

CLUTCH

1998 Toyota Supra

1997-98 CLUTCHES
Toyota RWD

1997: Supra
1997-98: Supra Turbo, Tacoma, T100, 4Runner

DESCRIPTION

The single, dry-type disc clutch uses a hydraulically-operated master cylinder with a clutch release cylinder mounted on clutch housing. Clutch release cylinder is nonadjustable. The clutch start system uses a clutch start switch which prevents the engine from starting unless clutch pedal is fully depressed.

On Supra turbo models, flywheel consists of a secondary and primary flywheel. On 4WD models, a clutch start cancel switch is located on instrument panel, left of steering column. When clutch start cancel switch is depressed to the ON position with ignition on, the engine will start without depressing the clutch pedal. Clutch start cancel switch will stay on as long as ignition is on. The switch will turn off when ignition is turned off. The switch allows vehicle to be driven by cranking the engine with clutch engaged.

ADJUSTMENTS

CLUTCH PEDAL HEIGHT

1) Measure clutch pedal height from highest point of clutch pedal pad to floor panel. See Fig. 1. Ensure clutch pedal height is within specification. See CLUTCH PEDAL HEIGHT SPECIFICATIONS table.

2) On Supra, if clutch pedal height adjustment is required, disconnect clutch switch connector. Loosen lock nut and rotate clutch switch until correct clutch pedal height is obtained. See Fig. 1.

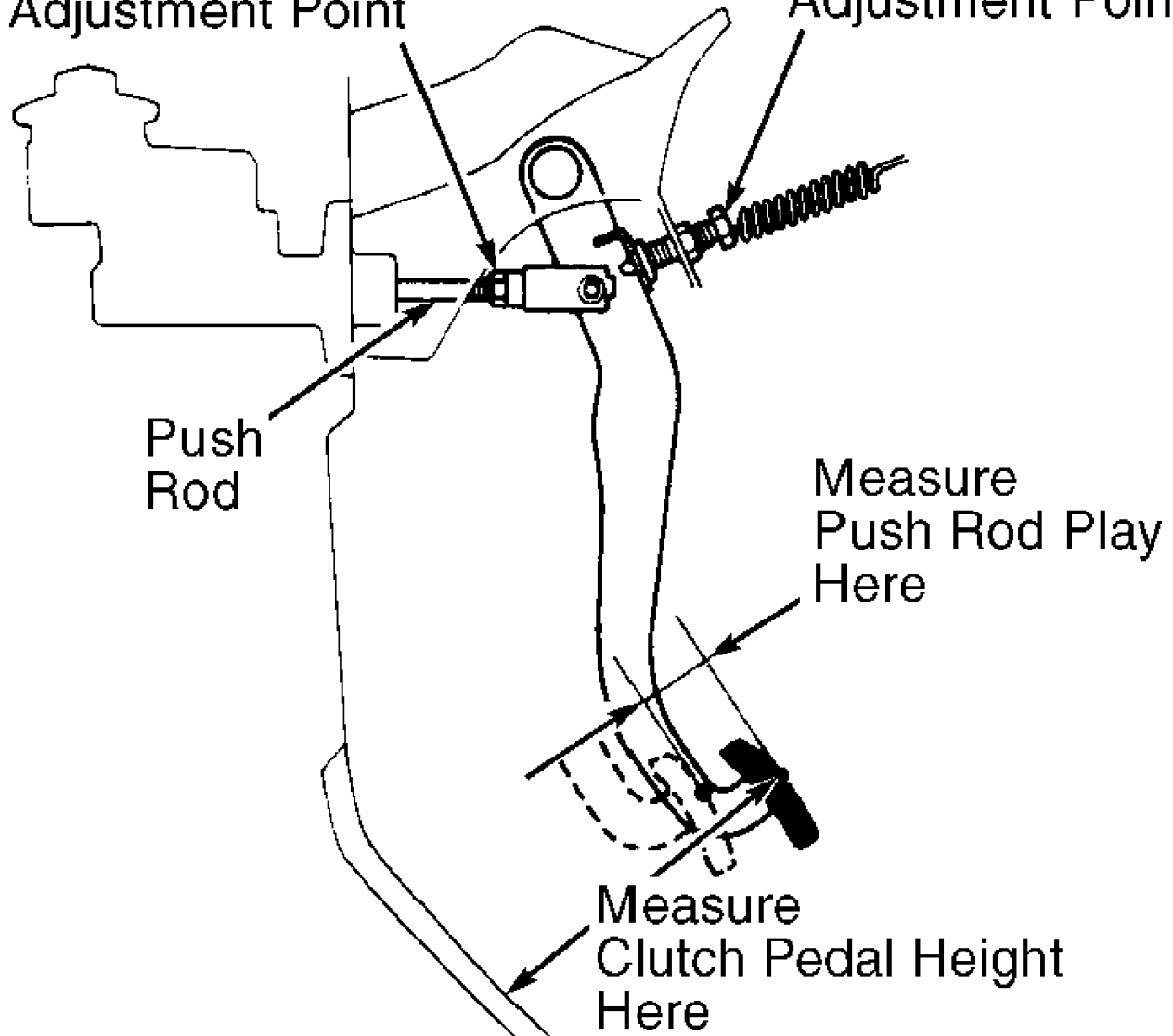
3) On all except Supra, if clutch pedal height adjustment is required, loosen lock nut and rotate bolt at clutch pedal height adjustment point until correct clutch pedal height is obtained. See Fig. 1. On all models, check clutch pedal free play and push rod play. See CLUTCH PEDAL FREE PLAY & PUSH ROD PLAY.

CLUTCH PEDAL HEIGHT SPECIFICATIONS

Application		In. (mm)
Supra	5.76-6.15 (146.2-156.2)
Tacoma	6.69-7.09 (170.0-180.0)
T100	6.08-6.48 (154.6-164.6)
4Runner	6.89-7.28 (175.0-185.0)

Clutch Pedal Free Play
& Push Rod Play
Adjustment Point

Clutch Pedal Height
Adjustment Point



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Fig. 1: Checking Clutch Pedal Height, Push Rod Play & Identifying Adjustment Points (Typical)
Courtesy of Toyota Motor Sales, U.S.A., Inc.

CLUTCH PEDAL FREE PLAY & PUSH ROD PLAY

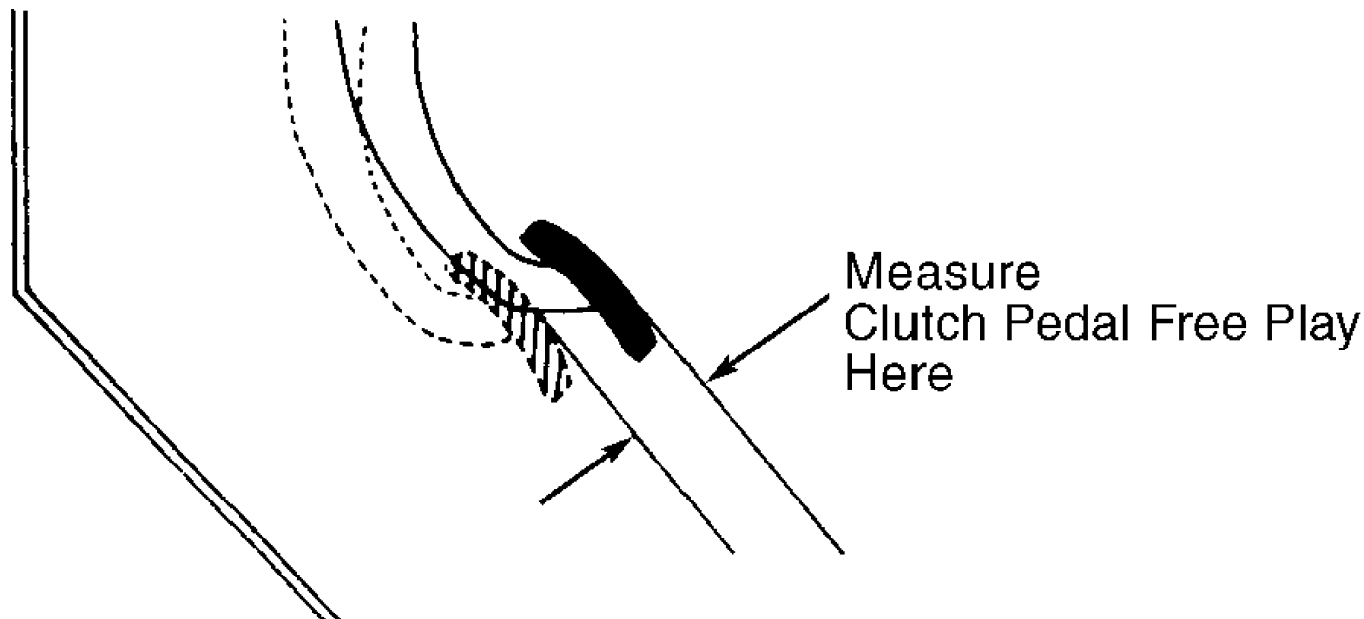
1) To check clutch pedal free play, push clutch pedal until beginning of clutch resistance is felt. See Fig. 2. Note distance clutch pedal moves. This is clutch pedal free play.

2) Clutch pedal free play should be .20-.59" (5.0-15.0 mm). If clutch pedal free play adjustment is required, loosen lock nut on push rod at master cylinder. See Fig. 1. Rotate push rod to obtain correct clutch pedal free play. Tighten lock nut.

3) To check push rod play, slightly push clutch pedal until

slight resistance is felt (point where push rod just starts to operate clutch master cylinder). See Fig. 1. Push rod play should be .039-.197" (1.00-5.00 mm) at top of clutch pedal. This ensures a slight amount of clearance at push rod.

4) If push rod play adjustment is required, loosen lock nut on push rod at master cylinder. Rotate push rod to obtain correct push rod play. Tighten lock nut. Recheck clutch pedal free play and clutch pedal height.



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Fig. 2: Measuring Clutch Pedal Free Play (Typical)
Courtesy of Toyota Motor Sales, U.S.A., Inc.

CLUTCH PEDAL RELEASE POINT

1) Block wheel and set parking brake. Start engine and allow it to idle. Without depressing clutch pedal, slowly move shift lever into reverse shift slot until gears begin to mesh (gear contact is heard). Gradually depress clutch pedal and measure stroke distance from point gear noise stops to full stroke end position.

