CLUTCH

CONTENTS

DESCRIPTION

A single plate, dry friction disc, finger, diaphragm-spring type clutch is used on all models with manual transmission. The assembly consists of the clutch driven plate, cover-pressure plate and clutch release mechanism.

The clutch driven plate has a spring damper hub to reduce the transmitting of torsional vibrations from the engine to transmission. Grooves on both sides of the clutch driven plate lining prevent sticking of the plate to flywheel and pressure plate due to vacuum between the members on disengaging.

The clutch cover and pressure plate of all clutch assemblies is of the diaphragm-spring type that not only provides the spring pressure required to hold the friction disc against the flywheel, but also acts as the release levers that take up the spring pressure when the clutch is disengaged.

The clutch release mechanism consists of a ball thrust bearing, appropriate levers, linkage (cable linkage H Series) to manually control the action of the bearing.

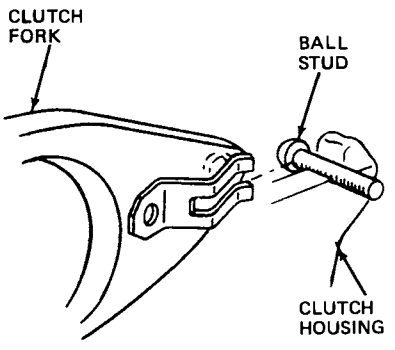
DIAGNOSIS

CLUTCH TROUBLE DIAGNOSIS

Condition	Possible Cause	Correction
Fails to Release (pedal pressed to floor - shift lever does not move freely in and out of "Reverse" gear).	1. Improper linkage adjustment.	1. Adjust linkage.
	2. Improper pedal travel.	2. Trim bumper stop and adjust linkage.
	3. Loose linkage.	3. Replace bushings.
	4. Faulty pilot bearing.	4. Replace bearing.
	5. Faulty driven plate.	5. Replace driven plate.
	6. Fork off ball stud.	6. Install properly.
	7. Clutch driven plate hub binding on main drive gear spline.	7. Repair or replace main drive gear.

Condition	Possible Cause	Correction
Slipping	1. Improper adjustment (no lash).	1. Adjust linkage.
	2. Oil soaked driven plate.	2. Install new driven plate and correct oil leak at its source.
	3. Worn facing or facing torn from driven plate.	3. Replace driven plate.
	4. Warped pressure plate or flywheel.	4. Replace same.
	5. Weak diaphragm spring.	5. Replace pressure plate. (Be sure lash is checked before replacing).
	6. Driven plate not seated in.	6. Make 20-50 normal starts.
	7. Driven plate overheated.	7. Allow to cool - check lash.
Grabbing	1. Oil on facing or burned or glazed facings.	1. Install new driven plate.
	2. Worn splines on main drive gear.	2. Replace transmission main drive gear.
	3. Loose engine mountings.	3. Tighten or replace mountings.
	4. Warped pressure plate or flywheel.	4. Replace pressure plate or flywheel.
	5. Burned or smeared resin on flywheel or pressure plate.	5. Sand off if superficial. Replace burned or heat checked parts.
Rattling - Transmission Click	1. Clutch fork loose on ball stud or in bearing groove.	1. Check ball stud and retaining spring and replace if necessary.
	2. Oil in driven plate damper.	2. Replace driven plate.
	3. Driven plate damper spring failure.	3. Replace driven plate.
Throw-Out Bearing Noise With Clutch Fully Engaged	1. Improper adjustment.	1. Adjust linkage.
	2. Throw-out bearing binding on transmission bearing retainer.	2. Clean, relubricate, check for burrs, nicks, etc.

Condition	Possible Cause	Correction
	3. Insufficient tension between clutch fork spring and ball stud.	3. Replace fork.
	4. Fork improperly installed.	4. Install properly.
	5. Weak linkage return spring.	5. Replace spring.
Noisy	1. Worn throw-out bearing.	1. Replace bearing.
	2. Fork off ball stud (heavy clicking).	2. Install properly.
Pedal Stays on Floor When Disengaged	1. Bind in linkage.	1. Lubricate and free-up linkage.
	2. Spring weak in pressure plate.	2. Replace
	3. Weak linkage return spring.	3. Replace
Hard Pedal Effort	1. Bind in linkage or cable.	1. Lubricate and free-up linkage.
	2. Driven plate worn.	2. Replace driven plate.



