CLUTCH

2-10

SUBARU

1988

MECHANISM AND FUNCTION

Cross Sectional View

FWD

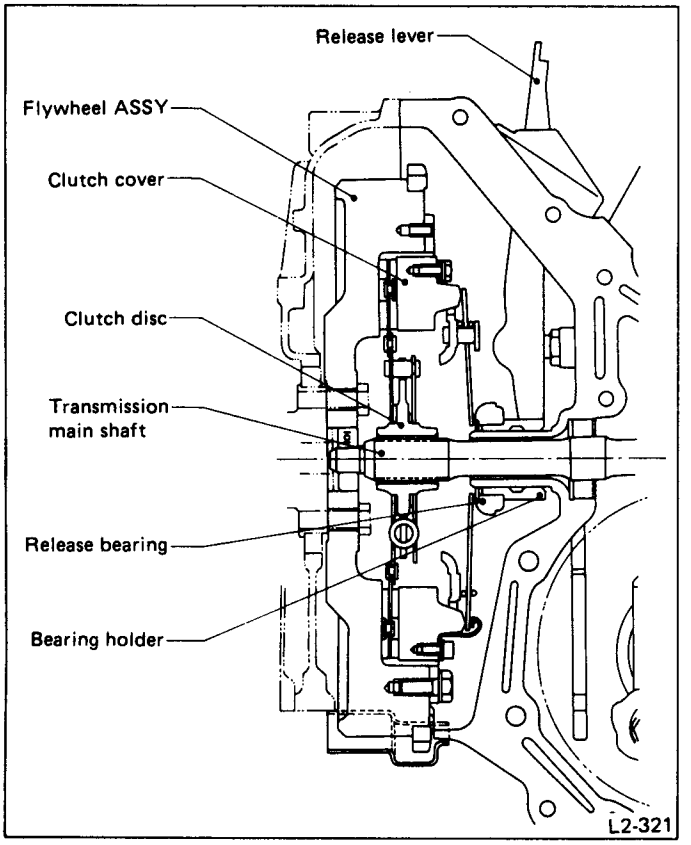


Fig. 1

4WD

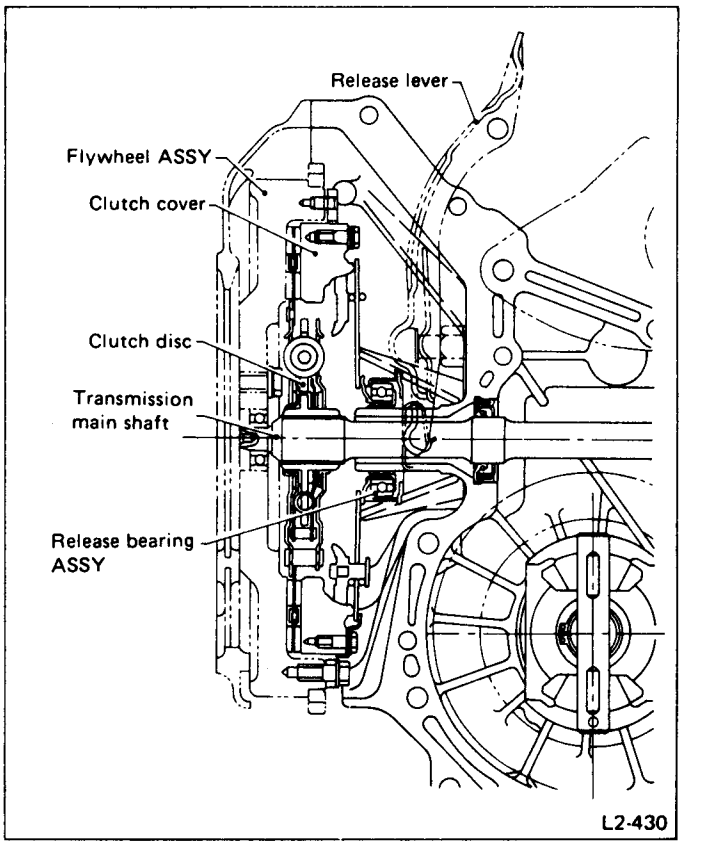


Fig. 2

SPECIFICATIONS AND SERVICE DATA

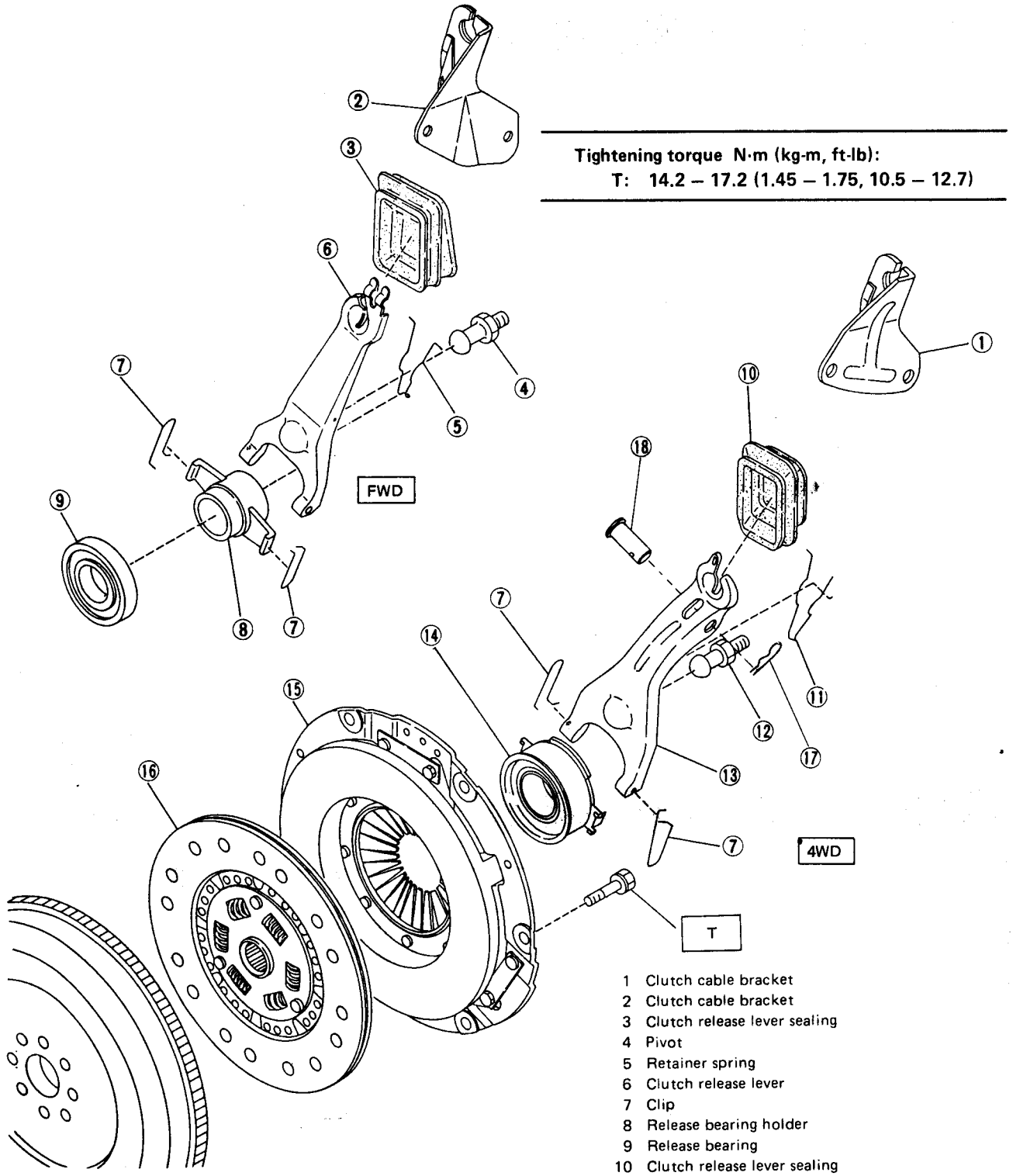
SPECIFICATIONS

Item		Model	FWD	4WD
Clutch cover	O.D.	mm (in)	244 (9.61)	266 (10.47)
	Thickness	mm (in)	5 (0.20)	6 (0.24)
	Pressure plate O.D.	mm (in)	202 (7.95)	228 (8.98)
	Pressure plate I.D.	mm (in)	128 (5.04)	147 (5.79)
	Diaphragm set load	kg (lb)	350 (772)	1800 cc 350 (772) 2700 cc 500 (1,103)
Clutch disc	Facing material		Woven	Woven
	O.D. x I.D. x thickness	mm (in)	200 x 130 x 3.5 (7.87 x 5.12 x 0.138)	225 x 150 x 3.5 (8.86 x 5.91 x 0.138)
	Spline O.D. (No. of teeth)	mm (in)	23.2 (0.913) (23)	25.2 (0.992) (25)
Clutch release lever ratio			2.0	3.0
Release bearing			Grease-packed ball bearing	Grease-packed self-aligning

