

1994 Hyundai Excel

MANUAL TRANS OVERHAUL - MITSU F4M20, F5M20/30, KM200 MANUAL TRANSMISSIONS Mitsubishi F4M20, F5M20, F5M30 & KM200 Series

MANUAL TRANS OVERHAUL - MITSU F4M20, F5M20/30, KM200**MANUAL TRANSMISSIONS Mitsubishi F4M20, F5M20, F5M30 & KM200 Series****APPLICATIONS****CHRYSLER MOTORS****TRANSMISSION APPLICATIONS (CHRYSLER MOTORS 2WD)**

Vehicle Application	Transmission Model
4-Speed	
1987-89 Colt (1.5L)	KM200
1988-89 Summit	KM200
1990-92 Colt (1.5L)	F4M21
1990-92 Summit (1.5L)	F4M21
5-Speed	
1987 Colt (1.5L)	KM201
1988-89 Colt Wagon (2WD)	KM201
1989 Colt	KM201
1989 Summit	KM201
1990-94 Colt (1.5L)	F5M21
1990 Colt Wagon (2WD)	F5M21
1990-91 Colt Vista Wagon (2.0L)	F5M22
1990-92 Laser SOHC (1.8L)	F5M22
1990 Summit DOHC	F5M22
1990-94 Summit (1.5L)	F5M21
1990-94 Talon SOHC (1.8L)	F5M22
1990-94 Talon DOHC Turbo (2.0L)	F5M33
1991-94 Talon DOHC Non-Turbo (2.0L)	F5M22
1991-92 Laser DOHC Non-Turbo (2.0L)	F5M22
1991-92 Laser DOHC Turbo (2.0L, FWD)	F5M33
1991-94 Stealth Non-Turbo	F5M33
1992-94 Colt Vista Wagon (1.8L)	F5M22
1992-94 Colt Vista Wagon (2.4L)	F5M31
1993-94 Colt (1.8L)	F5M22
1993-94 Summit (1.8L)	F5M22

HYUNDAI**TRANSMISSION APPLICATIONS (HYUNDAI)**

Vehicle Application	Transmission Model
4-Speed	

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1991-94 Excel	KM200
5-Speed	
1991-94 Excel	KM201
1991-92 Scoupe	KM201
1991 Sonata	F5M31
1992 Elantra	F5M22
1992 Sonata	F5M22
1993-94 Elentra	KM202
1993-94 Sonata	KM202

MITSUBISHI

TRANSMISSION APPLICATIONS (MITSUBISHI 2WD)

Vehicle Application	Transmission Model
4-Speed	
1987 Mirage (1.5L)	KM200
1990 Precis	F4M21
1991-92 Mirage (1.5L)	F4M21
1991-94 Precis (1.5L)	KM200
5-Speed	
1987-89 Mirage (1.5L)	KM201
1990-94 Eclipse SOHC (1.8L)	F5M22
1990-94 Eclipse DOHC Non-Turbo (2.0L)	F5M22
1990-94 Eclipse DOHC Turbo (2.0L)	F5M33
1990 Precis	F5M22
1990-92 Galant SOHC	F5M22
1990-94 Mirage (1.5L)	F5M21
1990-92 Mirage (1.6L)	F5M22
1991-94 Galant DOHC Non-Turbo	F5M31
1991-94 Precis (1.5L)	KM201
1991-94 3000 GT Non-Turbo	F5M33
1992-94 Expo (2.4L)	F5M31
1992-94 Expo LRV (1.8L)	F5M22
1993-94 Mirage (1.8L)	F5M22

IDENTIFICATION

Transaxle can be identified by vehicle information code plate, located on firewall (fender plate on 1991 Colt Vista) in engine compartment.

LUBRICATION & ADJUSTMENTS

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See appropriate TRANSMISSION SERVICING - M/T article in MANUAL TRANS SERVICE section. See menu below.

- For 1987 Colt, see TRANSMISSION SERVICING - M/T
- For 1988 Colt, see TRANSMISSION SERVICING - M/T
- For 1989 Colt, see TRANSMISSION SERVICING - M/T
- For 1990-92 Colt, see TRANSMISSION SERVICING - M/T
- For 1993 Colt, see TRANSMISSION SERVICING - M/T
- For 1994 Colt, see TRANSMISSION SERVICING - M/T
- For 1990 Laser, see TRANSMISSION SERVICING - M/T
- For 1991 Laser, see TRANSMISSION SERVICING - M/T
- For 1992 Laser, see TRANSMISSION SERVICING - M/T
- For 1991-92 Stealth, see TRANSMISSION SERVICING - M/T
- For 1993 Stealth, see TRANSMISSION SERVICING - M/T
- For 1994 Stealth, see TRANSMISSION SERVICING - M/T
- For 1988-89 Summit, see TRANSMISSION SERVICING - M/T
- For 1990-92 Summit, see TRANSMISSION SERVICING - M/T
- For 1993 Summit, see TRANSMISSION SERVICING - M/T
- For 1994 Summit, see TRANSMISSION SERVICING - M/T
- For 1990 Talon, see TRANSMISSION SERVICING - M/T
- For 1991 Talon, see TRANSMISSION SERVICING - M/T
- For 1992 Talon, see TRANSMISSION SERVICING - M/T
- For 1993 Talon, see TRANSMISSION SERVICING - M/T
- For 1994 Talon, see TRANSMISSION SERVICING - M/T
- For All 1991-92 Hyundai Models, see **TRANSMISSION SERVICING - M/T**
- For 1993 Elantra, see **TRANSMISSION SERVICING - M/T**
- For 1994 Elantra, see **TRANSMISSION SERVICING - M/T**
- For 1993 Excel, see **TRANSMISSION SERVICING - M/T**
- For 1994 Excel, see **TRANSMISSION SERVICING - M/T**
- For 1993 Sonata, see **TRANSMISSION SERVICING - M/T**
- For 1994 Sonata, see **TRANSMISSION SERVICING - M/T**
- For 1990-91 Mitsubishi Models, see TRANSMISSION SERVICING - M/T
- For 1992 Mitsubishi Models, see TRANSMISSION SERVICING - M/T
- For 1993 3000 GT, see TRANSMISSION SERVICING - M/T
- For 1994 3000 GT, see TRANSMISSION SERVICING - M/T
- For 1993 Eclipse, see TRANSMISSION SERVICING - M/T
- For 1994 Eclipse, see TRANSMISSION SERVICING - M/T
- For 1993 Expo & Expo LRV, see TRANSMISSION SERVICING - M/T

- For 1994 Expo & Expo LRV, see TRANSMISSION SERVICING - M/T
- For 1993 Galant, see TRANSMISSION SERVICING - M/T
- For 1994 Galant, see TRANSMISSION SERVICING - M/T
- For 1987 Mirage, see TRANSMISSION SERVICING - M/T
- For 1988 Mirage, see TRANSMISSION SERVICING - M/T
- For 1989 Mirage, see TRANSMISSION SERVICING - M/T
- For 1993 Mirage, see TRANSMISSION SERVICING - M/T
- For 1994 Mirage, see TRANSMISSION SERVICING - M/T
- For 1993 Precis, see TRANSMISSION SERVICING - M/T
- For 1994 Precis, see TRANSMISSION SERVICING - M/T

ON-VEHICLE SERVICE

DRIVE AXLE SHAFTS

See appropriate AXLE SHAFTS - FRONT article in DRIVE AXLES section. See menu below.