2) Distance should be .98" (25 mm) or more. On Supra, check full pedal stroke. Full pedal stroke should be 5.20-5.43" (132.0-138.0 mm). If distance is not as specified, check pedal height, push rod play and pedal free play. See CLUTCH PEDAL HEIGHT and CLUTCH PEDAL FREE PLAY & PUSH ROD PLAY. If clutch pedal adjustments are as specified, bleed clutch system. If after bleeding system, distance is still not as specified, inspect clutch cover and disc for excessive wear.

TESTING

CLUTCH START SYSTEM

Supra

Ensure engine does not start when clutch pedal is released. Ensure engine starts when clutch pedal is fully depressed. If system is not operating correctly, check clutch start switch. See CLUTCH START SWITCH under TESTING. If clutch start switch is okay,

adjust clutch start switch for correct system operation.

Tacoma, T100 & 4Runner

1) Ensure clutch start cancel switch on instrument panel is in OFF position. Clutch start cancel switch is located on instrument panel, left of steering column. Ensure engine does not start when clutch pedal is released. Ensure engine starts when clutch pedal is fully depressed.

2) If system fails to operate correctly, check clutch start switch and clutch start cancel switch (if equipped). See CLUTCH START SWITCH and

CLUTCH START CANCEL SWITCH under TESTING.

CLUTCH START CANCEL SWITCH

Tacoma, T100 & 4Runner

1) Disconnect electrical connector from clutch start cancel switch, located on instrument panel, left of steering column. Remove clutch start switch from instrument panel (if necessary).

2) To check switch continuity, connect positive lead of ohmmeter to terminal No. 2 and negative lead to terminal No. 1 on switch electrical connector. See Fig. 3 or 4. Continuity should not exist.

3) Connect positive lead of ohmmeter to terminal No. 3 and negative lead to terminal No. 1. Continuity should not exist. Ensure continuity does not exist between terminals No. 2 and 3.

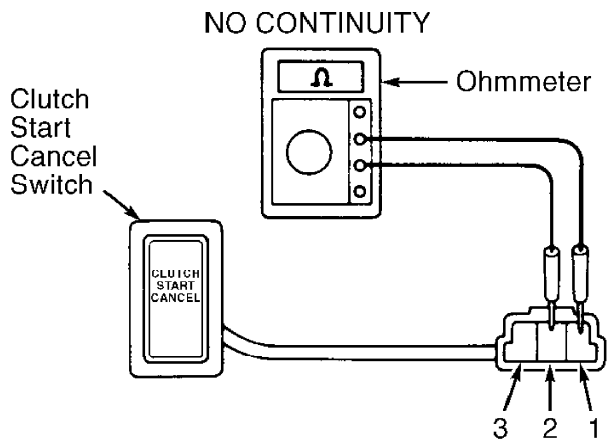
4) If continuity is as specified, proceed to next step.

Replace clutch start cancel switch if continuity is not as specified.

5) To check switch operation, connect battery voltage to terminals No. 1 and 3 on switch electrical connector. Connect positive lead of ohmmeter to terminal No. 2, and negative lead to terminal No. 1 on switch electrical connector. Continuity should not exist. Perform STEP 1. See Fig. 5.

6) With battery and ohmmeter still connected, depress switch button. Ensure light comes on in clutch start cancel switch, and continuity exists between terminals No. 1 and 2. Perform STEP 2. See Fig. 5.

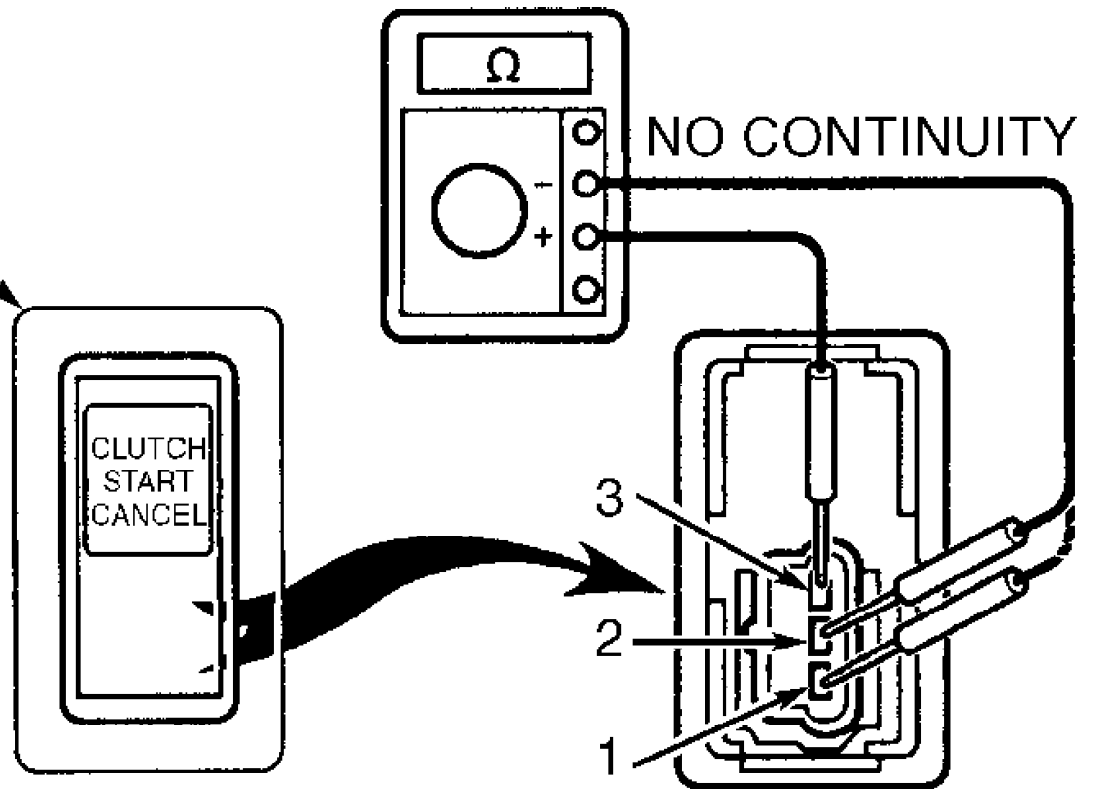
7) Disconnect positive battery lead. Ensure continuity does not exist between terminals No. 1 and 2. Perform STEP 3. See Fig. 5. Replace clutch start cancel switch if operation is not as specified.



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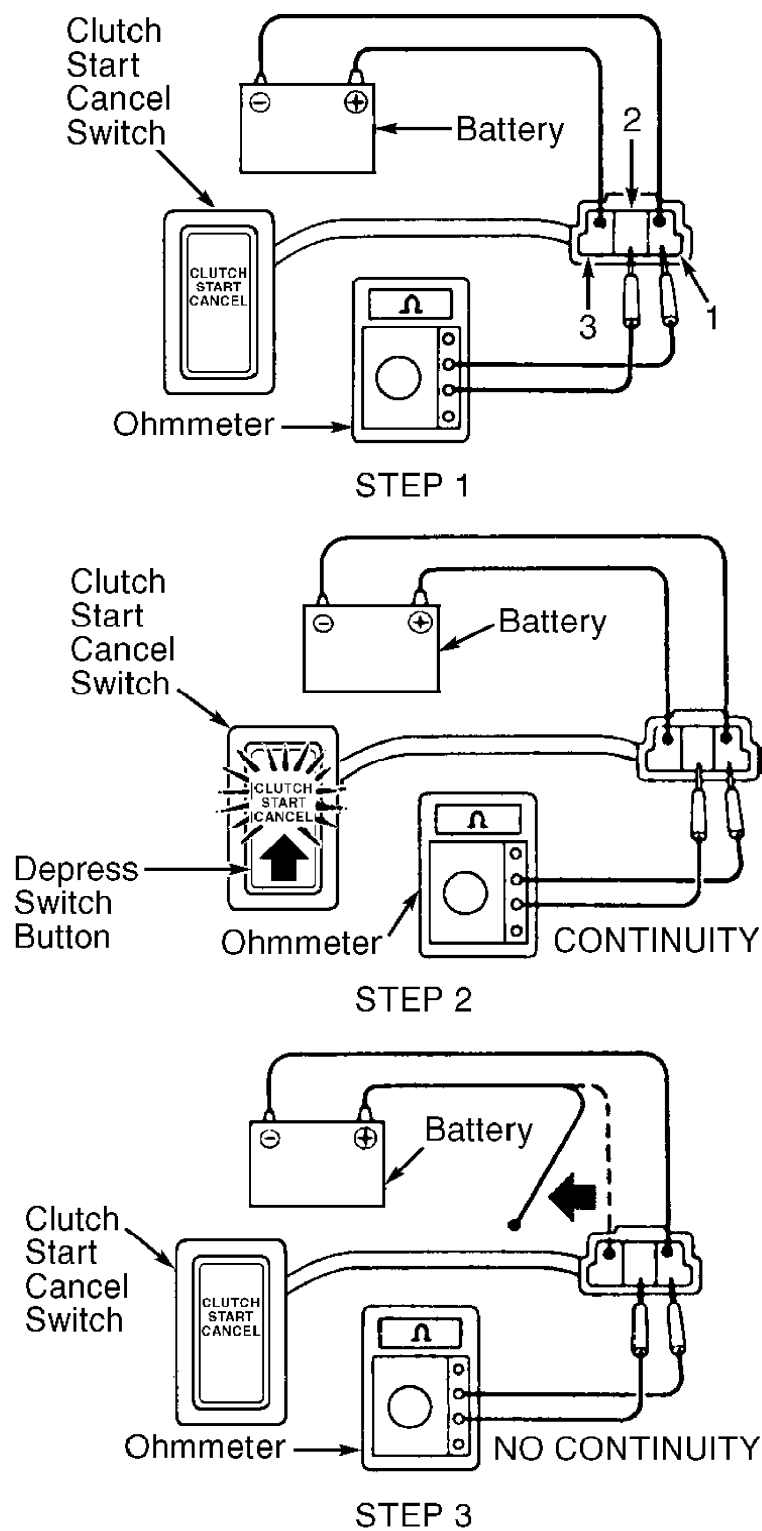
Fig. 3: Testing Clutch Start Cancel Switch Continuity (T100)
Courtesy of Toyota Motor Sales, U.S.A., Inc.

Clutch
Start
Cancel
Switch



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Fig. 4: Testing Clutch Start Cancel Switch Continuity (Tacoma & 4Runner)
Courtesy of Toyota Motor Sales, U.S.A., Inc.



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 Fig. 5: Testing Clutch Start Cancel Switch Operation (Tacoma, T100 & 4Runner)
 Courtesy of Toyota Motor Sales, U.S.A., Inc.

