LIGHTS, INSTRUMENTS AND ACCESSORIES

SERVICE TOOLS

Description	Part Number	Page
multimeter Fluke 111	529 035 868	231

GENERAL

NOTE: For a complete overview of the vehicle electrical system, refer to *ENGINE MANAGEMENT*.

⚠ WARNING

It is recommended to always disconnect the battery when replacing any electric or electronic parts. Always disconnect battery exactly in the specified order, BLACK (-) cable first. Do not place tools on battery.
During assembly/installation, use the torque values and service products as in the exploded views.
Clean threads before applying a threadlocker. Refer to *SELF-LOCKING FASTENERS* and *LOCTITE APPLICATION* at the beginning of this manual for complete procedure.
Torque wrench tightening specifications must strictly be adhered to.
Locking devices (e.g.: locking tabs, elastic stop nuts, self-locking fasteners, etc.) must be installed or replaced with new ones where specified. If the efficiency of a locking device is impaired, it must be renewed.

The following gives general electrical-related problems. For specific system-related problems, refer to proper system section.

It is possible that a component seems to operate in static condition but in fact, it is defective. In this case, the best way to solve this problem is to remove the original part and replace it with a known good component.

IMPORTANT: When solving an electrical problem, the first thing to do is to check battery condition as well as its cables and connections. Also ensure the ignition switch is turned on and engine run/stop switch is set to RUN. Check solidity (close to battery) and related-circuit fuse condition with an ohmmeter (visual inspection could lead to false results). Also visually examine harness and connections.

For best results, use the multimeter Fluke 111 (P/N 529 035 868).

529 035 868

Pay particular attention to ensure that pins are not out of their connectors or damaged. The troubleshooting procedures cover problems not resulting from one of these causes.

CAUTION: Ensure all terminals are properly crimped on wires and connector housings are properly fastened. replacing any electric or electronic part(s), always check electrical connections. Make sure that they are tight and they make good contact and are corrosion-free. The voltage and current might be too weak to go through dirty wire pins. Check the posts for signs of moisture, corrosion or if they look dull. Clean pins properly and then coat them with silicon-based dielectric grease or other appropriate lubricant (except if otherwise specified) when reassembling them. See connectors information in *ELECTRICAL CONNECTORS*.

IMPORTANT: In an usual electric circuit, the battery supplies a switch which then supplies the electric component. Therefore the switch opens and closes the positive side of the circuit. In circuits controlled by the ECM, the battery supplies the electric component and the ECM works as a switch to complete the circuit to the ground. Take this into account when troubleshooting the electrical system.

Pay attention to ground wires.

Checking for Shorts Between 2 Wires

When checking continuity of a wire in a circuit, wires should be checked for short circuit as follows.

Make sure to isolate circuit by unplugging connectors.

Let's suppose that the circuit to be checked has a RED and a BLACK wire. Using an ohmmeter, measure the resistance between the RED and the BLACK wire. The resistance should be infinite (O.L). Otherwise, there is a short circuit between both wires. We must therefore identify and correct the fault.

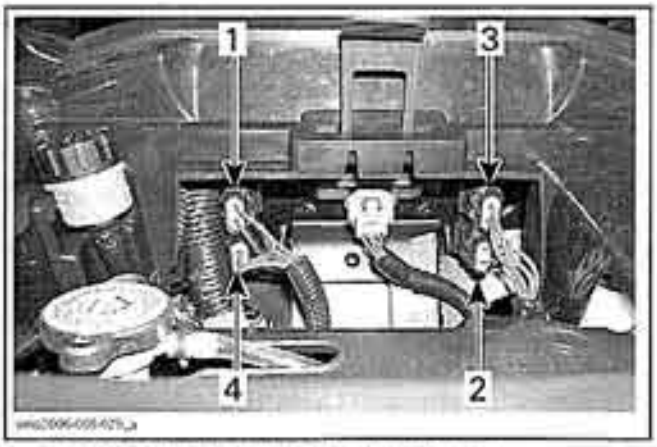
FUSES

If a fuse is damaged, replace it with one of the same rating.

CAUTION: Do not use a higher rated fuse as this can cause severe damage.