- For 1987 Colt, see AXLE SHAFTS - FRONT
- For 1988 Colt, see AXLE SHAFTS - FRONT
- For 1989 Colt, see AXLE SHAFTS - FRONT
- For 1990 Colt, see AXLE SHAFTS - FRONT
- For 1991-92 Colt, see AXLE SHAFTS - FRONT
- For 1993 Colt, see AXLE SHAFTS - FRONT
- For 1994 Colt, see AXLE SHAFTS - FRONT
- For 1990 Laser, see AXLE SHAFTS - FRONT
- For 1991-92 Laser, see AXLE SHAFTS - FRONT
- For 1991-92 Stealth, see AXLE SHAFTS - FRONT
- For 1993 Stealth, see AXLE SHAFTS - FRONT
- For 1994 Stealth, see AXLE SHAFTS - FRONT
- For 1988-89 Summit, see AXLE SHAFTS - FRONT
- For 1990 Summit, see AXLE SHAFTS - FRONT
- For 1991-92 Summit, see AXLE SHAFTS - FRONT
- For 1993 Summit, see AXLE SHAFTS - FRONT
- For 1994 Summit, see AXLE SHAFTS - FRONT
- For 1990 Talon, see AXLE SHAFTS - FRONT
- For 1991-92 Talon, see AXLE SHAFTS - FRONT
- For 1993 Talon, see AXLE SHAFTS - FRONT
- For 1994 Talon, see AXLE SHAFTS - FRONT
- For 1993 Elantra, see **AXLE SHAFTS - FRONT**

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- For 1994 Elantra, see **AXLE SHAFTS - FRONT**
- For 1991-94 Excel, see **AXLE SHAFTS - FRONT**
- For 1991-94 Sonata, see **AXLE SHAFTS - FRONT**
- For 1990-92 Mitsubishi Models, see AXLE SHAFTS - FRONT
- For 1993 3000 GT, see AXLE SHAFTS - FRONT
- For 1994 3000 GT, see AXLE SHAFTS - FRONT
- For 1993 Eclipse, see AXLE SHAFTS - FRONT
- For 1994 Eclipse, see AXLE SHAFTS - FRONT
- For 1993 Expo & Expo LRV, see AXLE SHAFTS - FRONT
- For 1994 Expo & Expo LRV, see AXLE SHAFTS - FRONT
- For 1993 Galant, see AXLE SHAFTS - FRONT
- For 1994 Galant, see AXLE SHAFTS - FRONT
- For 1987 Mirage, see AXLE SHAFTS - FRONT
- For 1988 Mirage, see AXLE SHAFTS - FRONT
- For 1989 Mirage, see AXLE SHAFTS - FRONT
- For 1993 Mirage, see AXLE SHAFTS - FRONT
- For 1994 Mirage, see AXLE SHAFTS - FRONT
- For 1993-94 Precis, see AXLE SHAFTS - FRONT

TROUBLESHOOTING

See **TROUBLE SHOOTING - BASIC PROCEDURES** article in the GENERAL TROUBLE SHOOTING section.

REMOVAL & INSTALLATION

For transaxle removal procedure, see appropriate TRANSMISSION REMOVAL & INSTALLATION - M/T article in MANUAL TRANS SERVICE section.

- For Colt, see TRANSMISSION REMOVAL & INSTALLATION - M/T
- For Stealth, see TRANSMISSION REMOVAL & INSTALLATION - M/T
- For Summit, see TRANSMISSION REMOVAL & INSTALLATION - M/T
- For Elantra, see **TRANSMISSION REMOVAL & INSTALLATION - M/T**
- For Excel, see **TRANSMISSION REMOVAL & INSTALLATION - M/T**
- For Sonata, see **TRANSMISSION REMOVAL & INSTALLATION - M/T**
- For 3000 GT, see TRANSMISSION REMOVAL & INSTALLATION - M/T
- For Eclipse, see TRANSMISSION REMOVAL & INSTALLATION - M/T
- For Expo & Expo LRV, see TRANSMISSION REMOVAL & INSTALLATION - M/T
- For Galant, see TRANSMISSION REMOVAL & INSTALLATION - M/T
- For Mirage, see TRANSMISSION REMOVAL & INSTALLATION - M/T

- For Preciis, see TRANSMISSION REMOVAL & INSTALLATION - M/T

TRANSAXLE DISASSEMBLY

1. Remove transaxle switch and gasket (if equipped). Remove rear cover. Remove back-up light switch and gasket. On KM200 and KM201 models, remove steel ball from back-up light switch case bore.
2. On F5M22, F5M31 and F5M33 models, remove wave spring, screw bolts and reverse brake cone. See **Fig. 1** and **Fig. 2** . On all models, remove poppet plugs, poppet springs and poppet balls.
3. Remove speedometer driven gear assembly from clutch housing. Remove air breather from clutch housing.
4. On all models except KM200 and F4M21, remove spring pin from 5th gear shift fork. Unstake lock nuts on input shaft and intermediate shaft. On all models, shift transaxle into Reverse using control and select levers. Install splined socket and breaker bar on input shaft. Install 10 mm bolt in clutch housing and position breaker against bolt to prevent input shaft from rotating. Remove lock nuts.
5. On all models except KM200 and F4M21, remove 5th gear synchronizer assembly and shift fork. Remove synchronizer ring, and 5th gear. On KM200 and F4M21 models, remove dished washer and roller bearing. On F5M21 models, remove needle bearing, spacer, bearing sleeve, snap ring and roller bearing. On KM201 models, remove needle bearing, dished washer, bearing sleeve and roller bearing.
6. On all models except KM200 and F4M21, remove intermediate 5th gear. Remove reverse idler gear shaft bolt and gasket. Remove transaxle case and oil guide. On all models except KM200 and F4M21, remove stopper bracket bolt and spring washer.
7. On all models except KM200 and F4M21, remove restrict ball assembly and gasket. On KM200, KM201, F4M21 and F5M21 models, remove outer ring. On all models, remove oil seal. On KM200, KM201, F4M21 and F5M21 models, remove 3 spacers and one bearing outer race. On F5M22 and F5M33 models, remove 3 spacers and 3 bearing outer races.
8. Remove reverse shift lever assembly, reverse shift lever shoe, reverse idler gear shaft and reverse idler gear.
9. Remove spring pins for 1st-2nd and 3rd-4th gear shift forks. Shift 1st-2nd gear shift fork to 2nd gear. Shift 3rd-4th gear shift fork to 4th gear.
10. On KM200, KM201, F4M21, F5M21 and F5M22 models, rotate shift rails as necessary to free shift lugs from control finger and interlock plate. Pull shift rails upward to extract rail ends from clutch housing. Remove shift rails and forks.
11. On F5M31 and F5M33 models, remove shift rail assembly. On all models, remove bearing retainer. Lift up on input shaft and remove intermediate gear assembly.
12. On all models, remove input shaft and output shaft assemblies. Remove differential assembly. Remove bearing outer races from input shaft, output shaft and differential bores in clutch housing (if equipped). Remove oil guide and oil seals from clutch housing. On F4M21, F5M21, F5M22, F5M31 and F5M33 models, remove magnet and magnet holder. See **Fig. 1** and **Fig. 2** .