CLUTCH START SWITCH

1) Disconnect electrical connector from clutch start switch, located near rear of clutch pedal. See Fig. 6. Using an ohmmeter, ensure continuity exists between clutch start switch terminals when clutch pedal is fully depressed (ON position).

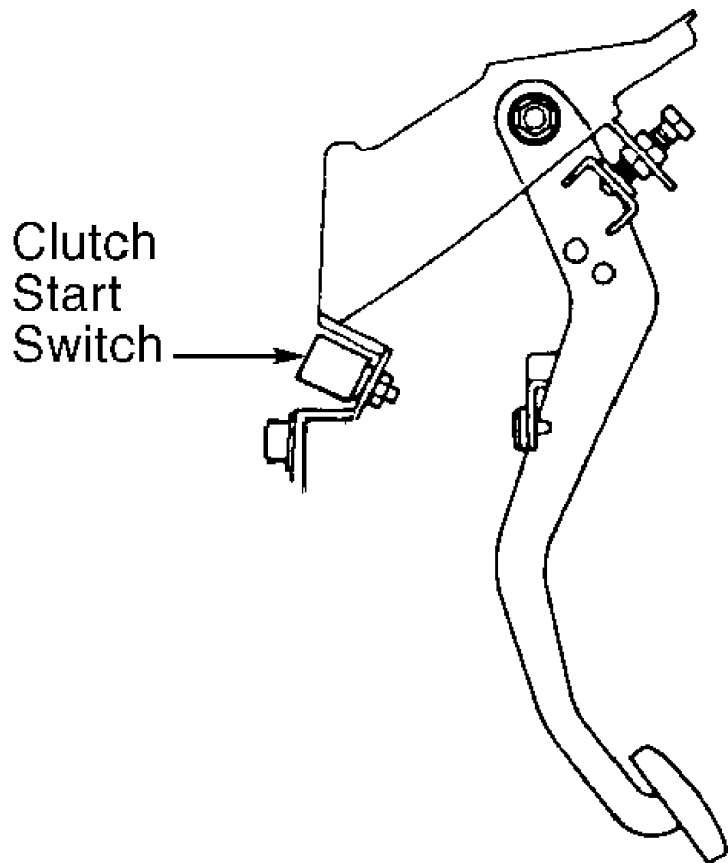
2) Ensure continuity does not exist when clutch pedal is released (OFF position). ON and OFF position is determined by distance that plunger extends from threaded end of clutch start switch. See Fig. 7 or 8.

3) For proper distance to determine switch continuity, see CLUTCH START SWITCH PLUNGER CONTINUITY SPECIFICATIONS table. Replace or adjust clutch start switch as necessary. Reinstall electrical connector.

CLUTCH START SWITCH PLUNGER CONTINUITY SPECIFICATIONS (1)

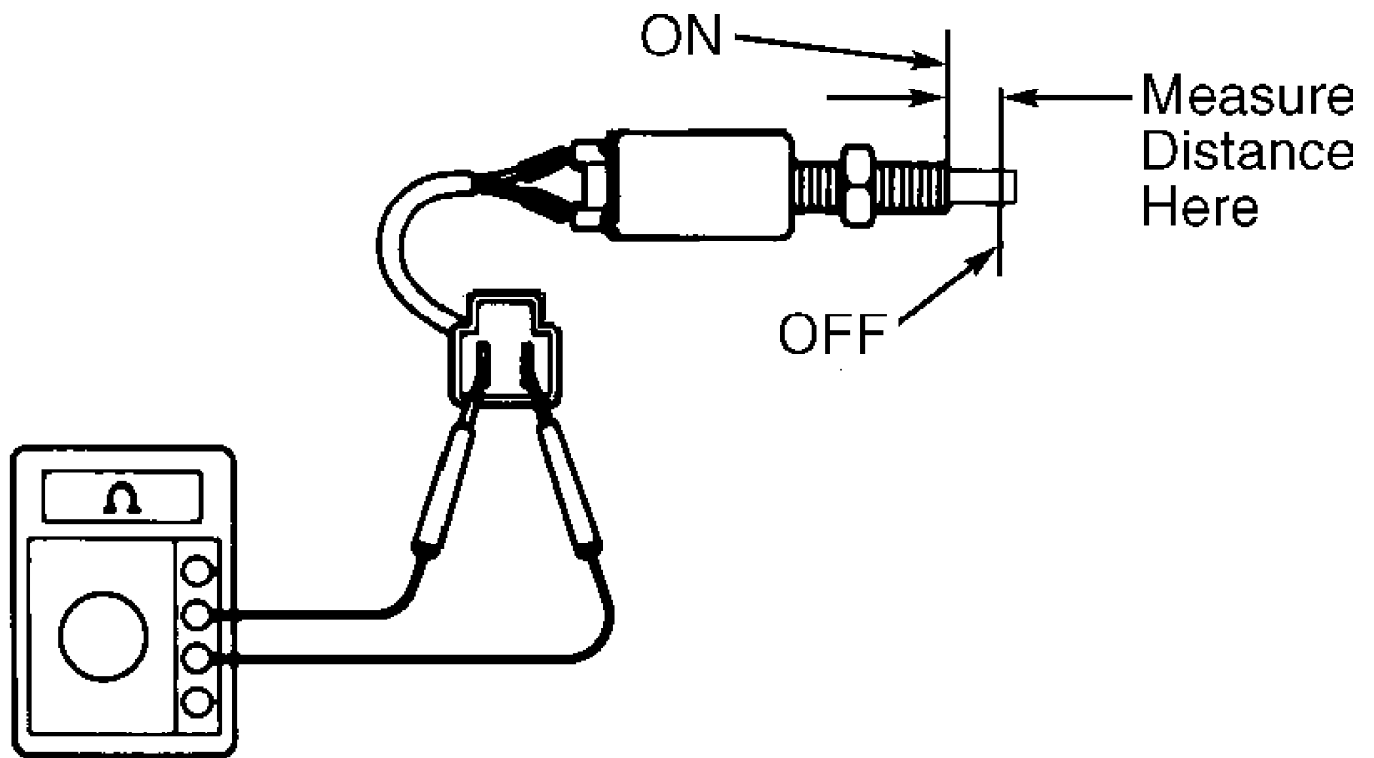
Application	In. (mm)
Supra, Tacoma, T100 & 4Runner295-.335 (7.50-8.50)

(1) - Distance from threaded end of clutch start switch where continuity changes. See Fig. 7 or 8.



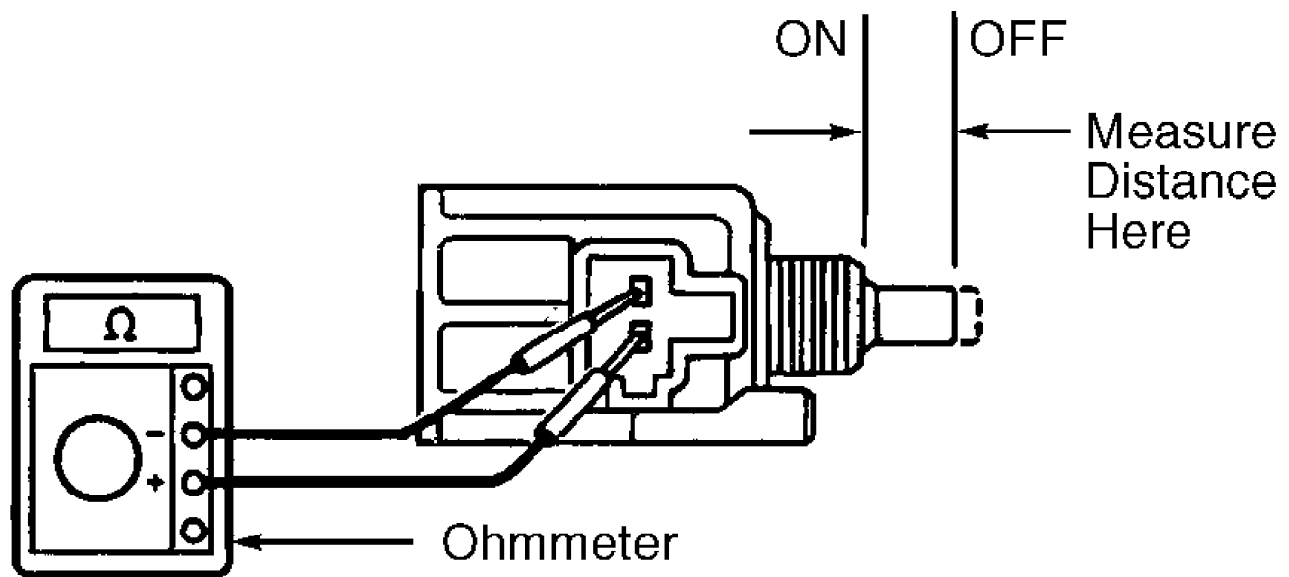
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Fig. 6: Identifying Clutch Start Switch Location (Typical)
Courtesy of Toyota Motor Sales, U.S.A., Inc.



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Fig. 7: Testing Clutch Start Switch (Supra & T100)
Courtesy of Toyota Motor Sales, U.S.A., Inc.



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Fig. 8: Testing Clutch Start Switch (Tacoma & 4Runner)
Courtesy of Toyota Motor Sales, U.S.A., Inc.

REMOVAL & INSTALLATION

*** PLEASE READ THIS FIRST ***

WARNING: To prevent air bag deployment, disconnect negative battery cable and wait at least 90 seconds before working on vehicle.

CLUTCH ASSEMBLY

Removal (Supra)

1) Disconnect negative battery cable. Remove shift knob from shift lever. Using a screwdriver, pry upper console panel (near shift lever) upward for access to shift lever bolts.

2) Remove bolts and shift lever boots. Remove shift lever bolts. On non-turbo models, remove upper shroud bolts from radiator. On all models, raise and support vehicle. Remove lower engine covers. Drain transmission. Remove and discard front exhaust pipe flange nuts. Remove cover and oxygen sensor. Remove and discard front exhaust pipe and oxygen sensor gaskets. Remove front exhaust pipe support bracket from clutch housing.

3) Remove center exhaust pipe that fits between front exhaust pipe and tailpipe with muffler assembly. Remove hangers. Remove and discard exhaust pipe gaskets. Remove heat insulator from body for access to drive shaft.

4) Remove crossmember brace bolted to body, below drive shaft. Place reference mark on drive shaft flanges for reassembly reference.

