

5-3. Transmission and differential

1. General

The model T42 transmission is newly designed for the front-engine front-wheel-drive SUBARU 700 Sedan.

It is a manual transmission having four forward speeds and one reverse

speed. The transmission and differential gears are assembled together and built into the clutch housing and transmission case, placed transversely on the left side of the engine.

The case consists of the clutch housing and transmission case and can

be split into right and left halves. The main shaft assembly, drive pinion assembly, differential gear assembly and gear shift mechanism are located in this case. The side cover, having built-in speedometer gear, is fitted to the left end of the case.

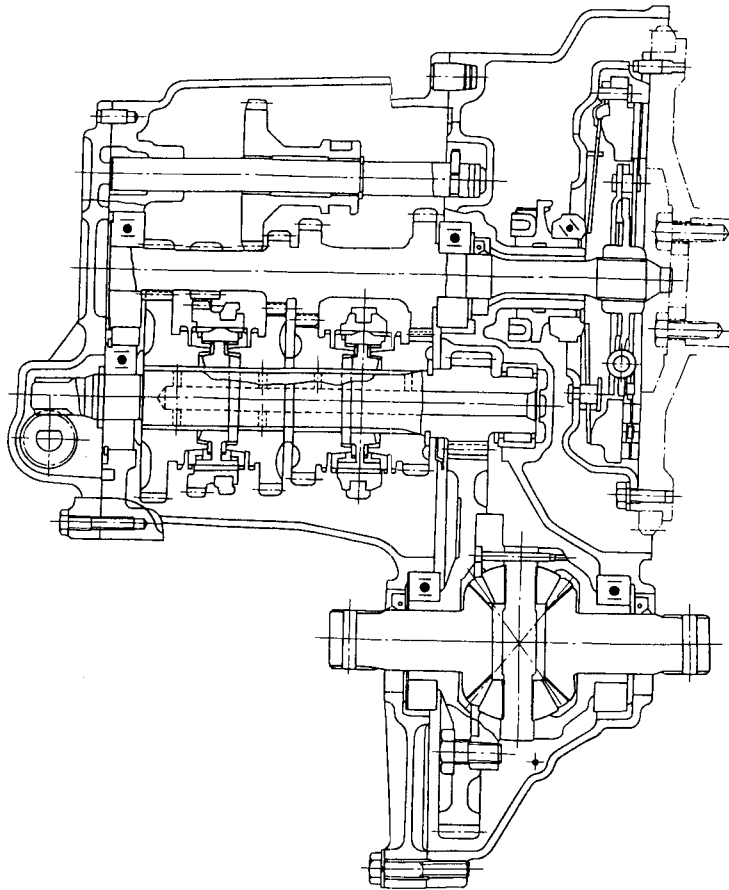


Fig. 5-3-1

K11-075

The gear shift system is designed as an assembly for ease of installation into the transmission. The interlock plate allows the interlock mechanism to function at the gear shift fork section.

1. The alternate long and short dash line indicates the N state.
2. The above Figure shows the gear in the 3rd position. Engagement of 1st-2nd gear and reverse gear is prevented by the interlock plate.
3. Gear selection is performed by the shifter arm and interlock plate which move as a single unit.

An oil bath type lubrication has been adopted for the transmission. In addition, the bearings are also directly lubricated by the oil that is fed by the rotation of the differential gear through the oil passage.

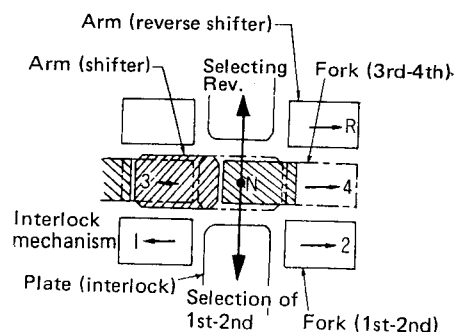


Fig. 5-3-2

K11-036

Gear Engagement and Power Transmitting Routes

•Neutral

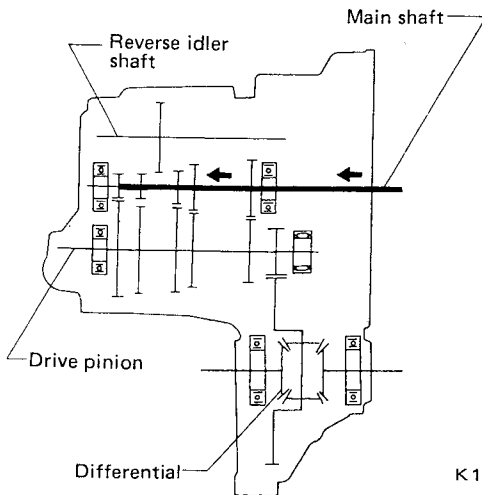


Fig. 5-3-3

K11-061

•Third

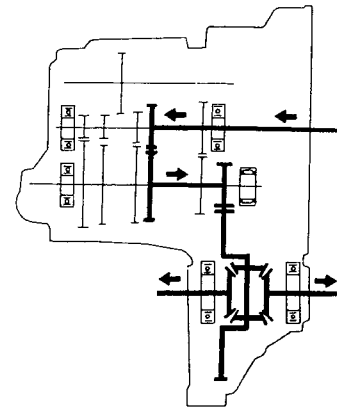


Fig. 5-3-6

K11-058

•First

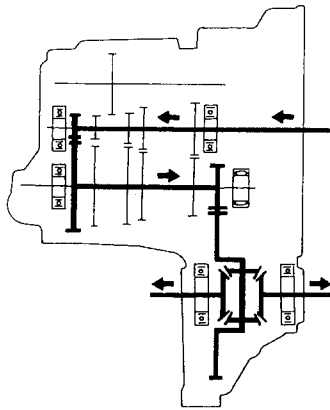


Fig. 5-3-4

K11-056

•Fourth

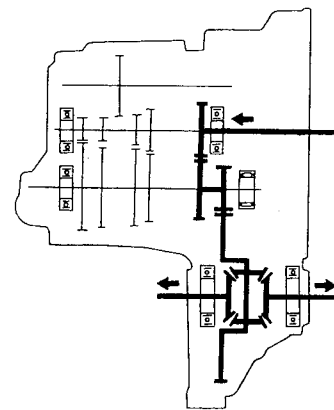


Fig. 5-3-7

K11-059

•Second

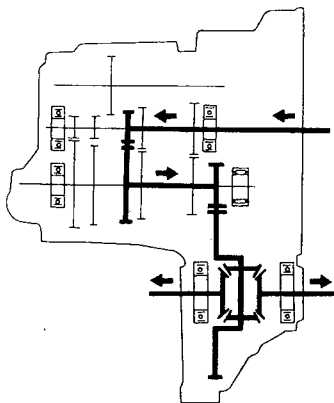


Fig. 5-3-5

K11-057

•Reverse

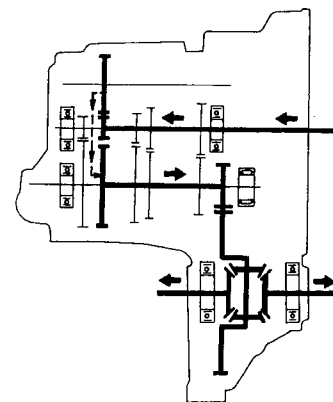


Fig. 5-3-8

K11-060

2. Specifications and Service Data

1) Transmission Gear

Gear ratio		1st	4.083	
		2nd	2.437	
		3rd	1.666	
		4th	1.115	
		Rev.	4.000	
No. of teeth	Main shaft	1st drive gear	12	
		2nd drive gear	16	
		3rd drive gear	21	
		4th drive gear	26	
		Rev. drive gear	12	
No. of teeth	Countershaft	1st driven gear	49	
		2nd driven gear	39	
		3rd driven gear	35	
		4th driven gear	29	
		Rev. driven gear	48	
	Reverse idler gear		37	
Speedometer		Gear ratio	4.200	
		Drive gear	5	
		Driven gear	21	
Backlash mm (in)	1st gear		0.017 - 0.089 (0.00067 - 0.0035)	
	2nd gear		0.014 - 0.084 (0.00055 - 0.00331)	
	3rd gear		0.018 - 0.082 (0.00071 - 0.00323)	
	4th gear		0.018 - 0.081 (0.00071 - 0.00319)	
	Rev. gear	Drive-idler	0.038 - 0.128 (0.0015 - 0.0050)	
		Idler-driven	0.041 - 0.144 (0.0016 - 0.0057)	
	Driven gear thrust clearance	mm (in)	1st gear	0.050 - 0.300 (0.0020 - 0.0118)
2nd gear			0.080 - 0.400 (0.0031 - 0.0157)	
3rd gear			0.080 - 0.400 (0.0031 - 0.0157)	
4th gear			0.090 - 0.410 (0.0035 - 0.0161)	
Clearance between synchronizer ring and splined end of gear		mm (in)	1st thru 4th	1.3 - 1.7 (0.051 - 0.067)
Clearance at the bearing of gear	mm (in)	1st thru 3rd	0.018 - 0.066 (0.0007 - 0.0026)	
		4th	0.025 - 0.073 (0.0010 - 0.0029)	
		Rev idler	0.015 - 0.052 (0.0006 - 0.0020)	

Transmission and differential

Play between synchronizer sleeve and shifter fork	mm (in)	Radial play	0.2 - 0.4 (0.008 - 0.016)
		Thrust play	0.2 - 0.4 (0.008 - 0.016)
Main shaft assembly rear bearing side clearance adjusting washers	mm (in)	803042021	0.98 - 1.02 (0.0386 - 0.0402)
		803042022	1.18 - 1.22 (0.0465 - 0.0480)
		803042023	1.38 - 1.42 (0.0543 - 0.0559)
		803042024	1.58 - 1.62 (0.0622 - 0.0638)

2) Differential Gear

Final reduction gear ratio			4.222
No. of teeth	Final	Gear	76
		Pinion	18
	Differential	Side gear	18
		Pinion	13
Backlash mm (in)		Final	0.046 - 0.122 (0.0018 - 0.0048)
		Differential (Side gear to pinion)	0.05 - 0.15 (0.0020 - 0.0059)
Final gear bearing clearance mm (in)			0.014 - 0.060 (0.0006 - 0.0024)
Differential case bearing clearance mm (in)			0.019 - 0.065 (0.0007 - 0.0026)
Side gear-to-pinion backlash adjusting washers mm (in)		803027041	0.075 - 1.000 (0.0030 - 0.0394)
		803027042	1.025 - 1.050 (0.0404 - 0.0413)
		803027043	1.075 - 1.100 (0.0423 - 0.0433)