BALL STUD ADJUSTMENT

1. PRIOR TO ATTACHMENT OF CABLE, PLACE GAGE J-23644 SO FLAT END IS AGAINST FRONT FACE OF THE CLUTCH HOUSING AND THE HOOKED END IS LOCATED AT POINT OF CABLE ATTACHMENT ON FORK.
2. TURN BALL STUD INWARD BY HAND UNTIL CLUTCH RELEASE BEARING MAKES CONTACT WITH CLUTCH SPRING FINGERS.
3. INSTALL LOCK NUT AND TIGHTEN (25 FT. LBS.) BEING CAREFUL NOT TO CHANGE BALL STUD ADJUSTMENT.
4. INSTALL BALL STUD CAP.
5. REMOVE GAGE BY PULLING OUTWARD AT HOUSING END.

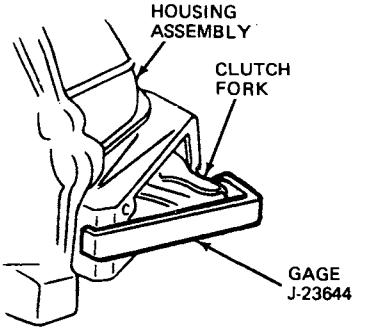
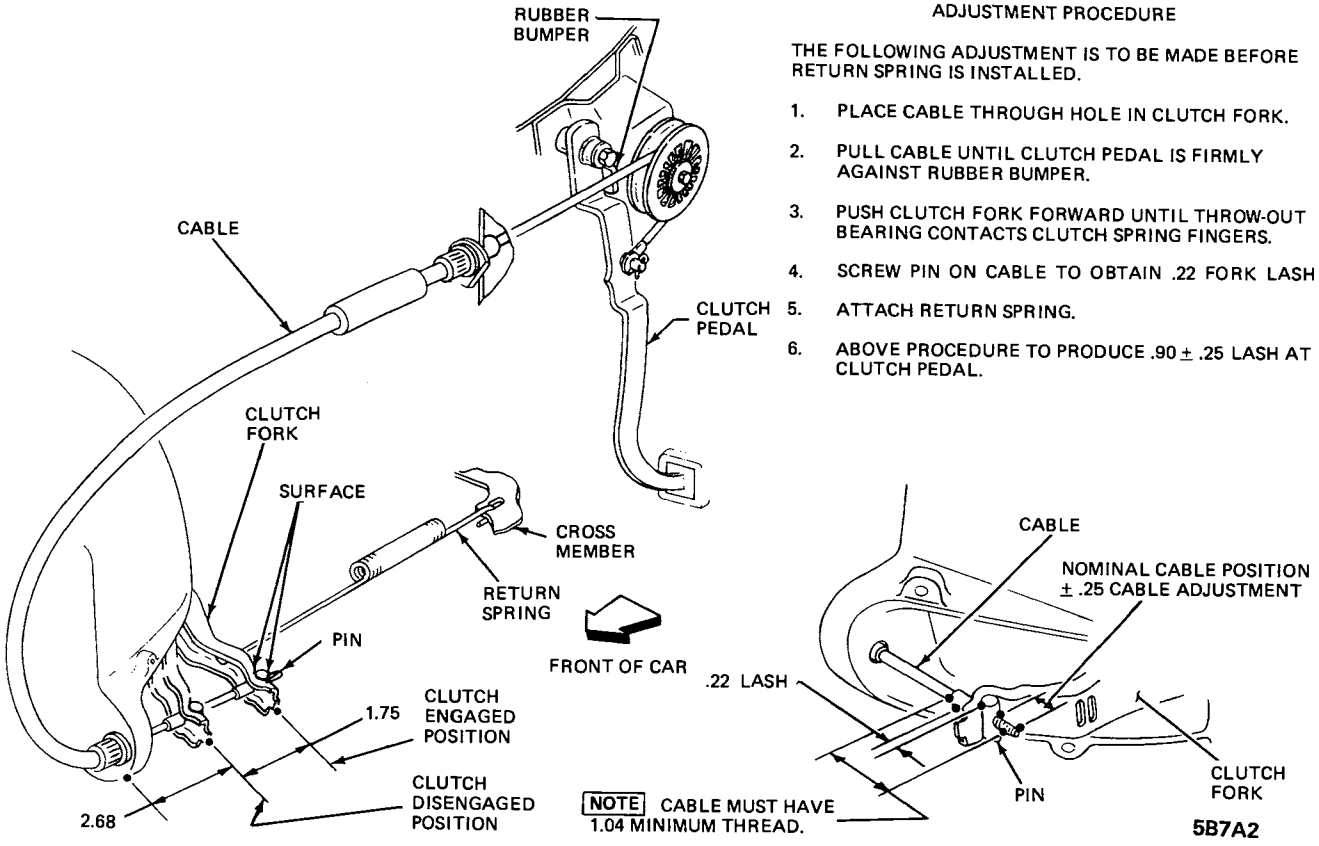