Outlander 400 Series

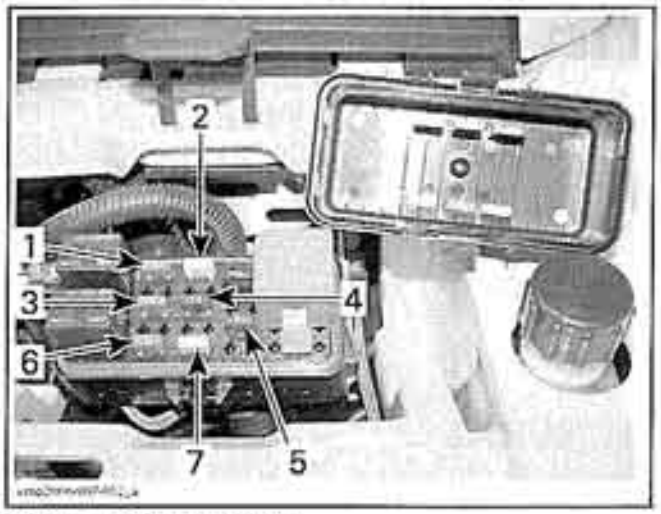
Fuses are located in the service compartment.



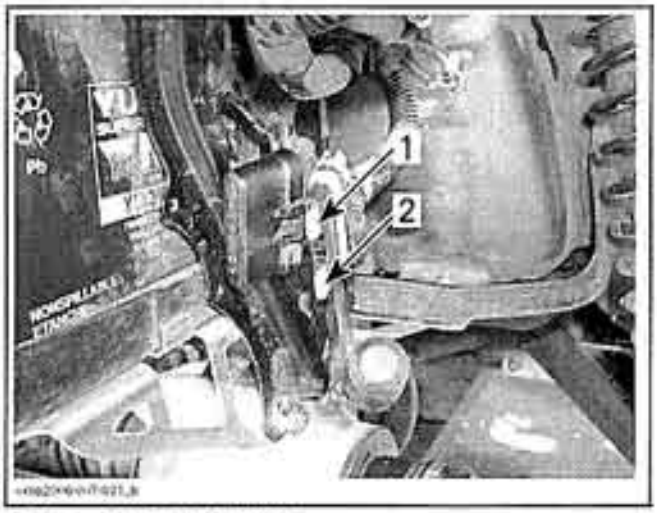
1. Accessories (power outlet and auxiliary supply)
2. Fan
3. Main
4. Charging system

Outlander 800 Series

Fuses are located in the front service compartment and at the back near battery.



FRONT — FUSES LOCATION
1. (F1) Ignition coils
2. (F2) Cooling fan
3. (F3) Fuel injectors
4. (F4) Accessories
5. (F5) Fuel pump
6. (F6) Engine Control Module (ECM)
7. (F7) Accessories



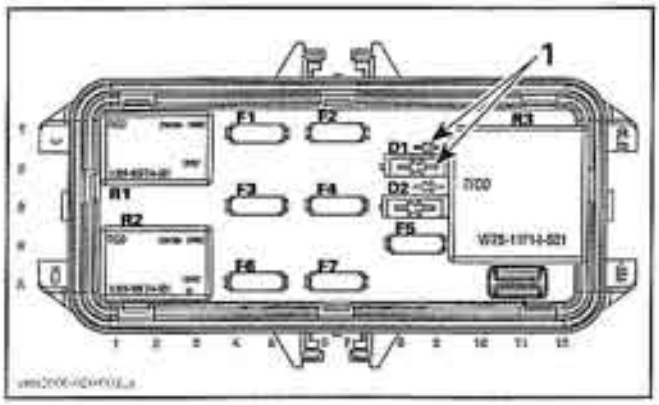
REAR — FUSES LOCATION
1. (F9) Accessories
2. (F8) Main

RELAY

Outlander 800 Series Only

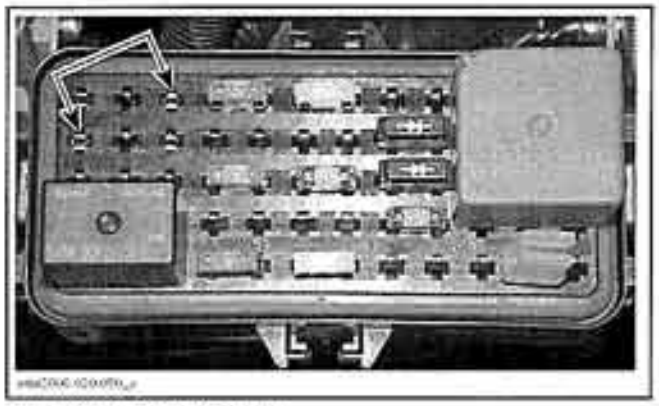
See illustration below for relays identification as used in this manual and the *WIRING DIAGRAM*.