3) Clutch

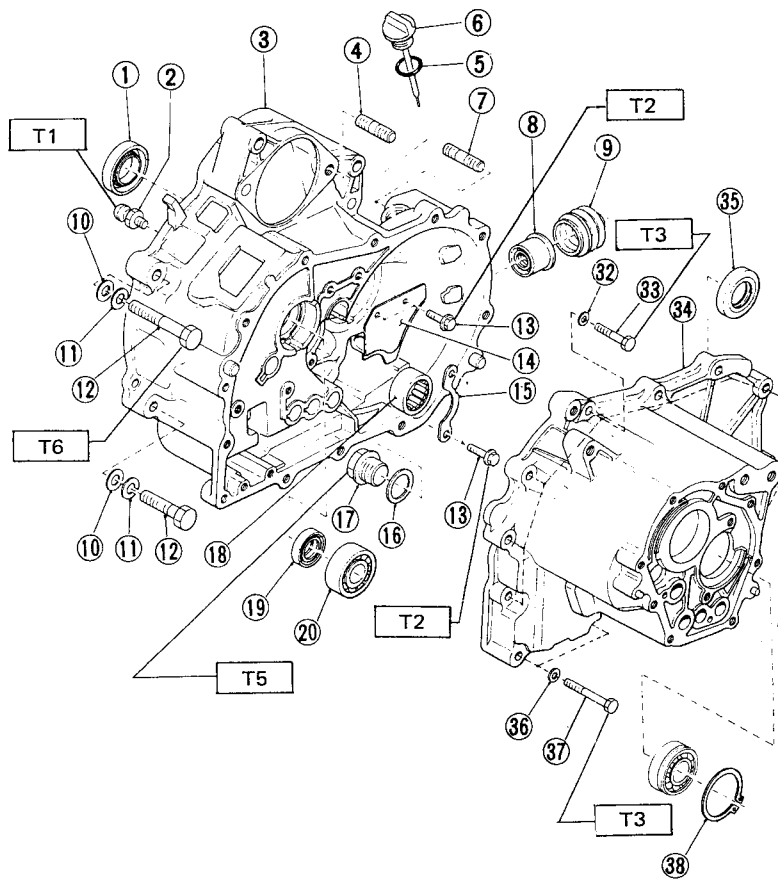
Cover	Cover O.D.	mm (in)	206 (8.11)
	Pressure plate O.D.	mm (in)	163 (6.42)
	Pressure plate I.D.	mm (in)	107 (4.21)
	Diaphragm setting load	kg (lb)	170 (375)
	Diaphragm height (from cover mounting face of flywheel when installed)	mm (in)	24.8 ± 0.8 (0.976 ± 0.031)
	Max. allowable unevenness of diaphragm	mm (in)	0.5 (0.020)
Disc	Facing material		Woven asbestos
	No. of facings		2
	O.D × I.D. × thickness	mm (in)	160 × 110 × 3 (6.30 × 4.33 × 0.12)
	Thickness when pressed (at full pressure)	mm (in)	7.2 (0.283)
	Free length	mm (in)	7.9 (0.311)

Transmission and differential

Disc	No. of torsion springs			6
	No. of spline hub teeth			23
	Wear on facing (rivet sinkage)	Standard	mm (in)	1.0 (0.039)
		Limit	mm (in)	0.3 (0.012)

3. Component Parts and Service Data

1) Transmission Case Component Parts



Tightening torque N·m (kg-m, ft-lb)
T1: 20 ± 5 (2 ± 0.5, 14 ± 3.6)
T2: 10 ± 0.7 (1 ± 0.075, 7 ± 0.5)
T3: 25 ± 2 (2.5 ± 0.2, 18 ± 1.4)
T4: 18 ± 2 (1.8 ± 0.2, 13 ± 1.4)
T5: 34 ± 4 (3.5 ± 0.4, 25 ± 2.9)
T6: 44 ± 3 (4.5 ± 0.3, 33 ± 2.2)

- 1 Oil seal
- 2 Clutch release fork pivot
- 3 Clutch housing
- 4 Stud
- 5 O-ring
- 6 Oil gauge
- 7 Stud 10 × 38 × 15
- 8 Oil seal
- 9 Boot
- 10 Washer
- 11 Spring washer
- 12 Bolt
- 13 Bolt
- 14 Oil guide plate
- 15 Needle bearing retainer

- 16 Gasket
- 17 Oil drain plug
- 18 Needle bearing
- 19 Oil seal
- 20 Ball bearing
- 21 Side cover gasket
- 22 Transmission side cover
- 23 Air bleed nipple
- 24 Air bleeder pipe
- 25 Bolt
- 26 Speedometer shaft
- 27 Snap ring
- 28 Washer
- 29 Bolt
- 30 Gasket

- 31 Back-up light switch
- 32 Washer
- 33 Bolt
- 34 Transmission case
- 35 Oil seal
- 36 Washer
- 37 Bolt
- 38 Snap ring
- 39 Oil seal

Fig. 5-3-11

6 mm bolts tightening sequence

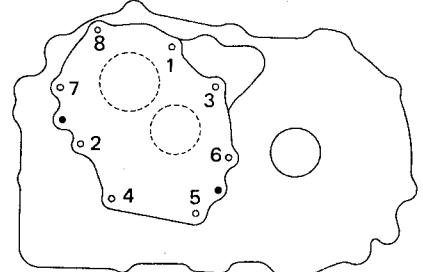


Fig. 5-3-9

K11-054

8 mm bolts tightening sequence

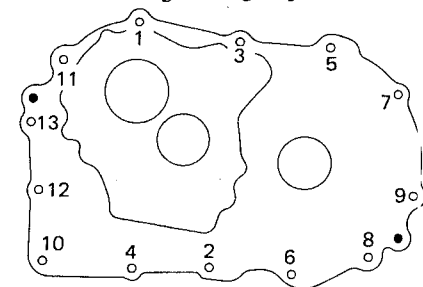
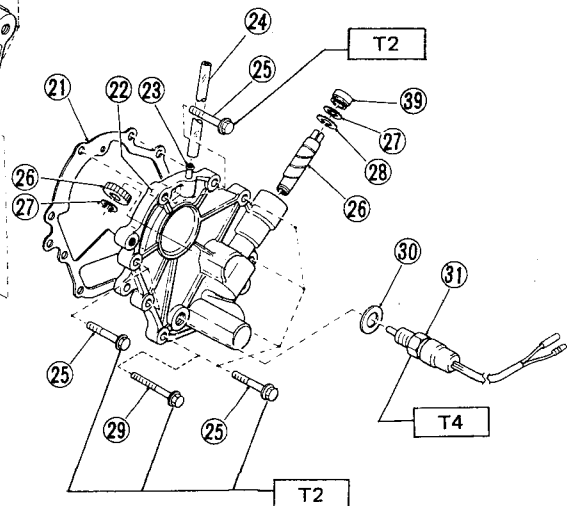


Fig. 5-3-10

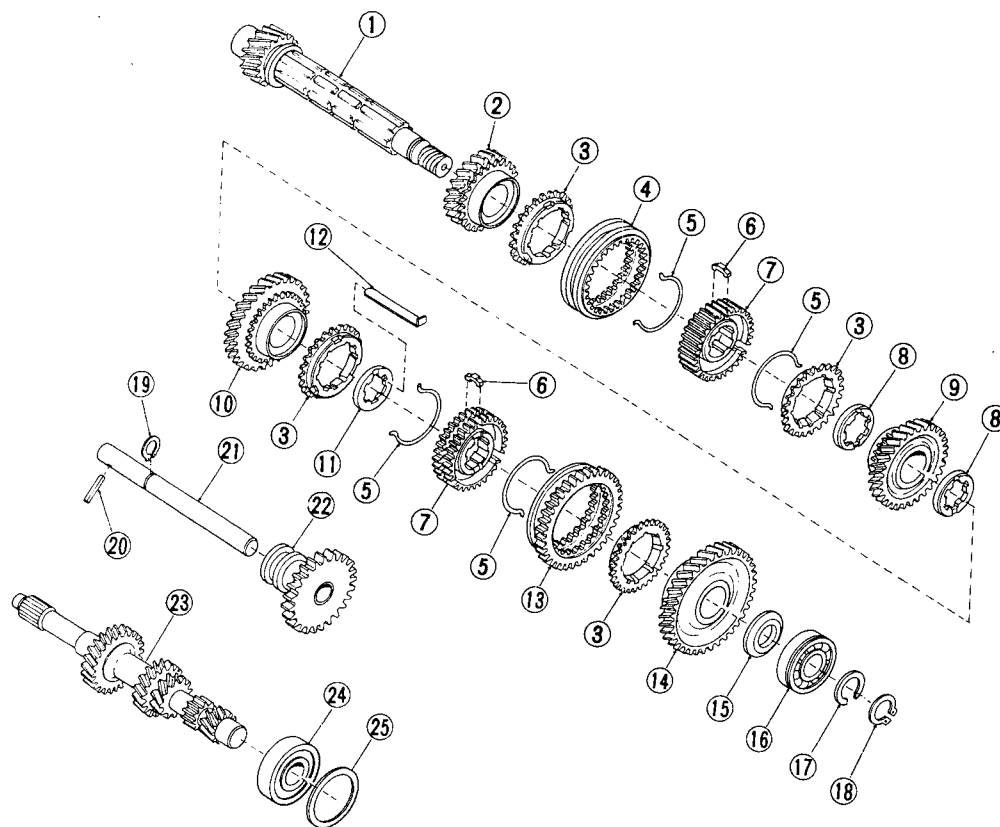
K11-051



K11-062

Transmission and differential

2) Transmission Gear Component Parts

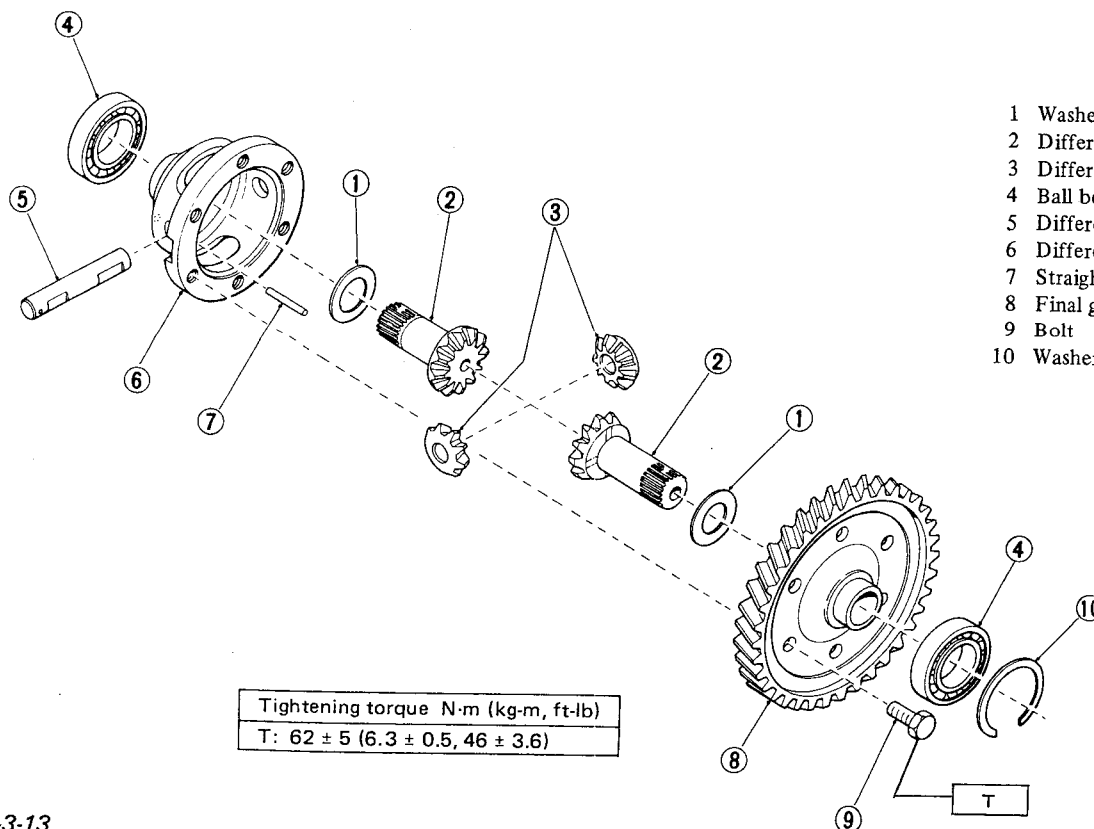


- 1 Drive pinion CP
- 2 4th driven gear
- 3 Synchronizer ring
- 4 Synchronizer sleeve
- 5 Synchronizer spring
- 6 Synchronizer hub insert
- 7 Synchronizer hub
- 8 Gear thrust spacer 2
- 9 3rd driven gear
- 10 2nd driven gear
- 11 Gear thrust spacer
- 12 Gear thrust spacer key
- 13 Reverse driven gear
- 14 1st driven gear
- 15 Washer
- 16 Ball bearing
- 17 Snap ring outer
- 18 Snap ring outer
- 19 Snap ring outer
- 20 Spring pin
- 21 Reverse idler gear shaft
- 22 Reverse idler gear
- 23 Transmission main shaft
- 24 Ball bearing
- 25 Washer

