TOYOTA

LAND CRUISER

ALL MODELS

REPAIR MANUAL

SUPPLEMENT

TOYOTA MOTOR SALES CO., LTD.

FOREWORD

This manual describes how to service the Recirculating Ball Type Steering System and Vacuum Shift Control System, and Electrical Wiring Diagram of Toyota Land Cruiser.

We hope that this manual will be used jointly with the following manuals:

F Engine Repair Manual (Pub. No.98087)

Toyota Land Cruiser Chassis & Body Repair Manual (Pub. No.98077)

Please keep this manual readly available to the servicemen for reference and guidance in their work.

Note: This manual is not supplied additionally.
Please order the Toyota Land Cruiser Chassis & Body Repair Manual (Pub. No.98077–1), if necessary.

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FRONT DRIVE VACUUM CONTROL SYSTEM (Option)

FRONT DRIVE VACUUM CONTROL SYSTEM (Option)

DESCRIPTION

This system is the easy shifting device (vacuum control) for front drive has been adopted as option from September, 1972 production.

1. Front drive can be easily operated by using the front drive switch on the instrument panel.

   PULL (ON) ⟶ Front Drive Engages
   PUSH (OFF) ⟶ Front Drive Disengages

2. When shifting the transfer shift lever into "LOW" position, the front drive engages automatically without the front drive switch.

OPERATION

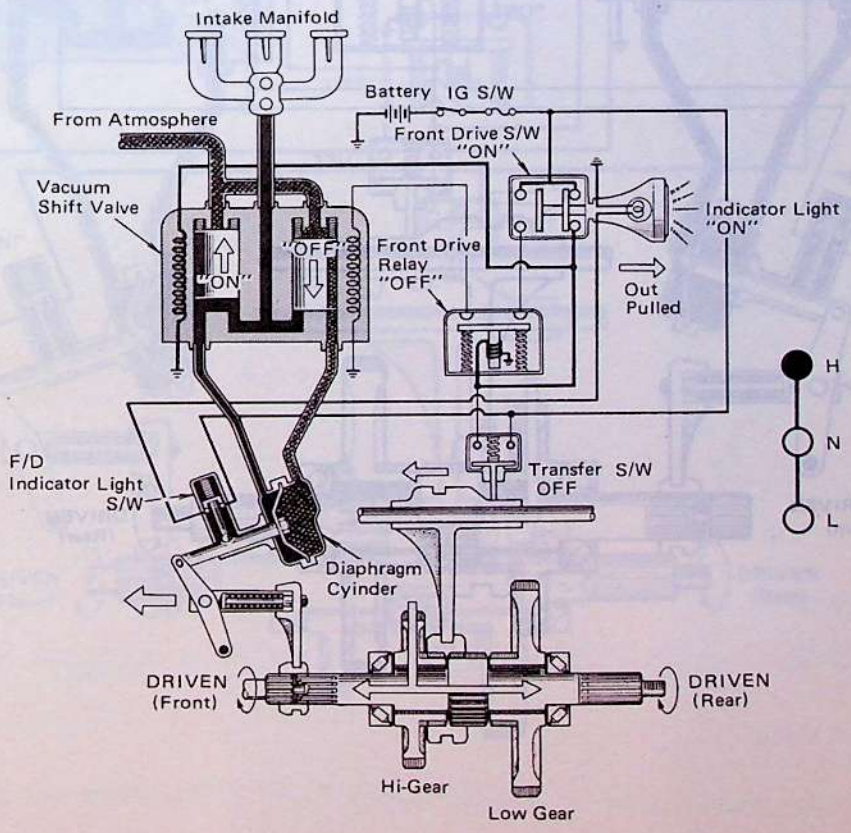


Fig. 1-1 Front Drive Switch "ON" State

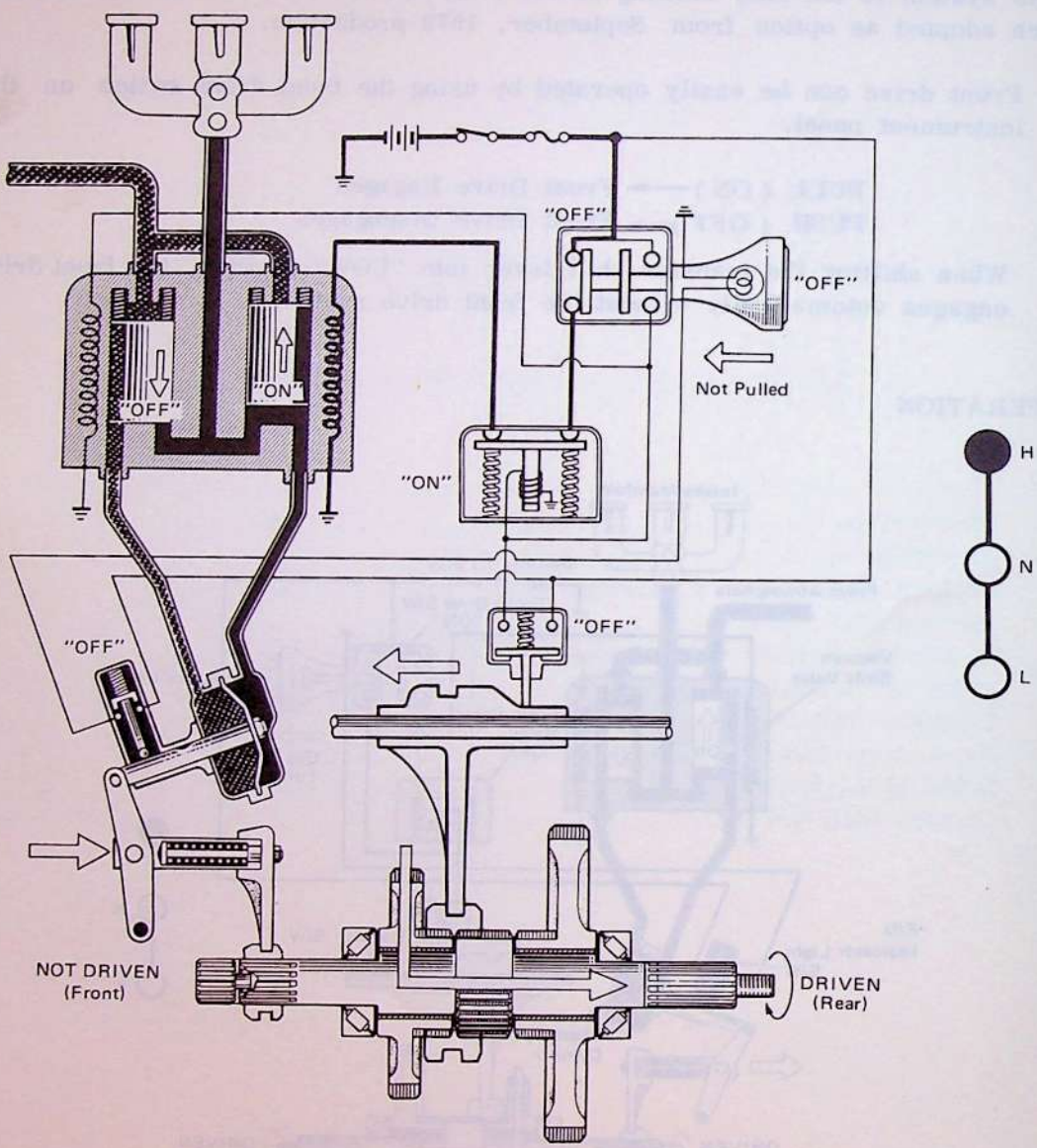


Fig. 1-2 Front Drive Switch "OFF" State

In case the transfer shift lever is shifted into "LOW" position, the front drive solenoid functions automatically without pulling the front drive switch.

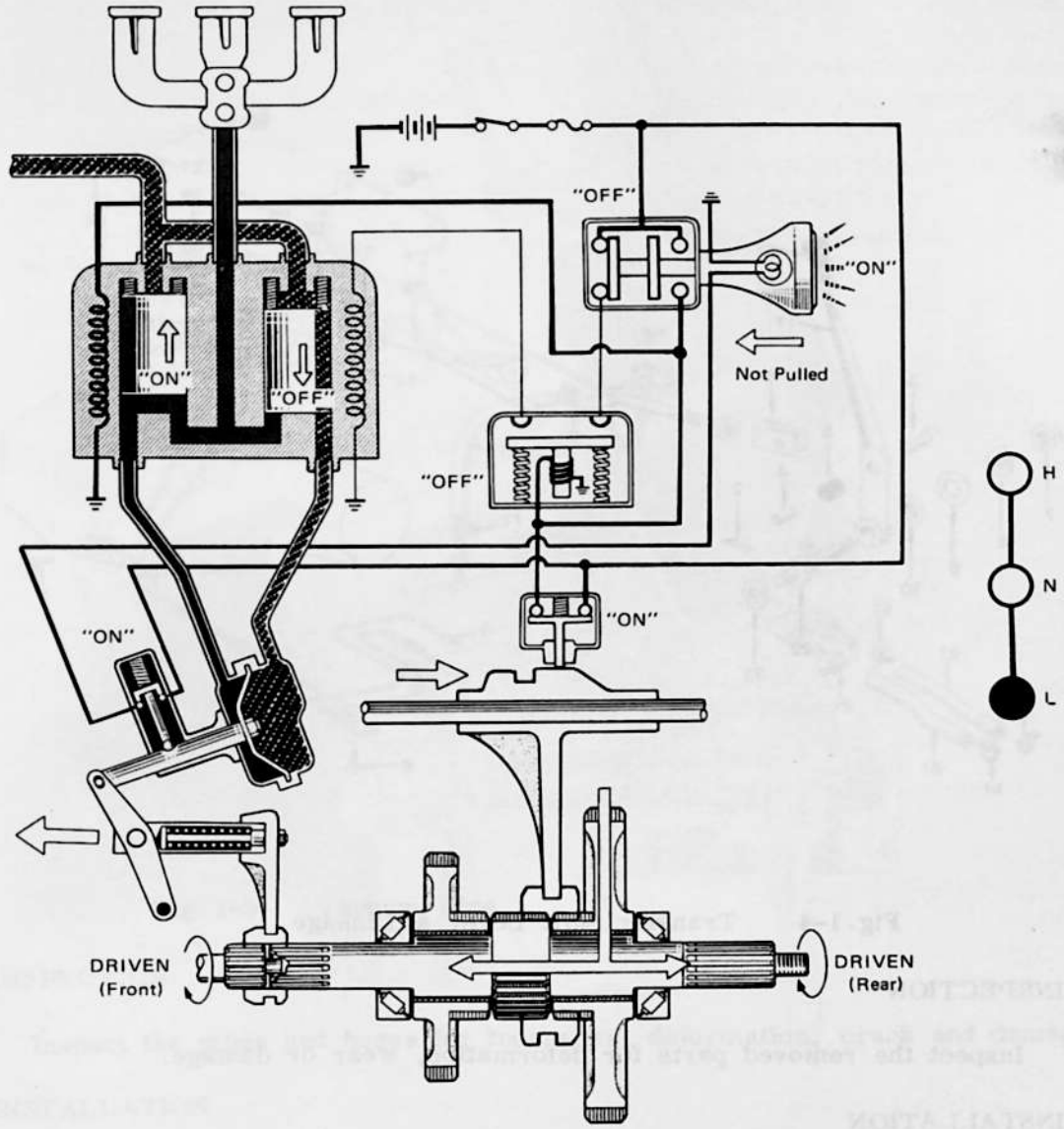


Fig. 1-3 Transfer Low Gear State

TRANSFER SHIFT LEVER & LINKAGE

REMOVAL

Remove the following parts in numerical order.

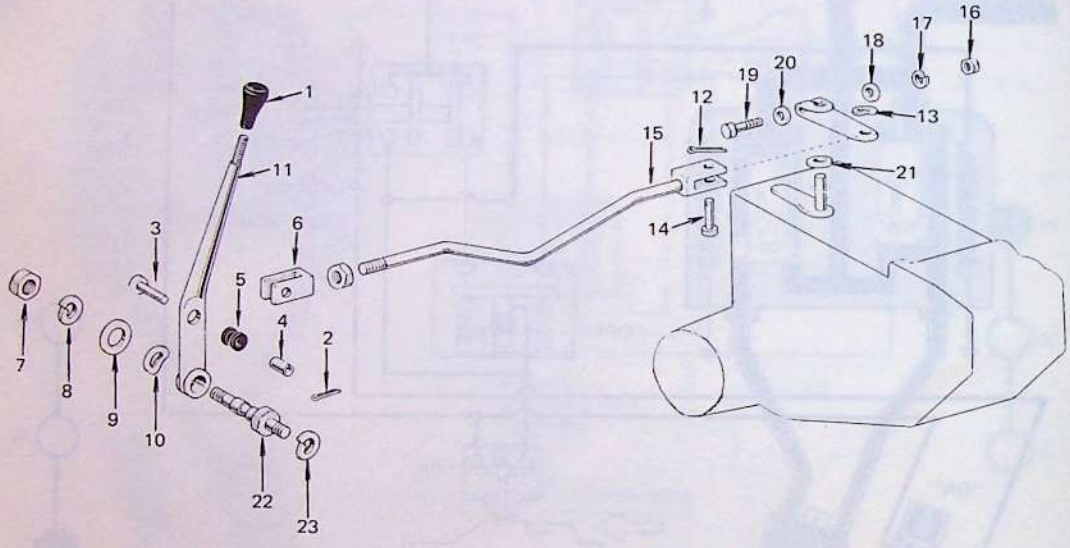


Fig. 1-4 Transfer Shift Lever & Linkage

INSPECTION

Inspect the removed parts for deformation, wear or damage.

