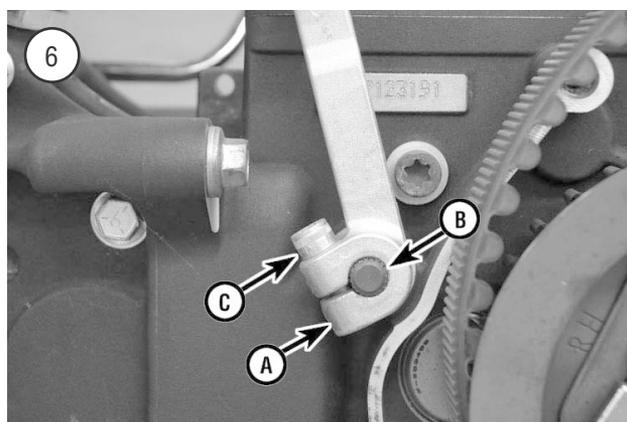
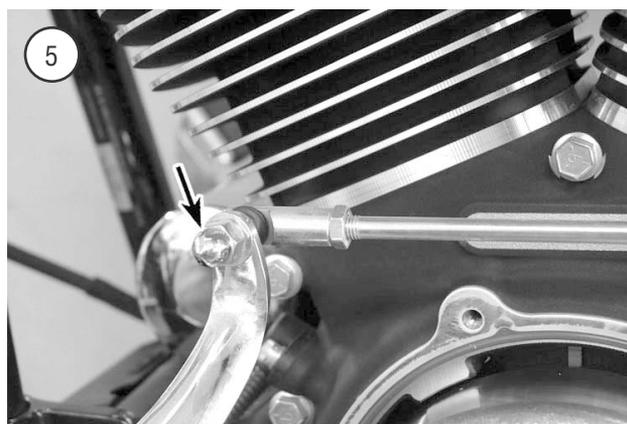
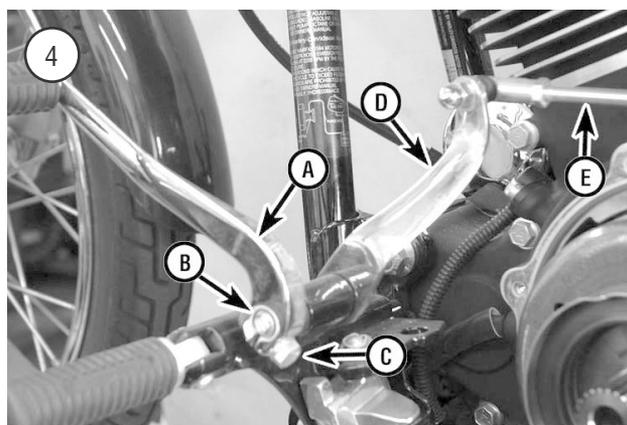
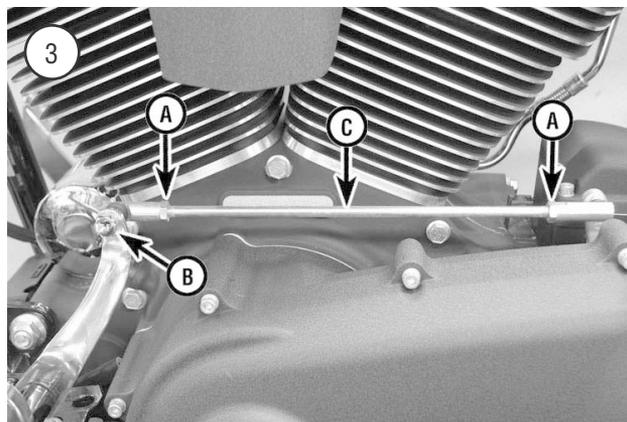
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**SHIFTER ASSEMBLY (CVO MODELS)**