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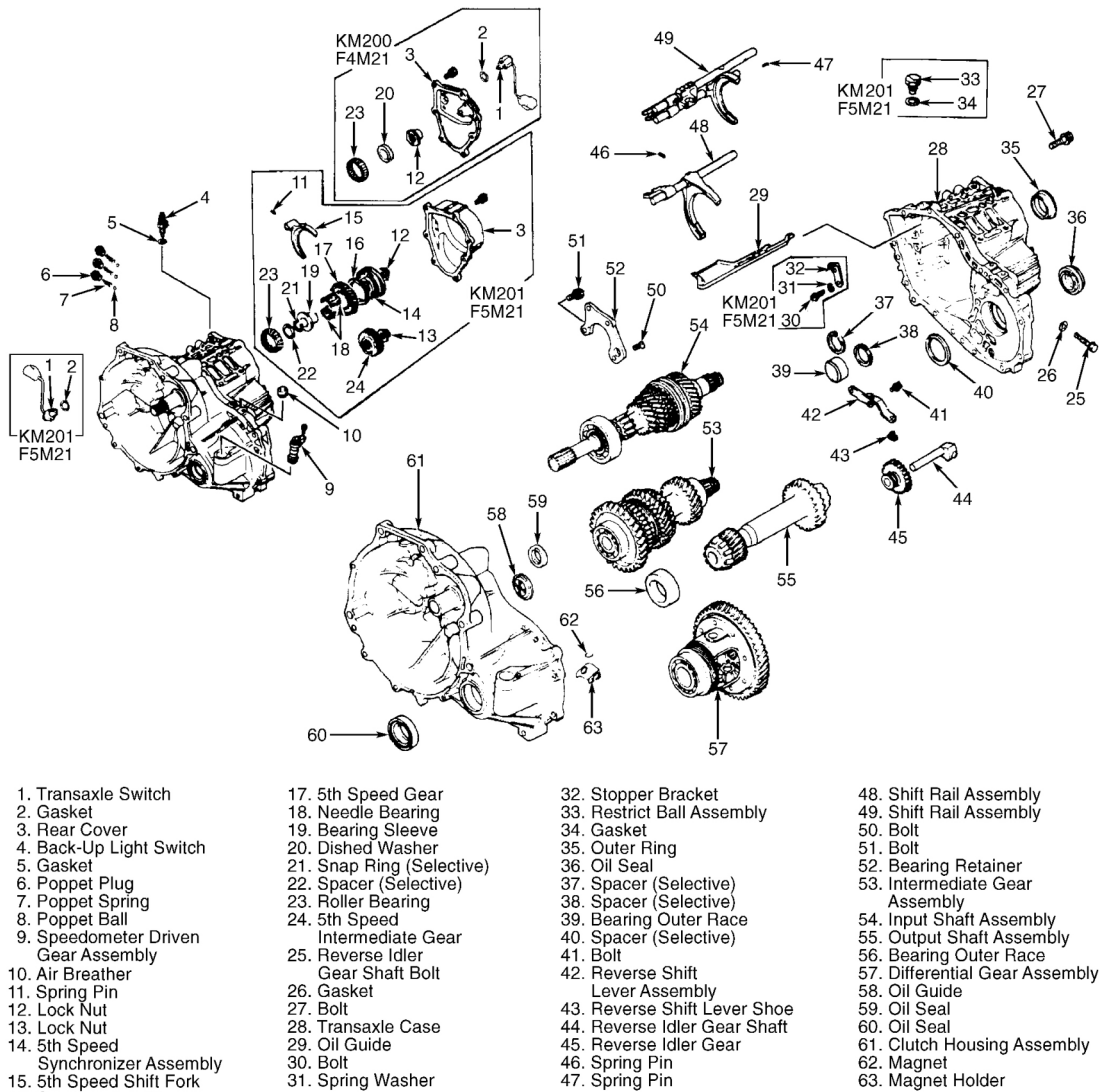


Fig. 1: Exploded View Of Transaxle (KM200, KM201, F4M21 & F5M21)
Courtesy of MITSUBISHI MOTOR SALES OF AMERICA.

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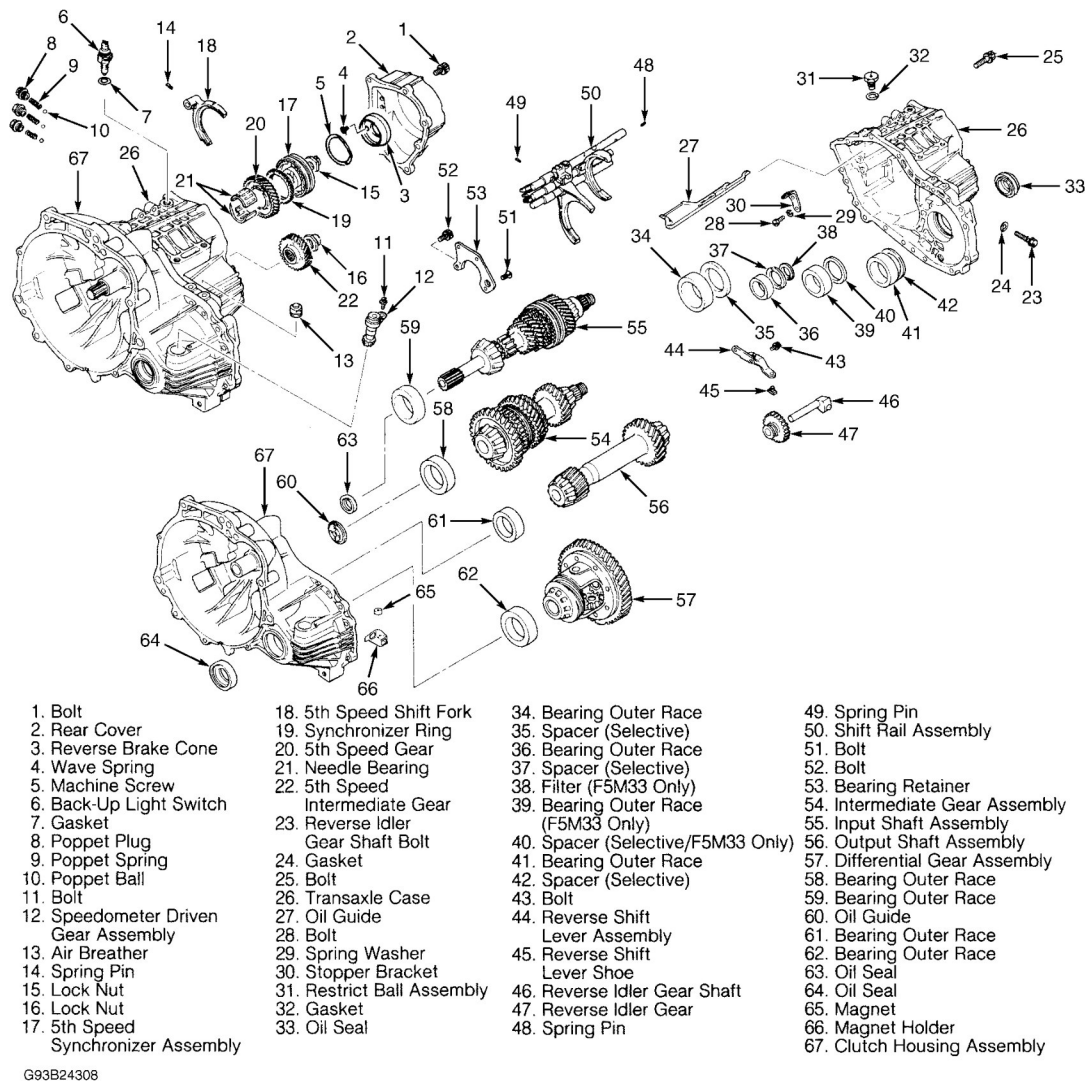


Fig. 2: Exploded View Of Transaxle (F5M22, F5M31 & F5M33)
Courtesy of MITSUBISHI MOTOR SALES OF AMERICA.