INSTALLATION

Install the above parts in reverse order.

VACUUM LINE

REMOVAL

Remove the following parts in numerical order.

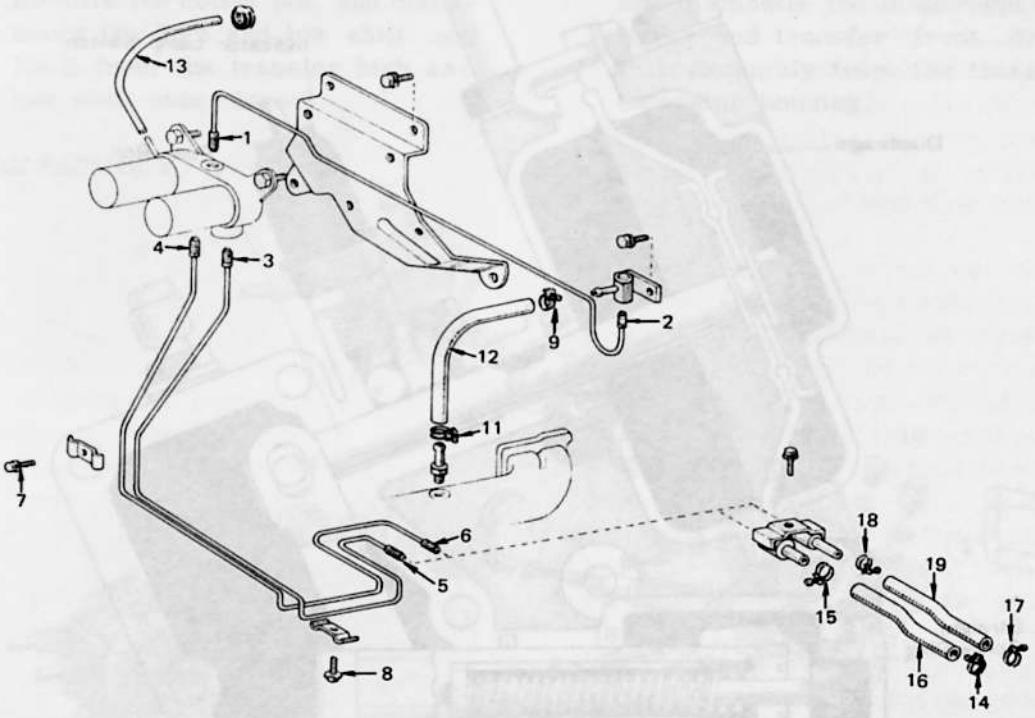


Fig. 1-5 Vacuum Line

INSPECTION

Inspect the pipes and hoses for looseness, deformation, crack and damage.

INSTALLATION

Install the above parts in reverse order.

DIAPHRAGM CYLINDER & TRANSFER FRONT DRIVE FORK

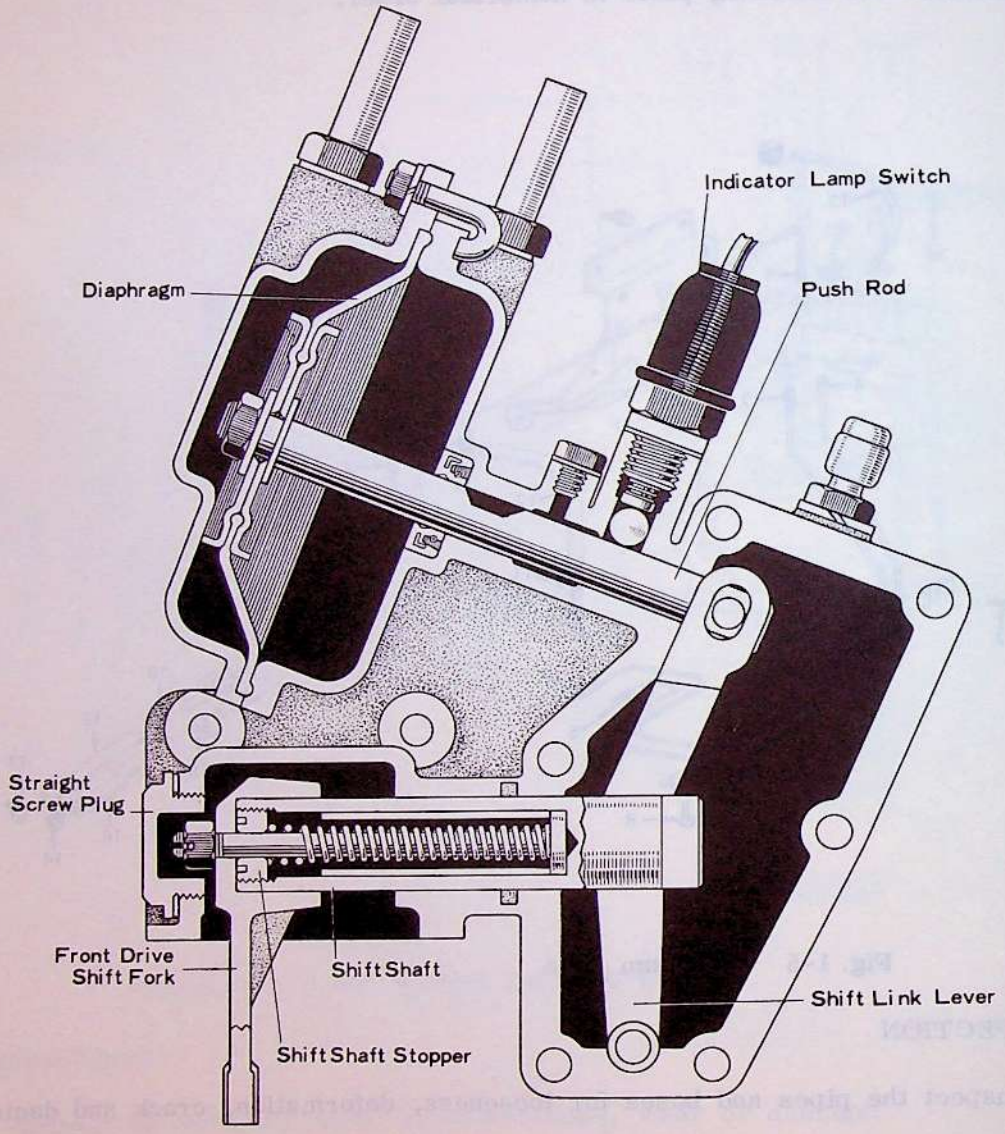


Fig. 1-6 Cross Section of Diaphragm Cylinder & Transfer Front Drive Fork

Y7021

REMOVAL

1. Remove the transmission under cover.

2. Remove the plug, and drain the gear lubricant from the transfer case.

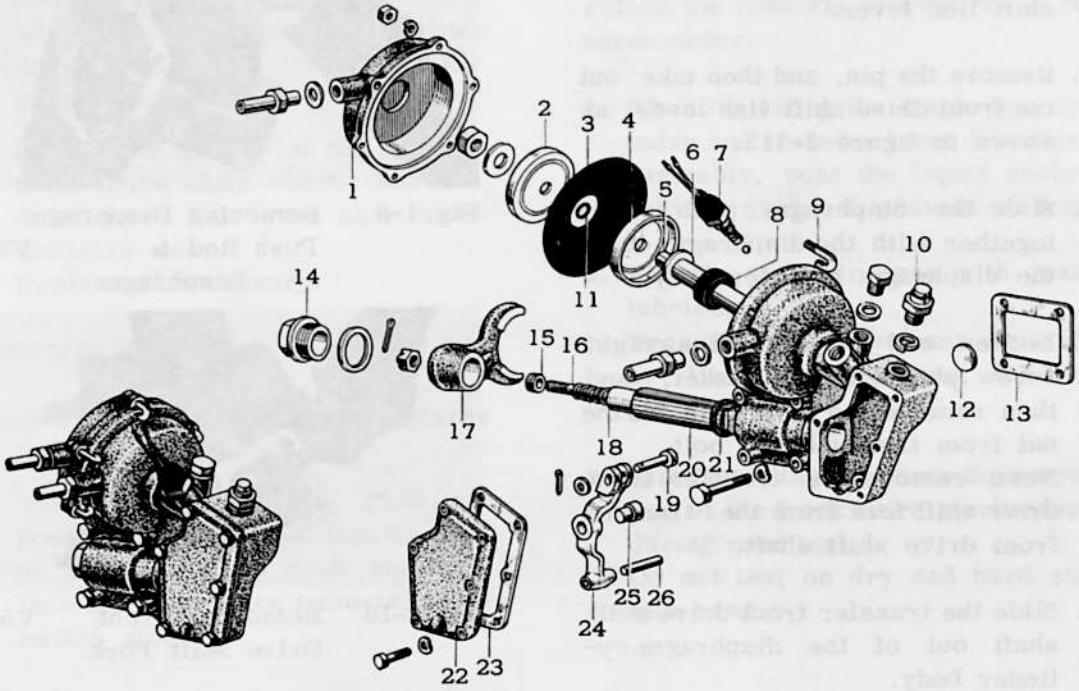
3. Remove the cotter pin, and disconnect the high and low shift rod No. 3 from the transfer high and low shift outer lever.

4. Loosen the clamps, and disconnect the two vacuum hoses from the unions on the diaphragm cylinder body and the cover.

5. Disconnect the wirings from the front drive indicator lamp switch.

6. Loosen and remove the bolts, and dismantle the diaphragm cylinder and transfer front drive fork assembly from the transfer extension housing.

DISASSEMBLY



1. Diaphragm cylinder body cover
2. Diaphragm plate
3. Diaphragm
4. Diaphragm plate
5. Diaphragm push rod
6. Washer
7. Front drive indicator switch
8. Oil seal
9. Diaphragm cylinder set bolt
10. Breather plug
11. "O" ring
12. Expansion plug
13. Gasket
14. Straight screw plug
15. Shift shaft stopper
16. Push rod bolt
17. Transfer front drive shift fork
18. Spacer
19. Pin
20. Transfer front drive shift shaft
21. Dust seal
22. Diaphragm cylinder cover
23. Cover gasket
24. Front drive shift link lever
25. Link lever shoe
26. Straight pin

Fig. 1-7 Diaphragm Cylinder & Transfer Front Drive Fork Components G2381

1. Loosen and remove the front drive indicator light switch and the steel ball from the diaphragm cylinder body.

2. Remove the diaphragm cylinder body cover.

3. Remove the diaphragm cylinder cover and the gasket.

4. Remove the straight pin from the front drive shift link lever. Remove the cotter pin and the washer at the end of the front drive shift link lever.

5. Remove the pin, and then take out the front drive shift link lever as shown in figure 2-113.

6. Slide the diaphragm push rod together with the diaphragm out of the diaphragm cylinder body.

7. Loosen and remove the straight screw plug with the gasket, and then remove the cotter pin and the nut from the push rod bolt. Next, remove the transfer front drive shift fork from the transfer front drive shift shaft.

8. Slide the transfer front drive shift shaft out of the diaphragm cylinder body.

9. Loosen and remove the shift shaft stopper with a suitable tool, and take out the push rod bolt together with the spring and the spacer from the front drive shift shaft.

10. Loosen and remove the diaphragm attaching nut, then remove the diaphragm plates, diaphragm and the washer from the diaphragm push rod.

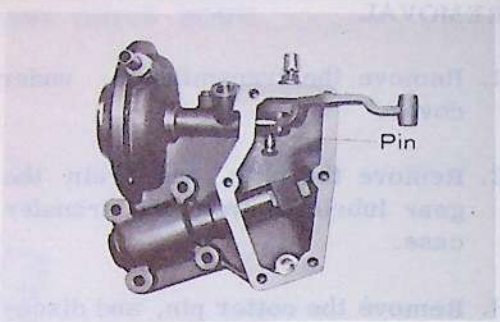


Fig. 1-8 Front Drive Shift Link Lever Removal V5059

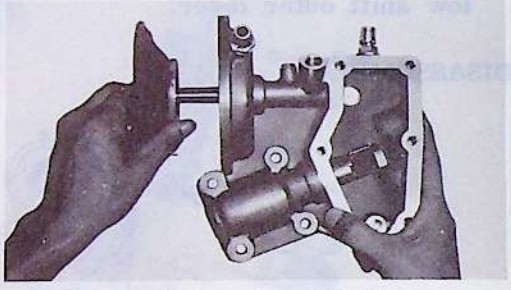


Fig. 1-9 Removing Diaphragm Push Rod & Diaphragm V5060

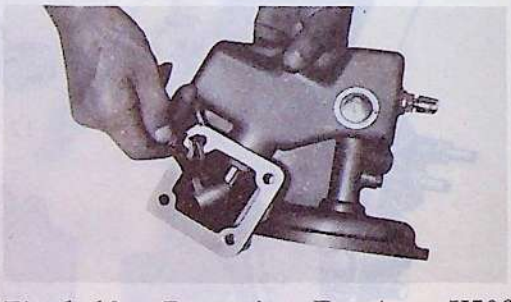


Fig. 1-10 Removing Front Drive Shift Fork V5061

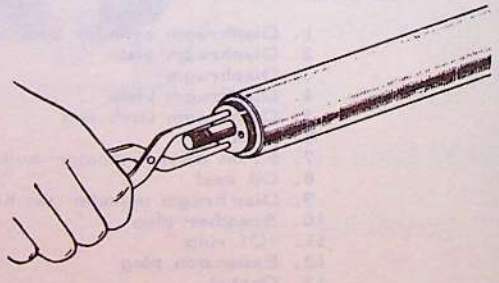


Fig. 1-11 Removing Shift Shaft Stopper G2399

INSPECTION

Wash all disassembled parts thoroughly except the diaphragm in cleaning solvent.