Fig. 5-3-12

K11-076

3) Differential Gear Component Parts



- 1 Washer
- 2 Differential side gear
- 3 Differential pinion
- 4 Ball bearing
- 5 Differential pinion shaft
- 6 Differential case
- 7 Straight pin
- 8 Final gear
- 9 Bolt
- 10 Washer

Fig. 5-3-13

K11-064

Transmission and differential

4) Gear Shift Control Component Parts

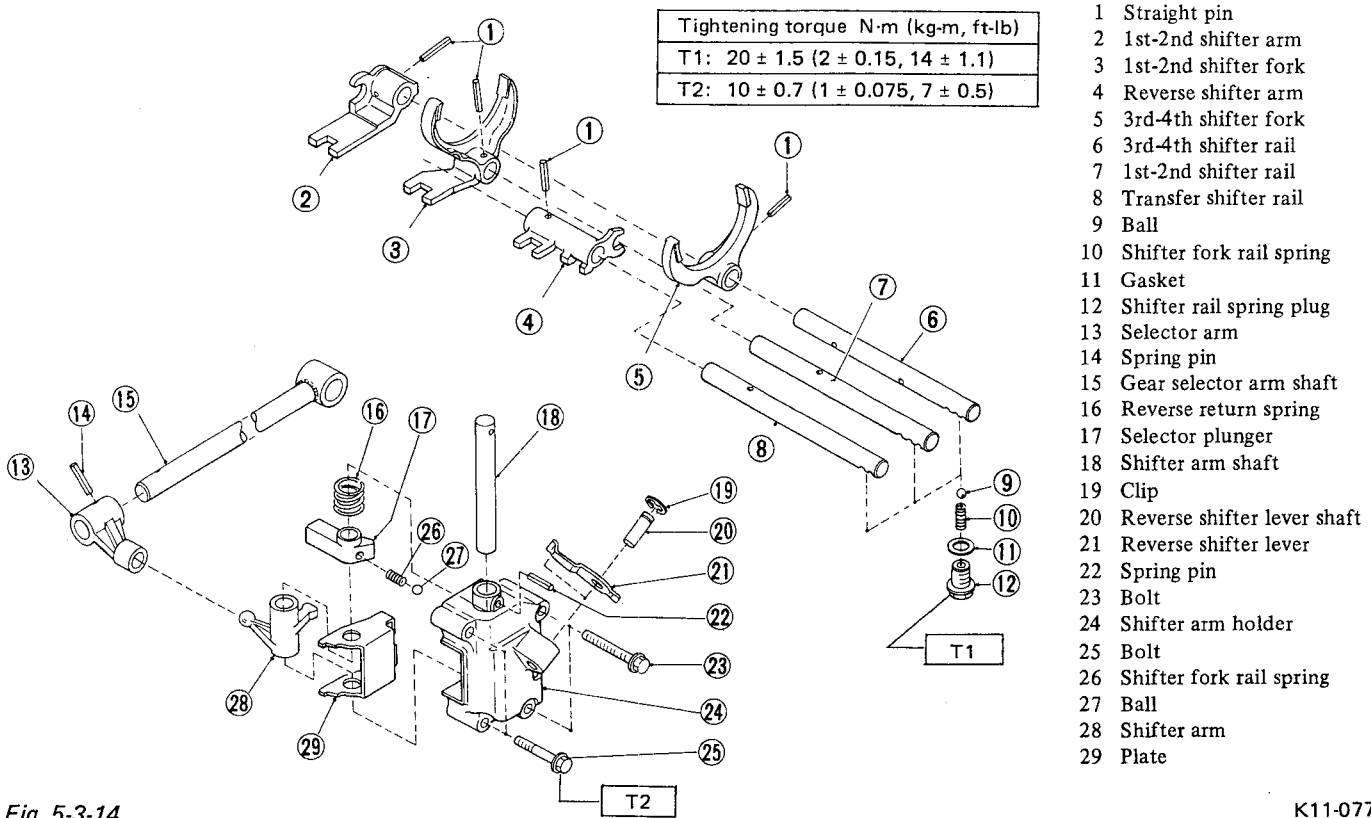


Fig. 5-3-14

K11-077

5) Clutch

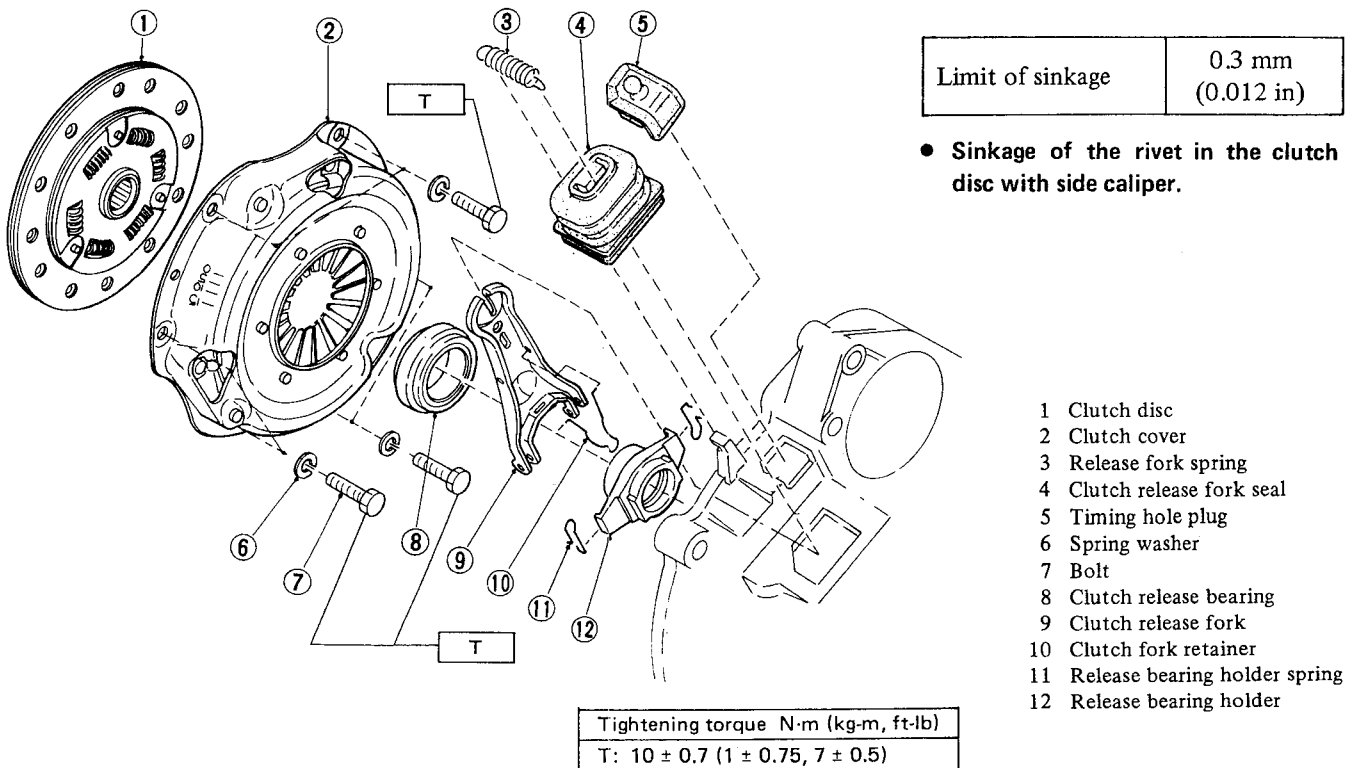


Fig. 5-3-15

K11-065

Gear Shift Lever Component Parts

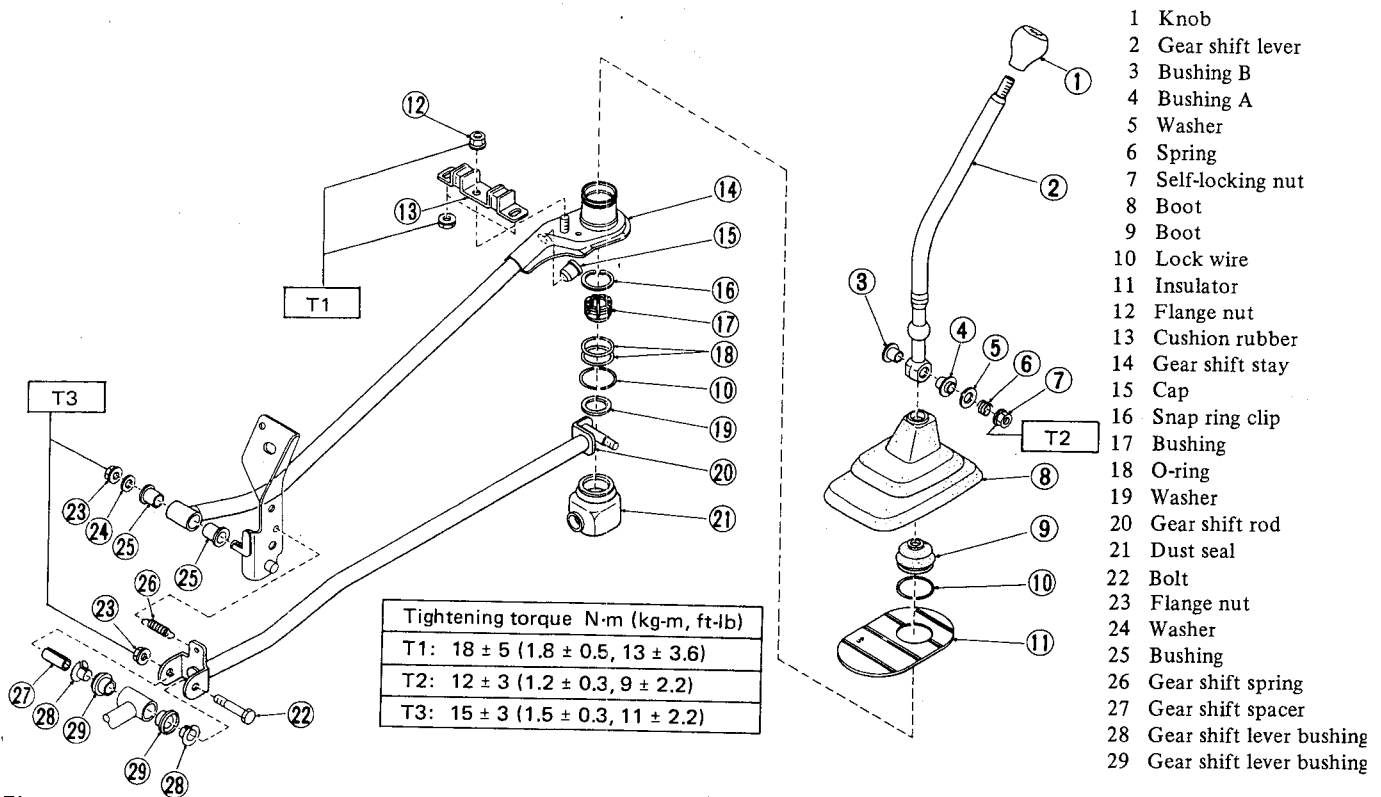


Fig. 5-3-16

K11-067

4. Service Precautions for Major Components

1) Transmission

1) When removing and installing the transmission, pay attention to the following points:

- (1) Do not hold the clutch fork or gear selector shift rod.
- (2) Do not remove the return spring from the clutch fork.
- (3) Use care not to damage the switch leads and air breather vinyl pipe.