COMPONENT DISASSEMBLY & REASSEMBLY

5TH GEAR SYNCHRONIZER ASSEMBLY

Disassembly

1. On KM201 model, remove stop plate, synchronizer spring, synchronizer sleeve, synchronizer key and hub. See **Fig. 1**.
2. On F5M21, F5M22, F5M31 and F5M33 models, remove reverse brake ring, stop plate, synchronizer spring, synchronizer sleeve, synchronizer key and hub. See **Fig. 1** and **Fig. 2**.

Inspection

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Insert synchronizer hub into sleeve. Ensure they slide smoothly. Ensure sleeve is not damaged or worn at inside front and rear edges. Inspect for wear on 5th gear mating surface of hub. Inspect for wear of synchronizer key center protrusion. Inspect spring for weakness, deformation and breakage.

NOTE: **Replace synchronizer sleeve and hub as a set.**

Reassembly

1. Assemble synchronizer hub, sleeve and key, noting their direction. See **Fig. 1** and **Fig. 2** . Synchronizer sleeve has a tooth missing at 6 places. Assemble hub to sleeve so center tooth is between 2 missing teeth and touches synchronizer key.
2. Install synchronizer springs so synchronizer keys rest in stepped portions in springs. Ensure synchronizer springs are not installed in same direction. Install stop plate and reverse brake ring (if equipped).

INPUT SHAFT (KM200, KM201, F4M21 & F5M21)

Disassembly

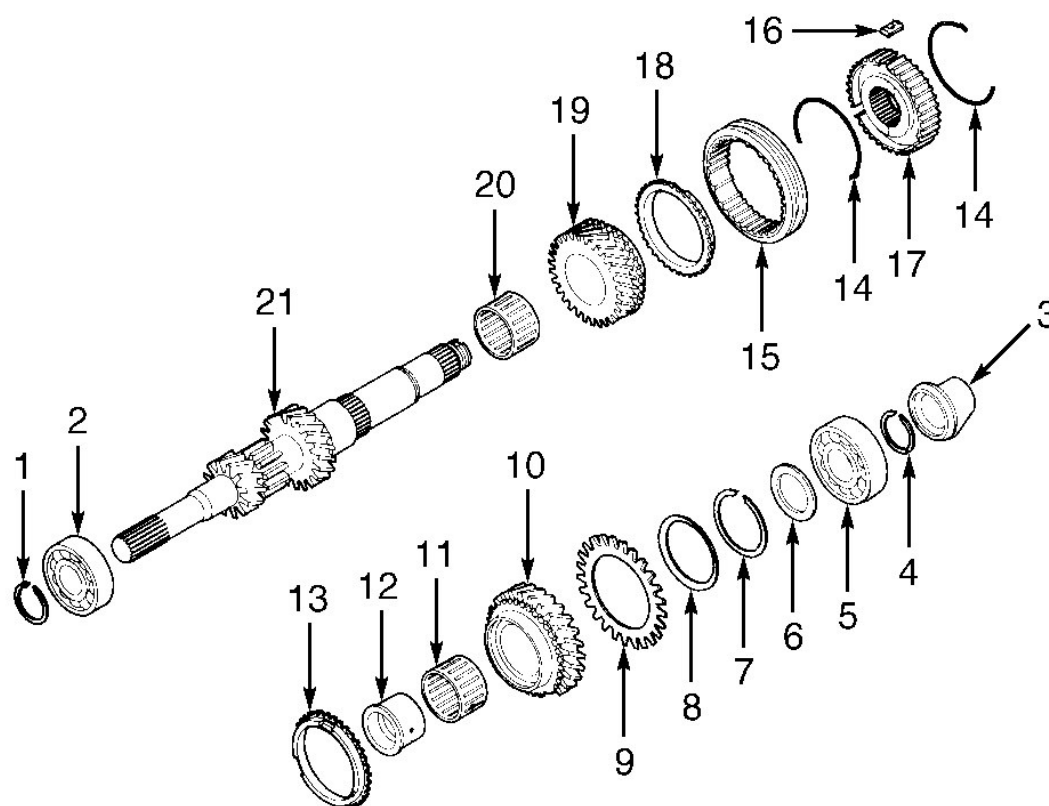
Remove snap ring. Press front bearing from input shaft. Press inner ring (rear bearing), spacer and 4th gear from input shaft. Press 3rd gear, 3rd-4th synchronizer assembly and bearing sleeve from input shaft. See **Fig. 3** .

Inspection

1. Inspect input shaft bearing surfaces for wear, seizure and damage. Inspect shaft splines for damage and wear. Assemble needle bearing to shaft and ensure it rotates smoothly without abnormal noise, roughness or play. Inspect bearing cage for deformation.
2. Inspect synchronizer ring for damaged or broken teeth. Inspect inner surface for damage, wear and broken threads. Force synchronizer ring toward clutch gear and check clearance between gear and synchronizer ring. Replace synchronizer ring if clearance is not at least .02" (.5 mm). See **Fig. 4** .

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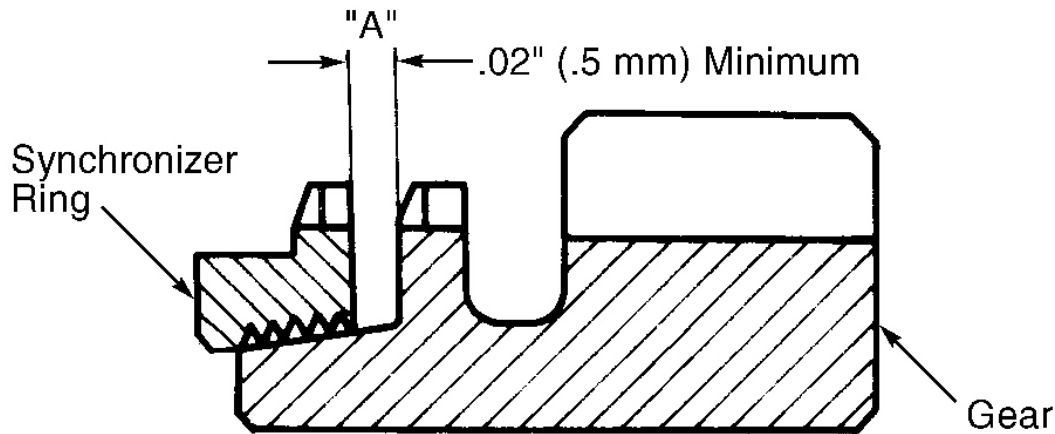
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- | | |
|--------------------------|---------------------------------------|
| 1. Snap Ring (Selective) | 13. Synchronizer Ring |
| 2. Ball Or Taper Bearing | 14. Synchronizer Spring |
| 3. Bearing Sleeve | 15. 3rd-4th Speed Synchronizer Sleeve |
| 4. Snap Ring (Selective) | 16. Synchronizer Key |
| 5. Ball Or Taper Bearing | 17. 3rd-4th Speed Synchronizer Hub |
| 6. Spacer (Selective) | 18. Synchronizer Ring |
| 7. Snap Ring (Selective) | 19. 3rd Speed Gear |
| 8. Cone Spring | 20. Needle Bearing |
| 9. Sub-Gear | 21. Input Shaft |
| 10. 4th Speed Gear | |
| 11. Needle Bearing | |
| 12. Bearing Sleeve | |

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Fig. 3: Exploded View Of Input Shaft (F5M31 Shown; Other Similar)
 Courtesy of MITSUBISHI MOTOR SALES OF AMERICA.



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Fig. 4: Checking Synchronizer-To-Gear Clearance

Courtesy of MITSUBISHI MOTOR SALES OF AMERICA.