1. Inspect the diaphragm for air tightness, damaged, swollen or torn condition.
   If any of these conditions exists, replace the diaphragm.
2. Check the oil seal, and replace if excessively worn.
3. Install the diaphragm push rod, and the transfer front drive shift shaft into the diaphragm cylinder body, and check the shafts for smooth movement.
4. Check the groove of the transfer front drive shift shaft, and the front drive link lever shoe for excessive wear.
   Replace if necessary.

ASSEMBLY

Follow the disassembly procedures in the reverse order.

1. Take care to keep the push rod position correctly so that the slot on the diaphragm push rod will face the front drive indicator lamp switch side.
2. After assembling the transfer front drive shift shaft, lock the shift shaft stopper in place by punching at two places.
3. When assembling the diaphragm push rod, transfer front drive shift shaft and the front drive shift link lever into the diaphragm cylinder body, apply multipurpose grease onto the sliding surfaces and connecting portions of these items.

INSTALLATION

Follow the removal procedures in reverse order.

1. When installing the diaphragm cylinder and transfer front drive fork assembly, coat the liquid sealer onto the gasket to prevent oil leak.
2. Fill the transfer case with gear lubricant.
   Transfer case lubricant capacity: 1.7 liters (1.8 US qts., 1.5 Imp. qts.).
3. After installation, check the operation of the front drive mechanism during road test.
   Do not test on dry and hard surface road.

* *

FRONT DRIVE SWITCH

Check "ON" and "OFF" states. If defective, replace front drive switch. To replace the lamp bulb, remove the switch knob and pull out the bulb. Install the bulb and knob.

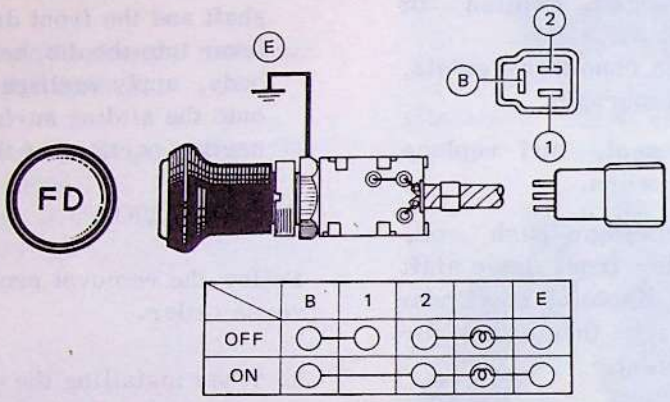


Fig1-12 Front Drive Switch Circuit

TRANSFER SWITCH

Check "ON" and "OFF" states. If defective, replace transfer switch.

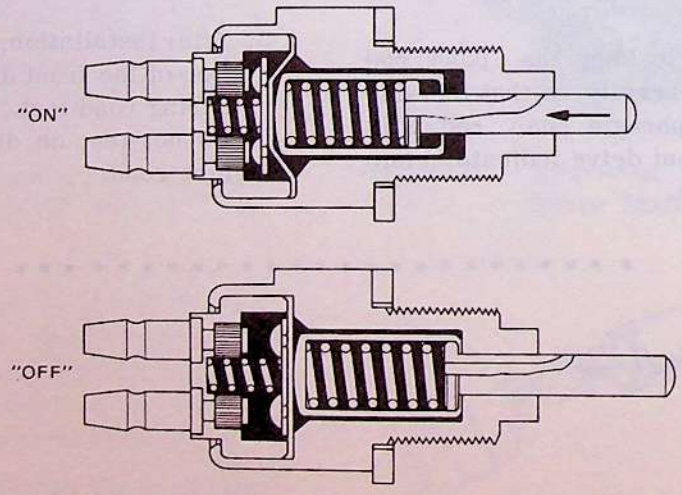


Fig1-13 Transfer Switch Checking

FRONT DRIVE RELAY

Check "ON" and "OFF" states. If defective, replace the front drive relay.

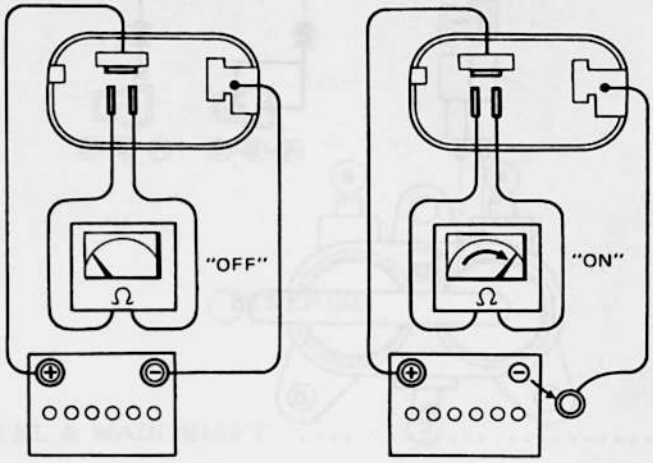


Fig1-14 Front Drive Relay Checking

INDICATOR LIGHT SWITCH

Check "ON" and "OFF" states. If defective, replace the indicator light switch.

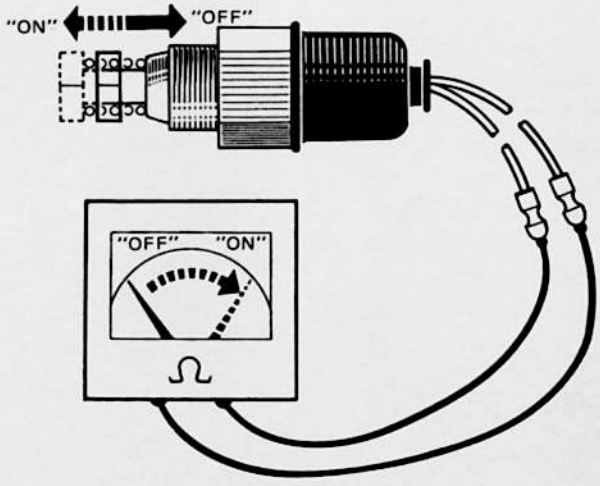


Fig. 1-15 Indicator Light Switch Checking

VACUUM SHIFT VALVE

Check air passages. If defective, replace vacuum shift valve.

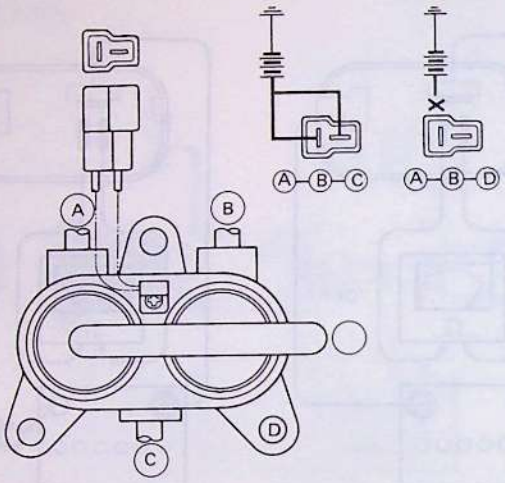
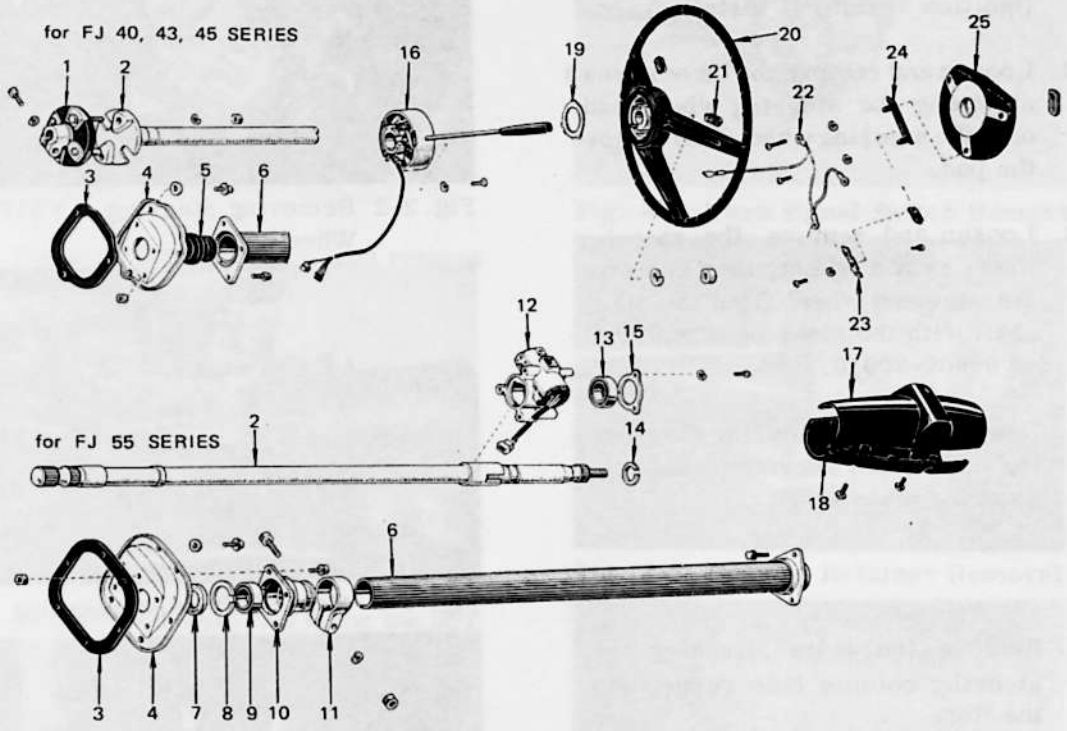


Fig. 1-16 Air Passage Checking

STEERING

STEERING WHEEL & MAIN SHAFT



1. Flexible coupling
2. Steering main shaft
3. steering column hole cover sealed
4. Steering column hole cover
5. Dust seal
6. Column tube
7. Dust seal
8. Hole snap ring
9. Bearing
10. Column tube support
11. Lower coamp
12. Column upper bracket
13. Bearing
14. Snap ring
15. Bearing retainer
16. Turn signal switch
17. Column upper cover
18. Column lower cover
19. Contact ring
20. Steering wheel
21. Horn button
22. Wiring
23. Horn contact spring
24. Horn button setting cover
25. Steering wheel pad

Fig. 2-1 Steering Wheel & Steering Main Shaft Component

REMOVAL

1. Disconnect the wirings of the horn button, turn signal switch and (ignition switch, if installed).

2. Loosen and remove the three screws attaching the steering wheel pad onto the steering wheel, and remove the pad.

3. Loosen and remove the steering wheel retaining nut, then remove the steering wheel from the main shaft with the Steering Wheel Puller 09609-20010.

4. Remove the bolt securing the steering main shaft serrations onto the steering main shaft.

5. Remove the bolts attaching the steering column hole cover onto the floor.

6. Remove the steering column upper and lower clamps, and pull out the steering column tube together with the steering main shaft, steering column hole cover and the control shaft toward the interior.