SERVICE DATA

Clutch pedal	Full stroke	mm (in)	138 – 152 (5.43 – 5.98)
Release lever	Stroke	mm (in) FWD 4WD	 17 – 18 (0.67 – 0.71) 25.5 – 27 (1.004 – 1.063)
	Play at release lever center	mm (in) FWD 4WD	 2 – 3 (0.08 – 0.12) 3 – 4 (0.12 – 0.16)
Clutch disc	Depth of rivet head	mm (in) Standard Limit of sinking	 1.4 (0.055) 0.3 (0.012)
	Limit for deflection	mm (in)	0.7 (0.028) at R = 95 (3.74) . . . . FWD R = 107 (4.21) 4WD

COMPONENT PARTS



Tightening torque N·m (kg-m, ft-lb):
T: 14.2 – 17.2 (1.45 – 1.75, 10.5 – 12.7)

1 Clutch cable bracket
2 Clutch cable bracket
3 Clutch release lever sealing
4 Pivot
5 Retainer spring
6 Clutch release lever
7 Clip
8 Release bearing holder
9 Release bearing
10 Clutch release lever sealing
11 Retainer spring
12 Pivot
13 Clutch release lever
14 Clutch release bearing ASSY
15 Clutch cover
16 Clutch disc
17 Snap ring
18 PHV cable pin

Fig. 3

L2-571

SERVICE PROCEDURE

ON-CAR SERVICE

CLUTCH CONTROL

Clutch Play Adjustment

1) Remove release lever return spring from lever.
2) Adjust spherical nut so that the play is within the specified value at the lever end (center of spherical nut).

Take care not to twist the cable during adjustment.

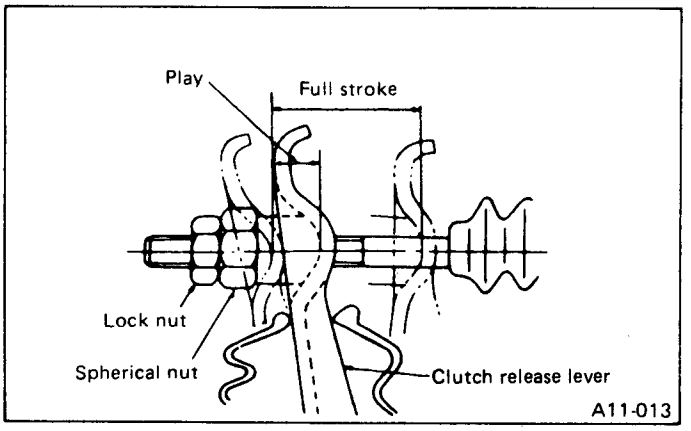


Fig. 4

Unit: mm (in)

	Play	Full stroke
FWD	2 – 3 (0.08 – 0.12)	17 – 18 (0.67 – 0.71)
4WD	3 – 4 (0.12 – 0.16)	25.5 – 27 (1.004 – 1.063)

Check

1) Upon completion of adjustment, securely lock spherical nut with lock nut.
2) Install return spring on lever.

Hook the long hook side of the return spring with the lever. (4WD)

3) Depress clutch pedal to assure there is no abnormality in the clutch system.

Precautions

When reinstallation, pay attention to the following items.
1) Check the routing of clutch cable for smoothness.
2) Excessive tightness or looseness of clutch cable have a had influence upon the cable durability.
3) Apply grease sufficiently to the connecting portion of clutch pedal.
4) Apply grease sufficiently to the release lever portion.
5) Position clutch cable through the center of toeboard hole and route it smoothly. Adjustment is done by moving the outer cable.
6) Make sure not to make clutch chattering at starting forward or rearward. If clutch chattering occurs, readjust so that the bend of clutch outer cable becomes flatter.