Figure 7A-1 - H Series Clutch Ball Stud Adjustment

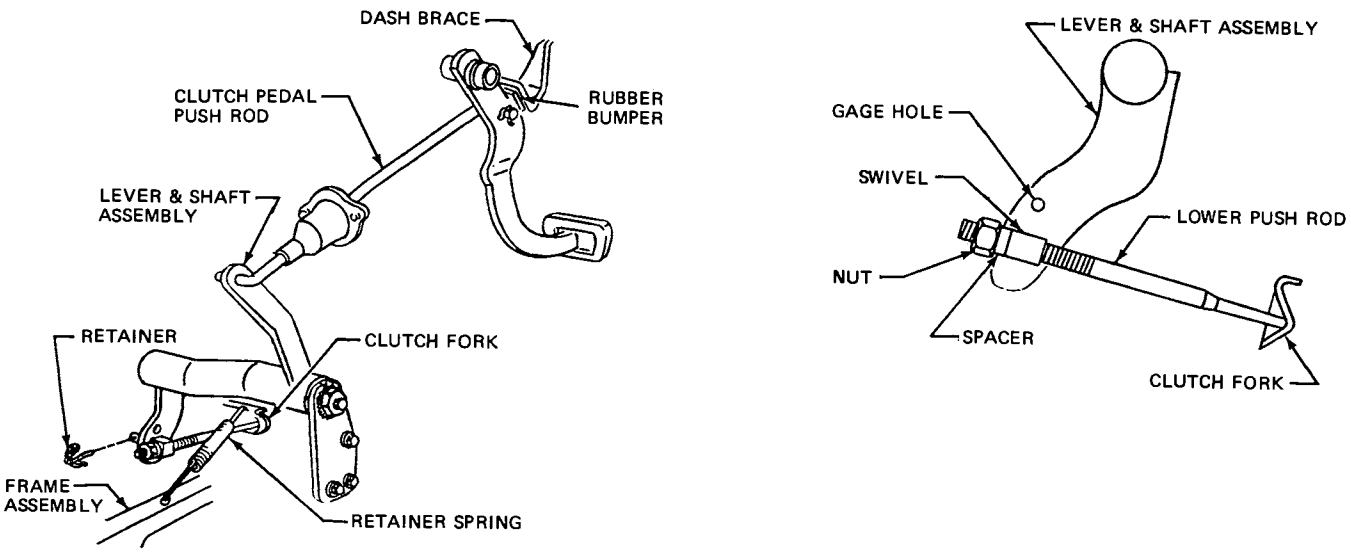


ADJUSTMENT PROCEDURE

THE FOLLOWING ADJUSTMENT IS TO BE MADE BEFORE RETURN SPRING IS INSTALLED.

1. PLACE CABLE THROUGH HOLE IN CLUTCH FORK.
2. PULL CABLE UNTIL CLUTCH PEDAL IS FIRMLY AGAINST RUBBER BUMPER.
3. PUSH CLUTCH FORK FORWARD UNTIL THROW-OUT BEARING CONTACTS CLUTCH SPRING FINGERS.
4. SCREW PIN ON CABLE TO OBTAIN .22 FORK LASH
5. ATTACH RETURN SPRING.
6. ABOVE PROCEDURE TO PRODUCE .90 ± .25 LASH AT CLUTCH PEDAL.