Fig. 2-2 Removing Steering Wheel V5136

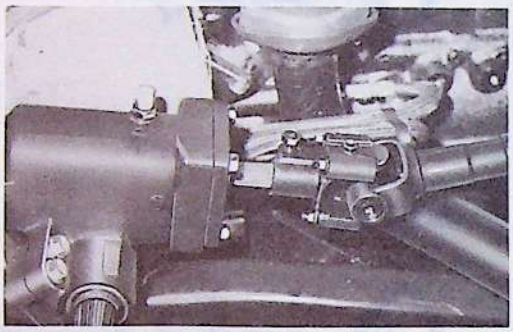


Fig. 2-3 Main Shaft Desconnecting

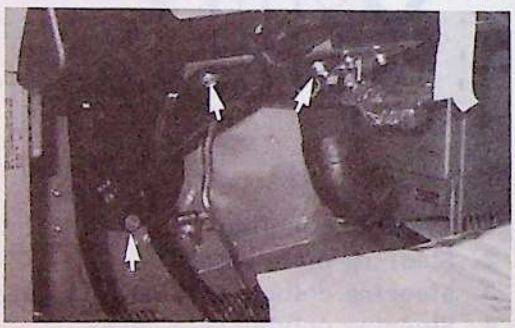


Fig. 2-4 Hole Cover

Fig. 2-5 Main Shaft Removal

DISASSEMBLY

1. Remove the screws, and remove the column upper and lower covers.

2. Remove the wiring clamp.

3. Remove the screws, and remove the turn signal switch.

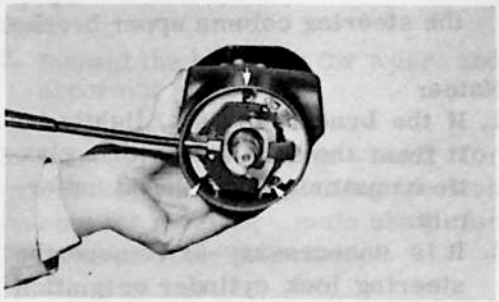


Fig. 2-6 Turn Signal Switch Removal

4. Remove three screws, and remove the bearing retainer.

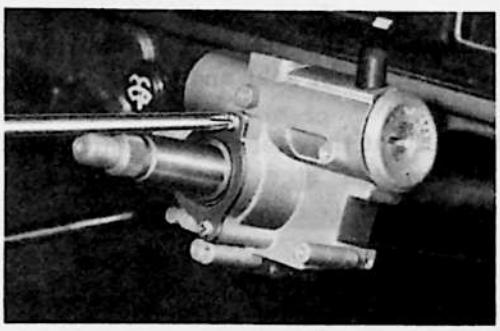


Fig. 2-7 Bearing Retainer Removal

5. Remove the snap ring using the SST (09905-00010).

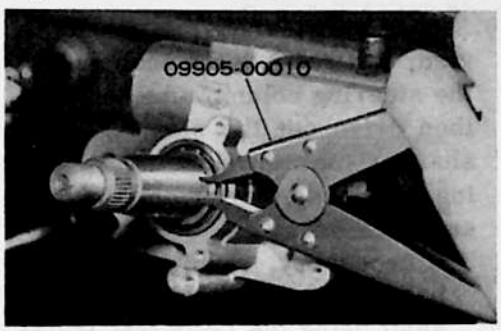


Fig. 2-8 Snap Ring Removal

6. Remove three upper bracket setting bolts.

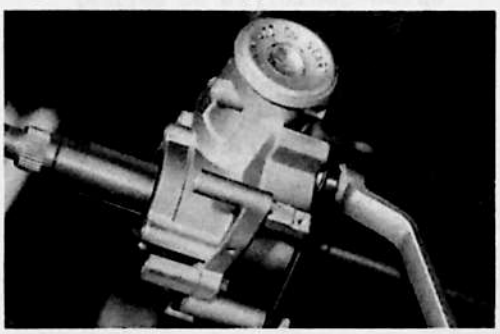


Fig. 2-9 Upper Bracket Removal

7. Remove the main shaft bearing and the steering column upper bracket.

Notes:
1. If the bracket is tight, lightly tap it from the back side with a plastic hammer and pull it out uniformly.
2. It is unnecessary to remove the steering lock cylinder or ignition switch.

Fig. 2-10 Upper Bracket Removal

8. Remove the steering cloumn hole cover, dust seal and lower clamp.

9. Pull out the steering column tube from the steering column tube support. (FJ 55 series)

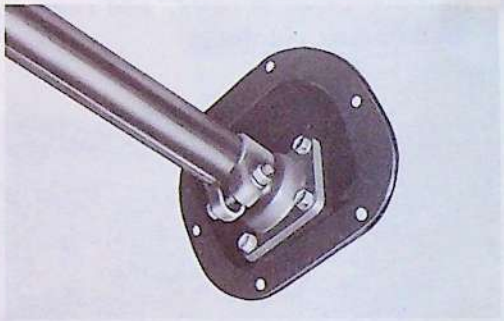


Fig. 2-11 Hole Cover Removal

10. Secure the steering main shaft in a vise, and remove the snap ring in the steering column tube support, then drive out the steering main shaft and the main shaft lower bearing from the steering column tube support.
    If necessary, remove the lower bearing from the steering main shaft using the Universal Puller 09950-20010. (FJ 55 series)

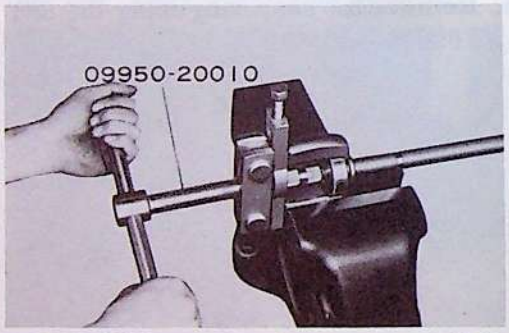


Fig. 2-12 Removing Lower Bearing V5119

11. Remove the flexible coupling from the main shaft.
    (FJ 40, 43, 45 series)

Fig. 2-13 Coupling Removal

INSPECTION

Clean the disassembled parts thoroughly, and check for damage.
Replace the defective part/s if necessary.

1. Inspect the steering main shaft for bend, and the serrations on the main shaft for damage.
2. Inspect the bearings for wear, and abnormal noise.
3. Inspect the steering wheel for cracks, and the installing portion onto the steering main shaft for wear or other defects.
4. Inspect the flexible coupling for crack, weakness or damage.

ASSEMBLY

1. Press the lower bearing onto the steering main shaft using SST (09620-30010-3).

Note :
Apply MP grease onto the bearing.

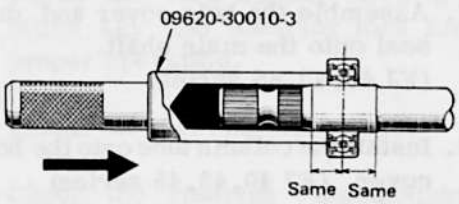


Fig. 2-14 Lower Bearing Assembly

2. Install the steering main shaft and the bearing into the steering column tube support.
(FJ 55 series)

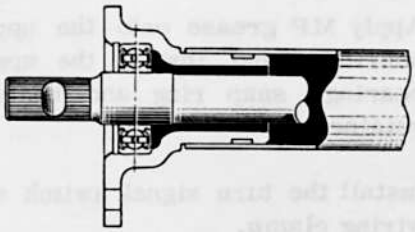


Fig. 2-15 Column Tube Support Assembly

3. Install the hole snap ring into the steering column tube support.
(FJ 55 series)

Fig. 2-16 Installing Hole Snap Ring V5120

4. Install the steering column tube onto steering column tube support.
   Tightenin torque : 100~160 kg-cm (7.2~11.6 ft-lb) (FJ 55 series)

5. Assemble the dust seal and steering column hole cover onto the column tube support. (FJ 55 series)

6. Assemble the flexible coupling onto the main shaft.
   (FJ 40, 43, 45 series)

7. Assemble the hole cover and dust seal onto the main shaft.
   (FJ 40, 43, 45 series)

8. Install the column tube onto the hole cover. (FJ 40, 43, 45 series)
   Tightening torque : 100~160 kg-cm (7.2~11.6 ft-lb)
9. Install the column upper bracket onto the column tube.

10. Apply MP grease onto the upper bearing, and install the upper bearing, snap ring and bearing retainer.

11. Install the turn signal switch and wiring clamp.

12. Assemble the column upper and lower bracket.

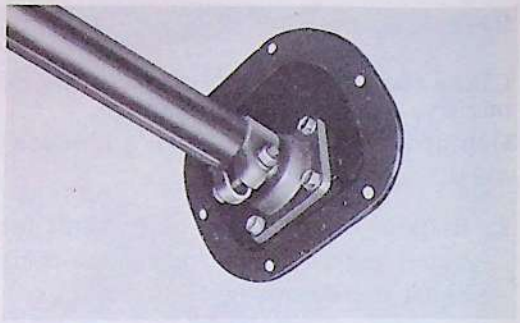


Fig. 2-17 Main Shaft Assembly

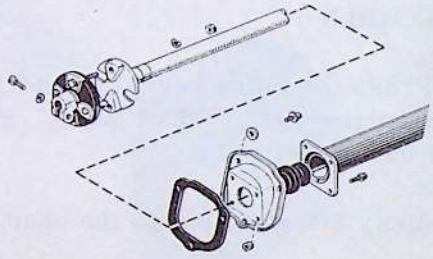


Fig. 2-18 Main Shaft Assembly

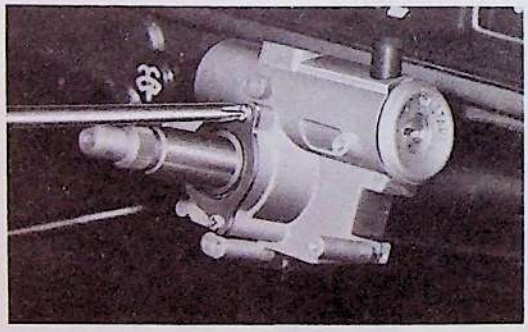


Fig. 2-19 Upper Bearing Retainer Assembly

INSTALLATION

1. Assemble the hole cover shield onto the hole cover.

2. Install the steering post assembly onto the vehicle, and connect the steering main shaft to the steering worm yoke or worm shaft temporarily.

3. Install the steering column upper and lower clamps, and tighten the clamp attaching bolts with the fingers.

4. Align the holes in the steering column hole cover and the floor, and tighten the hole cover attaching bolts securely.
   Next, tighten the steering column clamp attaching bolts securely.

5. Secure the steering worm yoke clamp bolt.
   Tightening torque :

FJ 40, 43, 45	200~300 kg-cm (14.5~21.7 ft-lb)
FJ 55	300~450 kg-cm (21.7~32.6 ft-lb)

6. Position the front wheels (straightforwards).
   Install the steering wheel temporarily onto the steering main shaft. The final setting of the steering wheel should be determined after driving the vehicle.
   Tightening torque : 200~300kg-cm (14.5~21.7 ft-lb)

7. Connect the wiring connectors. Check the turn signal, horn, ignition key and steering lock for proper operation.

8. Install the steering wheel pad.

9. Check the steering mechanism for proper operation.

STEERING KEY CYLINDER & IGNTION SWITCH (Option) REPLACEMENT

OPERATION CHECK

Check the continuity between the terminals with a circuit tester.

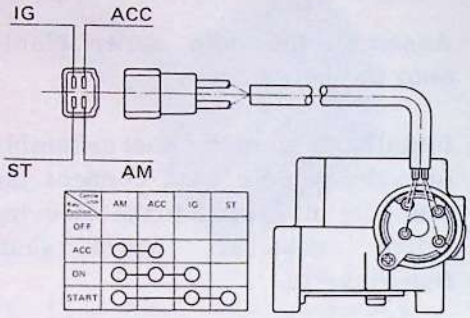


Fig. 2-20 Ignition Switch Connections

REMOVAL

1. Disconect the battery terminal.
2. Remove the steering column cover.
3. Disconnect the wiring connector.
4. Set the key plate to ACC position.
5. Pushing the stop key by using a cotter pin, pull out the key cylinder.
6. Remove the switch setting screw.
7. Pull out the switch.

Fig. 2-21 Key Cylinder Replacement

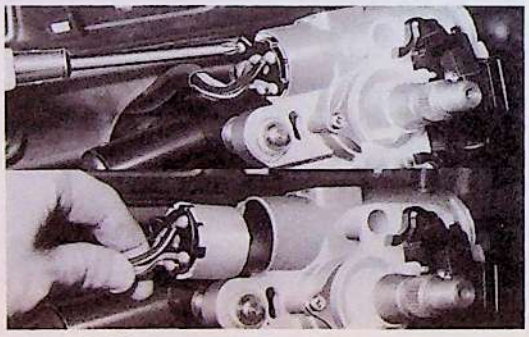
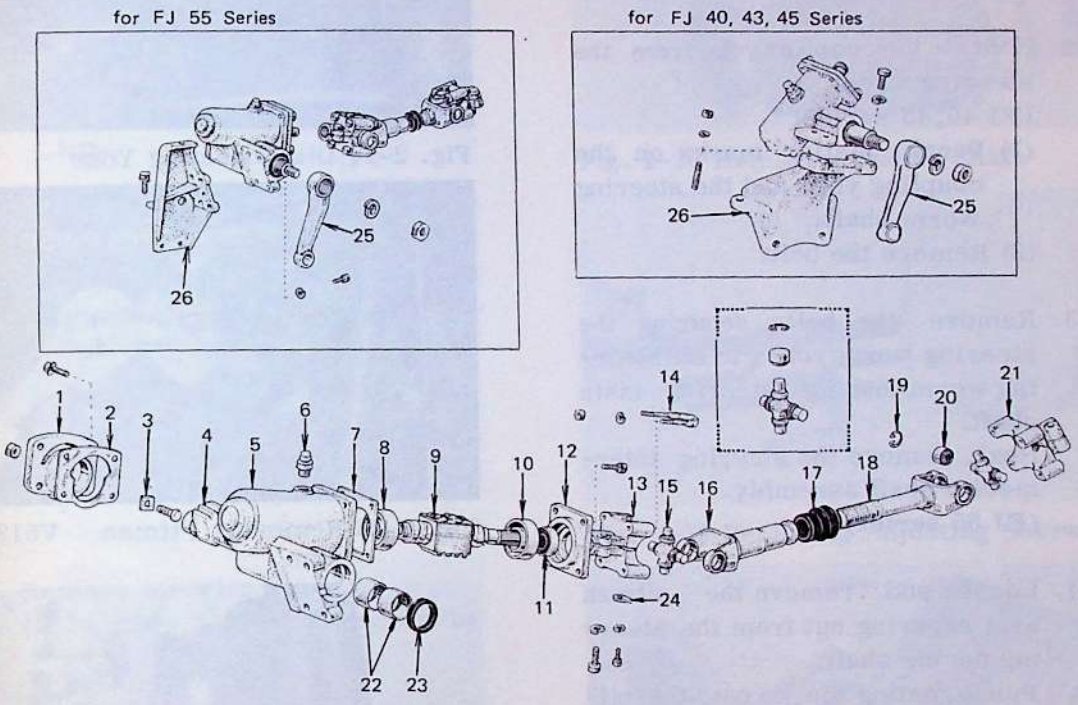


Fig. 2-22 IG Switch Replacement

INSTALLATION

Follow the removal procedures in reverse order.