REMOVAL

1) Clutch cover CP and clutch disc CP.

a. Take care not to allow oil on the clutch disc facing.
b. Do not disassemble either clutch cover CP or clutch disc CP.

2) Release bearing hoder and clutch release lever.

FWD

1) Two clips from lever
2) Release bearing holder
3) Retainer spring from pivot
4) Clutch release lever and sealing

4WD

1) Two clips from lever
2) Release bearing ASSY
3) Retainer spring from pivot
4) Clutch release lever and sealing

Be careful not to deform clutch lever & holder clip and clutch lever retaining spring.

INSPECTION

Inspect all the disassembled parts for wear or damage, and repair or replace if necessary.

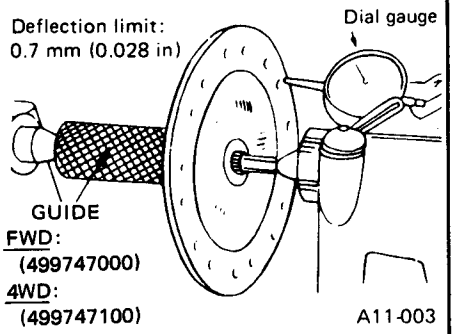
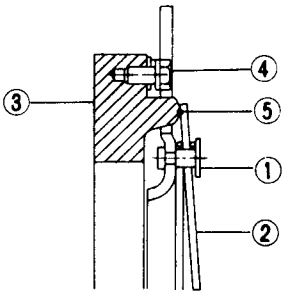
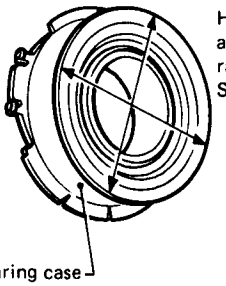
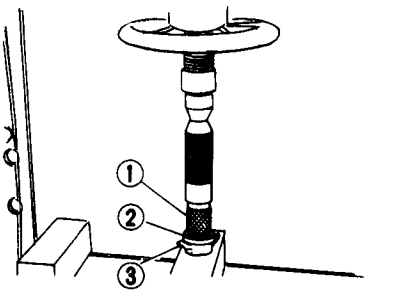
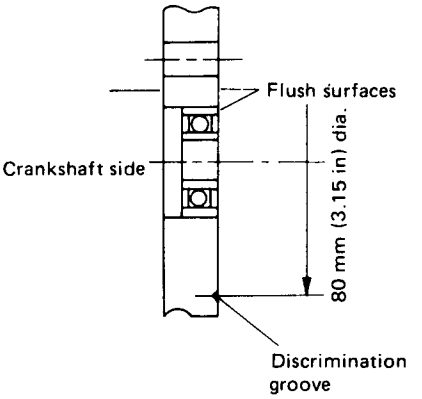
<table>
<tr><th>No.</th><th>Parts</th><th>Inspection</th><th>Corrective action</th></tr>
<tr><td rowspan="5">1</td><td rowspan="5">Clutch disc CP.</td><td>(1) Wear of facing</td><td>Measure the depth of rivet head from the surface of facing. Replace if facings are worn locally or worn down to less than the specified value.
<table><tr><td colspan="2">Depth of rivet head</td></tr><tr><td>Standard value</td><td>1.4 mm (0.055 in)</td></tr><tr><td>Limit of sinking</td><td>0.3 mm (0.012 in)</td></tr></table>Do not wash clutch disc with any cleaning fluid.</td></tr>
<tr><td>(2) Hardened facing</td><td>Correct by using emery paper or replace.</td></tr>
<tr><td>(3) Oil soakage on facing</td><td>Replace clutch disc and inspect transmission front oil seal, transmission case mating surface, engine rear oil seal and other points for oil leakage.</td></tr>
<tr><td>(4) Deflection of facing</td><td>If deflection exceeds the specified value at the outer circumference of facing, repair or replace.
Limit for deflection
0.7 mm (0.028 in)
at R = 95 mm (3.74 in)
... FWD
R = 107 mm (4.21 in)
... 4WD
 

Fig. 5</td></tr>
<tr><td>(5) Worn spline, loose rivets and torsion spring failure.</td><td>Replace.</td></tr>
</table>