NOTE: Relays may be inverted by 180° at installation and they will work correctly. Ensure to align tabs of relay with terminals of fuse holder at installation.

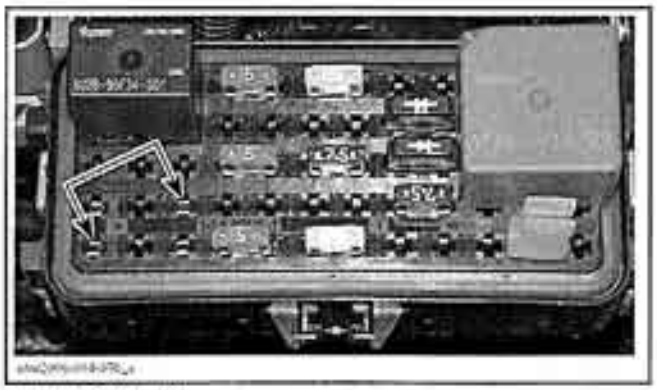


1. Position symbol on diode in same direction as symbol on fuse holder
R1: Cooling fan
R2: Main
R3: Accessories
D1: ECM diode
D2: Starter solenoid diode

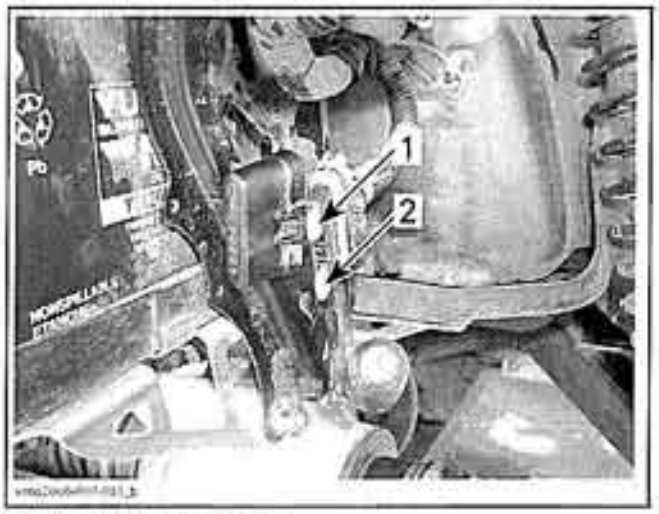
The easiest way to check a relay is to remove it and bypass it with a jumper. If the components then work, replace the relay. See illustration to find where to bypass the relays.



RELAY R1 (COOLING FAN)



RELAY R2 (MAIN)



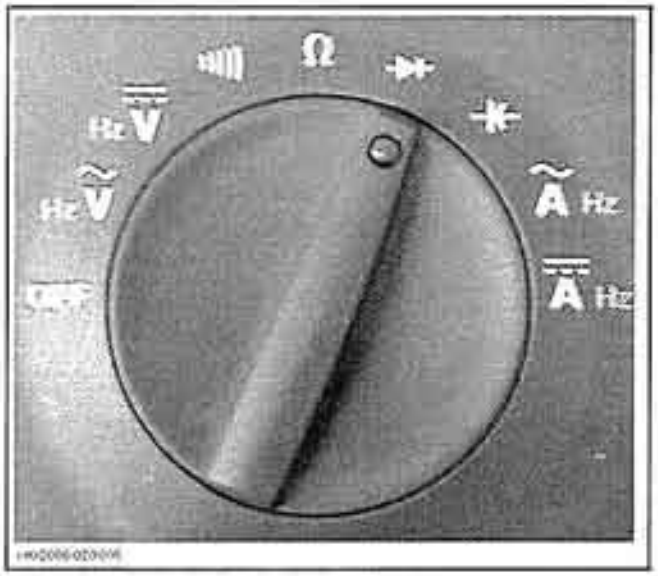
RELAY R3 (ACCESSORIES)

DIODE

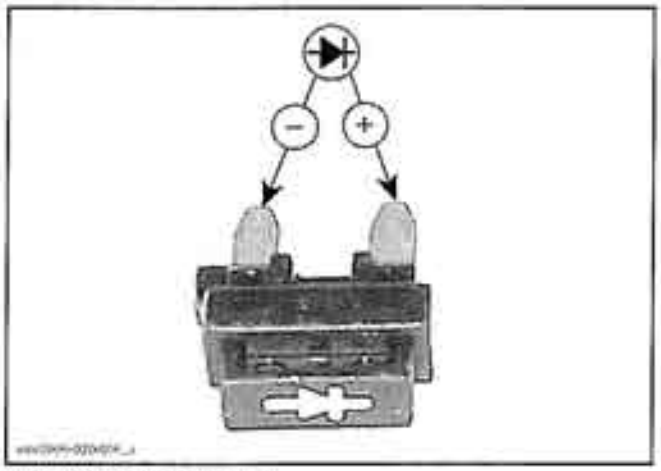
Whenever installing a diode, pay attention to the installation direction to allow proper operation.