STEERING GEAR HOUSING & INTERMEDIATE SHAFT



1. Sector shaft end cover
2. Gasket
3. Sector shaft thrust washer
4. Sector shaft
5. Steering gear housing
6. Plug
7. End cover shim
8. Bearing
9. Steering worm assembly
10. Bearing
11. Oil seal
12. Gear housing end cover
13. Worm yoke
14. "U" bolt
15. Spider
16. Sliding yoke
17. Boot
18. Sliding shaft
19. Hole snap ring
20. Spider bearing
21. Yoke
22. Bimetal bushing
23. Oil seal
24. Cup stopper plate
25. Pitman arm
26. Gear housing bracket

Fig. 2-23 Gear Housing Component Parts

REVOVAL

1. Raise the front of the vehicle, and support with suitable stands.
   Pry off the wheel cap, and remove the wheel.

2. Seprate the coupling yoke from the steering worm.
   (FJ 40, 43 series)
   (1) Punch mating marks on the coupling yoke and the steering worm shaft.
   (2) Remove the bolt.

3. Remove the bolts securing the steering worm yokes to the steering worm and the steering main shaft.
   Next, remove the steering intermediat shaft assembly.
   (FJ 55 series)

4. Loosen and remove the pitman arm securing nut from the steering sector shaft.
   Punch mating marks onto the pitman arm and the sector shaft.
   Disconnect the pitman arm from the sector shaft using the Pitman Arm Puller 09610-55011.

5. Remove the bolts retaining the steering gear housing onto the steering gear housing bracket, then dismount the gear housing assembly.

DISASSEMBLY

1. Hold gear housing assembly in a vice.

2. Remove sector shaft.

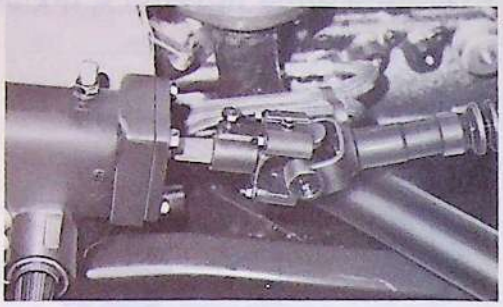


Fig. 2-24 Disconnecting Yoke

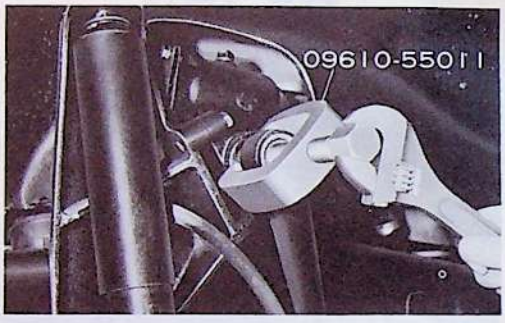


Fig. 2-25 Removing Pitman Arm V5129

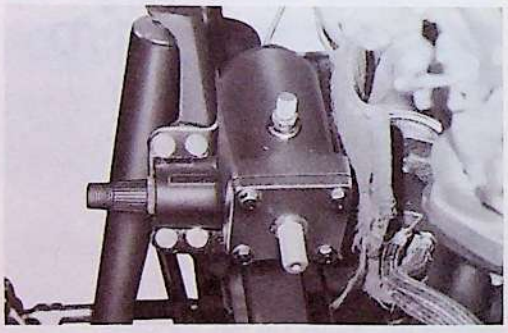


Fig. 2-26 Gear Housing Removal

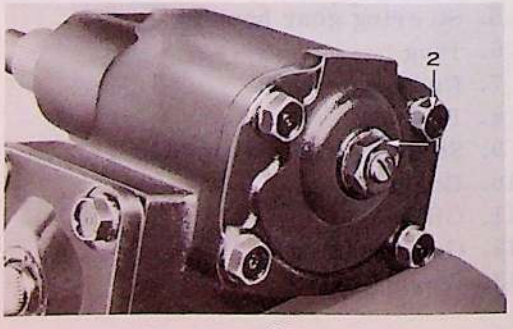


Fig. 2-27 Disassembling Gear Housing

(1) Loosen sector shaft adjusting screw locking nut (1).
(2) Remove four bolts attaching sector shaft end cover.
(3) Place sector shaft in the center of rotating position and pull sector shaft out of housing together with end cover.

Note :
Receive oil from the gear housing.

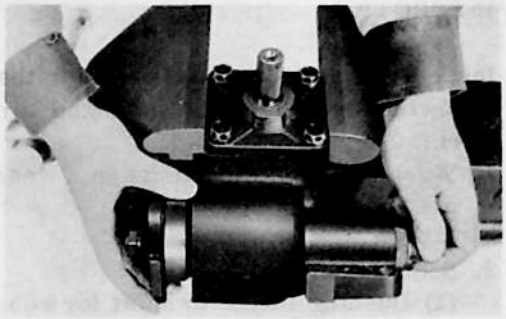


Fig. 2-28 Removing Sector Shaft

(4) Screw adjusting screw in and remove end cover from sector shaft.
(5) Remove adjusting screw and thrust washer from sector shaft.

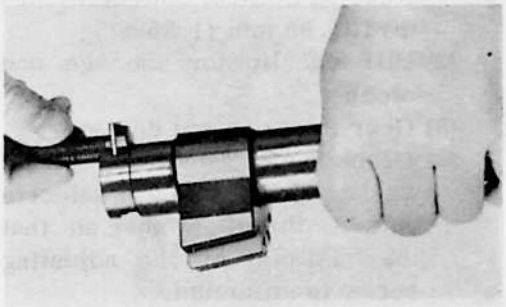


Fig. 2-29 Removing Adjusting Screw

3. Remove steering worm.
(1) Remove housing end cover by removing four bolts.

Note :
Check the number of shims.

Fig. 2-30 Removing End Cover

(2) Pull worm out.

Notes:
1. Be careful with the removed parts so that the combination of bearings is not interchanged.
2. Do not disassemble steering worm assembly. If any item is defective, replace with a new assembly.
3. Do not allow the ball nut running to the ends of the worm.

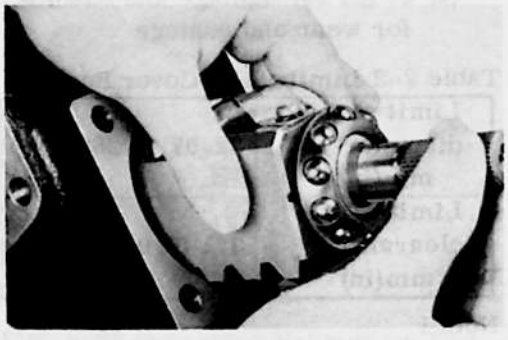


Fig. 2-31 Removing Worm Gear

INSPECTION

Inspect the disassembled parts for the following and replace if damaged or worn.

1. Worm bearing for damage, wear and smooth rotation.

2. Sector shaft
   (1) Bushing fitted to shaft for wear and damage
   Wearing Limit of Outside Diameter: 31.95 mm (1.2579")
   (2) Oil seal lip for damage and wear
   (3) Gear for wear and damage
   (4) Check sector shaft to thrust washer clearance, and select a suitable thrust washer so that the axial play of the adjusting screw is minimum.
   Replace adjusting screw if its head is worn.
   Clearance limit: 0.1mm(0.004")

Table 2-1 Thickness of Sector Shaft Thrust Washer

No.1 mm(in)	2.00(0.0787)
No.2 mm(in)	2.05(0.0807)
No.3 mm(in)	2.10(0.0827)
No.4 mm(in)	2.15(0.0846)
No.5 mm(in)	2.20(0.0866)

3. Sector shaft end cover
   (1) Cover for damage and bushing for wear and damage

Table 2-2 Limit of End Cover Bushing

Limit of inside diameter mm(in)	32.07 (1.2626)
Limit of clearance mm(in)	0.1 (0.004)

Note :
The limits of bimetal bushing are also shown in the above table.

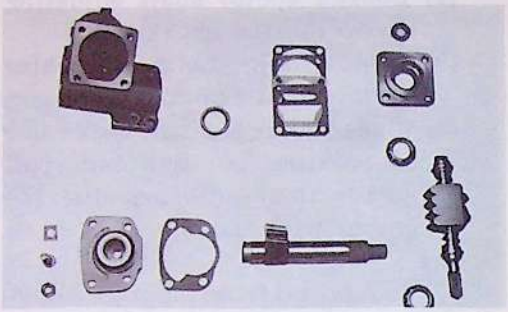


Fig. 2-32 Checking Gear Housing

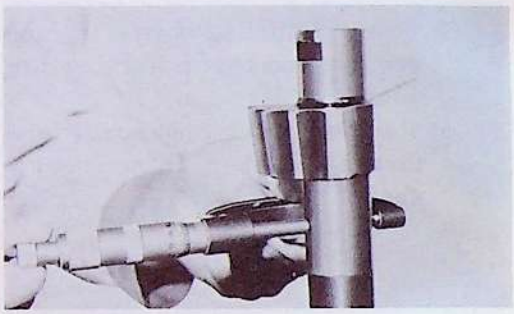


Fig. 2-33 Measuring Sector Shaft

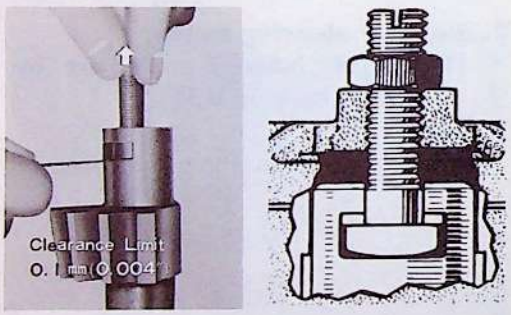


Fig. 2-34 Selecting Thrust Washer

Fig. 2-35 Measuring End Cover Bushing

4. Steering worm assembly

Note :

Do not allow the ball nut running to either end of the worm.

If any trouble is recognized with any component of the assembly, replace with a new assembly.

(1) Worm thread and ball nut rack for damage and wear

(2) Ball nut for turning condition

(3) Axial and radial plays of ball nut

Play limit: 0.07mm(0.0028")

5. Steering gear housing

(1) Type "T" oil seal lip for damage and wear

(2) The wear limit of the bimetal bushing is shown is table 2-2.

Note :

Replace the bushing or the sector shaft if any trouble is recognized.

REPLACEMENT

1. Replacing radial ball bearing for worm

(1) Remove bearing outer race on gear housing side by using SST (09612-65011).

(2) Remove bearing outer race on end cover side by using SST (09612-30011).

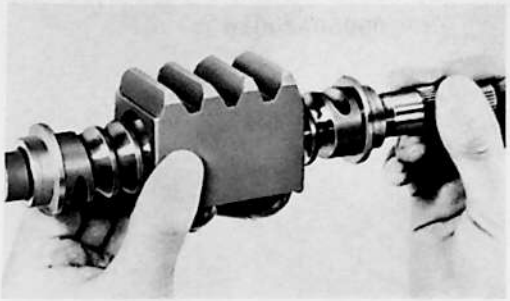


Fig. 2-36 Checking Worm

Fig. 2-37 Measuring Bushing Inner Dia.

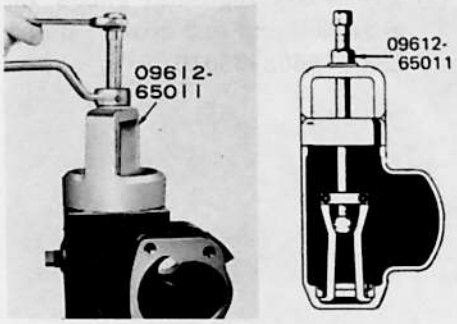


Fig. 2-38 Removing Bearing on Housing Side

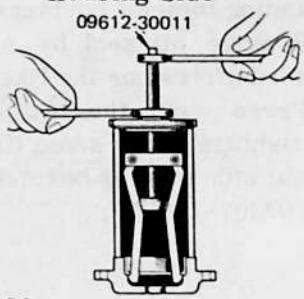


Fig. 2-39 Removing Bearing on End Cover Side

(3) Press off inner race with SST (09950-20010).

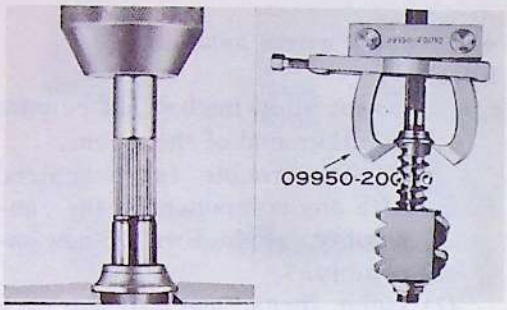


Fig. 2-40 Removing Inner Race

(4) Press inner race on worm gear using SST (09620-30010-3).

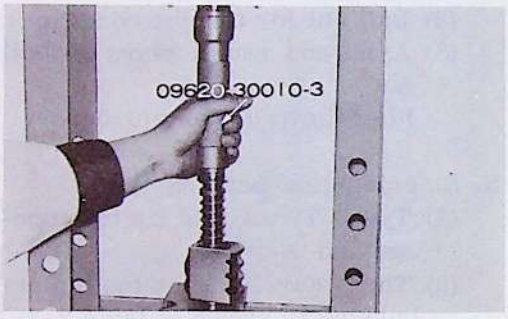


Fig. 2-41 Reinstalling Inner Rece

(5) Press bearing outer races on gear box and end cover using SST (09608-35010).