Figure 7A-2 - H Series Clutch Cable Adjustment



CLUTCH ADJUSTMENT

1 – ROTATE CLUTCH LEVER AND SHAFT ASSEMBLY UNTIL CLUTCH PEDAL IS FIRMLY AGAINST RUBBER BUMPER ON DASH BRACE.
2 – PUSH OUTER END OF CLUTCH FORK REARWARD UNTIL THROW-OUT BEARING LIGHTLY CONTACTS BELLEVILLE SPRING FINGERS.
3 – INSTALL LOWER PUSH ROD IN FORK AND GAGE HOLE, AND INCREASE LENGTH UNTIL ALL LASH IS REMOVED FROM SYSTEM.
4 – INSTALL SWIVEL OR ROD IN HOLE FURTHEST FROM CENTERLINE OF LEVER AND SHAFT ASSEMBLY AND INSTALL RETAINER.
5 – TIGHTEN LOCK NUT & SPACER AGAINST SWIVEL
6 – INSTALL CLUTCH FORK RETAINER SPRING.
7 – ABOVE PROCEDURE TO PRODUCE 1.15 ± .30 OF CLUTCH PEDAL "FREE TRAVEL" WHEN MEASURED AT THE CENTER OF THE PEDAL PAD.

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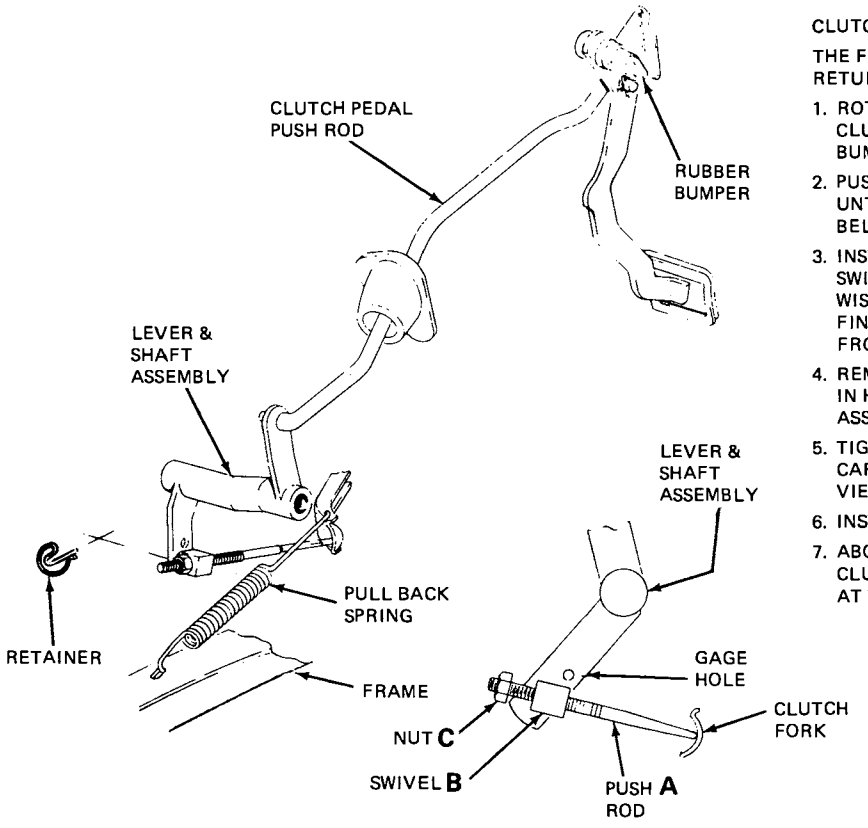
Figure 7A-3 - X Series Clutch Linkage Adjustment