Remove diode and lay down on a non-metallic table.

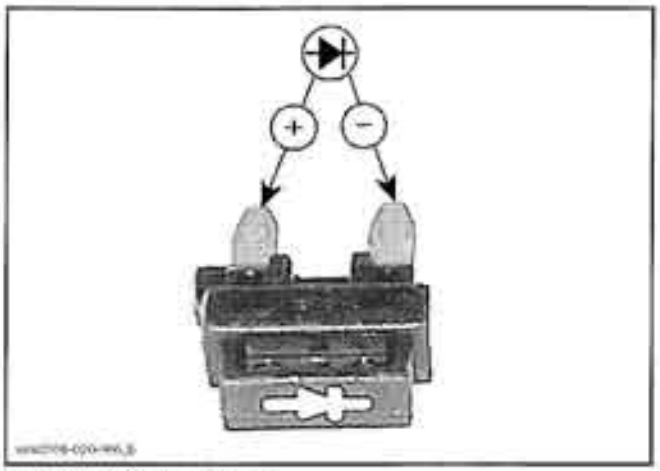
Set multimeter as shown.



Probe diode paying attention to proper polarity.



MUST BE OPEN CIRCUIT



MUST BE AROUND 0.5 V

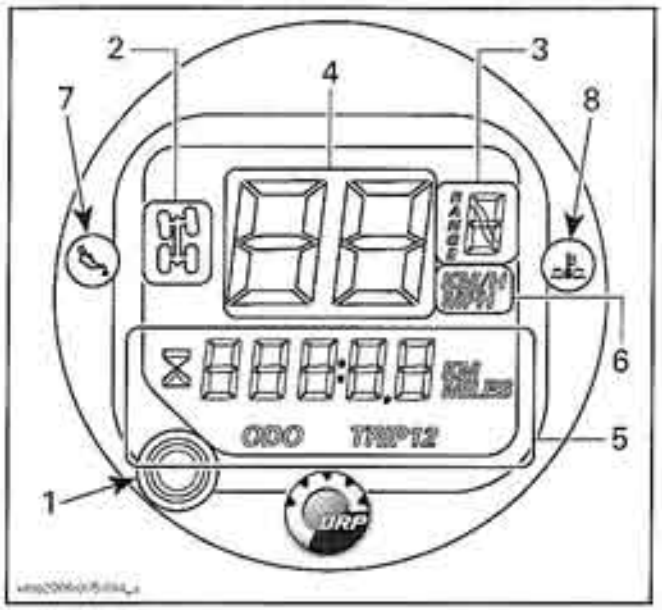
If diode fail any test, replace it.

SPEEDOMETER FUNCTIONS

Outlander 400 Series

This vehicle is equipped with an electronic speedometer. It indicates the speed of vehicle either in MPH or km/h.

The speedometer is located at the middle of cluster and it backlit every time the ignition switch is turned ON.

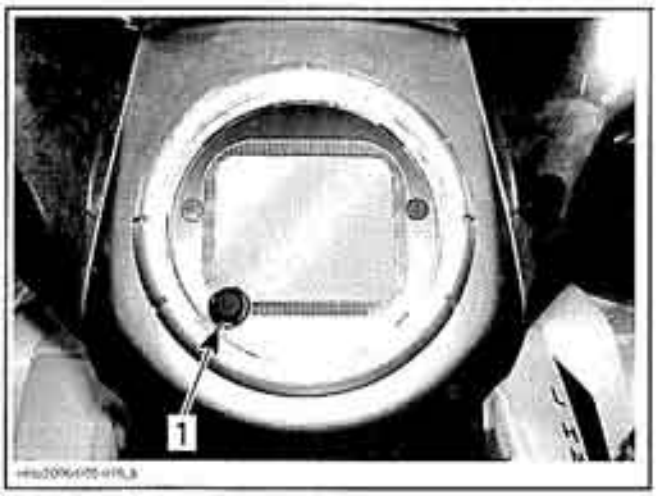


TYPICAL
1. *Display selector button*
2. *4WD system display*
3. *Transmission position display*
4. *Vehicle speed display*
5. *multi-function display*
6. *Unit display*
7. *Oil pressure indicator lamp*
8. *Engine temperature indicator lamp*

Display Selector Button

Use selector button to change speedometer display to the desired mode:

- hourmeter
- odometer
- trip meter 1
- trip meter 2.