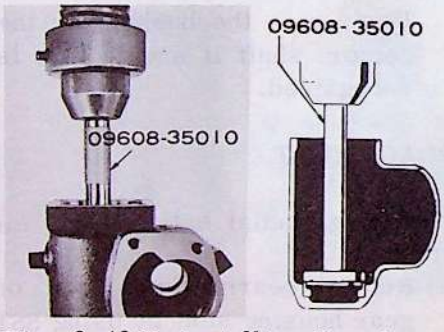


Fig. 2-42 Reinstalling Bearing Outer Races

2. Replacing bimetal bushings
   (1) Remove oil seal by using a screwdriver or the like.
   (2) Press out the two bimetal bushings at the same time to one side of gear box using SST (09307-12010).

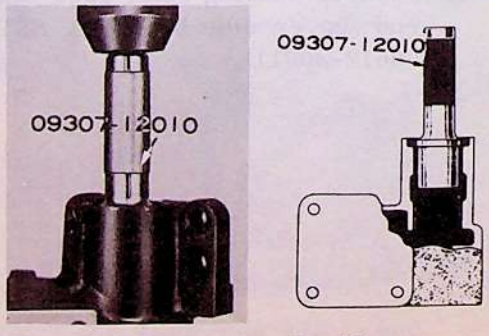


Fig. 2-43 Removing Bushings

(3) Press fit bimetal bushings from both sides of gear box using SST〔09307-12010〕.

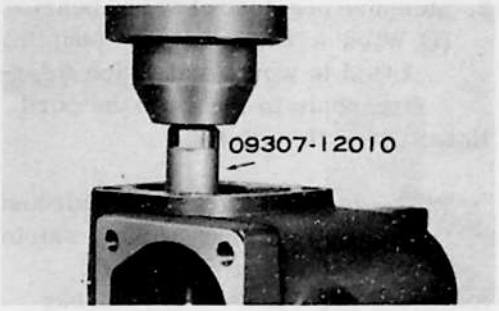


Fig. 2-44 Reinstalling Bushings

(4) Hone bimetal bushings by using a pin hole grinder or the like so that standard oil clearance is obtained between sector shaft and bimetal bushings.

Table 2-3 Bushing Finishing Dimensions

I.D. finishing dimension mm(in)	32.000~32.030 (1.2598~1.2610)
Standard clearance mm(in)	0.009~0.060 (0.0004~0.0024)

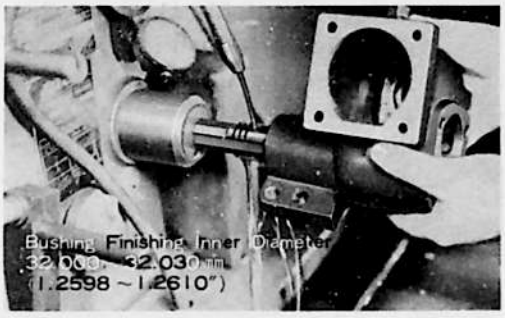


Fig. 2-45 Honing Bushing

(5) Install oil seal.

ASSEMBLY AND ADJUSTMENT

Notes:

1. Apply MP grease on oil seal lip.

2. Lightly apply gear oil on bearings and friction surfaces.

3. Be careful not to allow entry of chips and foreign substance. Exercise particular care with the threaded surface of the ball nut.

Fig. 2-46 Reinstalling Worm Gear

1. Install worm gear assembly.
   (1) Install bearing and worm gear assembly in housing.
   (2) Install end cover with the same number of shims as removed.

Tightening torque: 300~450kg-cm (21.7~32.5ft-lb)

Note: Confirm before tightening that the bearing is securely fitted.

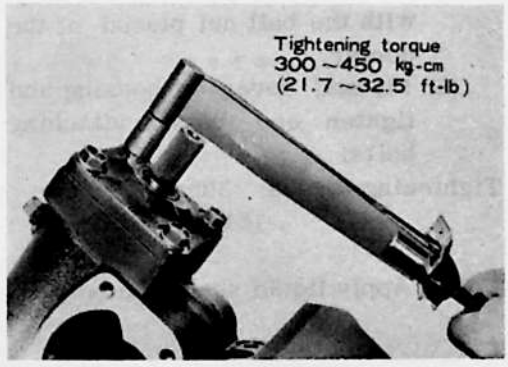


Fig. 2-47 Reinstalling End Cover

2. Measure pre-load of worm bearing.
   (1) Wind a cord on the coupling fitted to worm and attach a spring scale to the tip to the cord.

Note: Use a thin strap.

   (2) Lightly pull the spring scale and read when the worm starts turning (starting torque).

Specified pre-load 4.0 ~ 6.0kg (8.8 ~ 13.2lb)

   (3) Select a suitable shim so that specified pre-load is obtained. Increase the shim thickness if the pre-load is excessive, and decrease if the pre-load is insufficient.

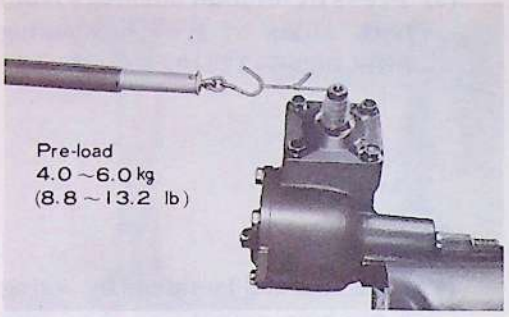


Fig. 2-48 Measuring Bearing Pre-load

Table 2-4 Shim (for adjusting bearing pre-load)

No. 1 mm(in)	0.05(0.0020)
No. 2 mm(in)	0.07(0.0028)
No. 3 mm(in)	0.08(0.0031)
No. 4 mm(in)	0.1 (0.004)
No. 5 mm(in)	0.2 (0.008)
No. 6 mm(in)	0.5 (0.020)

3. Install selector shaft.
   (1) Select a suitable sector shaft thrust washer. (See Table 6-1)
   (2) Install end cover on sector shaft and fully back off the adjusting screw by using a screwdriver.
   (3) Apply liquid sealer on a new gasket and install the gasket on the housing.
   (4) Make the gear of sector shaft to mesh with the center of nut with the ball nut placed at the center.
   (5) Fit end cover on housing and tighten end cover attaching bolts.

Tightening torque: 300~450kg-cm (21.7~32.5ft-lb)

Note : Apply liquid sealer on bolts.

Fig. 2-49 Reinstalling End Cover

Fig. 2-50 Reinstalling Sector Shaft

4. Adjusting sector shaft
   (1) Wind a cord on the coupling fitted to worm and attach a spring scale to the tip of the cord.
   (2) Lightly pull the spring scale and read the scale when the worm starts turning (starting-torque).
   Specified pre-load: 8.0~11.0kg (17.6~24.2lb)

Note :
Measurement should be made with the meshing positioned at the center.

   (3) Make adjustment by the adjusting screw so that specified pre-load is reached.

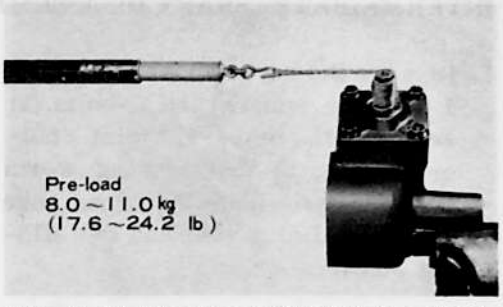


Fig. 2-51 Measuring Total Pre-load

Fig. 2-52 Adjusting Pre-load

   (4) Under specified pre-load install pitman arm and confirm that sector shaft is free from backlash when the worm is turned up to 45 degrees clockwise and counterclockwise.
   (5) Tighten adjusting screw lock nut.

Note :
Recheck pre-load after tightening.

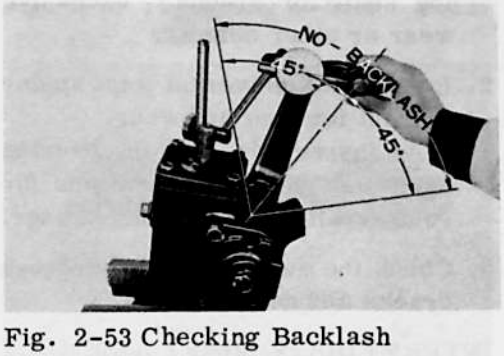


Fig. 2-53 Checking Backlash

* *

INTERMEDIATE SHAFT DISASSEMBLY

1. Remove the cup stopper plates No. 1 (1), then remove the U-bolts (2) securing the universal joint spider bearing to the steering worm yoke, and separate the worm yoke from the sliding yoke and the sliding shaft.
2. Remove the hole snap rings from the bearing holes, and tap the yoke lightly with a mallet, and remove the spider bearing.
   Next, push out the spider, and remove the opposite side bearing, and remove the spider from the yoke.

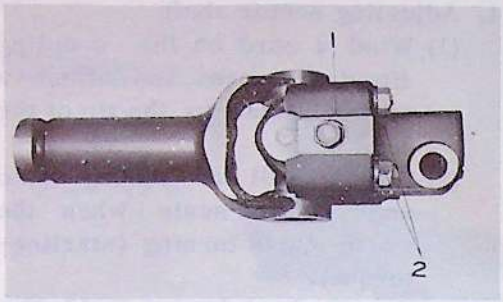


Fig. 2-54 Intermediate Shaft Disassembly V5130

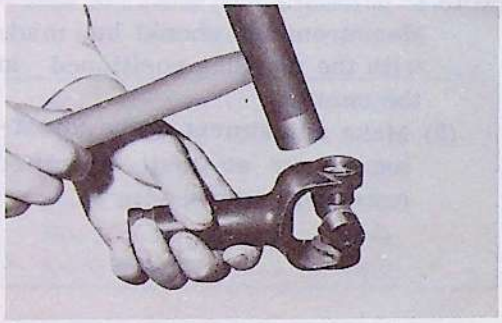


Fig. 2-55 Removing Spider Bearing V5131

INTERMEDIATE SHAFT INSPECTION

1. Inspect the splines of the steering sliding yoke and the steering sliding shaft for cracks, excessive wear or other defects.
2. Inspect the universal joint spider journal for rust and wear.
   Also inspect the spider bearing cups and the bearing rollers for rusty condition, wear and damage.
3. Check the dust cover for hardness cracks and deterioration.

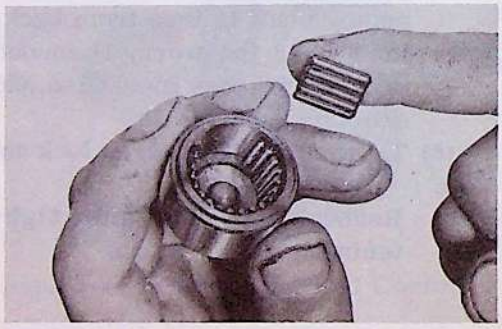


Fig. 2-56 Assembling Bearing Rollers V5125

INTERMEDIATE SHAFT ASSEMBLY & ADJUSTEMENT

1. Pack the spider bearing cups with multipurpose grease, and assemble the bearing rollers into the bearing cups.
2. Press the spider bearing into one side of the sliding shaft bearing holes until the bearing is flat with the yoke flange surface.

3. Install the bearing seal onto the joint spider, then install the joint spider into the yoke.

4. Press the opposite bearing with the bearing seal onto the joint spider into the yoke.

5. Install the hole snap rings, and check the joint spider for smooth operation.
   Check the joint spider thrust clearance.
   If the clearance exceeds 0.5 mm (0.02"), adjust the clearance to become less than 0.5 mm (0.2") by selecting the hole snap ring.

   Hole snap ring thickness:
   Part No. 90521-22011
   Thickness: 1.20 mm (0.047")
   Part No. 90521-22012
   Thickness: 1.25 mm (0.049")
   Part No. 90521-22013
   Thickness: 1.30 mm (0.051")

6. Install the two bearings with the bearing seals onto the joint spider, and then connect the sliding shaft to the steering worm yoke.
   Next, install the cup stopper plates No. 1 and the U-bolts.

7. Assemble the joint spider and the bearings onto the steering sliding yoke in the same manner.

8. Pack the inside hole of the sliding yoke with multipurpose grease to about one-half of the interior area.
   Align the cup stopper plates No. 1 of the sliding yoke side and the sliding shaft side.
   Next, install the dust cover, and connect the sliding shaft with the sliding yoke.

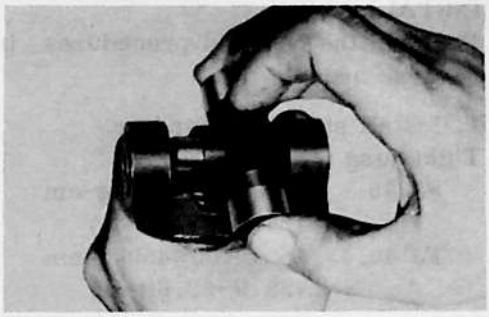


Fig. 2-57 Installing Joint Spider V5126

Fig. 2-58 Tightening U-bolt Nut V5127

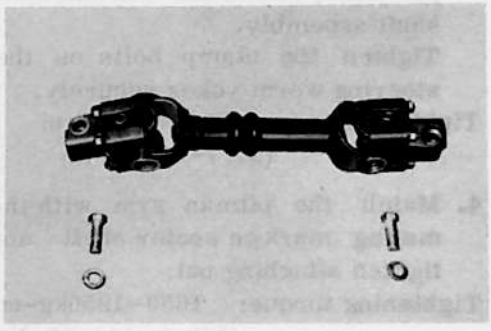


Fig. 6-59 Intermediate Shaft Assembly V5154

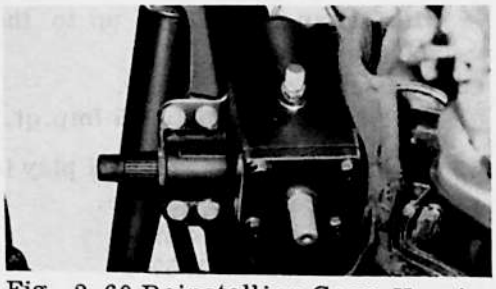


Fig. 2-60 Reinstalling Gear Housing

INSTALLATION

Perform the removal precedures in reverse order.