5) On non-Turbo models, remove center support bearing set bolts and adjusting washers (if equipped). Support center bearing. Remove 3 drive shaft flange-to-differential flange bolts. DO NOT remove drive shaft-to-drive shaft flange bolts. Separate drive shaft flange from differential flange. If drive shaft flange is not easily removed, insert screwdriver into bolt holes and pry drive shaft flange loose. DO NOT damage rubber portion of drive shaft flange with screwdriver. Remove drive shaft and plug transmission.

6) On turbo models, loosen adjusting nut, located in front of center support bearing, until it is finger tight. Remove 3 drive shaft flange-to-differential flange bolts. DO NOT remove drive shaft-to-drive shaft flange bolts. Separate drive shaft flange from differential flange. If drive shaft flange is not easily removed, insert screwdriver into bolt holes and pry drive shaft flange loose. DO NOT damage rubber portion of drive shaft flange with screwdriver.

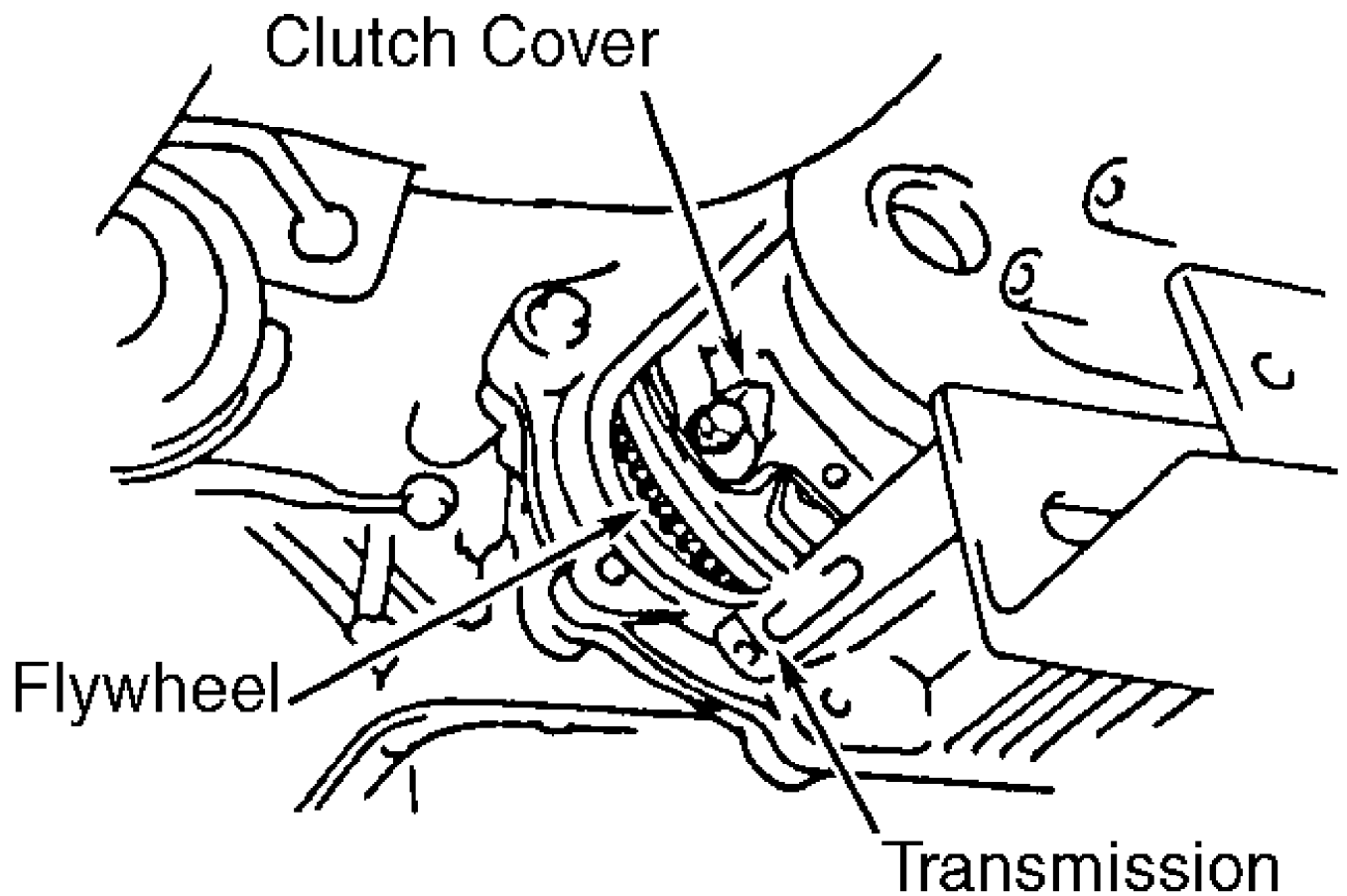
7) Remove 4 drive shaft flange-to-transmission flange nuts and washers. Remove center support bearing set bolts and adjusting washers (if equipped). Support center bearing.

8) On all models, slide drive shaft assembly forward to disengage drive shaft from centering pin on differential flange. Remove drive shaft.

9) Remove shift lever-to-shift linkage bolt at rear of transmission. Remove shift lever. Remove clutch release cylinder with hose attached and secure aside. Remove ground cable. Disconnect necessary electrical connectors at transmission.

NOTE: On turbo models, clutch cover bolts must be removed before transmission can be removed.

10) On turbo models, remove cover on driver's side of transmission for access to clutch cover bolts. Place reference mark on clutch cover and flywheel for reassembly reference. Remove 6 clutch cover bolts from flywheel. See Fig. 9.



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Fig. 9: Removing & Installing Clutch Cover Bolts (Supra Turbo)
 Courtesy of Toyota Motor Sales, U.S.A., Inc.

11) On all models, support engine with hoist. Using a transmission jack, slightly raise transmission to remove weight from mount.

12) Remove bolts/nuts and crossmember located at rear of transmission. Slightly lower engine. Remove starter. Remove transmission mounting bolts and transmission.

NOTE: On turbo models, clutch cover and disc will be removed with transmission.

13) On non-turbo models, place reference mark on clutch cover and flywheel for reassembly reference. Alternately loosen clutch cover bolts until spring tension is released. Remove clutch cover and clutch disc. Remove clutch release fork and clutch release bearing from transmission (if necessary). See Fig. 14.

14) On turbo models, remove clutch release fork assembly from left side of transmission. See Fig. 14. Remove clutch disc and clutch cover from transmission. Remove snap ring from end of hub at clutch disc side of clutch cover. Remove hub, cone spring and plate washer from clutch cover.

15) Remove snap ring from clutch release bearing at diaphragm spring side of clutch cover. Remove clutch release bearing, plate washer and wave washer from clutch cover.

Inspection

1) Check wear on facings of clutch disc by measuring depth of each rivet head. Minimum depth at any rivet is .012" (.30 mm). Check clutch disc runout. Maximum runout at facing on clutch disc is .031" (.80 mm). Replace clutch disc if not within specification.

2) Using a dial indicator, check flywheel runout. Replace flywheel if flywheel runout is greater than .004" (.10 mm).

3) Using a caliper, measure depth and wear on diaphragm spring on clutch cover. See Fig. 15. Maximum depth is .024" (.60 mm) and maximum width is .197" (5.00 mm). Replace clutch cover if necessary.

4) Ensure clutch release bearing rotates smoothly. Ensure pilot bearing at end of crankshaft rotates smoothly. Replace clutch release bearing or pilot bearing if necessary.

5) Using a dial indicator, check diaphragm spring tip runout. If diaphragm spring tip runout is greater than .02" (.5 mm), adjust or replace clutch cover.

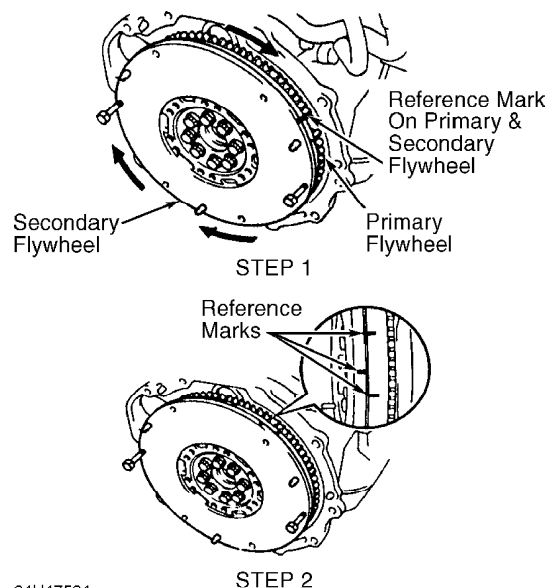
NOTE: On turbo models, flywheel consists of a secondary and primary flywheel. Special inspection procedure of flywheel must be performed. See steps 6) through 8).

6) On turbo models, if any grease leakage exists in clutch housing replace flywheel assembly. Flywheel damper rotational free play must be checked. Install 2 bolts in secondary flywheel opposite each other. See Fig. 10.

7) While holding bolts, rotate secondary flywheel clockwise until flywheel stops. Perform STEP 1. See Fig. 10. Place reference marks on primary flywheel and secondary flywheel at this position.

8) Rotate primary flywheel counterclockwise until flywheel stops. Place reference mark on primary flywheel at this position. Perform STEP 2. See Fig. 10. Measure circumferential length between both reference marks on primary flywheel.

9) Repeat step 8) 4 times to obtain greatest length. Replace flywheel assembly if circumferential length is greater than 4.134" (105.00 mm).



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Fig. 10: Checking Flywheel Damper Rotational Free Play (Supra Turbo)
Courtesy of Toyota Motor Sales, U.S.A., Inc.

Installation

1) If flywheel has been removed, install NEW flywheel bolts.

Flywheel bolts are supplied pre-coated from manufacturer. If flywheel bolts are not pre-coated, apply thread sealant to threads of flywheel bolts before installing. Install and alternately tighten flywheel bolts in a crisscross pattern to specification. See TORQUE SPECIFICATIONS.

2) On non-turbo models, install clutch disc in clutch cover. Align reference marks on clutch cover and flywheel. Install clutch disc and clutch cover on flywheel.

3) Using a clutch aligner, center clutch disc on flywheel. Install and alternately tighten clutch cover bolts in sequence to specification. See TORQUE SPECIFICATIONS. See Fig. 16.

4) Apply molybdenum disulfide grease to clutch release fork-to-pivot stud contact surfaces, hub on clutch release bearing and clutch disc splines. Install clutch release fork and clutch release bearing on transmission (if removed).