CLUTCH ADJUSTMENT

THE FOLLOWING ADJUSTMENT IS TO BE MADE BEFORE RETURN SPRING IS INSTALLED

1. ROTATE CLUTCH LEVER & SHAFT ASSEMBLY UNTIL CLUTCH PEDAL IS FIRMLY AGAINST RUBBER BUMPER ON DASH BRACE.
2. PUSH OUTER END OF CLUTCH FORK REARWARD UNTIL THROW-OUT BEARING LIGHTLY CONTACTS BELLEVILLE SPRING FINGERS.
3. INSTALL LOWER PUSH ROD (A) IN FORK AND SWIVEL (B) IN GAGE HOLE. ROTATE ROD (A) CLOCKWISE AS VIEWED FROM FRONT OF VEHICLE TO FINGER TIGHT CONDITION TO REMOVE ALL LASH FROM SYSTEM.
4. REMOVE SWIVEL (B) FROM GAGE HOLE AND INSTALL IN HOLE FURTHEST FROM ℄ OF LEVER & SHAFT ASSEMBLY. INSTALL WASHERS AND RETAINER.
5. TIGHTEN LOCK NUT (C) AGAINST SWIVEL (B) BEING CAREFUL NOT TO CHANGE ROD (A) LENGTH. SEE VIEW A.
6. INSTALL CLUTCH RETAINER SPRING.
7. ABOVE PROCEDURE TO PRODUCE 1.00 ± 30 OF CLUTCH PEDAL "FREE TRAVEL" WHEN MEASURED AT THE CENTER OF THE PEDAL PAD.

Figure 7A-4 - A Series Clutch Linkage Adjustment

MAJOR REPAIR

REMOVAL OF CLUTCH

1. Remove transmission.
2. Remove pedal return spring from clutch fork.
3. Disconnect rod assembly from clutch fork.

(NOTE: On H Series remove clutch fork cover then disconnect clutch return spring and control cable from clutch fork.

Remove clutch fork cover then disconnect clutch return spring and control cable from clutch fork.

4. Remove flywheel housing.
5. Remove clutch throw-out bearing from clutch fork.
6. Disconnect clutch fork from ball stud by moving it toward the center of flywheel housing.
7. Mark clutch cover and flywheel so that cover can be reinstalled in the same position on flywheel to preserve engine balance.
8. Loosen clutch cover to flywheel attaching bolts one turn at a time each to avoid bending of clutch cover flange until spring pressure is released.
9. Support the pressure plate and cover assembly while removing last bolts, then remove pressure plate and clutch driven plate assemblies. Use extreme care in keeping clutch driven plate clean.

Should it be necessary to disassemble the pressure plate, proceed as follows:

a. Remove three drive-strap to pressure plate bolts and retracting spring. Then lift off clutch cover.

Alignment marks should be made on clutch cover and pressure plate for assembly purposes to maintain balance.

b. The clutch belleville spring and two pivot rings are riveted to the clutch cover. The spring, rings and cover should be inspected for wear or damage. If necessary, replace the complete cover assembly.

LUBRICATION AND INSPECTION OF CLUTCH

Inspection of Clutch

Wash all metal parts of clutch, except release bearing and driven plate in suitable cleaning solution to remove dirt and grease. Soaking release bearing in cleaning solution would permit solution to seep into bearing and destroy the lubricant. Soaking driven plate in cleaning solution would damage the facings.

1. Flywheel and Pressure Plate. Examine friction surfaces of flywheel and pressure plate for scoring or roughness. Slight roughness may be smoothed with fine emery cloth, but if surface is deeply scored or grooved the part should be replaced.

2. Clutch Driven Plate. Inspect driven plate for condition of facings, loose rivets, broken or very loose torsional springs, and flattened cushion springs.

If facings are worn down near rivets or are oily, the plate assembly should be replaced. A very slight amount of oil on clutch facings will cause clutch grab and chatter. A large amount of oil on facings will cause slippage. Removal of oil by solvents or by buffing is not practical since oil will continue to bleed from facing material when hot.

When oil is found on driven plate facings, examine transmission drainback hole, pilot bearing, engine rear main bearing and other points of oil leakage.

Test the fit of driven plate hub on transmission main drive gear for a easy sliding fit.

3. Inspect clutch throw-out bearing for scoring or excessive wear on front contact face. Test for roughness of balls and races by pressing and turning front race slowly.

Lubrication of Clutch

1. Very sparingly apply wheel bearing lubricant in pilot bearing in crankshaft. If too much lubricant is used, it will run out on face of flywheel when hot and ruin the driven plate facings.

2. Make sure that splines in the driven plate hub are clean and apply a light coat of wheel bearing lubricant. Apply a light coat of wheel bearing lubricant on transmission drive gear splines. Slide driven plate over transmission drive gear several times. Remove driven plate and wipe off all excess lubricant pushed up by hub of plate. Driven plate facings must be kept clean and dry.