1. Install steering gear box.

Tightening torque:

FJ 55 400~550kg-cm (28.9~39.8ft-lb)

FJ 40,43,45 400~450kg-cm (28.9~32.6ft-ib)

2. Tighten steering worm shaft and flexible coupling set bolt (1). (FJ 40,43,45)

Tightening torque: 200~300kg-cm (14.5~21.7ft-lb)

Note :

1. Match the coupling to worm shaft mating marks punched before removal.
2. Flexible coupling should be free from deformation.

3. Straighten the front wheels and the steering wheel. Maintaining these positions, install the intermediate shaft assembly.
   Tighten the clamp bolts on the steering worm yokes securely.

Tightening torque: 300~450kg-cm (21.7~32.6ft-lb)

4. Match the pitman arm with the mating mark on sector shaft and tighten attaching nut.

Tightening torque: 1650~1950kg-cm (119.3~141.0ft-lb)

5. Remove plug and fill the housing with gear oil SAE 90 up to the specified level.

Oil capacity: 0.6 liter (0.6US qt., 0.5 Imp.qt.)

6. Be sure the steering wheel play is within the standard range.

Standard: 20~40mm (0.70~1.57")

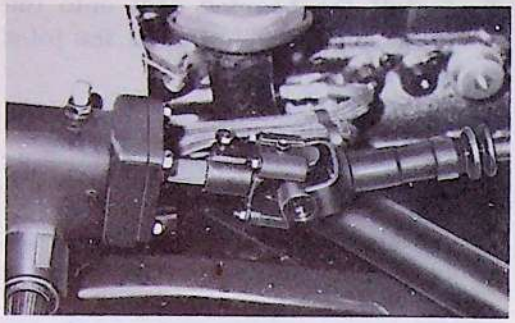


Fig. 2-61 Reinstalling Intermediate Shaft

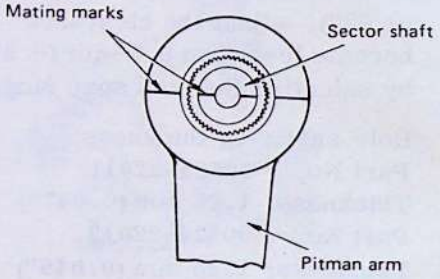


Fig. 2-62 Pitman Arm Mating Marks

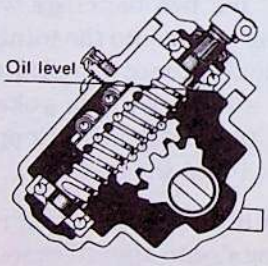


Fig. 2-63 Oil Level

Prepared by

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Haruhi Plant

Haruhi-mura, Nishikasugai-gun

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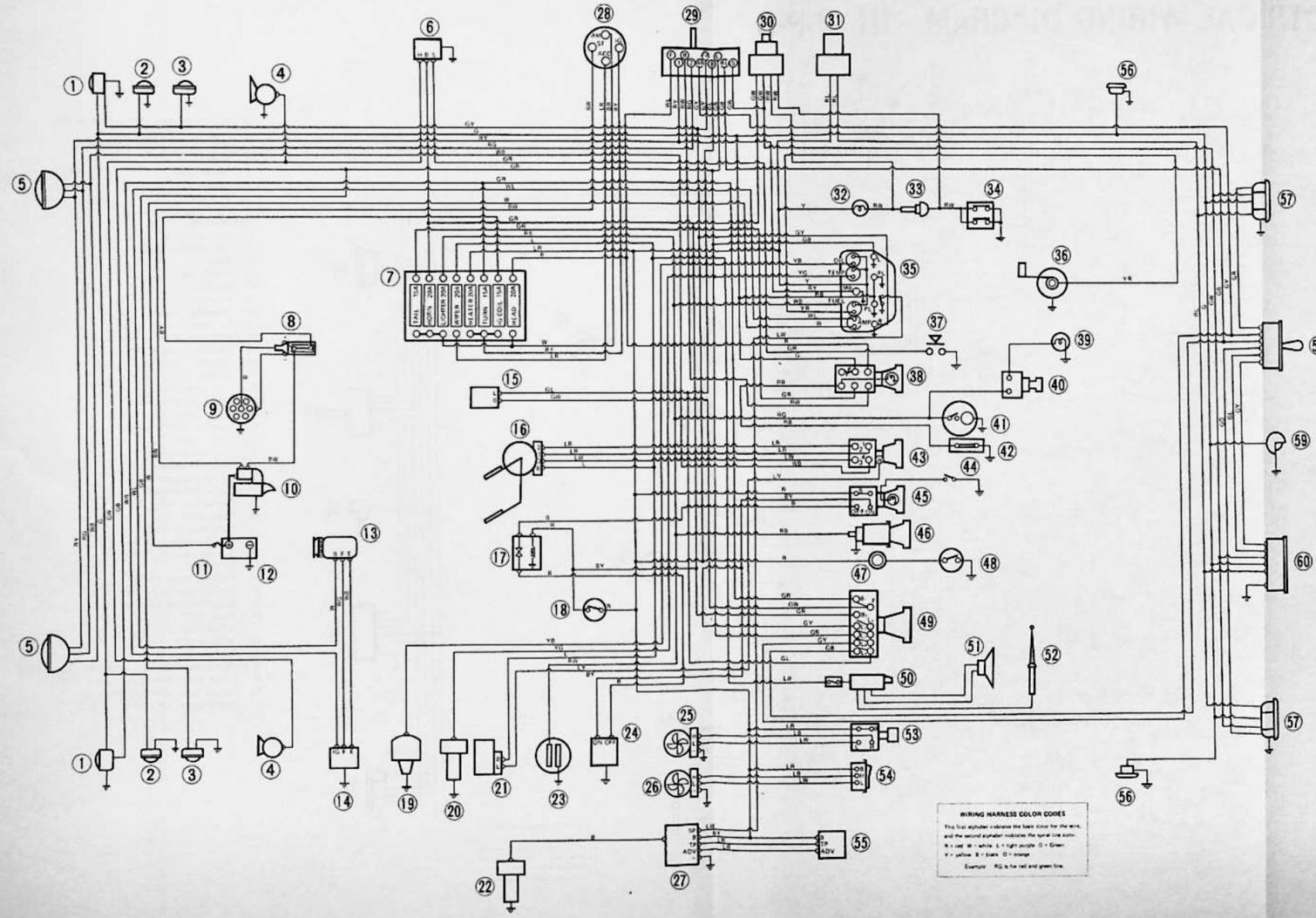
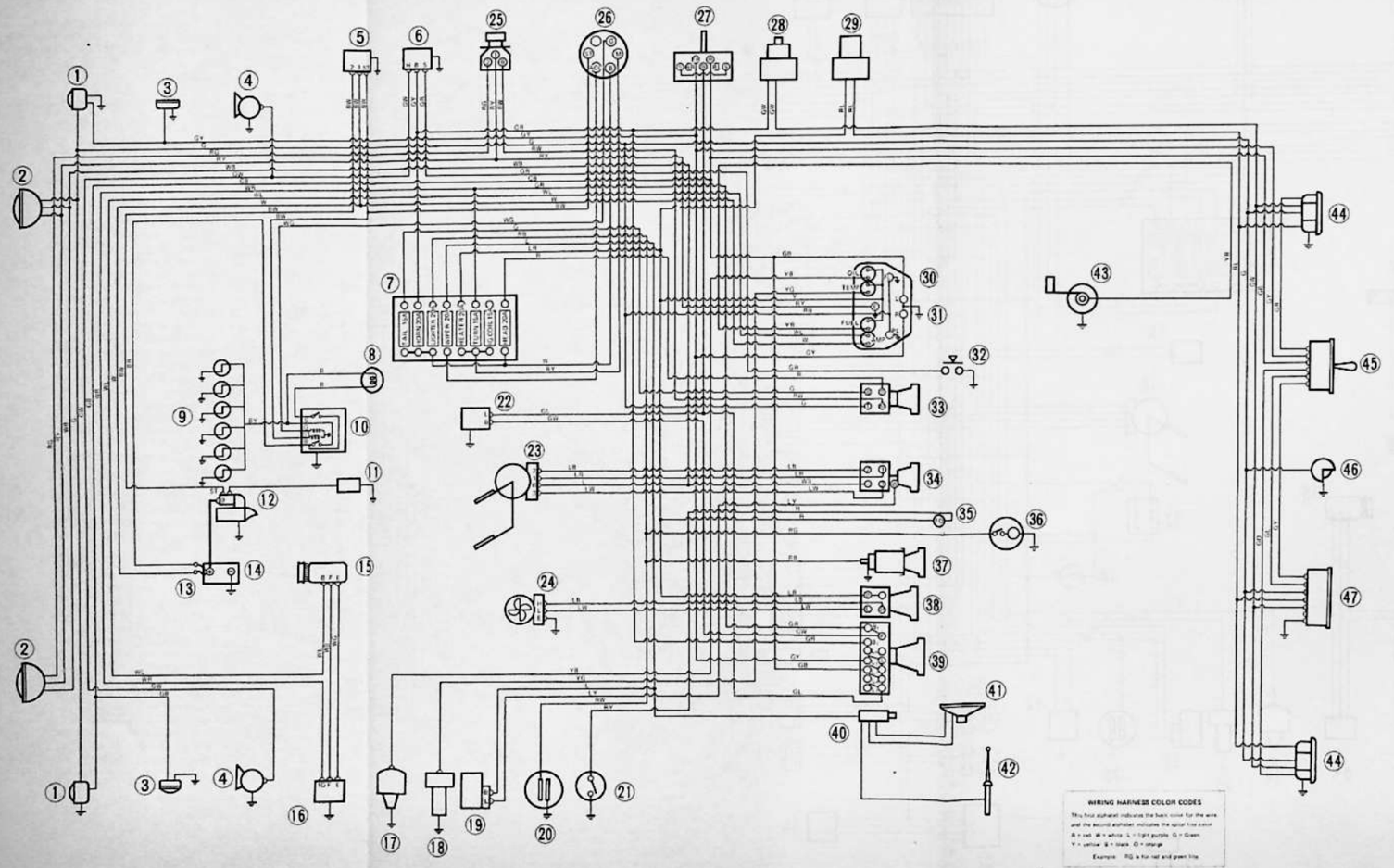


1. Front turn signal light (12V 23W, 8W)
2. Front side marker light (12V 8W) – for USA
3. Side turn signal light (12V 8W) – Ex. USA
4. Horn
5. Headlight
6. Horn relay
7. Fuse block
8. Ignition coil
9. Distributor
10. Starter
11. Fusible link
12. Battery
13. Alternator
14. Alternator
15. Turn signal flasher
16. Windshield wiper motor
17. Front drive relay (OPT)
18. Transfer indicator switch (OPT)
19. Oil pressure sender gauge
20. Water temperature sender gauge
21. Windshield washer (OPT)
22. Water temperature sender gauge – for USA
23. Inspection light socket
24. Vacuum switching solenoid
25. Heater blower motor (OPT)
26. Heater blower motor rear (OPT)
27. Computor – for USA
28. Ignition switch
29. Turn signal dimmer switch
30. Stop light switch
31. Back-up light switch
32. Brake warning indicator light (OPT)
33. Parking brake switch (OPT)
34. Brake warning switch (OPT)
35. Combination meter
36. Fuel sender gauge
37. Horn switch
38. Light control switch
39. Courtesy light – Ex. FJ45P-B
40. Courtesy light switch
41. Dome light
42. Heater control light – for USA
43. Windshield wiper switch
44. Front drive switch (OPT)
45. Front drive switch (OPT)
46. Cigarette lighter (OPT)
47. Front drive indicator light
48. Transfer indicator switch
49. Hazard warning signal switch (OPT)
50. Radio (OPT)
51. Speaker (OPT)
52. Antenna (OPT)
53. Heater blower switch (OPT)
54. Heater blower switch, rear (OPT)
55. Vacuum switching valve – for USA
56. Side marker rear light (12V 8W)
57. Rear combination light (12V 23W, 23W, 23/8W)
58. Trailer socket change over switch (OPT)
59. License plate light (12V 10W)
60. Trailer socket (OPT)

WIRING HARNESS COLOR CODES

This first alphabet indicates the basic color for the wire, and the second alphabet indicates the spiral line color.
R = red, W = white, L = light purple, G = Green,
Y = yellow, B = black, O = orange
Example: RG is for red and green line.