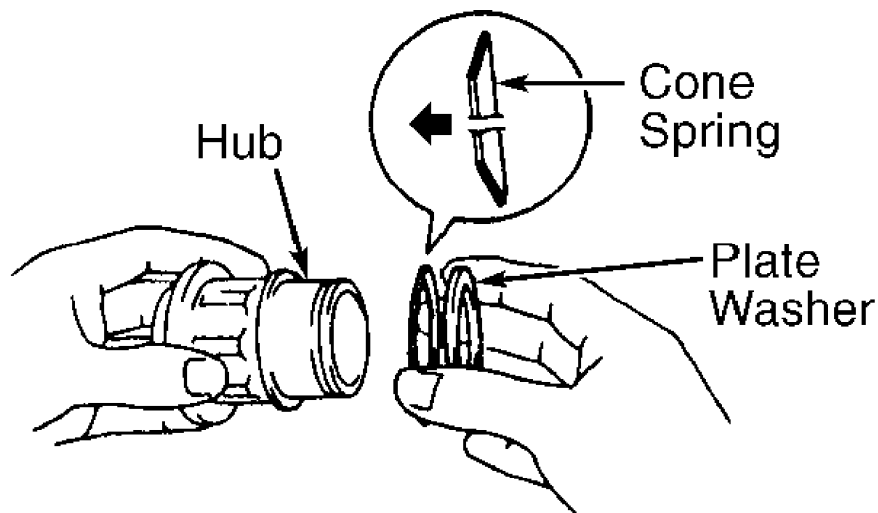
5) On turbo models, use NEW clip ring when installing pin in clutch release fork (if removed). Apply molybdenum disulfide grease to clutch release fork-to-hub and pin contact surfaces, hub and splines on clutch release bearing and clutch disc splines.

6) Using NEW snap rings, install clutch release bearing and components on clutch cover. Ensure cone spring is installed in correct direction on hub. See Fig. 11. Install clutch disc, clutch cover and clutch release fork on transmission.

7) On all models, to install remaining components, reverse removal procedure. Install NEW exhaust flange nuts and gaskets. Tighten bolt/nuts to specification. See TORQUE SPECIFICATIONS.

CAUTION: On turbo models, ensure reference marks on clutch cover and flywheel are aligned before installing and tightening clutch cover bolts to specification once transmission is installed on cylinder block.

8) Before installing drive shaft, apply grease on bushing on inside of drive shaft at differential end of drive shaft. Ensure reference marks on drive shaft flanges are aligned. On non-turbo models, fill transmission with 75W-90 gear oil with API GL-4 or GL-5 rating. On turbo models, fill transmission with Toyota Gear Oil V160.



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Fig. 11: Installing Cone Spring On Hub (Supra Turbo)
Courtesy of Toyota Motor Sales, U.S.A., Inc.

Removal (Tacoma 2WD & T100 2WD)

1) Disconnect negative battery cable. Remove transmission

shift lever boot retainer. Pull transmission shift lever boot upward. Place shop towel on shift lever cap, located at top of transmission on transmission shift lever. See Fig. 13.

2) Press shift lever cap downward and rotate counterclockwise to remove from transmission. Remove transmission shift lever with shift lever cap from transmission.

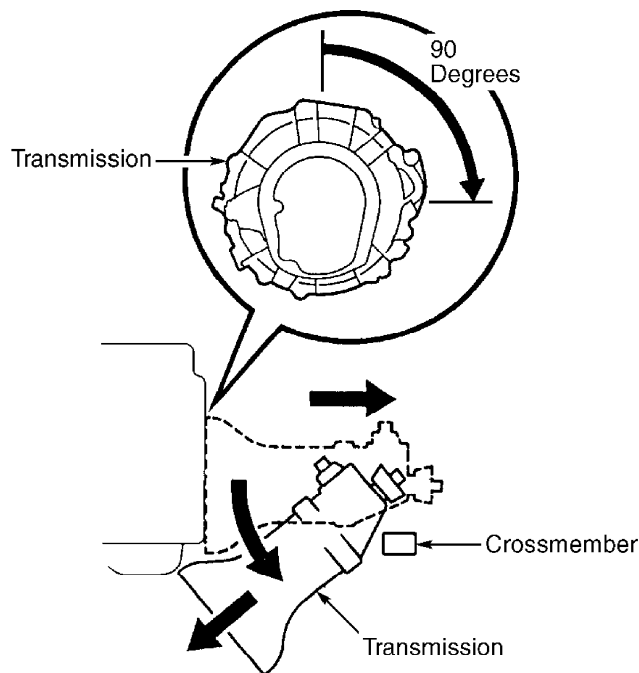
3) Raise and support vehicle. Drain transmission fluid. Place reference mark on drive shaft flanges for reassembly reference. Remove drive shafts as required. On T100, remove stabilizer bar bracket-to-frame bolts and stabilizer bar.

4) Disconnect oxygen sensor harness connector. Remove necessary front exhaust pipe components for removal of transmission. Discard exhaust pipe gasket and flange nuts. Disconnect speedometer and backup light switch harness connectors.

5) Remove clutch release cylinder with hose attached and secure aside. Remove starter. On all models, remove rear end plate. Support transmission with transmission jack. Remove rear engine mount bracket. Remove rear engine mount. Remove transmission-to-engine mounting bolts. Disconnect necessary electrical connectors at transmission.

6) Pull transmission up and to rear of vehicle. See Fig. 12. If starter is mounted on left side of transmission, rotate transmission counterclockwise 90 degrees. If starter is mounted on right side of transmission, rotate transmission clockwise 90 degrees. Move transmission to rear of vehicle again. Lower front side transmission and remove transmission.

7) Place reference mark on clutch cover and flywheel for reassembly reference. Alternately loosen clutch cover bolts until spring tension is released. Remove clutch cover and clutch disc. Remove clutch release fork and clutch release bearing from transmission (if necessary). See Fig. 14.



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Fig. 12: Removing Transmission Assembly (Tacoma, T100 & 4Runner)
Courtesy of Toyota Motor Sales, U.S.A., Inc.

Inspection

1) Check wear on facings of clutch disc by measuring depth of

each rivet head. Minimum depth at any rivet is .012" (.30 mm). Check clutch disc runout. Maximum runout at facing on clutch disc is .031" (.80 mm). Replace clutch disc if not within specification.

2) Using a dial indicator, check flywheel runout. Replace flywheel if flywheel runout is greater than .004" (.10 mm).

3) Using a caliper, measure depth and wear on diaphragm spring on clutch cover. See Fig. 15. Maximum depth is .024" (.60 mm) and maximum width is .197" (5.00 mm). Replace clutch cover if necessary.

4) Ensure clutch release bearing rotates smoothly. Ensure pilot bearing at end of crankshaft rotates smoothly. Replace clutch release bearing or pilot bearing if necessary.

5) Using a dial indicator, check diaphragm spring tip runout. If diaphragm spring tip runout is greater than .02" (.5 mm), adjust or replace clutch cover.

Installation

1) If flywheel has been removed, install NEW flywheel bolts. Flywheel bolts are supplied pre-coated from manufacturer. If flywheel bolts are not pre-coated, apply thread sealant to threads of flywheel bolts before installing. Install and alternately tighten flywheel bolts in a crisscross pattern to specification. See TORQUE SPECIFICATIONS.

2) Install clutch disc in clutch cover. Align reference marks on clutch cover and flywheel. Install clutch disc and clutch cover on flywheel.

3) Using a clutch aligner, center clutch disc on flywheel. Install and alternately tighten clutch cover bolts in sequence to specification. See TORQUE SPECIFICATIONS. See Fig. 16.

4) Apply molybdenum disulfide grease to clutch release fork-to-pivot stud contact surfaces, hub on clutch release bearing and clutch disc splines. Install clutch release fork and clutch release bearing on transmission (if removed).

5) Install remaining components, reverse removal procedure. Tighten bolt/nuts to specification. See TORQUE SPECIFICATIONS.

6) Apply light coat of grease on lever-to-case contact surfaces on transmission or transfer case shift lever before installing. Ensure reference marks on drive shaft flanges are aligned. Fill transmission or transfer case with 75W-90 gear oil with API GL-4 or GL-5 rating.

Removal (Tacoma 4WD & T100 4WD)

1) Manufacturer recommends removing transfer case and transmission as an assembly for servicing of clutch assembly. Disconnect negative battery cable.

2) Remove front console box. Remove transmission shift lever boot retainer. Pull transmission shift lever boot upward. Place shop towel on shift lever cap, located at top of transmission on transmission shift lever. See Fig. 13.

3) Press shift lever cap downward and rotate counterclockwise to remove from transmission. Remove transmission shift lever with shift lever cap from transmission.

4) Shift transfer case shift lever to "H4" position (without one touch 2-4 selector system) or "H2" (with one touch 2-4 selector system). Remove snap ring and transfer case shift lever.

5) Raise and support vehicle. Drain transmission and transfer case fluid. Remove drive shaft dust cover (if equipped). Place reference mark on drive shaft flanges for reassembly reference. Remove drive shafts as required.

6) Disconnect vehicle speed sensor, back-up lights switch and 4WD position switch connectors. Remove oxygen sensor. Discard oxygen sensor gasket. Remove necessary front exhaust pipe components for removal of transmission and transfer case. Discard exhaust pipe flange

nuts and gaskets. Remove clutch release cylinder with hose attached and secure aside. On T100, remove stabilizer bar bracket-to-frame bolts.

7) Support engine with hoist. Support transmission with transmission jack. Remove necessary crossmember for removal of transmission and transfer case.

8) On all models, remove rear engine mount. Raise transmission slightly, remove starter connectors and remove starter. Remove stiffener plates, located between rear of cylinder block and transmission. Remove transmission mounting bolts. Remove transmission and transfer case assembly. Remove rear engine mounts and transfer case-to-transmission bolts. Separate transfer case from transmission.

9) Place reference mark on clutch cover and flywheel for reassembly reference. Alternately loosen clutch cover bolts until spring tension is released. Remove clutch cover and clutch disc.

10) Remove clutch release fork and clutch release bearing from transmission (if necessary). See Fig. 14.

Inspection

1) Check wear on facings of clutch disc by measuring depth of each rivet head. Minimum depth at any rivet is .012" (.30 mm). Check clutch disc runout. Maximum runout at facing on clutch disc is .031" (.80 mm). Replace clutch disc if not within specification.

2) Using a dial indicator, check flywheel runout. Replace flywheel if flywheel runout is greater than .004" (.10 mm).

3) Using a caliper, measure depth and wear on diaphragm spring on clutch cover. See Fig. 15. Maximum depth is .024" (.60 mm) and maximum width is .197" (5.00 mm). Replace clutch cover if necessary.