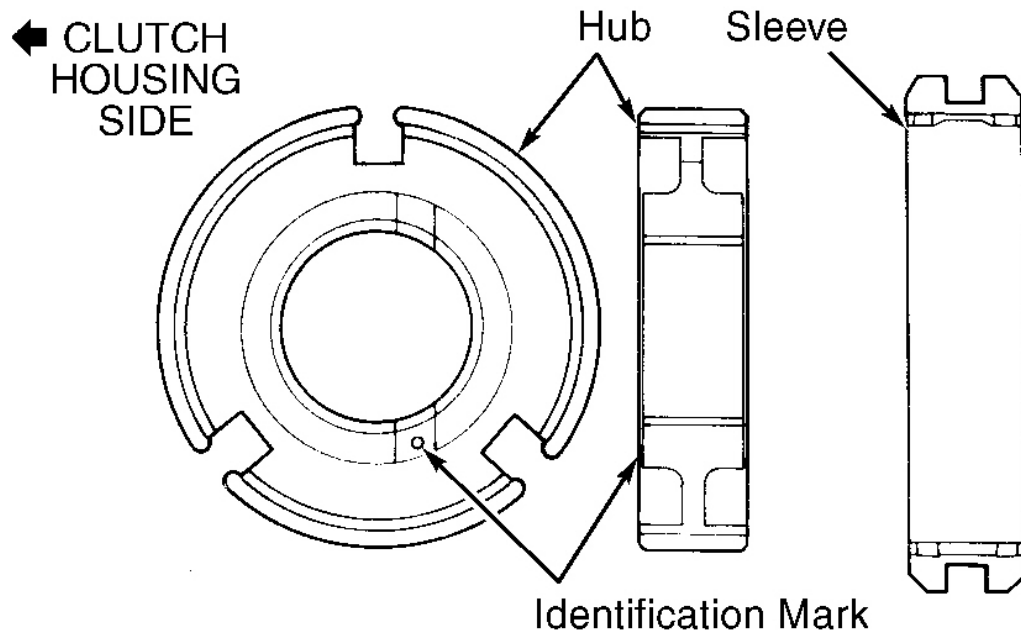
3. Insert synchronizer hub into sleeve. Ensure they slide smoothly. Ensure sleeve is not damaged or worn at inside front and rear edges. Inspect for wear on gear mating surfaces of hub. Inspect for wear of synchronizer key center protrusion. Inspect spring for weakness, deformation and breakage.

NOTE: Replace synchronizer sleeve and hub as a set.

4. Inspect synchronizer cone for rough surface, damage and wear. Inspect gear bore and front and rear mating surfaces for damage and wear.

Reassembly

1. To reassemble, reverse disassembly procedure. Install synchronizer hub and sleeve with mark on hub toward front. Synchronizer sleeve has a tooth missing at 6 places. Assemble hub to sleeve so center tooth is between 2 missing teeth and touches synchronizer key. See **Fig. 5**.



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Fig. 5: Installing 3rd-4th Synchronizer

Courtesy of MITSUBISHI MOTOR SALES OF AMERICA.

2. Install synchronizer springs so synchronizer keys rest in stepped portions in springs. Ensure synchronizer springs are not installed in same direction. Install 3rd-4th synchronizer assembly on input shaft using Installer.

NOTE: Ensure synchronizer keys are seated in grooves in ring. After installing synchronizer assembly, ensure 3rd gear rotates smoothly.

3. Install bearing sleeve using installer. Install spacer with identification mark "1" toward 4th gear side. If spacer is not marked, it can be installed in either direction. Install inner ring (rear bearing) on input shaft using installer.
4. Install front bearing on input shaft using bearing installer. Install NEW snap ring in groove. Snap rings are available in various thicknesses. Install thickest snap ring that will fit in groove. Be careful to avoid damaging oil seal area on input shaft.

INPUT SHAFT (F5M22, F5M31 & F5M33)

Disassembly

Remove snap ring. Press front bearing from input shaft. Press rear bearing and bearing sleeve from input shaft. Remove spacer, 4th gear and bearing. Press bearing sleeve, 3rd-4th synchronizer assembly and 3rd gear from

input shaft. Remove needle bearing. See **Fig. 3**.

Inspection

1. Inspect input shaft bearing surfaces for wear, seizure and damage. Inspect shaft splines for damage and wear. Assemble needle bearing to shaft and ensure it rotates smoothly without abnormal noise, roughness or play. Inspect bearing cage for deformation.
2. Inspect synchronizer ring for damaged or broken teeth and inner surface for damage, wear and broken threads. Force synchronizer ring toward clutch gear and check clearance between gear and synchronizer ring. Replace synchronizer ring if clearance is not at least .02" (.5 mm). See **Fig. 4**.
3. Insert synchronizer hub into sleeve. Ensure they slide smoothly. Ensure sleeve is not damaged or worn at inside front and rear edges. Inspect for wear on gear mating surfaces of hub. Inspect for wear of synchronizer key center protrusion. Inspect spring for weakness, deformation and breakage.

NOTE: Replace synchronizer sleeve and hub as a set.

4. Inspect synchronizer cone for rough surface, damage and wear. Inspect gear bore and front and rear mating surfaces for damage and wear. Inspect bevel gear and clutch gear teeth for damage and wear.

Reassembly

1. To reassemble, reverse disassembly procedure. Install synchronizer hub and sleeve with mark on hub toward front. Synchronizer sleeve has a tooth missing at 6 places. Assemble hub to sleeve so center tooth is between 2 missing teeth and touches synchronizer key.
2. Install synchronizer springs so synchronizer keys rest in stepped portions in springs. Ensure synchronizer springs are not installed in same direction. Install 3rd-4th synchronizer assembly on input shaft using installer.

NOTE: Ensure synchronizer keys are seated in grooves in ring. After installing synchronizer assembly, ensure that 3rd gear rotates smoothly.

3. Install bearing sleeve using installer. Install spacer with identification mark "1" toward the 4th gear side. If spacer is not marked, it can be installed in either direction. Install bearing and bearing sleeve on input shaft using installer. See **Fig. 5**.
4. Install front bearing on input shaft. Install NEW snap ring in groove. Snap rings are available in various thicknesses. Install thickest snap ring that will fit in groove. Be careful to avoid damaging oil seal area on input shaft.

INTERMEDIATE GEAR ASSEMBLY

Disassembly

Remove snap ring. Press bearing, bearing sleeve, needle bearing and 1st gear from intermediate gear. DO NOT reuse bearing. Press 1st-2nd synchronizer assembly, 2nd gear and needle bearing from intermediate gear. Press bearing from rear of intermediate gear. See **Fig. 6**.