1. Selector button

Change from One Unit to the Other

The speedometer is factory preset in miles but it is possible to change it to kilometer reading.

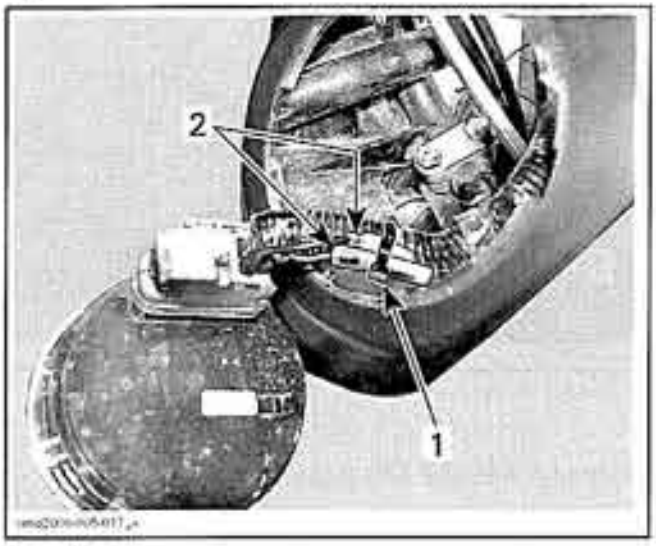
NOTE: The unit modification is applied to the speedometer, odometer and trip meter.

Turn ignition switch to OFF position.

Lift speedometer. Refer to *REMOVAL* further in this section.

Plug connectors to change units from miles to kilometers. Unplug to return to miles reading.

Fix the change wires to the harness with new locking tie.



1. Locking tie
2. Connectors to change units

Reinstall speedometer.

Multi-Function Display

Odometer (ODO)

Odometer records the total distance travelled either in miles or kilometers.

Trip Meter (TRIP 1/TRIP 2)

For your convenience, your speedometer is equipped with two separate trip meter.

The trip meter records distance travelled since it has been reset. Distance travelled is displayed either in miles or kilometers.

It can be used to establish a fuel tank range or distance between 2 way points for instance.

Push and HOLD display selection button for 2 seconds to reset the trip meter.

Hourmeter

The hourmeter records engine running time in hours and minutes.

Transmission Position (RANGE)

Indicates the transmission is in park position.

Indicates the transmission is in reverse position.

Indicates the transmission is in neutral position.

4-Wheel Drive System

When this indicator is ON, it indicates the 4WD system is activated.

Indicator Lamps

OIL PRESSURE (RED)

When this indicator light is ON, it indicates a low oil pressure condition of the engine.

CAUTION: If the light does not turn off right after engine starting, stop engine. Check engine oil level. Refill if necessary. Do not use the vehicle until repaired.

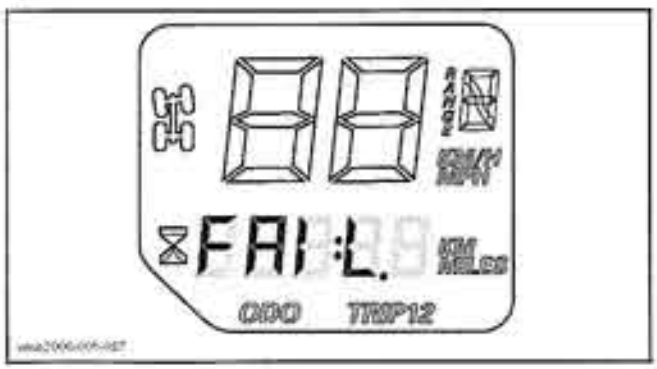
ENGINE TEMPERATURE (RED)

When this indicator light is ON, it indicates the engine is overheating.
If engine overheats, refer to *ENGINE OVERHEAT* in *TROUBLESHOOTING*.

CAUTION: If the light does not turn off right after engine starting, stop engine. Do not use the vehicle until repaired.