4) Ensure clutch release bearing rotates smoothly. Ensure pilot bearing at end of crankshaft rotates smoothly. Replace clutch release bearing or pilot bearing if necessary.

5) Using a dial indicator, check diaphragm spring tip runout. If diaphragm spring tip runout is greater than .02" (.5 mm), adjust or replace clutch cover.

Installation

1) If flywheel has been removed, install NEW flywheel bolts. Flywheel bolts are supplied pre-coated from manufacturer. If flywheel bolts are not pre-coated, apply thread sealant to threads of flywheel bolts before installing. Install and alternately tighten flywheel bolts in a crisscross pattern to specification. See TORQUE SPECIFICATIONS.

2) Install clutch disc in clutch cover. Align reference marks on clutch cover and flywheel. Install clutch disc and clutch cover on flywheel.

3) Using a clutch aligner, center clutch disc on flywheel. Install and alternately tighten clutch cover bolts in sequence to specification. See TORQUE SPECIFICATIONS. See Fig. 16.

4) Apply molybdenum disulfide grease to clutch release fork-to-pivot stud contact surfaces, hub on clutch release bearing and clutch disc splines. Install clutch release fork and clutch release bearing on transmission (if removed).

5) To install remaining components, reverse removal procedure. Tighten bolt/nuts to specification. See TORQUE SPECIFICATIONS. Install NEW exhaust flange nuts and gaskets.

6) Apply light coat of grease on lever-to-case contact surfaces on transmission or transfer case shift lever before installing. Apply light coat of grease on lip of transfer case input shaft oil seal. Ensure reference marks on drive shaft flanges are aligned. Fill transmission or transfer case with 75W-90 gear oil with API GL-4 or GL-5 rating.

Removal (4Runner)

1) Disconnect negative battery cable. Remove transmission shift lever boot retainer.

2) Pull transmission shift lever boot upward. Place shop towel on shift lever cap, located at top of transmission on transmission shift lever. See Fig. 13. Press shift lever cap downward and rotate counterclockwise to remove from transmission. Remove transmission shift lever with shift lever cap from transmission.

3) On 4WD models, remove snap ring and transfer case shift lever. On all models, raise and support vehicle. Drain transmission and transfer case fluid (if equipped).

4) Remove drive shaft dust cover (if equipped). Place reference mark on drive shaft flanges for reassembly reference. Remove drive shaft(s) as required. Disconnect necessary electrical connectors at transmission and transfer case (if equipped).

5) Remove necessary exhaust pipe components for removal of transmission and transfer case (if equipped). Discard exhaust pipe flange nuts and gaskets. Remove clutch release cylinder with hose attached and secure aside. Remove rear cover plate.

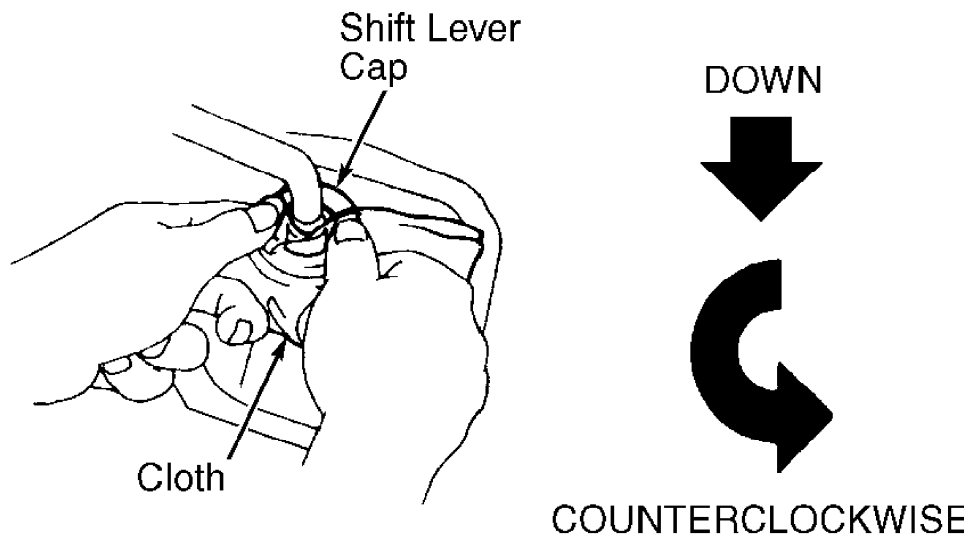
6) Support transmission with transmission jack. Remove starter connectors and starter. Remove necessary crossmember for removal of transmission and transfer case (if equipped). Slightly lower transmission.

7) Remove starter and exhaust pipe bracket. Remove stiffener plates, located between rear of cylinder block and transmission. Remove transmission mounting bolts. Slowly pull transmission and transfer case (if equipped) rearward.

8) Remove breather hose located between transmission control retainer and transfer case upper cover. Remove rear transfer case mount. Remove propeller shaft upper dust cover, transfer case-to-transmission bolts and transfer case from transmission.

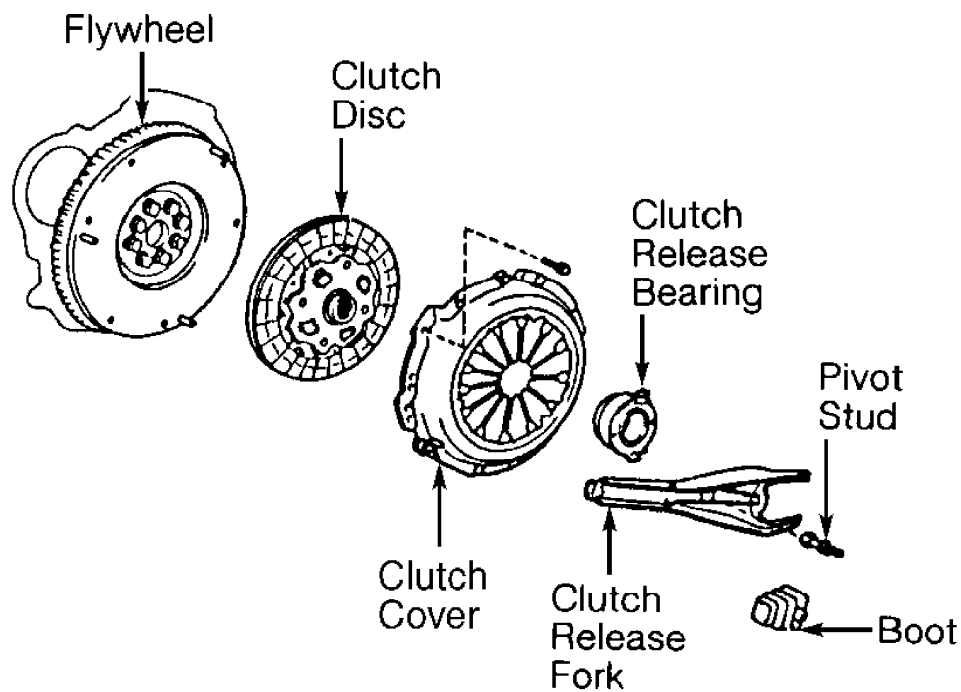
9) Place reference mark on clutch cover and flywheel for reassembly reference. Alternately loosen clutch cover bolts until spring tension is released. Remove clutch cover and clutch disc.

10) Remove clutch release fork and clutch release bearing from transmission (if necessary). See Fig. 14.

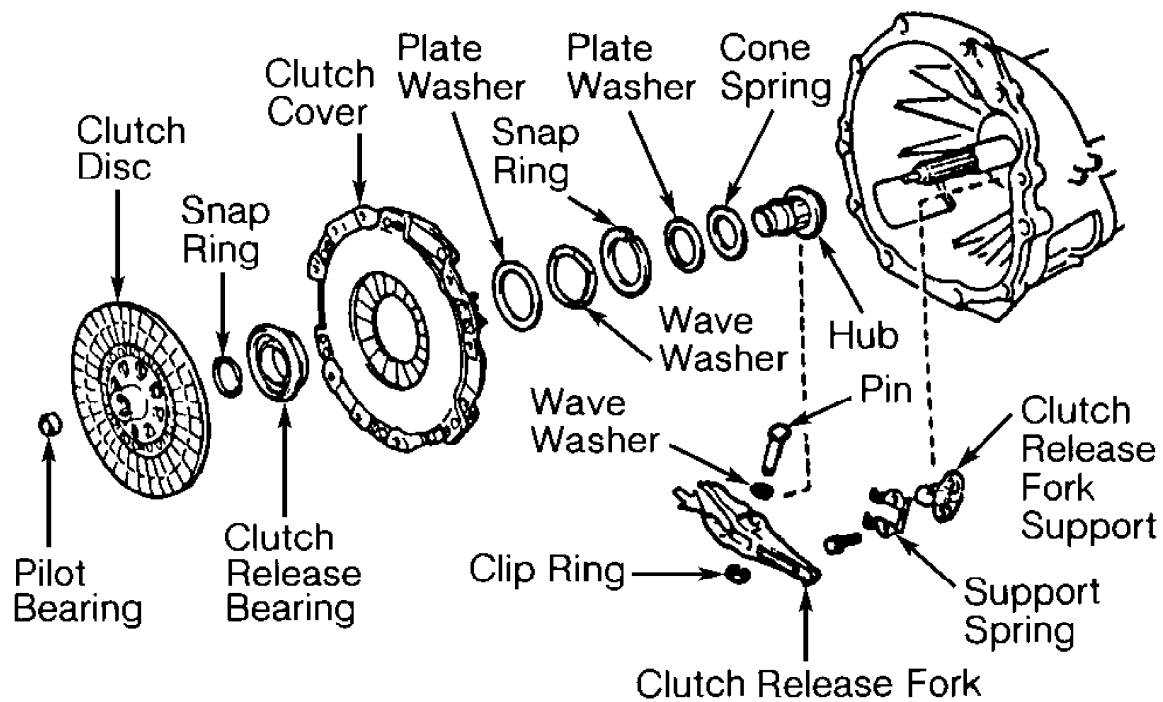


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Fig. 13: Removing Transmission Shift Lever (Tacoma, T100 & 4Runner)
Courtesy of Toyota Motor Sales, U.S.A., Inc.



EXCEPT SUPRA TURBO



SUPRA TURBO

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Fig. 14: Exploded View Of Clutch Assembly (Supra Is Shown: Others Are Similar)

Courtesy of Toyota Motor Sales, U.S.A., Inc.