No.	Parts	Inspection	Corrective action
2	Clutch cover CP.	Visually check for the following items without disassembling. 1) Loose thrust rivet ①. 2) Damaged or worn bearing contact area at center of diaphragm spring ②. 3) Damaged or worn disc contact surface of pressure plate ③. 4) Loose strap plate setting bolt ④. 5) Worn diaphragm sliding surface ⑤.  A12-437 *Fig. 6*	Repair or replace.
3	Clutch release bearing. **Since this bearing is grease-sealed and is of a non-lubrication type, do not wash with gasoline or any solvent when servicing the clutch.**	(1) Smoothness of rotation Rotate bearing applying pressure in thrust direction.	Repair or replace.
		(2) Wear and damage of holder surface contacting with lever.	Repair or replace. Replacing of clutch release bearing (FWD only) 1) Remove bearing out of holder. 2) Press bearing. **Do not depress outer race.**
		(3) 4WD Check the bearing ASSY for smooth movement by applying force in the radial direction.  Holding bearing case, apply force in the radial direction. Stroke: approx. 1.6 mm (0.063 in) Bearing case L2-216 *Fig. 7*	 A11-007 1 PRESS (899754112) 2 Bearing (Clutch release) 3 Holder (Release bearing) *Fig. 8*
4	Clutch release lever.	Check lever pivot portion and the point of contact with holder for wear.	Repair or replace.

No.	Parts	Inspection	Corrective action
5	Flyweel CP **Since this bearing is grease-sealed and is of a non-lubrication type, do not wash with gasoline or any solvent.**	(1) Damage of facing.	Replace.
		(2) Smoothness of rotation Rotate ball bearing applying pressure in thrust direction.	Repair or replace. Pressing of ball bearing Press bearing into flywheel until bearing end surface is flush with flywheel. **Do not press inner race.**  A12-438 *Fig. 9*

INSTALLATION

1) Install clutch release lever and release bearing holder (FWD) or bearing ASSY (4WD).

Before or during assembling, lubricate the following points with a light coat of grease.
a. Inner groove of release bearing holder.
b. Contact surface of lever and pivot.
c. Contact surface of lever and holder.
d. Transmission main shaft spline. (Use grease containing molybdenum disulphide.)

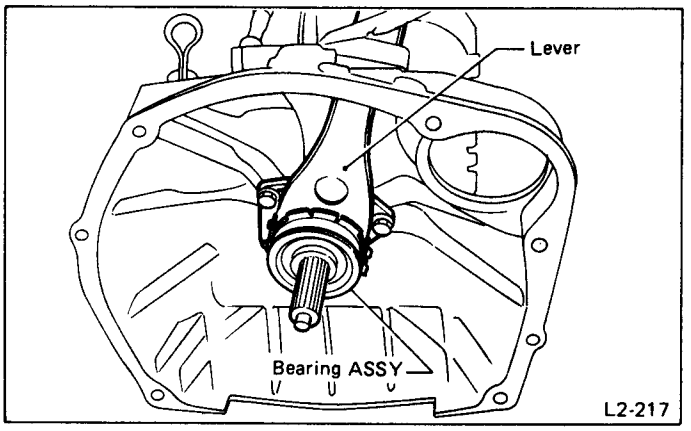


Fig. 10

(1) Install retainer spring into lever.
(2) While pushing lever to pivot and twisting it to both sides, fit retainer spring onto the constricted portion of pivot.

Confirm that retainer spring is securely fitted by seeing through the main case hole.

(3) Install holder (FWD) or bearing ASSY (4WD) and fasten it with two clips.
(4) Install clutch release lever sealing.

2) Insert GUIDE (499747000) for FWD or (499747100) for 4WD into clutch disc CP and install them on flywheel by inserting the end of Guide into pilot bearing.

Install clutch cover CP on flywheel and tighten bolts to the specified torque.

Tightening torque:
14.2 – 17.2 N·m
(1.45 – 1.75 kg-m, 10.5 – 12.7 ft-lb)

a. When installing the clutch cover on the flywheel, position the clutch cover so that there is a gap of 120° or more between "0" marks on the flywheel and clutch cover.
("0" marks indicate the directions of residual unbalance.)
b. Note the front and rear of the clutch disc when installing.
c. Tighten clutch cover installing bolts gradually.
Each bolt should be tightened in a crisscross fashion to the specified torque.