Before disassembling the transmission, clean the outside of the transmission by removing oils and dirt, and drain the transmission gear oil by removing the drain plug located at the bottom of the clutch housing. After draining, reinstall the drain plug.

Tightening torque:
 34 ± 4 N·m
 $(3.5 \pm 0.4$ kg-m, 25 ± 2.9 ft-lb)

NOTE:

- a. Clean the drain plug magnet before reinstalling.

- b. Replace the gasket with a new one.
- c. Wrap the splined portion of the main shaft and the differential side gear with vinyl tape.

2) Disassemble the transmission, using the following procedure, and remove the main shaft assembly, drive pinion assembly and differential assembly.

- (1) Remove the clutch fork.
- (2) Remove the transmission side cover.

NOTE:

- a. Use special care not to damage the nylon speedometer gear built inside the side cover.
- b. When the side cover is removed, the main shaft rear adjusting washer may be removed together with the side cover. Use care not to lose the washer.

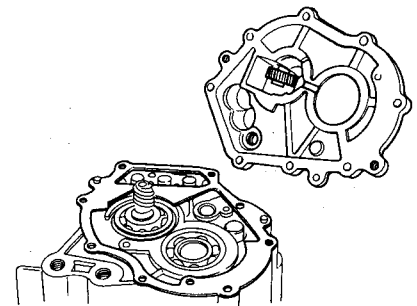


Fig. 5-3-17

K11-071

- (3) When disassembling the side cover, remove the snap ring (outer 12) toward the side opposite to the oil seal. This will prevent possible damage to the oil seal sliding surface of the shaft.

Transmission and differential

NOTE:

Be sure to replace the oil seal, once removed, with a new one.

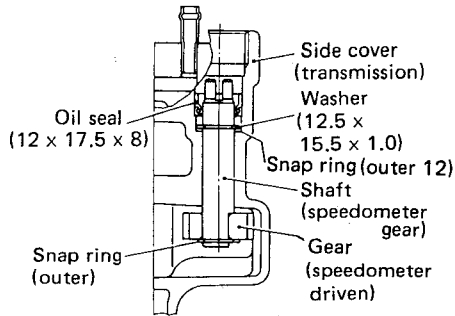


Fig. 5-3-18

K11-039

(4) Disassemble the transmission case. To remove the snap ring (outer 47) of the drive pinion rear ball bearing, use the snap ring expander (special tool: 899474100).

NOTE:

Be sure to replace the snap ring, with a new one.

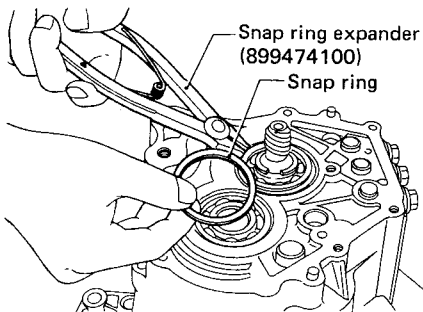


Fig. 5-3-19

K11-072

Remove the shifter rail spring plugs and take out the springs and balls [6.350 mm (0.2500 in) dia.].

To remove the transmission case, lightly tap the bolt attaching portion and the mating face of the case with a plastic hammer.

NOTE:

- Do not hit the outer wall of the case, the mating portion of the side cover or the rib; otherwise, these portions may be damaged.
- The differential unit washer may be removed with the transmission case. Use care not to lose the washer.

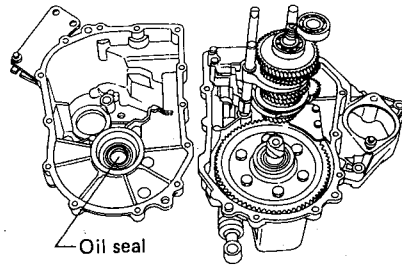
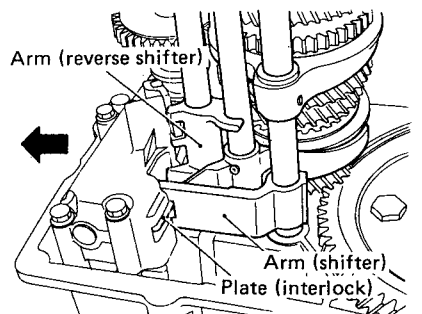


Fig. 5-3-20

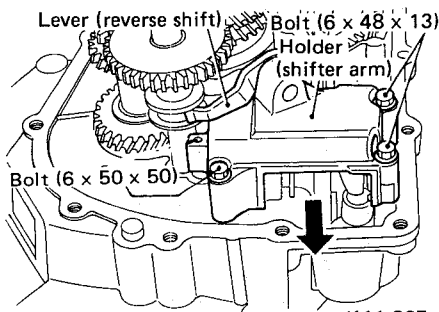
K11-006

(5) Remove the shifter arm holder.

Move the entire holder in the direction of the arrow shown in the Figure and drive out the spring pin using the straight pin remover 2 (special tool: 398791600). Remove each part.



K11-008

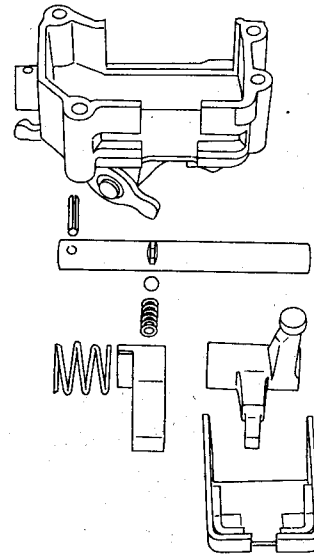


K11-007

Fig. 5-3-21

NOTE:

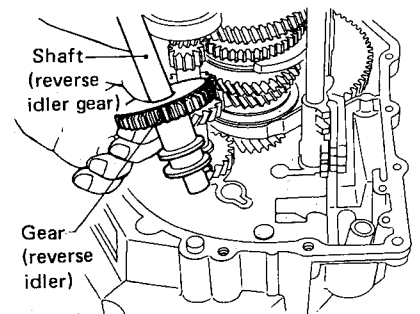
The selector plunger contains a ball and spring. Do not lose these parts.



K11-078

Fig. 5-3-22

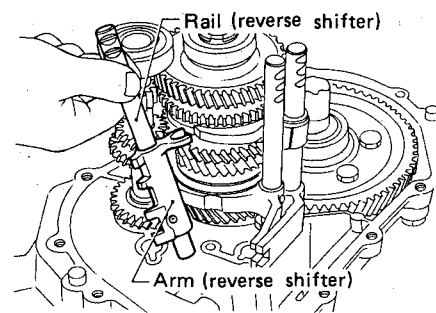
(6) Pull out the reverse idler gear shaft with the gear.



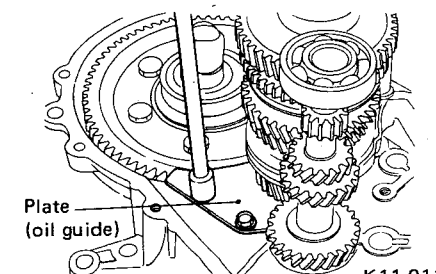
K11-034

Fig. 5-3-23

(7) Remove the reverse shifter rail, reverse shifter arm and oil guide plate.



K11-073



K11-011

Fig. 5-3-24

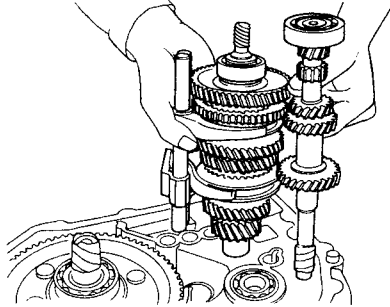
Transmission and differential

(8) Carefully pull the main shaft assembly, drive pinion assembly and the rail and fork upward.

To remove the differential gear assembly, lightly tap the end face of the differential side gear with a plastic hammer.

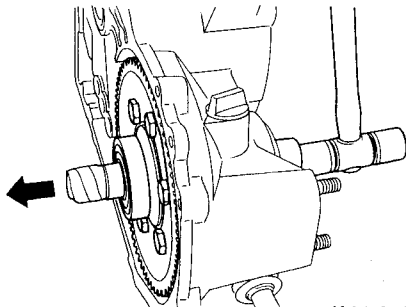
NOTE:

When removing the differential gear assembly, use care not to drop it.



K11-074

Fig. 5-3-25

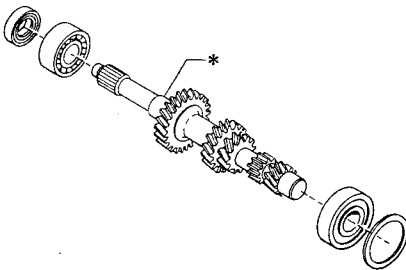


K11-013

Fig. 5-3-26

(9) When disassembling the main shaft assembly, drive pinion assembly and differential assembly, pay attention to the following points:

- Use a puller or press to remove the main shaft ball bearing. Use special care not to damage the oil seal sliding surface indicated by the mark "*".



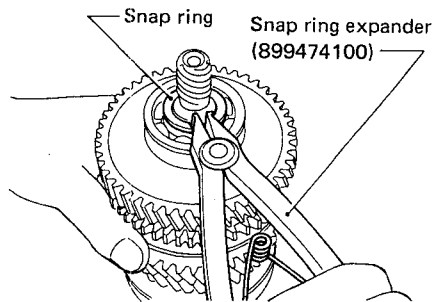
K11-071

Fig. 5-3-27

- To disassemble the drive pinion assembly, first remove the snap ring (outer 20) using the expander (special tool: 899474100). Arrange the disassembled parts in the order of removal. Do not confuse them.

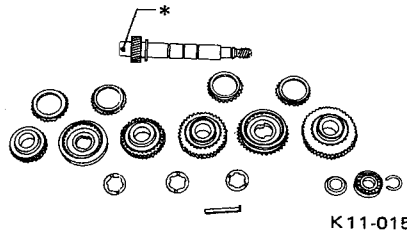
NOTE:

- Be sure to replace the snap ring (outer 20) with a new one.
- Use special care not to damage the needle bearing rolling surface (indicated by "*" mark) of the drive pinion.
- Do not remove the washer (32.2 x 42 x 4) from the drive pinion assembly unless necessary. If it should be removed, discard it and install a new one.



K11-014

Fig. 5-3-28

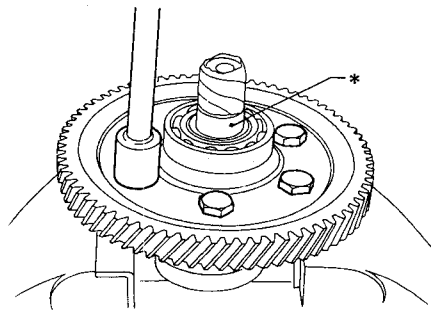


K11-015

Fig. 5-3-29

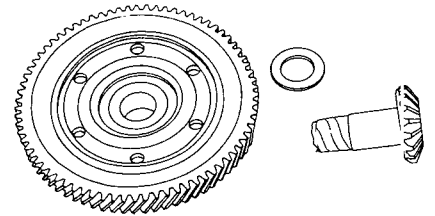
- Use special care not to damage the oil seal sliding surface of the side gear (indicated by mark "*") of the differential assembly.

Classify the side gears and adjusting washers as final gear side and differential case side.