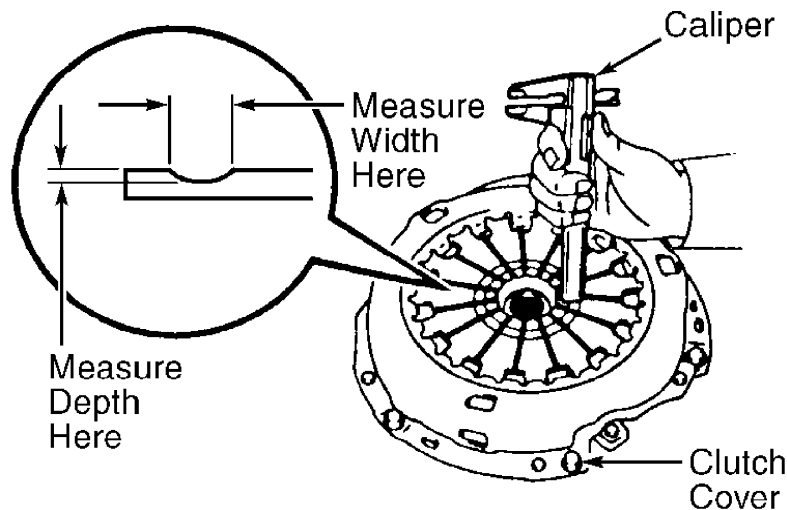
1) Check wear on facings of clutch disc by measuring depth of each rivet head. Minimum depth at any rivet is .012" (.30 mm). Check clutch disc runout. Maximum runout at facing on clutch disc is .031" (.80 mm). Replace clutch disc if not within specification.

2) Using a dial indicator, check flywheel runout. Replace flywheel if flywheel runout is greater than .004" (.10 mm).

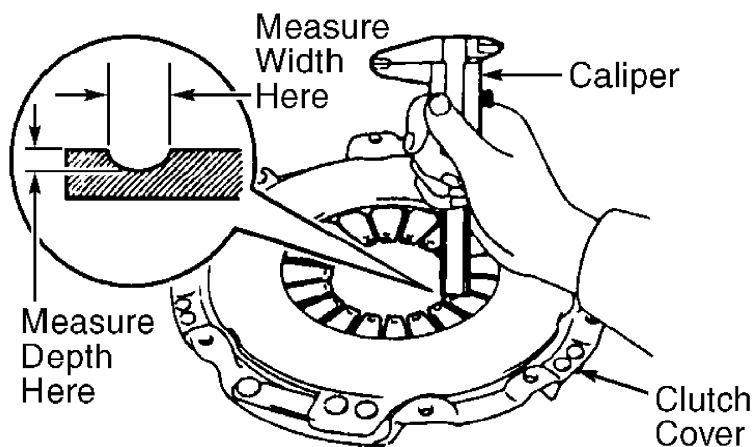
3) Using a caliper, measure depth and wear on diaphragm spring on clutch cover. See Fig. 15. Maximum depth is .024" (.60 mm) and maximum width is .197" (5.00 mm). Replace clutch cover if necessary.

4) Ensure clutch release bearing rotates smoothly. Ensure pilot bearing at end of crankshaft rotates smoothly. Replace clutch release bearing or pilot bearing if necessary.

5) Using a dial indicator, check diaphragm spring tip runout. If diaphragm spring tip runout is greater than .02" (.5 mm), adjust or replace clutch cover.



EXCEPT SUPRA TURBO



SUPRA TURBO

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Fig. 15: Checking Diaphragm Spring Depth & Width (Supra Is Shown: Others Are Similar)

Courtesy of Toyota Motor Sales, U.S.A., Inc.

1) If flywheel has been removed, install NEW flywheel bolts. Flywheel bolts are supplied pre-coated from manufacturer. If flywheel bolts are not pre-coated, apply thread sealant to threads of flywheel bolts before installing. Install and alternately tighten flywheel bolts in a crisscross pattern to specification. See TORQUE SPECIFICATIONS.

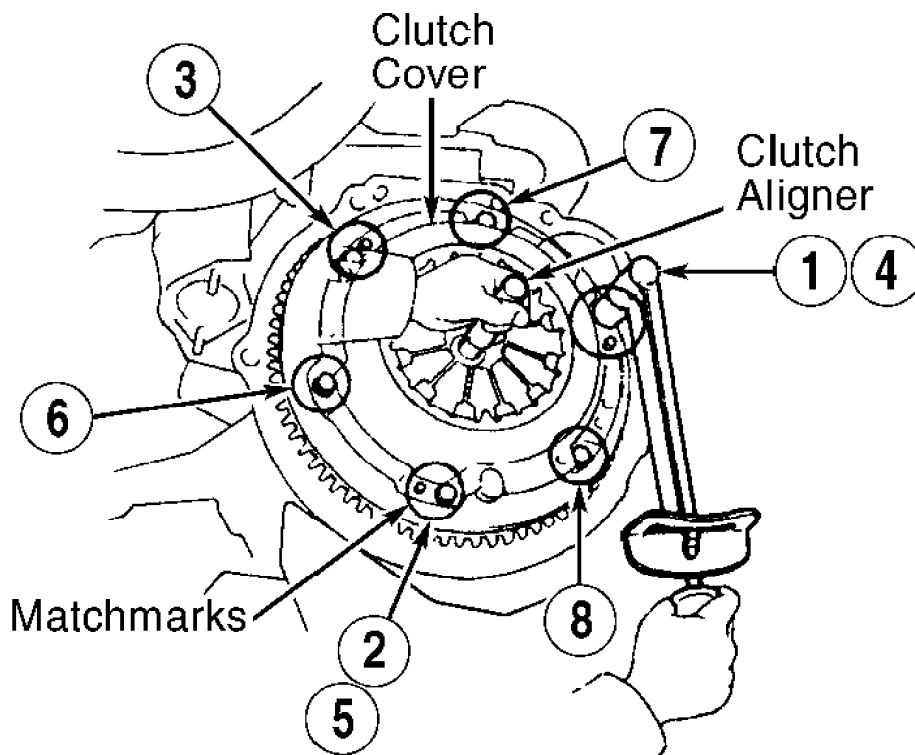
2) Install clutch disc in clutch cover. Align reference marks on clutch cover and flywheel. Install clutch disc and clutch cover on flywheel.

3) Using a clutch aligner, center clutch disc on flywheel. Install and alternately tighten clutch cover bolts in sequence to specification. See TORQUE SPECIFICATIONS. See Fig. 16.

4) Apply molybdenum disulfide grease to clutch release fork-to-pivot stud contact surfaces, hub on clutch release bearing and clutch disc splines. Install clutch release fork and clutch release bearing on transmission (if removed).

5) On 4WD models, Install NEW gasket between transfer case and transmission. Apply light coat of grease on lip of transfer case input shaft oil seal. Install NEW transfer case and drive shaft upper dust cover gasket. On all models, to install remaining components, reverse removal procedure. Install NEW exhaust flange nuts and gaskets. Tighten bolt/nuts to specification. See TORQUE SPECIFICATIONS

6) Apply light coat of grease on lever-to-case contact surfaces on transmission or transfer case shift lever before installing. Ensure reference marks on drive shaft flanges are aligned. Fill transmission or transfer case with 75W-90 gear oil with API GL-3, GL-4 or GL-5 rating.



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Fig. 16: Identifying Clutch Cover Tightening Sequence (Typical)
Courtesy of Toyota Motor Sales, U.S.A., Inc.

Removal & Installation

1) Remove hydraulic fluid from clutch master cylinder. Remove clip and clevis pin from push rod assembly at clutch pedal. Disconnect hydraulic line at clutch master cylinder. Remove nuts and clutch master cylinder.

2) To install, reverse removal procedure. Bleed hydraulic system. Adjust clutch pedal height, clutch free play and push rod play. See CLUTCH PEDAL HEIGHT and CLUTCH PEDAL FREE PLAY & PUSH ROD PLAY under ADJUSTMENTS.

CLUTCH RELEASE CYLINDER R & I

Removal & Installation

If equipped, remove clutch housing cover. Disconnect hydraulic line at clutch release cylinder. Remove bolts and clutch release cylinder. To install, reverse removal procedure. Bleed hydraulic system.

PILOT BEARING

Removal & Installation

Remove pilot bearing from crankshaft with Bearing Puller (SST 09303-35011). Coat NEW pilot bearing with multipurpose grease and drive into crankshaft with Bearing Driver (SST 09304-30012).

OVERHAUL

CLUTCH MASTER CYLINDER

Disassembly

Remove clutch master cylinder. See CLUTCH MASTER CYLINDER R & I under REMOVAL & INSTALLATION. Remove slotted spring pin. See Fig. 17. Remove reservoir and grommet. Pull back boot. Remove piston snap ring and pull out push rod.

Reassembly

To reassemble reverse disassembly procedure. Coat parts with rubber lubricant. Install piston, push rod assembly and snap ring. Install reservoir tank and NEW grommet. Drive slotted spring pin in to reservoir tank until a protrusion of .059-.138" (1.5-3.5 mm) exists. Bleed hydraulic system.