- |   |  |                                  |
|---|--|----------------------------------|
| 1. Bolt                                       | 18. Shift peg                            | 33. Shift cam                    |
| 2. Rod end                                    | 19. Bolt                                 | 34. Retaining ring               |
| 3. Locknut                                    | 20. Shift peg<br>(FLSTNSE models)        | 35. 1st/2nd gear shift<br>fork   |
| 4. Shift rod                                  | 21. Toe shift pedal<br>(FLSTNSE models)  | 36. Short shift fork shaft       |
| 5. Acorn nut                                  | 22. Heel shift pedal<br>(FLSTNSE models) | 37. 3rd/4th gear shift fork      |
| 6. Shift lever, forward                       | 23. Transmission case                    | 38. Shift shaft/pawl<br>assembly |
| 7. O-ring                                     | 24. Spring                               | 39. Shift shaft spring           |
| 8. Bearing sleeve                             | 25. Sleeve                               | 40. Shift pawl spring            |
| 9. Washer                                     | 26. Detent arm                           | 41. Centering pin                |
| 10. Shift pedal                               | 27. Detent arm bolt                      | 42. Sleeve                       |
| 11. Clamp bolt                                | 28. Long shift fork shaft                | 43. Washer                       |
| 12. Washer                                    | 29. 5th/6th gear shift fork              | 44. Oil seal                     |
| 13. Shaft cover                               | 30. Shift cam lockplate                  | 45. Snap ring                    |
| 14. Set screw                                 | 31. Lockplate bolt                       | 46. Shift lever, rear            |
| 15. Lockwasher                                | 32. Retaining ring                       | 47. Shift cover spacer           |
| 16. Spacer                                    |  | 48. Shift cover                  |
| 17. Peg cover (FLSTSE2 and<br>FLSTSE3 models) |  |                                  |

- b. Loosen the clamp bolt, and remove the heel shift pedal from the forward shift lever.
  - c. Make an indexing mark on the toe shift pedal that corresponds to the mark made on the forward shift-lever shaft.
  - d. Loosen the clamp bolt and remove the toe shift pedal.
- 3B. On models with a single shift pedal, perform the following:
- a. Make an indexing mark on the shift pedal (A, **Figure 4**) and a corresponding mark on the shaft (B) of the forward shift lever.
  - b. Loosen the clamp bolt (C, **Figure 4**), and remove the shift pedal from the forward shift lever.
4. Remove the nylon washer from the shaft of the forward shift lever.
  5. Remove the acorn nut (**Figure 5**), lockwasher and washer securing the shift linkage rod to the forward shift lever.
  6. Remove the jiffy stand and mounting bracket assembly (Chapter Fifteen).
  7. Remove the primary chaincase assembly (Chapter Six).
  8. Make an indexing mark on the rear shift lever (A, **Figure 6**) and a corresponding mark on the shift shaft (B).
  9. Remove the clamp bolt (C, **Figure 6**) from the rear shift lever.
  10. Remove the forward shift lever (D, **Figure 4**), shift rod (E), and rear shift lever (A, **Figure 6**) as an assembly.
  11. Install by reversing the removal steps. Note the following:
    - a. Align the indexing marks made during removal.
    - b. Tighten the rear shift lever clamp bolt to 18-22 ft.-lb. (24.4-29.4 N•m) on all models except 2012-on FSX, FXSB and FXST. Tighten the bolt to 13-16 ft.-lb. (17.6-21.7 N•m) on 2012-on FXS, FXSB and FXST models.
    - c. Tighten the shift rod-to-shift lever locknut to specification:
      - 1) 2011 models: 80-120 in.-lb. (9.0-13.6 N•m),
      - 2) 2012 models: 96-144 in.-lb. (10.8-16.9 N•m),
      - 3) 2013-on models: 70-90 in.-lb. (7.9-10.2 N•m).



### TRANSMISSION TOP COVER

The transmission top cover assembly can be serviced with the transmission installed in the frame.

Refer to **Figure 7**.

#### Removal/Installation

1. Pull the Main-Fuse as described in Chapter Nine.
2. Remove the exhaust system as described in Chapter Four.
3. Remove the oil tank and oil lines (Chapter Five).
4. Disconnect the vent hose (**Figure 8**) from the top cover.

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