Inspection

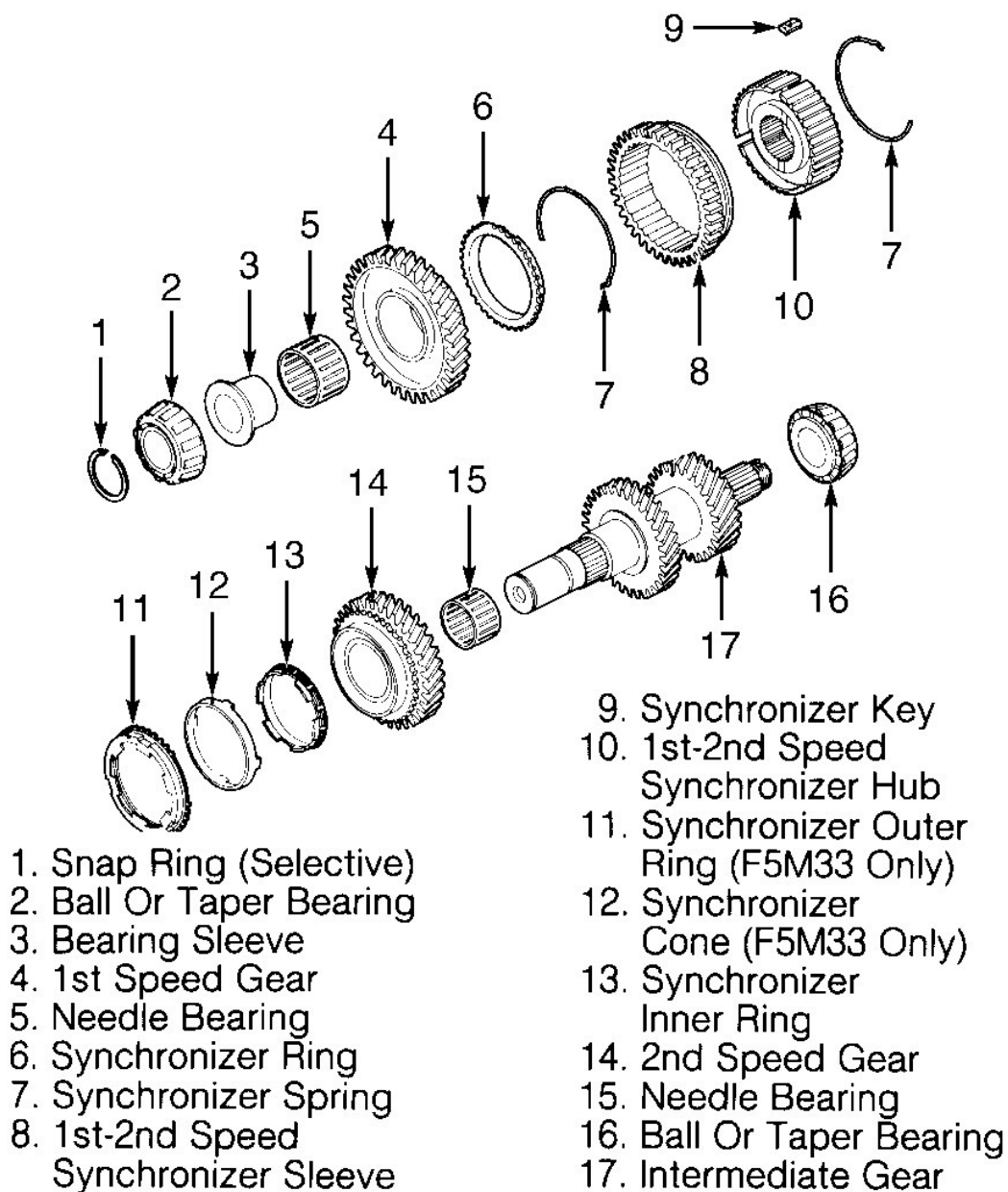
1. Inspect intermediate gear bearing surfaces for damage, wear and seizure. Assemble needle bearing to shaft and ensure it rotates smoothly without abnormal noise, roughness or play. Check bearing cage for deformation.
2. Inspect synchronizer ring for damaged or broken teeth and inner surface for damage, wear and broken threads. Force synchronizer ring toward clutch gear and measure clearance between gear and synchronizer ring. Replace synchronizer ring if clearance is not at least .02" (.5 mm). See **Fig. 4**.
3. Insert synchronizer hub into sleeve. Ensure that they slide smoothly. Ensure sleeve is not damaged or worn at inside front and rear edges. Inspect for wear on gear mating surfaces of hub. Inspect for wear of synchronizer key center protrusion. Inspect spring for weakness, deformation and breakage.

NOTE: Replace synchronizer sleeve and hub as a set.

4. Inspect synchronizer cone for rough surface, damage and wear. Inspect gear bore and front and rear mating surfaces for damage and wear. Inspect bevel gear and clutch gear teeth for damage and wear.

Reassembly

1. To reassemble, reverse disassembly procedure. Install bearing on intermediate gear using bearing installer. Ensure installer pushes on bearing inner race only.
2. The 1st-2nd synchronizer rings have an identification mark. See **Fig. 5**. Install synchronizer hub and sleeve with mark on hub toward front. The synchronizer sleeve has a tooth missing at 6 places. Assemble hub to sleeve so center tooth is between 2 missing teeth and touches synchronizer key.



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Fig. 6: Exploded View Of Intermediate Gear Assembly (F5M33)

Courtesy of MITSUBISHI MOTOR SALES OF AMERICA.

NOTE: Ensure synchronizer keys are seated in grooves in ring. After installing synchronizer assembly, ensure 3rd gear rotates smoothly.

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3. Install synchronizer springs so synchronizer keys rest in stepped portions in springs. Ensure synchronizer springs are not installed in same direction. Install 1st-2nd synchronizer assembly on intermediate shaft.
4. Install bearing sleeve. Install 1st gear and bearing sleeve together. Install bearing on intermediate shaft.

OUTPUT SHAFT

Disassembly, Inspection & Reassembly

Press bearings from output shaft. DO NOT reuse bearings. Replace inner and outer bearing races as a set. Inspect output shaft for damage or wear. Press NEW bearings on output shaft. See **Fig. 1** and **Fig. 2**.

SHIFT FORK ASSEMBLY (KM200 & F4M21)

Disassembly & Reassembly

Remove 1st-2nd gear shift fork. Remove 1st-2nd gear shift rail. Remove 3rd-4th gear shift fork. Remove 3rd-4th gear shift rail. Remove reverse gear shift rail. To reassemble, reverse disassembly procedure. See **Fig. 1**.

SHIFT FORK ASSEMBLY (KM201, F5M21, F5M22, F5M31 & F5M33)

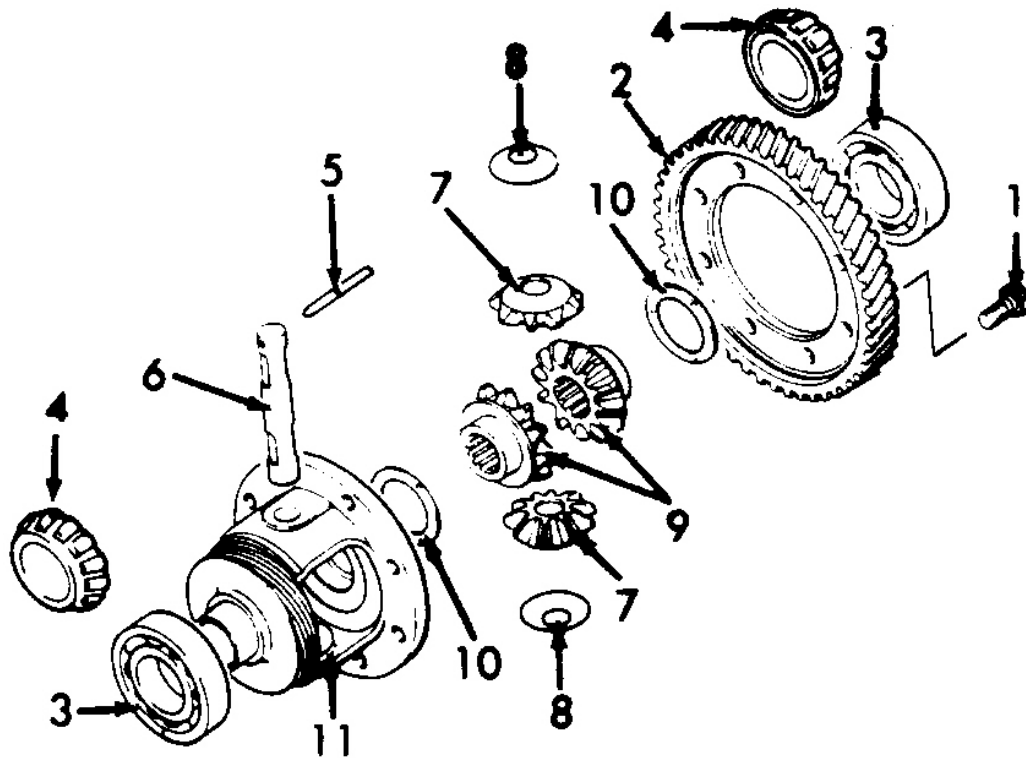
Disassembly & Reassembly

Remove 1st-2nd gear shift fork. Remove 1st-2nd gear shift rail. Remove 3rd-4th gear shift fork. Remove 5th-reverse gear shift rail. Remove interlock plunger. Remove 3rd-4th gear shift rail. Remove reverse shift lug. To reassemble, reverse disassembly procedure. Insert interlock plunger in reverse shift lug in 3rd-4th gear shift rail notch. See **Fig. 1** and **Fig. 2**.