Speedometer Display Codes

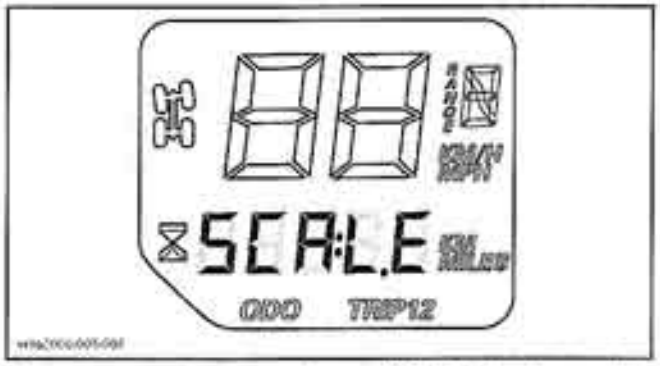
Speedometer Reads FAIL



If your speedometer shows FAIL in the multi-function display, it means that the speedometer as sensed 18 volts in the electrical system, caused by a disconnected or defective voltage regulator.

Check voltage regulator connection.

Speedometer Reads SCALE

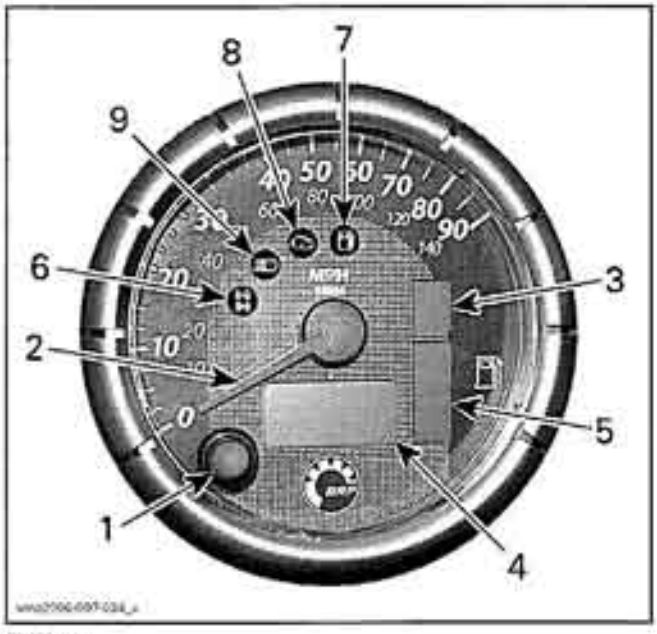


If your speedometer shows SCALE in the multi-function display, it means that the display selector button is stuck in the down position or depressed when the electrical system was activated.

Outlander 800 Series

This vehicle is equipped with an electronic multi-function speedometer.

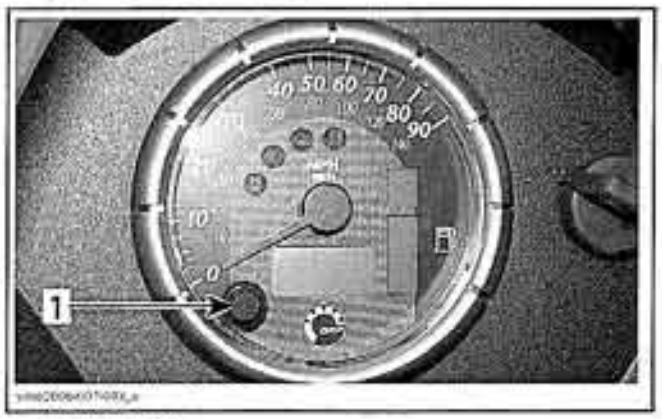
It is backlit every time the ignition switch is turned ON and engine run/stop switch is set to RUN.



TYPICAL
1. *Display selector button*
2. *Pointer mode display*
3. *Transmission position display*
4. *multi-function display*
5. *Fuel level display*
6. *4WD indicator lamp*
7. *Low fuel level indicator lamp*
8. *Check engine indicator lamp*
9. *High beam indicator lamp*

Display Selector Button

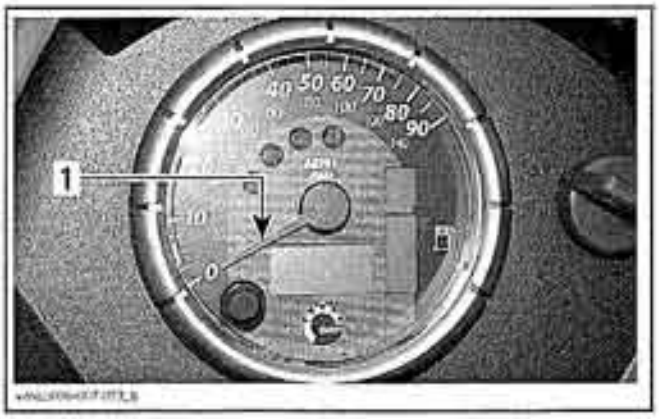
Use selector button to change speedometer multi-function display to the desired mode:
- odometer
- trip meter (resettable)
- hour meter (resettable)
- vehicle hour meter
- speed or RPM mode.