ELECTRICAL WIRING DIAGRAM— HJ 45P-B



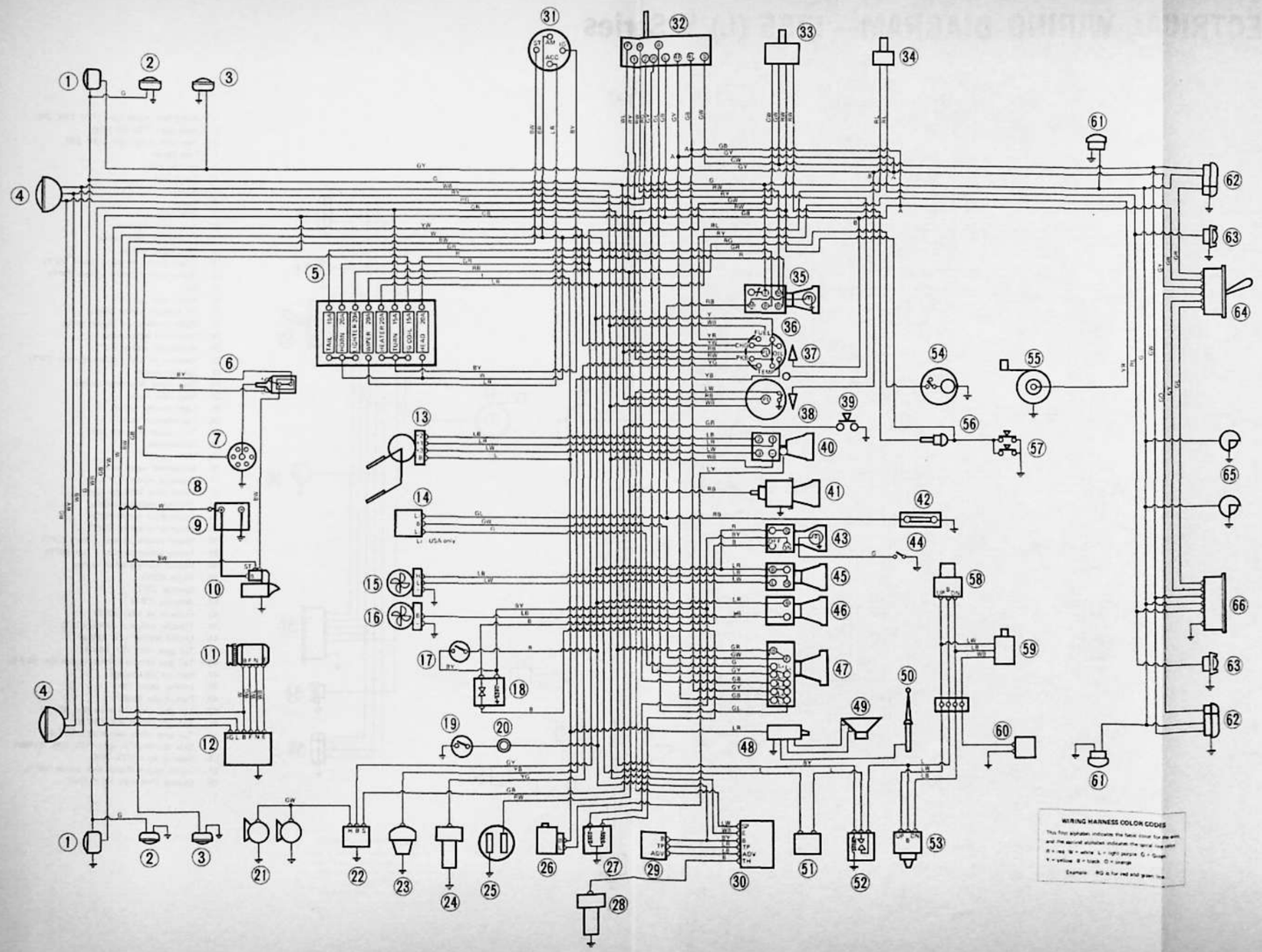
1. Front turn signal light (12V 23W, 8W)
2. Headlight (12V 50/40W)
3. Side turn signal light (12V 8W)
4. Horn
5. Starter relay
6. Horn relay
7. Fuse block
8. Glow plug controller
9. Glow plug
10. Glow plug relay
11. Over injection magnet
12. Starter
13. Fusible link
14. Battery
15. Alternator
16. Alternator regulator
17. Oil pressure sender gauge
18. Water temperature sender gauge
19. Windshield washer (OPT)
20. Inspection light socket
21. Transfer indicator switch
22. Turn signal flasher
23. Windshield wiper motor
24. Heater blower motor
25. Headlight dimmer switch
26. Starter switch
27. Turn signal switch
28. Stop light switch
29. Back-up light switch
30. Turn signal indicator light
31. Combination meter
32. Horn switch
33. Light control switch
34. Windshield wiper switch
35. Transfer indicator light
36. Dome light
37. Cigarette lighter (OPT)
38. Heater blower motor switch
39. Hazard warning signal switch
40. Radio (OPT)
41. Speaker (OPT)
42. Antenna (OPT)
43. Fuel sender gauge
44. Rear combination light (12V 23W, 23W, 23/8W)
45. Trailer socket change over switch (OPT)
46. License plate light (12V 10W)
47. Trailer socket (OPT)

WIRING HARNESS COLOR CODES

This first alphabet indicates the basic color for the wire and the second alphabet indicates the spiral line color.
B = black, W = white, L = light purple, G = Green,
Y = yellow, R = red, O = orange

Example: RG is for red and green line.

ELECTRICAL WIRING DIAGRAM— FJ 55LG, 55V W/Tandem Master Cylinder



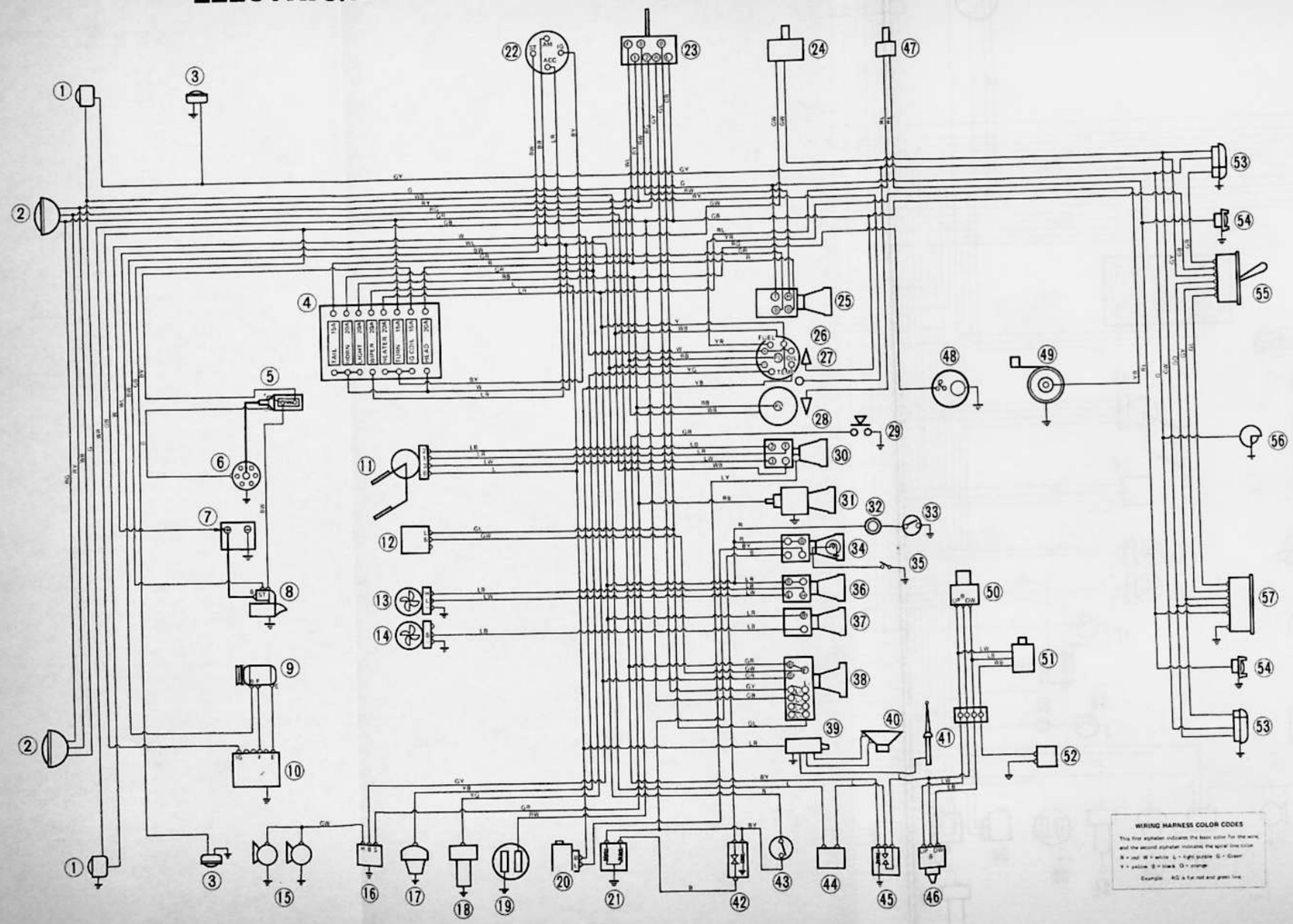
1. Front turn signal light (12V 23W, 8W)
2. Front side marker light (12V 8W) – for USA
3. Side turn signal light (12V 8W)
4. Headlight (12V 50/40W)
5. Fuse block
6. Ignition coil
7. Distributor
8. Fusible link
9. Battery
10. Starter
11. Alternator
12. Alternator regulator
13. Windshield wiper motor
14. Turn signal flasher
15. Heater blower motor, front (OPT)
16. Heater blower motor, rear (OPT)
17. Transfer indicator switch (OPT)
18. Front drive relay (OPT)
19. Transfer indicator switch
20. Front drive indicator light
21. Horn
22. Horn relay
23. Oil pressure sender gauge
24. Water temperature sender gauge
25. Inspection light switch
26. Windshield washer (OPT)
27. Vacuum switching solenoid
28. Water temperature sender gauge – for USA
29. Vacuum switching valve – for USA
30. Computor – for USA
31. Ignition switch
32. Turn signal & dimmer switch
33. Stop light switch
34. Back-up light switch
35. Light control switch
36. Combination meter
37. Turn signal indicator light
38. Speedometer
39. Horn switch
40. Windshield wiper switch
41. Cigarette lighter (OPT)
42. Heater control indicator light – for USA
43. Front drive switch (OPT)
44. Front drive switch (OPT)
45. Heater blower switch, front (OPT)
46. Heater blower switch, rear (OPT)
47. Hazard warning signal switch
48. Radio (OPT)
49. Speaker (OPT)
50. Antenna (OPT)
51. Circuit breaker – Ex. FJ55V-B
52. Tail gate relay – Ex. FJ55V-B
53. Tail gate remote control switch – Ex. FJ55V-B
54. Dome light
55. Fuel sender gauge
56. Parking brake switch
57. Brake warning switch
58. Tail gate control switch – Ex. FJ55V-B
59. Tail gate motor – Ex. FJ55V-B
60. Tail gate safety switch – Ex. FJ55V-B
61. Rear side marker light (12V 8W) – for USA
62. Rear combination light (12V 23W, 23/8W)
63. Back-up light (12V 23W)
64. Trailer socket change over switch (OPT)
65. License plate light (12V 10W)
66. Trailer socket (OPT)

WIRING HARNESS COLOR CODES

This first alphabet indicates the basic color for the wire, and the second alphabet indicates the stripe (marker). B = black, BR = brown, G = green, GR = gray, L = blue, LG = light green, O = orange, P = pink, R = red, V = violet, W = white, Y = yellow

Example: RG is for red and green line.

ELECTRICAL WIRING DIAGRAM— FJ55 (L) V Series



1. Front turn signal light (12V 23W, 8W)
2. Head light (12V 50/40W)
3. Side turn signal light (12V 8W)
4. Fuse block
5. Ignition coil
6. Distributor
7. Battery
8. Starter
9. Alternator
10. Alternator regulator
11. Windshield wiper motor
12. Turn signal flasher
13. Heater blower motor — front (OPT)
14. Heater blower motor — rear (OPT)
15. Horn
16. Horn relay
17. Oil pressure sender gauge
18. Water temperature sender gauge
19. Inspection light socket
20. Windshield washer (OPT)
21. Vacuum switching solenoid valve (OPT)
22. Ignition switch
23. Turn signal & dimmer switch
24. Stop light switch
25. Light control switch
26. Combination meter
27. Turn signal indicator light
28. Speedometer
29. Horn switch
30. Windshield wiper switch
31. Cigarette lighter (OPT)
32. Front drive indicator light
33. Transfer indicator switch
34. Front drive switch (OPT)
35. Front drive switch (OPT)
36. Heater blower switch — front (OPT)
37. Heater blower switch — rear (OPT)
38. Hazard warning signal switch
39. Radio (OPT)
40. Speaker (OPT)
41. Antenna (OPT)
42. Front drive relay (OPT)
43. Transfer indicator switch (OPT)
44. Circuit breaker (Ex. 55V-B)
45. Tail gate relay (Ex. 55V-B)
46. Tail gate remote control switch (Ex. 55V-B)
47. Back-up light switch
48. Interior dome light
49. Fuel sender gauge
50. Tail gate control switch (Ex. 55V-B)
51. Tail gate motor (Ex. 55V-B)
52. Tail gate safety switch (Ex. 55V-B)
53. Rear combination light (12V 23W, 23/8W)
54. Back-up light (12V 23W)
55. Trailer socket change over switch (OPT)
56. License plate light (12V 10W)

WIRING HARNESS COLOR CODES

The first alphabet indicates the basic color for the wire, and the second alphabet indicates the spiral line color.

B = red W = white L = light purple G = Green
Y = yellow B = black O = orange

Example: RG is for red and green line.

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