DIFFERENTIAL ASSEMBLY

Disassembly & Inspection

Remove drive gear. Press bearings from differential case. DO NOT reuse bearings. Remove and discard lock pin from drive gear side of differential case. Remove pinion shaft, pinion gears, washers, side gears and spacers from differential case. See **Fig. 7**. Inspect all parts for wear and damage. Replace as necessary.



- | | |
|--|------------------------|
| 1. Bolt | 5. Lock Pin |
| 2. Differential Drive Gear | 6. Pinion Shaft |
| 3. Ball Bearing (KM200, KM201, F4M21 & F5M21) | 7. Pinion |
| 4. Taper Roller Bearing (F5M22, F5M31 & F5M33) | 8. Washer |
| | 9. Side Gear |
| | 10. Spacer (Selective) |
| | 11. Differential Case |

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Fig. 7: Exploded View Of Differential Assembly

Courtesy of MITSUBISHI MOTOR SALES OF AMERICA.

Reassembly

1. Install spacers on backs of side gears and install side gears in case. Install washers on back of pinion gears. Position pinion gears opposite each other on side gears and rotate them into case. Install pinion shaft. Measure backlash between side and pinion gears. If backlash is not .001-.006" (.025-.150 mm), disassemble and install spacers of correct thickness.

NOTE: If installing new side gears, install spacers of a medium thickness .037-

.039" (.93-1.00 mm). Install same thickness spacer on each side gear.

2. Align pinion shaft lock pin hole with lock pin hole in case. Install NEW lock pin. Lock pin must not protrude more than .118" (3.00 mm) on KM200, KM201, F4M21 and F5M21 models, and must be countersunk from flange surface of differential case on F5M22, F5M31 and F5M33 models.
3. Press NEW bearings on differential case. When installing bearings, press on bearing inner race only. If reusing drive gear bolts, clean thread locking compound from threads. Apply fresh thread locking compound to bolts and torque to specification in a crisscross pattern. See **TORQUE SPECIFICATIONS** .

CLUTCH HOUSING

Disassembly

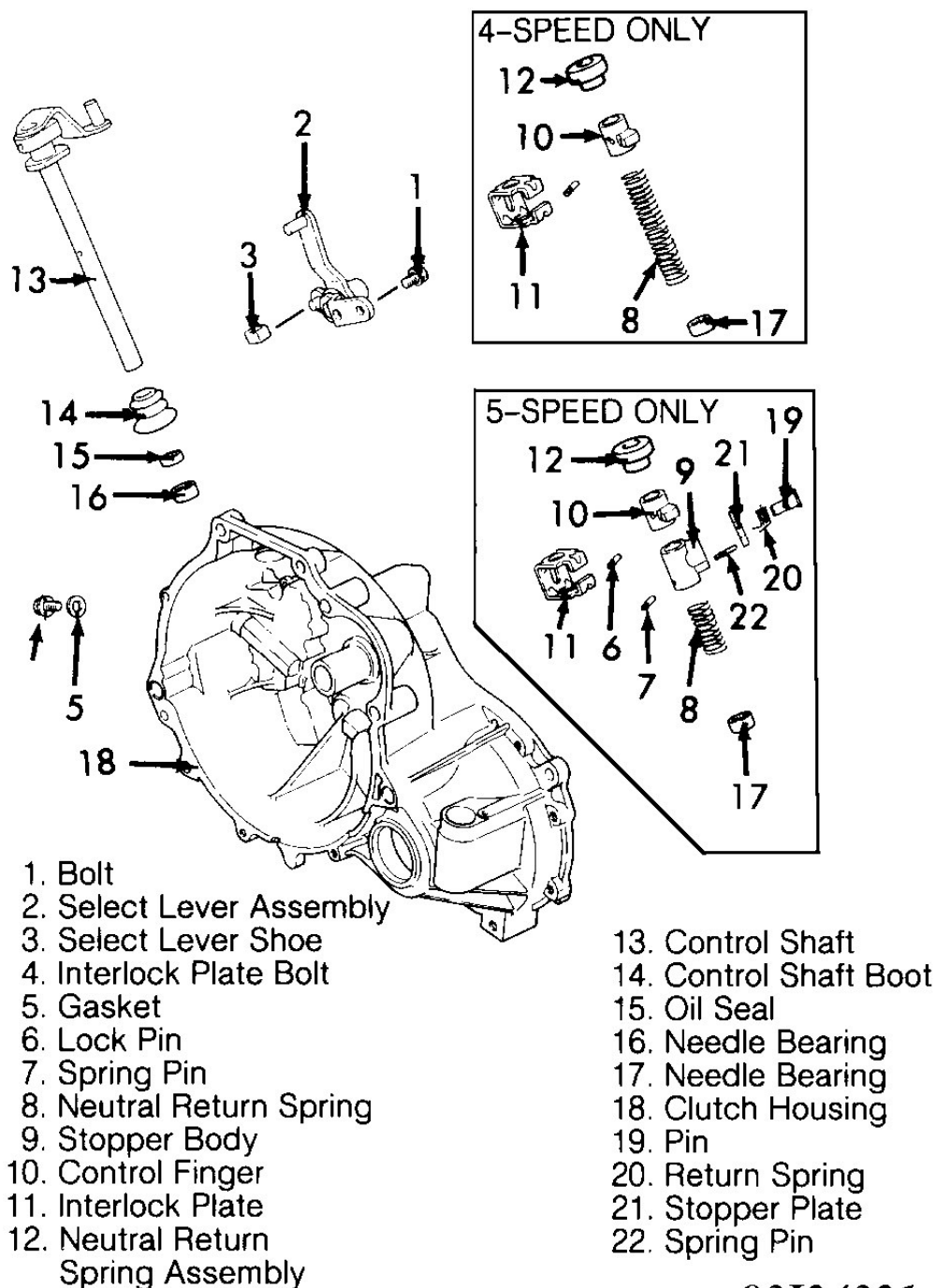
1. Remove select lever assembly and select lever shoe. Remove interlock plate bolt and gasket. Position control finger so that spring pin will not contact clutch housing. Drive spring pin from control finger using a punch.
2. Remove spacer, control finger, neutral return spring and interlock plate. Using a 13 mm socket and extension bar, remove needle bearings. Remove control shaft, dust boot, oil seal and needle bearing from clutch housing. See [Fig. 8](#) .

Reassembly

To reassemble, reverse disassembly procedure. Install needle bearings flush with clutch housing surface using a 14 mm socket and extension bar. Install new oil seal and spring pins. Install lock pins with slit perpendicular to center line of control shaft.