3. Fill groove in throw-out bearing with wheel bearing lubricant. Make certain transmission front bearing retainer is clean and apply a light coat of wheel bearing lubricant. Slide throw-out bearing over transmission retainer several times. Remove throw-out bearing and wipe off all excess lubricant pushed up by hub of bearing.

4. Clean and apply wheel bearing lubricant to ball stud in flywheel housing and to the seat in clutch fork.

PILOT BEARING

Check clutch pilot bearing for excessive wear or damage. If replacement is necessary, remove bearing with Puller J-1448. For installation use Driver J- 1522.

Very sparingly apply wheel bearing lubricant in pilot bearing. If too much lubricant is used, it will run out on face of flywheel when hot and ruin the driven plate facings.

INSTALLATION OF CLUTCH

1. If the pressure plate was disassembled, follow steps a and b.

a. Install the pressure plate in the cover assembly, lining up the groove on the edge of the pressure plate with the groove on the edge of the cover.

b. Install pressure plate retracting springs and drive-strap to pressure plate bolts and lock washers and tighten to 16 lb.ft. torque. The clutch is now ready to be installed.

2. Install the pressure plate and driven plate. Support both assemblies with a spare main drive gear. Be sure to align marks on clutch cover with the mark made on the flywheel at disassembly.

3. Install all bolts so that clutch is drawn in place square with flywheel. Each bolt must be drawn one turn at a time to avoid bending the clutch cover flange. Torque bolts to 30-40 lb.ft.

4. Lubricate the ball stud and clutch fork with wheel bearing lubricant and install clutch fork.

Check and insure that fork retaining spring is tight on pivot ball stud.

5. Lubricate the recess on the inside of the throw-out bearing collar. Be careful not to use too much lubricant.

6. Install throw-out bearing assembly.

7. Install flywheel housing. Insure that dowel pins are in place in crankcase. Make certain throw-out bearing is seated in clutch fork.

8. Install transmission.

9. Connect and adjust clutch linkage.

CLUTCH CABLE REPLACEMENT H SERIES

1. Remove clutch fork cover at side of housing.

2. Disconnect return spring and clutch cable at clutch shift fork.

3. Remove clip and pin retaining cable to pedal arm.

4. Pull cable assembly through reinforcement and disengage from fender skirtreinforcement.

5. Push new cable through body reinforcement and around pulley. Secure cable end to pedal arm with pin, washer and clip.

(NOTE: Lubricate retaining pin with graphite type grease.)

6. Route cable over fender skirt reinforcement and down to the clutch fork lever. Install cable end in fork lever and install screw pin.

7. Push clutch fork forward until throwout bearing contacts clutch spring fingers and tighten screw pin on cable to obtain .22 fork lash. This should produce .90 $\pm$ .25 clutch pedal lash.

8. Attach return spring.

9. Install clutch fork cover and tighten retaining screws to 80 in. lbs.

CLUTCH CABLE PULLEY REPLACEMENT H SERIES

1. Remove clutch fork cover at side of clutch housing.

2. Disconnect clutch fork return spring and clutch cable at clutch fork.

3. Remove pulley retaining bolt, washer and pulley from clutch pedal bracket.

4. Lubricate pulley bushing and insert into pulley.

5. Position pulley to bracket, and then install washer, and retaining bolt. Tighten bolt to 20 ft. lbs.

6. Route cable over pulley, then reinstall cable and return spring at clutch fork. Check and adjust clutch as required.

7. Install clutch fork cover and tighten retaining screws to 80 in. lbs.

CLUTCH SPECIFICATIONS

	Torque Lbs. Ft.
X A Series	
Clutch Cover to Flywheel	35
Clutch Release Fork Ball	40
Flywheel Housing to Cylinder Block	53
Clutch Equalizer Ball Stud:	
To Engine	28
To Frame Bracket	21
Trans. to Flywheel Housing	53
Clutch Equalizer Bracket:	
To Frame	15
Clutch Adjustment Lock Nut	10
H Series	
Clutch Fork Cover Bolts	7
Transmission to Clutch Housing Bolts	55
Transmission Filler Plug	18
Clutch Cover and Pressure Plate Bolts	18
Clutch Housing Lower Cover Bolts	7
Clutch Housing to Engine Bolts	25
Clutch Fork Ball Stud Lock Nut	25
Clutch Gear Bearing Retainer Bolts	16