1. Selector button

Pointer Mode Display

The speedometer pointer has two modes, it can show vehicle speed or engine revolution per minute.



1. Pointer

To change pointer from one mode to the other do the following:
- change speedometer multi-function display to the odometer (ODO) mode
- push and HOLD display selector button for 2 seconds to change mode.

Speed Mode

In this mode, the pointer indicates the speed of the vehicle.

The speedometer measures speed from 0 to 140 km/h and 0 to 90 MPH.

RPM Mode

In this mode, the pointer indicates engine RPM.

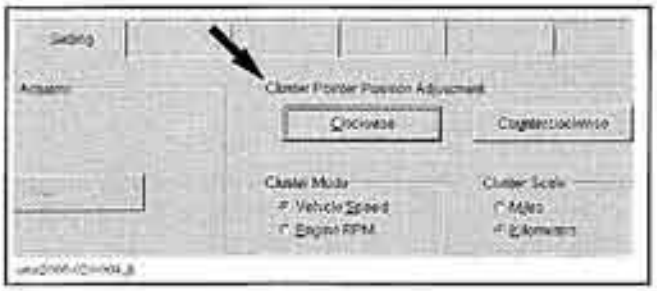
The speedometer measures engine RPM from 0 to 9000 RPM.

NOTE: In the RPM mode, the vehicle speed will be automatically displayed in the multi-function display once the vehicle moves over 10 km/h or 6 MPH.

Pointer Alignment

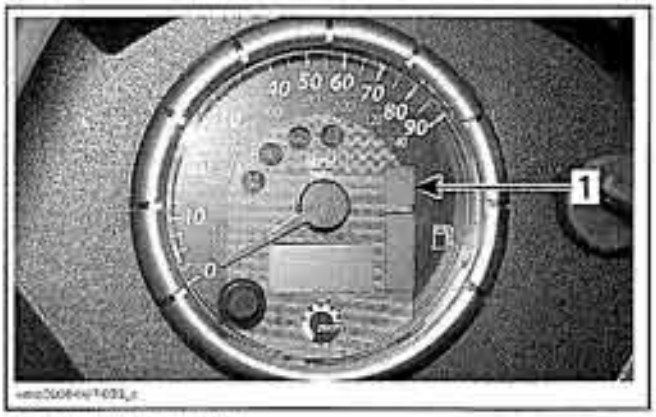
If for any reason, the speedometer pointer is not properly aligned with the 0 (zero) it can be set.

Connect the VCK (Vehicle Communication Kit) and use B.U.D.S. software. Go in **Setting** tab and use **Cluster Pointer Position Adjustment**.



Transmission Position Display

This display will show transmission position.



1. Transmission position

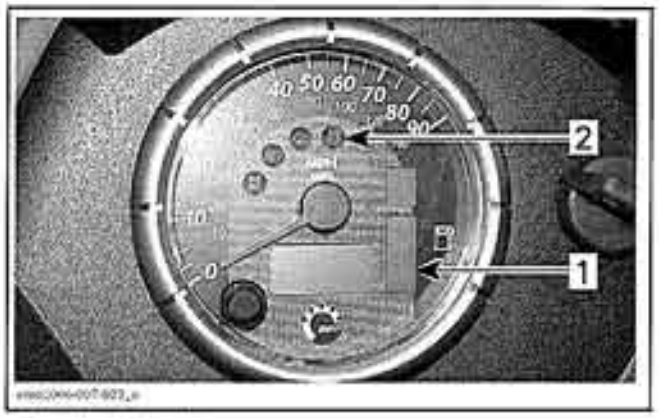
DISPLAY	FUNCTION
P	Park
N	Neutral
R	Reverse
H	High gear
L	Low gear

NOTE: If the letter "E" is displayed in the transmission position display, it means that there is a electrical communication error.