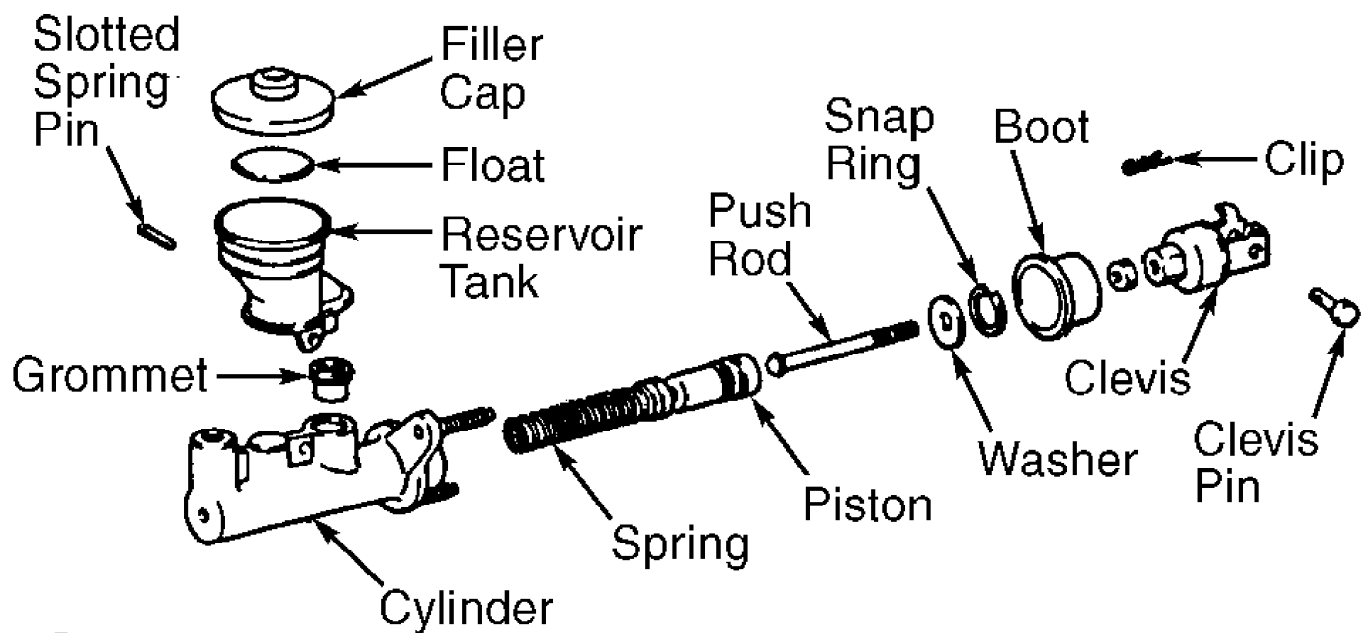
CLUTCH RELEASE CYLINDER

Disassembly

Remove clutch release cylinder. See CLUTCH RELEASE CYLINDER R & I under REMOVAL & INSTALLATION. Remove bleeder plug. See Fig. 18. Remove boot with push rod. Place a shop towel at end of clutch release cylinder to catch piston. Apply compressed air to bleeder plug hole. Remove piston and spring.

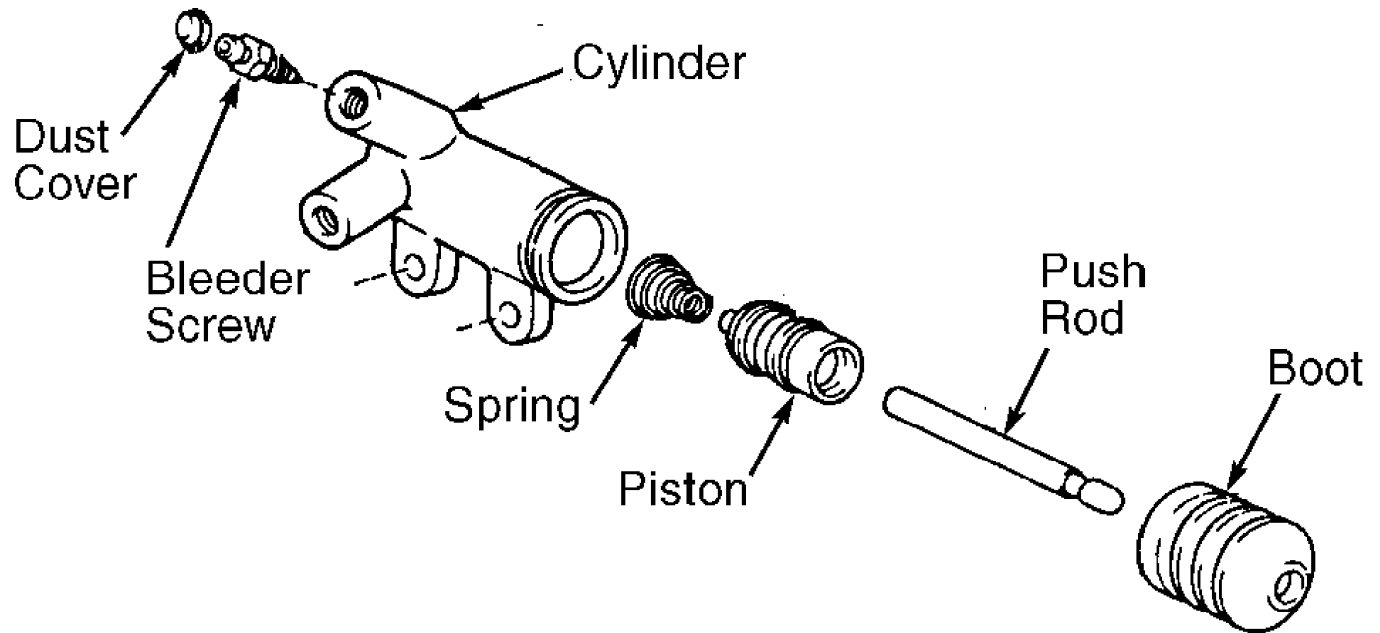
Reassembly

To reassemble reverse disassembly procedure. Coat parts with rubber lubricant. Bleed hydraulic system.



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Fig. 17: Exploded View Of Clutch Master Cylinder (Typical)
Courtesy of Toyota Motor Sales, U.S.A., Inc.



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Fig. 18: Exploded View Of Clutch Release Cylinder (Typical)
Courtesy of Toyota Motor Sales, U.S.A., Inc.

TORQUE SPECIFICATIONS

TORQUE SPECIFICATIONS (SUPRA)

Application	Ft. Lbs. (N.m)
Clutch Cover Bolt	14 (19)

Clutch Master Cylinder Nut	(1)
Clutch Release Cylinder Bolt	(1)
Clutch Release Fork Support Bolt (Turbo Models)	18 (24)
Crossmember Bolt	19 (26)
Crossmember Nut	(1)
Crossmember Brace Bolt	(1)
Drive Shaft Center Bearing Bolt	36 (49)
Drive Shaft Flange-To-Differential Flange Bolt	58 (79)
Drive Shaft Flange-To-Transmission Flange Nut	41 (56)
Exhaust Pipe Bracket Bolt (Front)	27 (37)
Exhaust Pipe Flange Nut (Front)	43 (58)
Exhaust Pipe Flange Nut (Center)	14 (19)
Flywheel Bolt	
Step 1	36 (49)
Step 2	Additional 90 Degrees
Hydraulic Line Nut	11 (15)
Oxygen Sensor Nut	14 (19)
Pivot Stud-To-Transmission	
Turbo	18 (24)
Non Turbo	29 (39)
Shift Lever-To-Shift Linkage Bolt	14 (19)
Starter Bolt	29 (39)
Transmission Drain Plug	29 (39)
Transmission-To-Engine Bolt	
10-mm Bolt	27 (37)
12-mm Bolt	53 (72)

(1) - Tighten to 115 INCH lbs. (13.0 N.m).

TORQUE SPECIFICATIONS (TACOMA)

Application	Ft. Lbs. (N.m)
Clutch Cover Bolt	14 (19)
Clutch Master Cylinder Nut	(1)
Clutch Release Cylinder Bolt	(1)
Crossmember-To-Frame Bolt	48 (65)
Drive Shaft Center Bearing Bolt (4WD)	27 (37)
Drive Shaft Flange Bolt	54 (73)
Exhaust Pipe Bracket Bolt	52 (71)
Exhaust Pipe Flange Nut	35 (47)
Exhaust Pipe-To-Manifold Nut	46 (62)
Flywheel Bolt	
2.4L (2RZ-FE) 4-Cylinder	65 (88)
2.7L (3RZ-FE) 4-Cylinder	
Step 1	19 (26)
Step 2	Additional 90 Degrees
3.4L (5VZ-FE) V6	63 (85)
Hydraulic Line Nut	11 (15)
Pivot Stud-To-Transmission	
4-Cylinder	29 (39)
V6	35 (47)
Rear End Plate Bolt	27 (37)
Rear Mount-To-Crossmember	14 (19)
Rear Mount-To-Transmission	
2WD	43 (58)
4WD	48 (65)
Starter Bolt	29 (39)
Stiffener Plate Bolt	27 (37)
Transmission Drain Plug	27 (37)
Transmission-To-Engine Bolt	53 (72)
Transmission-To-Transfer Case Bolt	17 (23)

(1) - Tighten to 115 INCH lbs. (13.0 N.m) .

TORQUE SPECIFICATIONS (T100)

Application	Ft. Lbs. (N.m)
Clutch Cover Bolt	14 (19)
Crossmember-To-Frame Bolt (4WD)	70 (95)
Drive Shaft Center Bearing Bolt (4WD)	27 (37)
Drive Shaft Flange Bolt (4WD)	54 (73)
Exhaust Pipe Bracket Bolt	33 (45)
Exhaust Pipe Bolt	46 (62)
Flywheel Bolt	
4-Cylinder	
Step 1	19 (26)
Step 2	Additional 90 Degrees
V6	65 (88)
Pivot Stud-To-Transmission	
4-Cylinder	29 (39)
V6	35 (47)
Rear End Plate	13 (18)
Rear Engine Mount Bracket Bolt	
Bracket-To-Engine Mount Bolt	13 (18)
Bracket-To-Frame Bolt	43 (58)
Stabilizer Bar Bracket-To-Frame Bolt (4WD)	22 (29)
Starter Bolt	29 (39)
Stiffener Plate Bolt	27 (37)
Transfer Case-To-Transmission Bolt	27 (37)
Transmission Drain Plug	27 (37)
Transmission-To-Engine Bolt	53 (72)

TORQUE SPECIFICATIONS (4RUNNER)

Application	Ft. Lbs. (N.m)
Clutch Cover Bolt	14 (19)
Clutch Master Cylinder Nut	(1)
Clutch Release Cylinder Bolt	(1)
Crossmember-To-Frame Bolt	70 (95)
Drive Shaft Center Bearing Bolt	27 (37)
Drive Shaft Dust Cover Bolt	17 (23)
Drive Shaft Flange Bolt	54 (73)
Dynamic Damper Bolt	27 (37)
Exhaust Pipe Bracket Bolt	
Upper	14 (19)
Lower	51 (69)
Exhaust Pipe Flange Nut	35 (47)
Exhaust Pipe-To-Manifold Nut	46 (62)
Flywheel Bolt	
4-Cylinder	80 (109)
V6	65 (88)
Front Differential Mounting Bolt (4WD V6 Models)	
Differential Carrier Cover-To-Frame Bolt	108 (146)
All Others	123 (167)
Hydraulic Line Nut	11 (15)
Pivot Stud-To-Transmission	
4-Cylinder	29 (39)
V6	35 (47)
Rear Transmission Mount Bolt	19 (26)
Stabilizer Bar Bracket-To-Frame Bolt	22 (29)

Starter Bolt	29 (39)
Stiffener Plate Bolt	27 (37)
Transmission Drain Plug	27 (37)
Transmission-To-Engine Bolt	53 (72)

(1) - Tighten to 115 INCH lbs. (13.0 N.m).