K11-016

Fig. 5-3-30



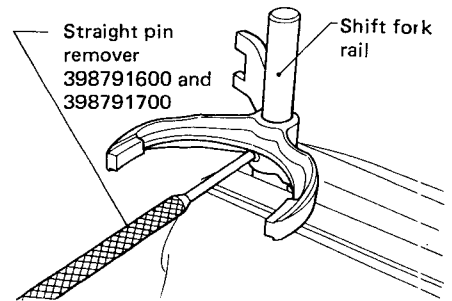
K11-C17

Fig. 5-3-31

(10) Disassemble the arm and forks with the straight pin remover (special tool: 398791600 and 398791700).

NOTE:

- Do not attempt to drive out the straight pin with the rail assembled in the clutch housing. The rail hole may be deformed.
- Do not reuse the straight pin after it has been removed; install a new one.



K11-013

Fig. 5-3-32

3) Wash each disassembled part and check carefully.

NOTE:

Replace the oil seals and gaskets with new ones.

(1) Gears

Check the tooth surface and contact surface. Replace if abnormal wear or damage is found.

Thrust clearance of each gear

Gear	Standard value mm (in)
1st	0.050 - 0.300 (0.0020 - 0.0118)
2nd, 3rd	0.080 - 0.400 (0.0031 - 0.0157)
4th	0.090 - 0.410 (0.0035 - 0.0161)

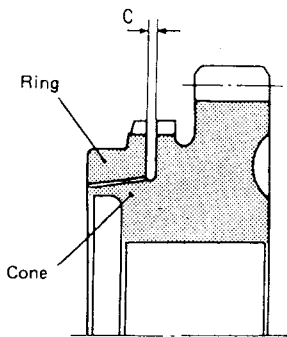
Transmission and differential

(2) Synchronizer

Check the inner surface of the ring, tooth surface and contact surface. Replace if abnormal wear or damage is found.

Measure the clearance "C" between the ring and gear when the ring is pressed to the cone. If the clearance exceeds the specified limit, replace the ring.

Standard value of C	1.3 - 1.7 mm (0.051 - 0.067 in)
Limit of C	0.5 mm (0.020 in)



T11-008

Fig. 5-3-33

(3) Bearing

Check each bearing for seizure, wear, abnormal noise and binding. If faulty, replace.

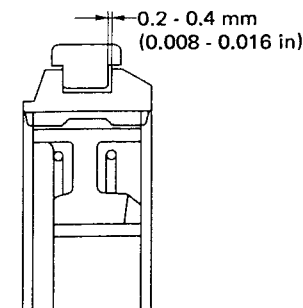
Check for noise and binding by lubricating the bearing with gear oil.

(4) Gear shift mechanism

Check each part for abnormal wear and deformation. If faulty, replace.

Clearance between shifter fork and synchronizer hub sleeve groove.

Standard value	0.2 - 0.4 mm (0.008 - 0.016 in)
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K11-055

Fig. 5-3-34

(5) Backlash of gears

Item		Standard mm (in)
Shift gears	1st	0.017 - 0.089 (0.00067 - 0.0035)
	2nd	0.014 - 0.084 (0.00055 - 0.00331)
	3rd	0.018 - 0.082 (0.00071 - 0.00323)
	4th	0.018 - 0.081 (0.00071 - 0.00319)
	Rev.	
	Drive-idler	0.038 - 0.128 (0.0015 - 0.0050)
	Idler-driven	0.041 - 0.144 (0.0016 - 0.0057)
Final reduction gear		0.046 - 0.122 (0.0018 - 0.0048)
Differential gear		0.05 - 0.15 (0.0020 - 0.0059)

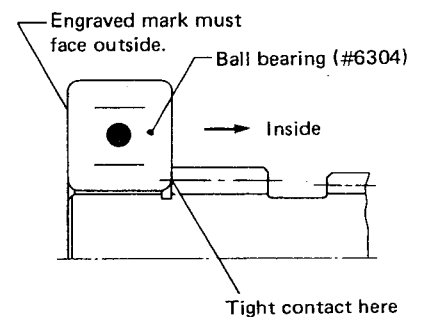
4) To assemble the transmission, reverse the disassembly procedure being careful to observe the following points:

(1) Coat the oil seal lips of the main shaft front, shift rod and speedometer gear with grease (Unilube No. 2 or equivalent).

Coat the lip of oil seal on both sides of the differential gear and other force-fitting and sliding portions with hypoid gear oil.

(2) The bearings and oil seals to be used in the transmission are listed below. Be sure to install them in their proper positions.

(3) Assemble the main shaft bearing (#6304) with the engraved mark facing outside.



K11-040

Fig. 5-3-35

Location	Bearing	Oil seal
Main shaft right	Ball bearing (#6204)	Oil seal (19.8 x 35 x 7)
Main shaft left	Ball bearing (#6304)	
Drive pinion right	Needle bearing (25 x 37 x 17)	
Drive pinion left	Ball bearing (#6204N)	
Differential right	Ball bearing (#6007)	Oil seal (R) (27 x 45 x 9)
Differential left	Ball bearing (#6007)	Oil seal (L) (27 x 45 x 9)

Transmission and differential

(4) Assemble the drive pinion using the following procedure:

- a. Install the 4th driven gear, synchronizer ring and hub assembly (3rd and 4th) in that order.

When assembling the hub assembly (3rd-4th), make sure that the portion indicated by "*" on the synchronizer sleeve is on the H_1 side of the 40 mm (1.57 in) dia. boss of the synchronizer hub.

Stagger the openings of the synchronizer hub springs by 120° so that the insert will not drop off.

NOTE:

- a. Use a hub which has no groove in the spline at the periphery for the 3rd and 4th hub.
- b. When installing the hub assembly on the drive pinion assembly, ensure that the H_2 side of the 40 mm (1.57 in) dia. boss faces the force driven gear and that the no-angular-splined portion of the synchronizer hub is positioned at a location other than the oil hole in the drive pinion.

$H_2 > H_1$

Remember the location of this cut-out portion as the spacer fixing key is to be installed here.

- c. Assemble the insert to the insert groove of the synchronizer ring.

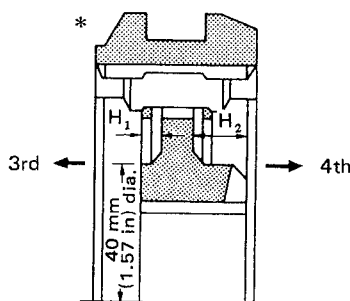


Fig. 5-3-36

K11-079

- b. Install the spacer 2, synchronizer ring, 3rd driven gear, spacer 2 and 2nd driven gear in that order.

NOTE:

Turn the spacer 2 by one tooth.

- c. Install the spacer and gear thrust spacer key.

NOTE:

Face the end surface of the grooved side [width 6.6 mm (0.260 in) depth

1.5 mm (0.059 in)] of the spacer toward the 1st driven gear and align the groove with the cut-out portion of the spline by turning the spacer by one tooth. Then install the key to the groove.

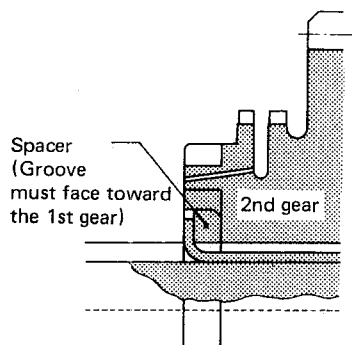


Fig. 5-3-37

K11-080

- d. Assemble the hub assembly (1st-2nd) and install the synchronizer ring, hub assembly (1st-2nd), synchronizer ring, and 1st driven gear, in that order.

Install the reverse driven gear so that the fork groove is on the H_1 side of the 38 mm (1.50 in) dia. boss of the synchronizer hub.

$(H_1 < H_2)$

NOTE:

- a. When installing the hub assembly to the drive pinion, be sure to face the H_1 side of the 38 mm (1.50 in) dia. boss to the 2nd driven gear.
- b. Fit the insert to the insert groove of the synchronizer ring.

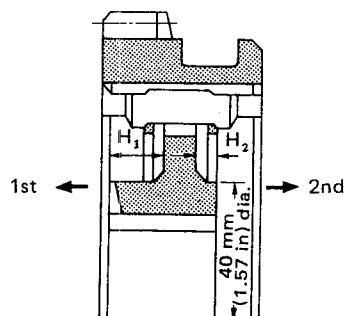


Fig. 5-3-38

K11-081

- e. Install the washer (20 x 38 x 4) and ball bearing (20 x 47 x 14).

NOTE:

- a. Install the washer with the oil groove side facing the 1st driven gear.
- b. Install the ball bearing with the ℓ_1 side facing out.

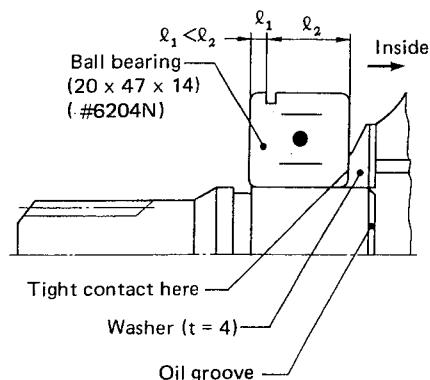


Fig. 5-3-39

K11-082

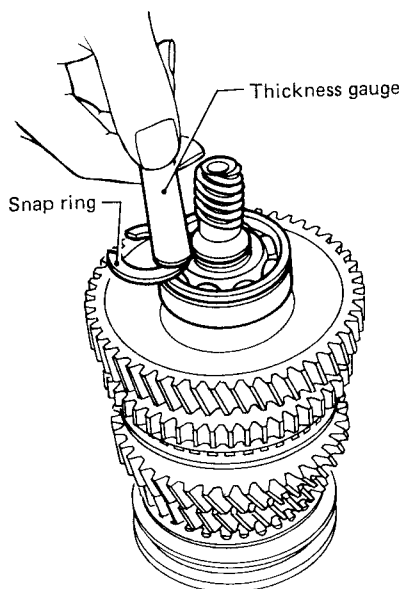
- f. Select a snap ring (outer 20) which will provide a clearance of 0 to 0.05 mm (0 to 0.0020 in) from the end face of the ball bearing inner race when it is fitted in the snap ring groove.

Install the snap ring using the snap ring press (special tool: 899754102). After installation, check to ensure the clearance is correct.

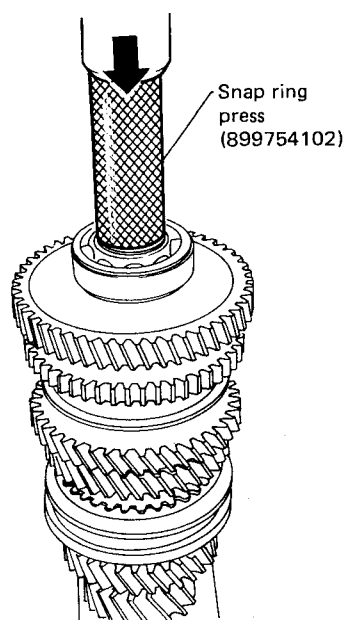
Snap ring (outer 20)	
Part No.	Thickness mm (in)
805020020	2.45 (0.0965)
805020022	2.51 (0.0988)
805020024	2.57 (0.1012)
805020026	2.63 (0.1035)
805020028	2.69 (0.1059)

NOTE:

- a. Be sure to use a new snap ring and ensure that it is securely fitted in the groove.
- b. Use care not to damage the needle bearing rolling surface of drive pinion CP.