3) After remounting engine and transmission on body, make adjustment with the nut at the lever end so that the clutch release lever end play is 2 to 3 mm (0.08 to 0.12 in) for FWD and 3 to 4 mm (0.12 to 0.16 in) for 4WD.

Take care not to twist the cable during adjustment.

4) Install release lever return spring.

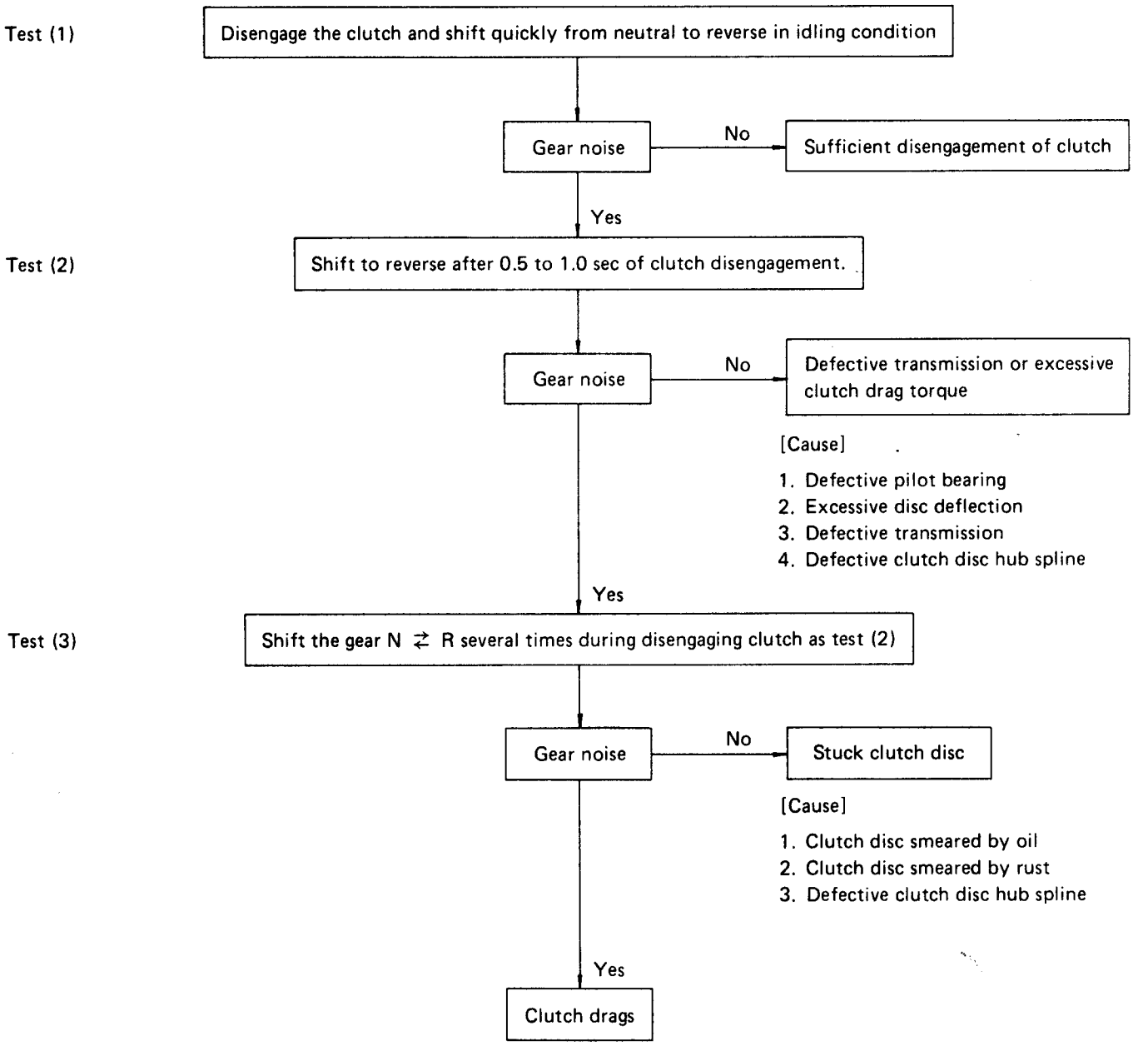
Hook up the long hook side of the return spring with the lever (4WD).