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Fig. 8: Exploded View Of Clutch Housing

Courtesy of MITSUBISHI MOTOR SALES OF AMERICA.

TRANSAXLE REASSEMBLY

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MANUAL TRANS OVERHAUL - MITSU F4M20, F5M20/30, KM200 MANUAL TRANSMISSIONS Mitsubishi F4M20, F5M20, F5M30 & KM200 Series

NOTE: Spacers used for preload adjustments and snap rings are available in selective sizes.

1. To reassemble, reverse disassembly procedure. On F4M21, F5M21, F5M22, F5M31 and F5M33 models, install magnet and magnet holder. On all models, install drive shaft oil seals using seal installer. Install input shaft oil seal using seal installer.
2. Install intermediate shaft and input shaft simultaneously. Apply 3M STUD Locking Sealant (4170) to threads of input shaft bearing retainer bolt closest to differential. DO NOT apply sealant to bolt head. Torque bolts to specification. See **TORQUE SPECIFICATIONS**.
3. Position 1st-2nd gear shift sleeve in 2nd gear. Position 3rd-4th gear shift sleeve in 4th gear. Fit shift forks of shift rail assembly to groove of sleeves. Insert shift rails into shift rail holes of clutch housing. Rotate shift rails to engage shift lugs to control finger and interlock plate.
4. Using a punch, install NEW spring pins with slit of spring pin on center line of shift rail. Install reverse idler gear shaft with threaded hole in head facing differential case.
5. On KM200 and KM201 models only, place 2 pieces of solder measuring .4" (10 mm) long and .12" (3 mm) diameter on gear shaft outer bearing races and on differential at spacer mounting positions.
6. On all other models, place 2 pieces of solder measuring .4" (10 mm) long and .06" (1.6 mm) diameter at spacer mounting positions. On F5M22 models, place solder in transaxle case and install outer races. On F4M21 and F5M21 models, place solder on bearing outer races of intermediate gear and differential. Place solder on transaxle case. Install output shaft bearing outer race on transaxle. On F5M31 and F5M33 models, place solder in transaxle case. Install outer races.
7. On all models, install transaxle case and torque bolts to specification. See **TORQUE SPECIFICATIONS**. Remove transaxle case. Remove outer races and take out crushed solder. Measure thickness of crushed solder with a micrometer. Select and install spacer that gives correct end play. See **TRANSAXLE END PLAY**.

TRANSAXLE END PLAY

Application	Thickness: In. (mm)
Differential Case End Play	
KM200, KM201, F4M21 & F5M21	.002-.007 (.05- .17)
Differential Case Preload	
F5M22, F5M31 & F5M33	.002-.004 (.05- .10)
Differential Pinion Backlash	
All Models	.001-.006 (.025-.150)
Input Shaft Bearing End Play	

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(F5M33)	0-.002 (0-.05)
Input Shaft Front Bearing End Play	
All Models Except F5M33	.0004-.0047 (.010-.120)
Input Shaft Rear Bearing End Play	
(KM201)	.0004-.0035 (.010-.090)
Intermediate Gear Front Bearing End Play	
All Except F5M31	.0004-.0055 (.010-.140)
F5M31	.0004-.0044 (.010-.110)
Intermediate Rear Bearing End Play	
KM200, KM201, F4M21 & F5M21	.002-.007 (.05-.17)
Intermediate Shaft Preload	
F5M22, F5M31 & F5M33	.002-.004 (.05-.10)
Output Shaft	
All Except KM200	.002-.004 (.05-.10)
KM200	.002-.007 (.05-.17)

8. Install oil guide into transaxle case. Position selected spacers on intermediate gear and differential bearing outer race. Insert selected spacer between output shaft bearing outer race and transaxle case. Ensure threaded hole of reverse idler gear shaft head is facing correct direction before installing transaxle case.
9. Apply .04-.08" (1.0-2.0 mm) bead of Mitsubishi Sealant (MD997740) or Three Bond (1216) to clutch housing side of transaxle case. Apply sealer bead uniformly, without excess or discontinuity. Install transaxle case to clutch housing.
10. Using a Phillips screwdriver .32" (8.0 mm) diameter, align threaded hole in reverse idler gear shaft with bolt hole in transaxle case. Install reverse idler gear shaft bolt finger tight. Torque all transaxle case bolts

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to specification. See **TORQUE SPECIFICATIONS**.

11. On models with snap rings, select thickest snap ring available that will fit in groove. DO NOT reuse old snap ring. Standard clearance between spacer and snap ring should be .0004-.0035" (.010-.090 mm). Install bearing sleeve on input shaft. Ensure sleeve flange fits tightly against bearing.
12. On KM200 and F4M22 models, install dished washer with mark toward lock nut. On all models except KM200 and F4M21, install 5th gear shift fork and synchronizer simultaneously.
13. Install splined socket and breaker bar on input shaft. Install 10 mm bolt in clutch housing and position breaker bar against 10 mm bolt to keep input shaft from rotating. Shift transaxle into reverse using control and select levers. Install NEW lock nuts and torque to specification. Stake lock nuts.
14. On all models except KM200 and F4M21, install NEW spring pin in 5th gear shift fork. Align slit in spring pin with shift rail center line.
15. Apply sealant 3M Super Weatherstrip (8001) to air breather mounting portion and install in clutch housing. Apply Mitsubishi Sealant (MD997740) or Three Bond (1216) to rear cover. Apply sealer bead uniformly, without excess or discontinuity, approximately .04-.08"(1-2 mm) in diameter.

TORQUE SPECIFICATIONS

TORQUE SPECIFICATIONS

Application	Ft. Lbs. (N.m)
Back-Up Light Switch	22-26 (30-35)
Bearing Retainer Bolt	11-16 (15-22)
Differential Drive Gear Bolt	96-103 (130-140)
Drain Plug	22-26 (30-35)
Filler Plug	22-26 (30-35)
Input Shaft Lock Nut	103-118 (140-160)
Interlock Plate Bolt	15-20 (20-27)
Intermediate Shaft Lock Nut	103-118 (140-160)
Lower Control Arm Ball Joint-To-Knuckle	44-53 (60-72)
Poppet Plug	22-31 (30-42)
Rear Cover Bolt	11-16 (15-22)
Restrict Ball Assembly	22-26 (30-35)
Reverse Idler Gear Shaft Bolt	32-41 (43-55)
Reverse Shift Lever Assembly Attaching Bolt	11-16 (15-22)
Roll Rod-To-Roll Rod Bracket	44-52 (60-70)
Roll Rod-To-Transaxle	44-52 (60-70)
Starter-To-Transaxle	20-25 (27-34)
Stopper Bracket Bolt	11-16 (15-22)
Tie Rod End-To-Knuckle	17-25 (23-34)
Transaxle Bracket-To-Transaxle	44-59 (60-80)
Transaxle Mount Bolt	
12 mm	32-39 (43-53)
10 mm	22-26 (30-35)

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6-8 mm	7-9 (10-12)
Transaxle Mounting Bracket-To-Body	66-81 (90-110)
Transaxle Mounting Bracket-To-Transaxle	44-59 (60-80)
Transaxle Case Tightening Bolt	26-31 (35-42)
Transaxle Switch (FWD Only)	24 (33)
INCH Lbs. (N.m)	
Bellhousing Cover-To-Transaxle	71-89 (8-10)
Clutch Tube Flare Nut (1.6L)	115-150 (13-17)
Lever Assembly-To-Body	84-124 (9-14)
Select & Shift Cable Guide	84-124 (9-14)
Speedometer Sleeve Bolt	27-44 (3-5)