K11-019



K11-020

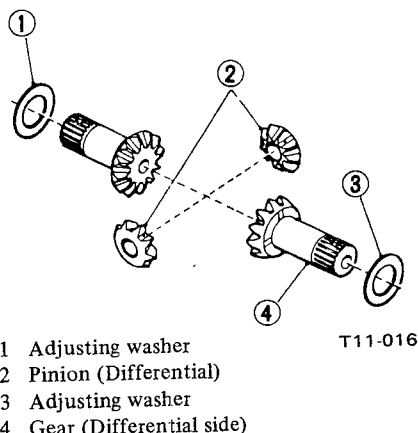
5) When assembling the differential gear, adjust the side gear to the pinion backlash by using washers of different thickness.

Choose washers from the following to obtain a backlash of 0.05 to 0.15 mm (0.0020 to 0.0059 in).

Washer (27.1 × 42 × t)	
Part No.	Thickness mm (in)
803027041	1.000 (0.0394)
803027042	1.050 (0.0413)
803027043	1.100 (0.0433)

NOTE:

- Install the washer with the chamfered portion facing the differential side gear.
- Make sure that the gear rotates smoothly without binding.

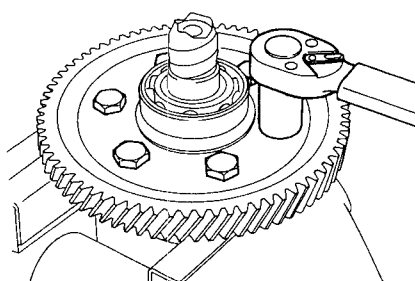


T11-016

Fig. 5-3-41

Install the differential case to the final gear by tightening the bolts to the specified torque:

Tightening torque:
 $62 \pm 5 \text{ N}\cdot\text{m}$
 $(6.3 \pm 0.5 \text{ kg}\cdot\text{m}, 46 \pm 3.6 \text{ ft}\cdot\text{lb})$



K11-022

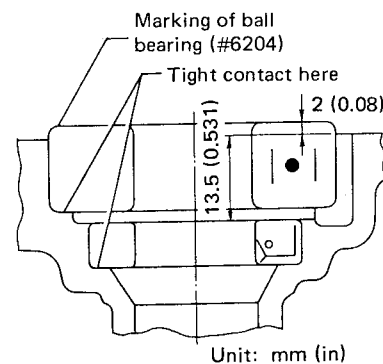
Fig. 5-3-42

NOTE:

When fixing the differential assembly in a vice, be sure to fix it in the axial direction of the pinion shaft.

- When assembling the clutch housing, pay attention to the following points:

(1) Make sure that the lip of the main shaft oil seal (19.8 × 35 × 7) is coated with grease (UNILUBE No. 2 or equivalent) and force-fit the oil seal with the dust lip facing down. Fit the ball bearing (#6204) with the marking facing up.



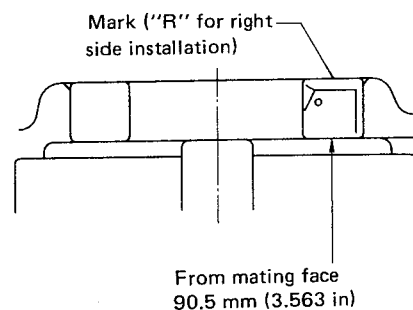
K11-042

Fig. 5-3-43

- Be sure to install the oil seal R (27 × 45 × 9) with the mark "R" on the right side of the differential gear.

If the oil seal having "L" mark is used on the right side by mistake, oil leakage will result.

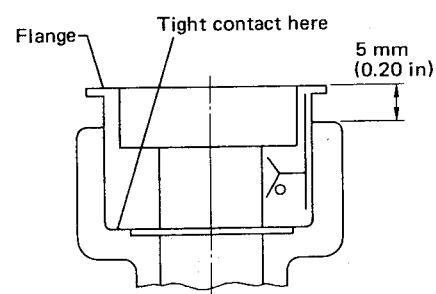
Make sure that the oil seal lip is coated with hypoid gear oil and that the oil seal is force fit with the marking facing up.



K11-043

Fig. 5-3-44

- Ensure that the lip of the oil seal (15 × 30 × 20) of the shift rod portion is coated with grease (UNILUBE No. 2 or equivalent) and that the oil seal is force fit with the flange facing up.



K11-044

Fig. 5-3-45

Transmission and differential

- (4) Tighten the clutch release fork pivot to the specified torque.

Tightening torque:
 $20 \pm 5 \text{ N}\cdot\text{m}$
 $(2 \pm 0.5 \text{ kg}\cdot\text{m}, 14 \pm 3.6 \text{ ft}\cdot\text{lb})$

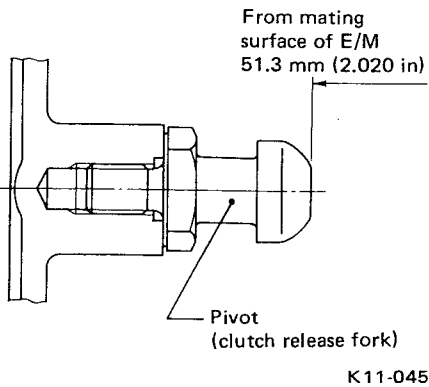


Fig. 5-3-46

- (5) Connect the shift connecting rod and select arm. Install a new spring pin.

- (6) Be sure to install the oil seal L (27 x 45 x 9) with the mark "L" on the left side of the transmission case differential gear. Ensure that the lip is coated with hypoid gear oil.

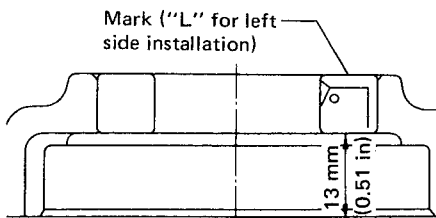


Fig. 5-3-47

- (7) To assemble the gears, first install the differential gear to the clutch housing and install the 1st-2nd and 3rd-4th rails and forks in the clutch housing.

Install the reverse shifter rail and reverse shifter arm as a unit.

NOTE:

- Wrap each splined portion with vinyl tape to avoid damaging the oil seal.
- Install the differential gear assembly with the differential gear case facing down.
- Install the straight pin with the slit facing the axial direction of the rail.

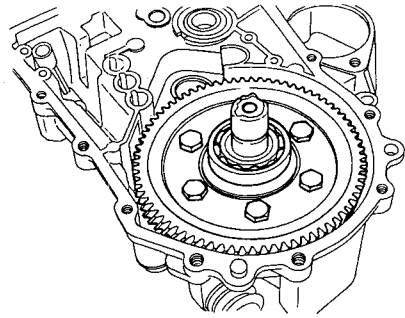


Fig. 5-3-48

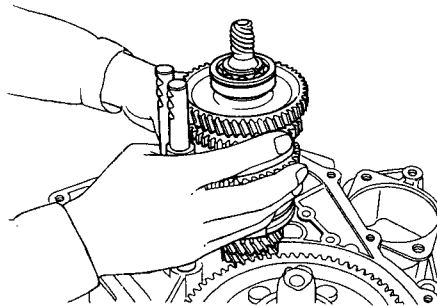


Fig. 5-3-49

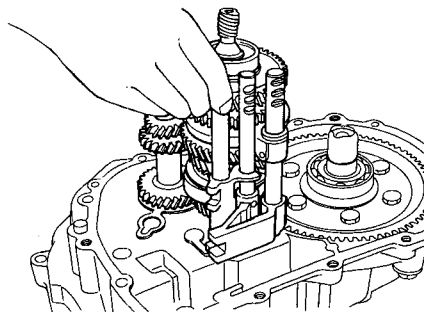


Fig. 5-3-50

When installing the reverse idler gear shaft to the clutch housing, ensure that the spring pin, snap ring and reverse idler gear are installed. After installing the shaft to the clutch housing, install the spring pin on the shaft to prevent the shaft from turning.

Also ensure that the oil guide plate is installed properly.

Height of spring pin:
 $5 \begin{smallmatrix} +1 \\ -0 \end{smallmatrix} \text{ mm } (0.20 \begin{smallmatrix} +0.04 \\ -0 \end{smallmatrix} \text{ in})$

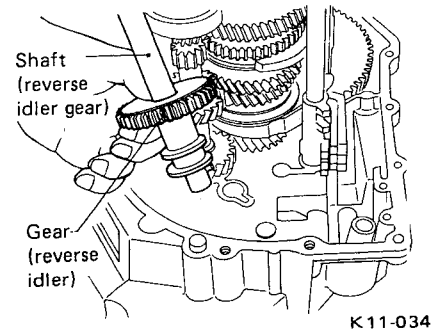


Fig. 5-3-51

- 8) When assembling the holder, pay attention to the following points:

- Insert the shifter fork spring and ball into the selector plunger and push the ball into the selector plunger and push the ball in with an accent ball installer (special tool 499415400).
- Insert the selector plunger, shifter arm and plate into the shifter arm holder as a unit.
- Drive the accent ball installer out by the shifter arm shaft.

NOTE:

- Ensure that the shifter arm shaft is installed with the V groove facing the ball.
- Discard the old spring and install a new one.

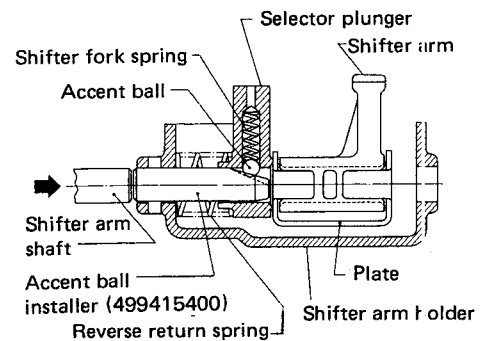


Fig. 5-3-52

- (4) Adjust the height of the reverse shifter lever shaft so that the clearance from the reverse shifter lever clip is 0.05 to 0.2 mm (0.0020 to 0.0079 in).

Transmission and differential

Never remove the press-fitted shaft, even if the clearance is less than the specified value.

If necessary, replace the holder with shaft.

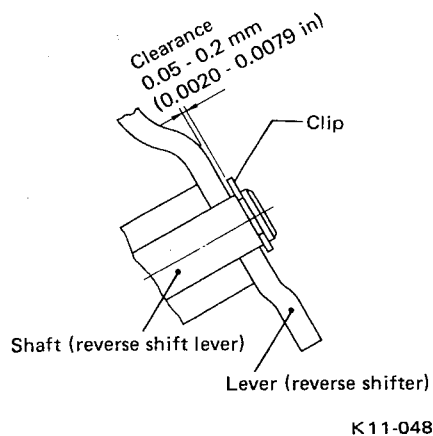


Fig. 5-3-53

10) Assemble the transmission case using the following procedure:

(1) Measure the thrust clearance of the differential gear and adjust it to 0 to 0.2 mm (0 to 0.008 in). To adjust, proceed as follows:

- Using the bearing height gauge (special tool: 499575400) and depth gauge, measure the depth (h_2) of the ball bearing (#6007) outer race.
- Measure the depth (h_1) of the case.
- Using the following equation, calculate the thickness of the washer to be used.

$$C = h_1 - (15 - h_2)$$

C : Thrust clearance

h_1 : Depth of case

h_2 : Depth of housing

C mm (in)	Washer (51 × 60.2 × 0.2)
Less than 0.2 (0.008)	None
0.2 - 0.4 (0.008 - 0.016)	One
Greater than 0.4 (0.016)	Two

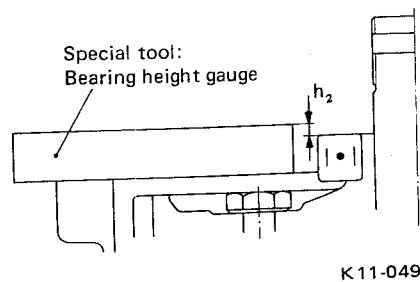


Fig. 5-3-54

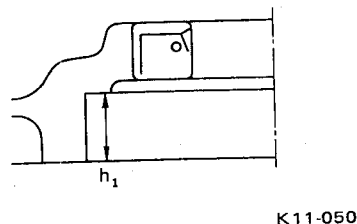


Fig. 5-3-55

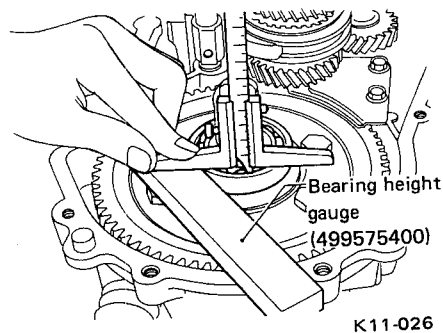


Fig. 5-3-56

(2) Install the washer (51 × 60.2 × 0.2) to the case. Coat the washer with grease to prevent it from dropping.