TROUBLESHOOTING

Condition	Possible cause and testing	Corrective action
1. Clutch slippage	It is hard to perceive clutch slippage in the early stage, but pay attention to the following symptoms. (a) Engine revs up when shifting. (b) High speed driving is impossible; especially rapid acceleration impossible and vehicle speed does not increase in proportion to an increase in engine speed. (c) Power falls, particularly when ascending a slope, and there is a smell of burning of the clutch facing. ● Method of testing: Put the car in stationary condition with parking brake fully applied. Disengage the clutch and shift the transmission gear into the first. Gradually allow the clutch to engage while gradually increasing the engine speed. The clutch function is satisfactory if the engine stalls. However, the clutch is slipping if the car does not start off and the engine does not stall.	
	(a) No clutch pedal play	Readjust.
	(b) No release lever end play	Readjust.
	(c) Clutch facing smeared by oil	Replace.
	(d) Worn clutch facing	Replace.
	(e) Deteriorated diaphragm spring	Replace.
	(f) Distorted pressure plate or flywheel	Correct or replace.
	(g) Defective release bearing holder	Correct or replace.
	(h) Defective pedal and cable system	Correct or replace.
2. Clutch drags	As a symptom of this trouble, a harsh scratching noise develops and control becomes quite difficult when shifting gears. The symptom becomes more apparent when shifting into the first gear. However, because much trouble of this sort is due to defective synchronization mechanism, carry out the test as described after. ● Method of testing: Refer to diagnostic diagram on page after.	
	It may be judged as insufficient disengagement of clutch if any noise occurs during this test.	
	(a) Excessive clutch pedal play	Readjust.
	(b) Excessive clutch release lever play	Readjust.
	(c) Worn or rusty clutch disc hub spline	Replace clutch disc.
	(d) Excessive deflection of clutch disc facing	Correct or replace.
	(e) Seized crankshaft pilot needle bearing	Replace.
	(f) Malfunction of pedal and cable system	Correct or replace.
	(g) Cracked clutch disc facing	Replace.
	(h) Sticked clutch disc (smeared by oil or water)	Replace.

Condition	Possible cause and testing	Corrective action
3. Clutch chatters	Clutch chattering is an unpleasant vibration to the whole body when the vehicle is just started with clutch partially engaged.	
	(a) Improper clutch cable routing	Correct.
	(b) Adhesion of oil on the facing	Replace clutch disc.
	(c) Weak or broken torsion spring	Replace clutch disc.
	(d) Defective facing contact or excessive disc deflection	Replace clutch disc.
	(e) Warped pressure plate or flywheel	Correct or replace.
	(f) Loose disc rivets	Replace clutch disc.
	(g) Loose engine mounting	Retighten or replace mounting.
	(h) Improper adjustment of pitching stopper	Adjustment.
4. Noisy clutch	Examine whether the noise is generated when the clutch is disengaged, engaged, or partially engaged.	
	(a) Broken, worn or unlubricated release bearing	Replace release bearing.
	(b) Insufficient lubrication of pilot bearing	Apply grease.
	(c) Loose clutch disc hub	Replace clutch disc.
	(d) Loose torsion spring retainer	Replace clutch disc.
	(e) Deteriorated or broken torsion spring	Replace clutch disc.
5. Clutch grabs	When starting the vehicle with the clutch partially engaged, the clutch engages suddenly and the car jumps instead of making a smooth start.	
	(a) Grease or oil on facing	Replace clutch disc.
	(b) Deteriorated cushioning spring	Replace clutch disc.
	(c) Worn or rusted spline of clutch disc or main shaft	Take off rust, apply grease or replace clutch disc or mainshaft.
	(d) Deteriorated or broken torsion spring	Replace clutch disc.
	(e) Loose engine mounting	Retighten or replace mounting.
	(f) Deteriorated diaphragm spring	Replace.

Diagnostic Diagram of Clutch Drags



[Cause]

1. Cracked clutch disc facing
2. Damaged or worn clutch cover
3. Malfunction of clutch release system
4. Insufficient clutch release amount
5. Excessive clutch pedal play