(3) Remove oils from the mating surfaces of the clutch housing and transmission case and coat with fluid packing (three bond No. 1215 or equivalent).

Aligning the bearing of the main shaft, drive pinion and differential with the bore of the rail, install the transmission. Tighten the 8 mm bolts in the sequence shown in the Figure to the specified torque.

Tightening torque:
25 ± 2 N·m
(2.5 ± 0.2 kg·m, 18 ± 1.4 ft·lb)

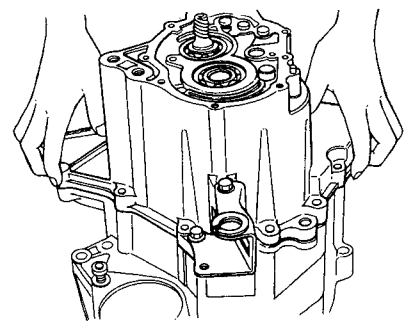


Fig. 5-3-57

8 mm bolts tightening sequence

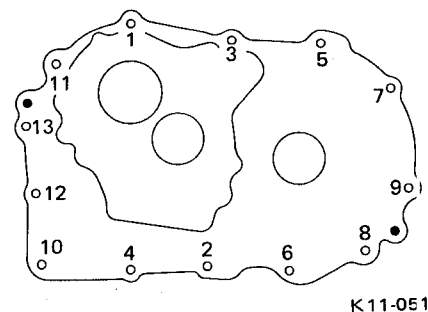


Fig. 5-3-58

No.	Bolt size	No. of bolts
1-3, 5-9, 11-13	8 × 40	11
4, 10	8 × 55	2

(4) Shift gears to the 3rd position so that the groove of the outer race of the drive pinion side cover ball bearing (20 × 47 × 14) can be seen above the case and install the shift rod stopper (special tool: 498275500) to the pipe of the rod.

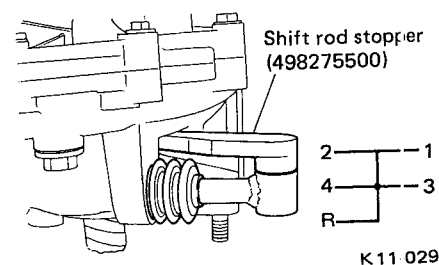


Fig. 5-3-59

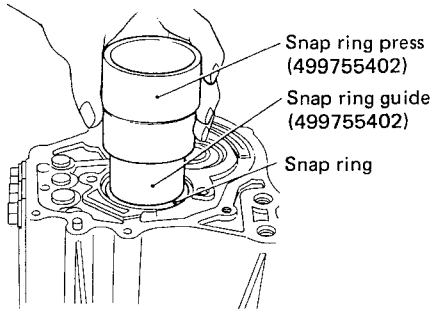
(5) Place the snap ring guide (special tool: 499755401) on the ball bearing (20 × 47 × 14) and fit the snap ring to the tapered portion of the guide.

Transmission and differential

Press the snap ring down with the snap ring press (special tool: 499755402) until the snap ring is fitted into the groove of the ball bearing.

NOTE:

Use a new snap ring and ensure that it is securely fitted into the groove.



K11-084

Fig. 5-3-60

(6) After setting the shift rod in the neutral position, install the ball (6.350), spring, gasket and plug to the rail end.

Tightening torque:

$20 \pm 1.5 \text{ N}\cdot\text{m}$
 $(2 \pm 0.15 \text{ kg}\cdot\text{m}, 14 \pm 1.1 \text{ ft}\cdot\text{lb})$

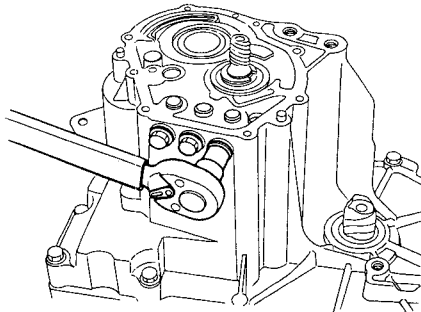


Fig. 5-3-61

K11-085

(7) Measure the depth (ℓ) of the main shaft side cover ball bearing (#6304) and select the washers to be used.

NOTE:

After installing the side cover gasket, the thrust clearance on the main shaft side cover portion should be 0.01 to 0.2 mm (0.0004 to 0.0079 in).

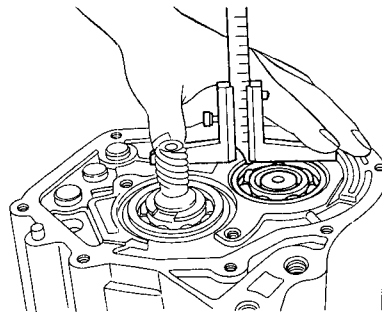
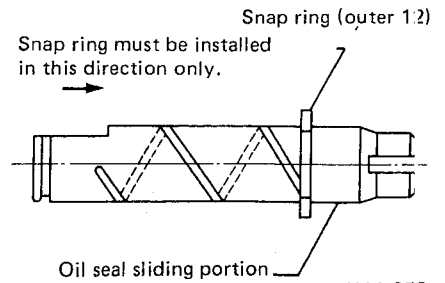


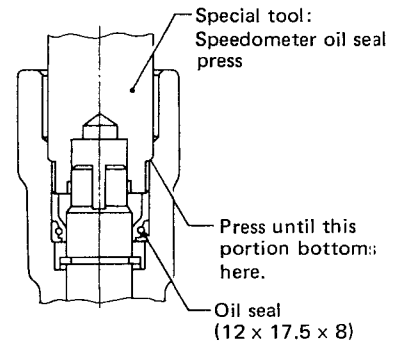
Fig. 5-3-62

K11-086



K11-052

Fig. 5-3-63



K11-053

Fig. 5-3-64

12) Remove oils from the mating surfaces of the transmission side cover and transmission case. Install the side cover and the gasket by tightening the 6 mm bolts in the sequence shown in figure.

Tightening torque:

$10 \pm 0.7 \text{ N}\cdot\text{m}$
 $(1 \pm 0.075 \text{ kg}\cdot\text{m}, 7 \pm 0.5 \text{ ft}\cdot\text{lb})$

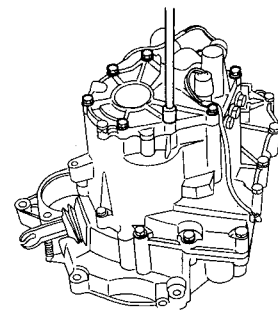


Fig. 5-3-65

K11-032

6 mm bolts tightening sequence

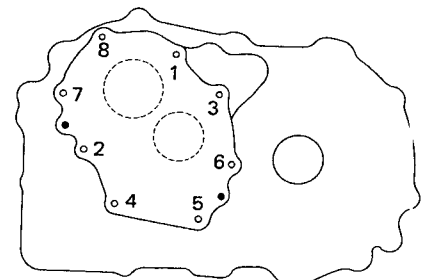


Fig. 5-3-66

K11-054

11) Install the snap ring (outer 12) to the speedometer gear shaft from the side on which the speedometer driven gear is to be assembled. Force-fit the oil seal (12 x 17.5 x 8) using the speedometer oil seal press (special tool: 499827000).

NOTE:

a. Never attempt to install the snap ring from the oil seal sliding portion.

b. Coat the lip of the oil seal with grease before installing. (UNILUBE No. 2 or equivalent)

Sec.	Depth (ℓ) mm (in)	Part No.	Thickness mm (in)
1	Less than 1.03 (0.0406)	803042021	1.0 (0.039)
2	1.03 - 1.23 (0.0406 - 0.0484)	803042022	1.2 (0.047)
3	1.23 - 1.43 (0.0484 - 0.563)	803042023	1.4 (0.055)
4	1.43 - 1.69 (0.563 - 0.0665)	803042024	1.6 (0.063)

Transmission and differential

13) After assembling the transmission, manipulate the shift connecting rod and check to see that each gear shifts properly.

14) When installing the transmission to the engine, be sure to coat the main shaft spline with grease.

2) Clutch

1) To remove the clutch from the engine, insert the clutch disc guide (special tool: 499745400) to the center of the clutch and evenly loosen the clutch cover mounting bolts.

NOTE:

- Be sure to apply oil or grease to the end of the clutch disc guide before inserting.
- Use care not to get oil or grease on the facing of the disc.

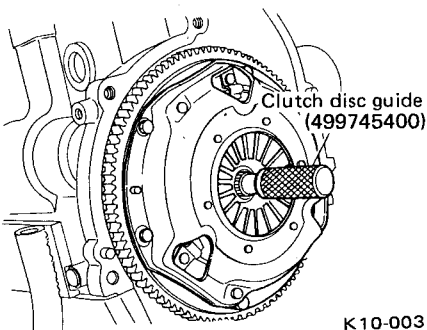


Fig. 5-3-67

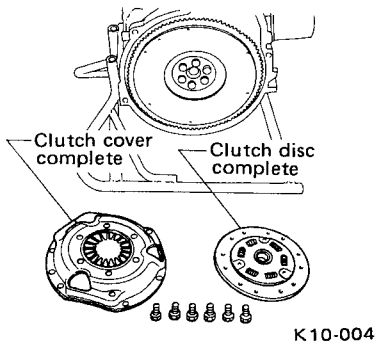


Fig. 5-3-68

2) Check the clutch cover for wear, distortion and damage, and replace if it is faulty.

Carefully check the end of the diaphragm spring and replace if worn excessively.

3) Measure the sinkage of the rivet in the clutch disc with slide calipers. If the facing is worn excessively, replace.

Limit of sinkage	0.3 mm (0.012 in)
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Check the torsion spring for damage and fatigue and the spline hub rivet for looseness. Also check the facing for oil. Replace all faulty parts.

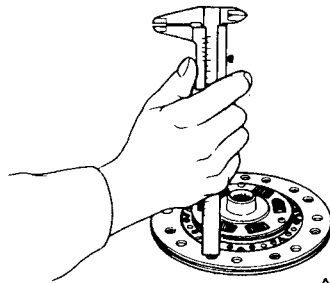


Fig. 5-3-69

4) Fit the clutch disc guide (special tool: 499745400) to the spline of the clutch disc and measure the play of the spline in the direction of rotation on the outer periphery of the facing. If the play is excessive, replace the disc. Also check the face runout of the disc and replace if faulty.

Free play in direction of rotation (on the periphery of facing)	Max. 0.5 mm (0.020 in)
Face runout	Max. 0.5 mm (0.020 in)

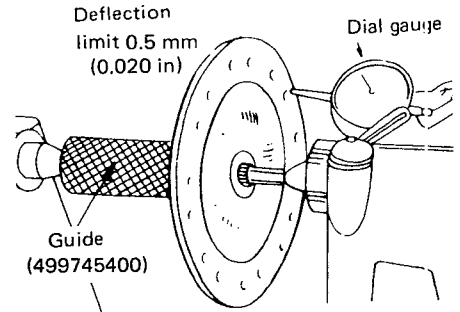


Fig. 5-3-70

5) Check the release bearing holder and clutch release fork for abnormal wear and damage and replace if faulty.

The release bearing can be removed from the holder with a press. To install, force fit using the snap ring press (special tool: 899754112).

NOTE:

The bearing is a lubrication-free type and grease is packed in it. Do not wash the bearing when removed.

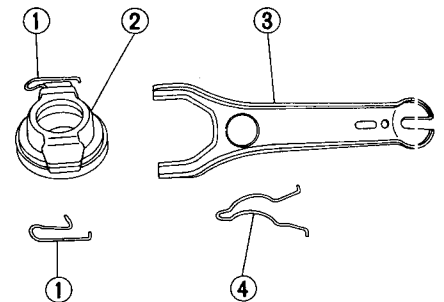
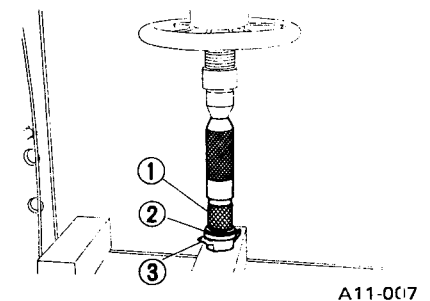


Fig. 5-3-71



- Snap ring press
- Bearing
- Holder

Fig. 5-3-72

Transmission and differential

6) When assembling the clutch release fork, apply grease to the groove inside the holder, to the contact point between the fork and holder and to

the contact point between the fork and pivot. (UNILUBE No. 2 or equivalent).

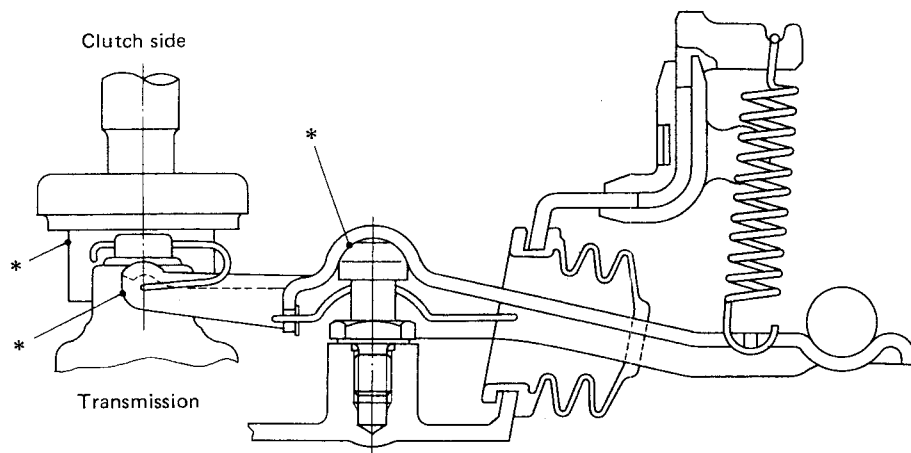


Fig. 5-3-73

7) Install the clutch cover and clutch disc to the flywheel with a clutch disc guide (special tool: 499745400). Align the two dowel pin holes of the clutch cover with the dowel pins of the flywheel and secure the cover by tightening the 6 mm bolts.

Tightening torque:
 $10 \pm 0.7 \text{ N}\cdot\text{m}$
 $(1 \pm 0.075 \text{ kg}\cdot\text{m}, 7 \pm 0.5 \text{ ft}\cdot\text{lb})$

NOTE:
 Evenly tighten the bolts.

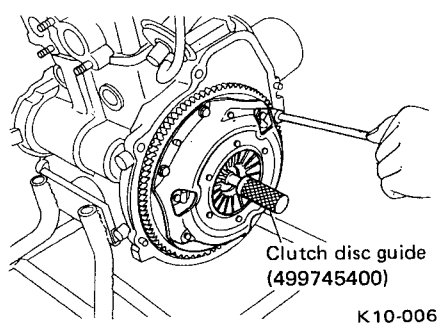


Fig. 5-3-74

8) Adjust the free travel of the clutch with the release fork return spring removed.

Clutch pedal	Total stroke	$105 \pm 5 \text{ mm}$ ($4.13 \pm 0.20 \text{ in}$)
	Free travel	$10 - 25 \text{ mm}$ ($0.39 - 0.98 \text{ in}$)

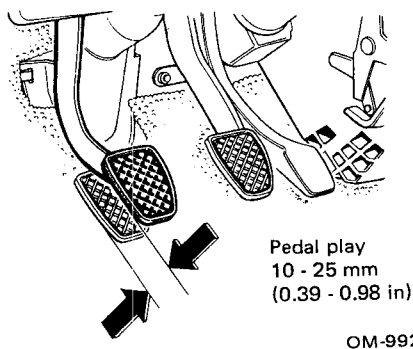
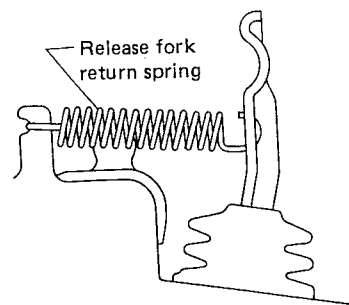


Fig. 5-3-75



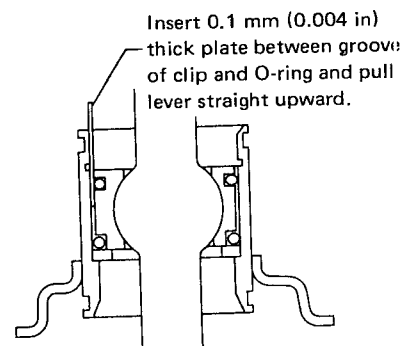
K10-008

Fig. 5-3-76

NOTE:
 After completing clutch play adjustment, be sure to securely tighten the nut of the cable.

3) Gear Shift Lever

1) To separate the gear shift lever from the stay, insert a thin plate [approx. 0.1 mm (0.004 in) thick] between the clip groove and O-ring and pull the lever straight up.



K10-009

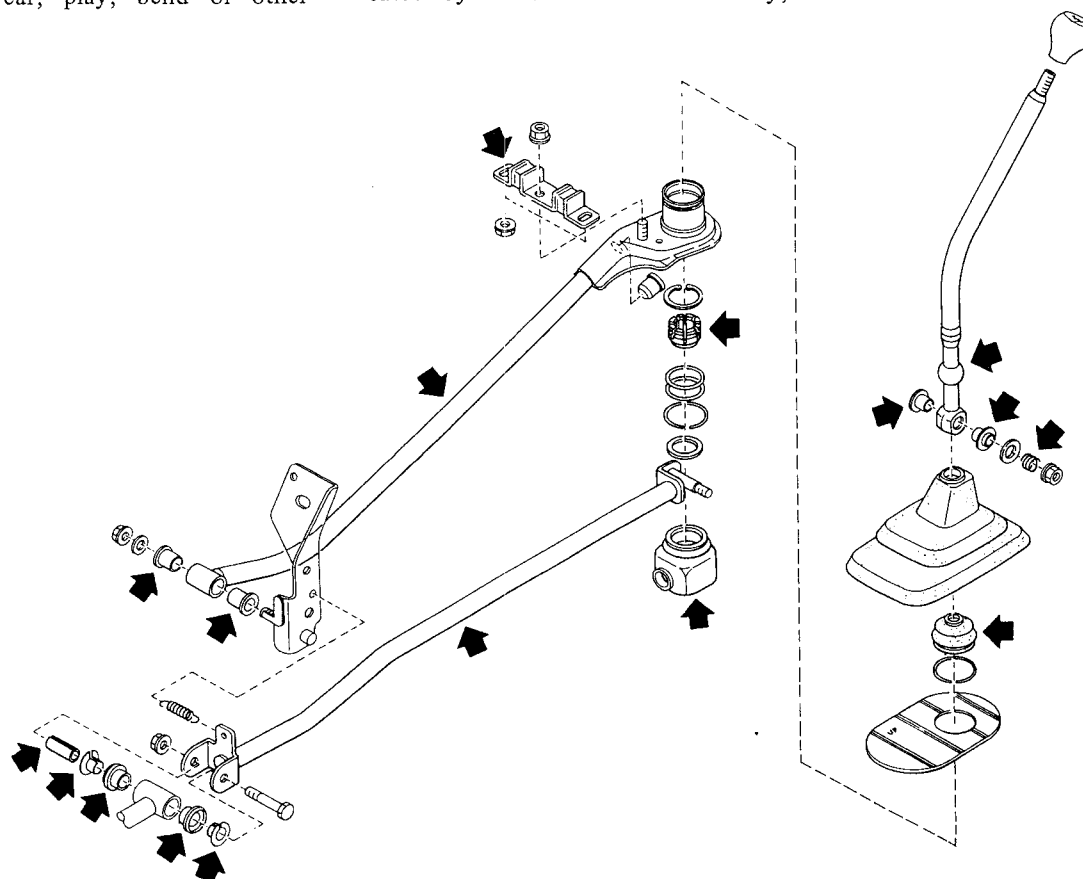
Fig. 5-3-77

Transmission and differential

2) Check each part for damage, cracks, wear, play, bend or other

faults, especially on the portion indicated by the arrow mark. If faulty,

repair or replace.



K11-068

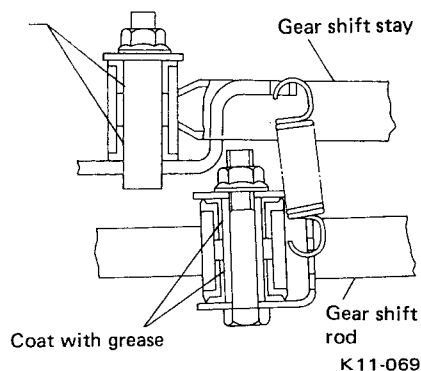
Fig. 5-3-78

3) Assemble parts, using special care on those portions indicated in the Figure.

NOTE:

Apply grease to the portions indicated in Figure.

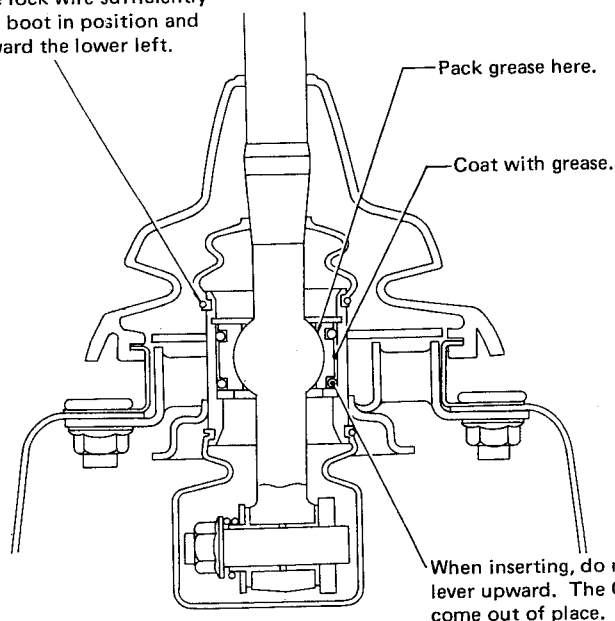
Coat with grease.



K11-069

Fig. 5-3-79

Tighten the lock wire sufficiently to keep the boot in position and bend it toward the lower left.



K11-070

Fig. 5-3-80