Fuel Level Display

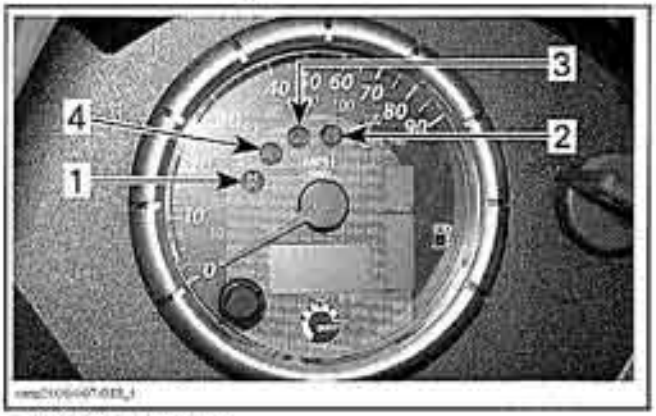
Bar gauge continuously indicates the amount of fuel in the fuel tank while riding.

When the low fuel indicator lamp is ON, it indicates that there is only 30% of fuel left in fuel tank, approximately 6 L (1.6 U.S. gal).



1. Fuel level display
2. Low fuel indicator lamp

Indicator Lamps



1. 4WD indicator lamp
2. Low fuel level indicator lamp
3. Check engine indicator lamp
4. High beam indicator lamp

When this indicator is ON, it indicates the 4WD system is activated.

When this indicator is ON, it indicates that there is only 30% of fuel left in fuel tank, approximately 6 L (1.6 U.S. gal).

When this indicator is ON, it indicates an engine fault code, look for message in multi-function display.
When this indicator blinks, it indicates that the LIMP HOME mode is activated, refer to *TROUBLESHOOTING* for more details.

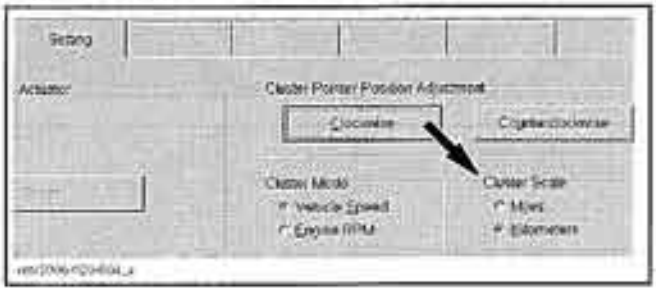
When this indicator is ON, it indicates high intensity is selected on the headlamps and ignition key is in LIGHTS position.

Unit Selection (MPH vs KM/H)

The speedometer is factory preset in miles but it is possible to change it to kilometer reading.

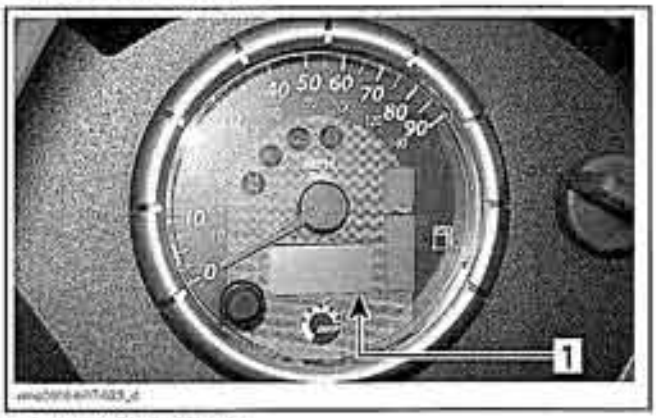
NOTE: The unit modification is applied to the odometer and trip meter.

Connect the VCK (Vehicle Communication Kit) and use B.U.D.S. software. Go in **Setting** tab and use **Cluster Scale**.



Multi-Function Display

NOTE: Use the selector button to change display to the desired mode.



1. multi-function display

Odometer (ODO)

Odometer records the total distance travelled either in miles or kilometers.

Trip Meter (TRIP)

The trip meter records distance travelled since it has been reset. Distance travelled is displayed either in miles or kilometers.

It can be used to establish a fuel tank range or distance between 2 way points for instance.

Push and HOLD display selection button for 2 seconds to reset the trip meter.

Hour Meter (TRIP TIME)

The hour meter records vehicle running time when the electrical system is activated. It can be used to establish traveling time between 2 way points for instance.

Push and HOLD display selection button for 2 seconds to reset the hour meter.

Hour Meter (ENGINE HOURS)

The hour meter records engine running time.

Speed/RPM

In the RPM mode, vehicle speed will be automatically displayed once the vehicle moves over 10 km/h or 6 MPH.

In the speed mode, display will show engine RPM from 0 to 9000 RPM.

Fault Codes

Fault codes (if so) can be displayed in the speedometer. Refer to *DIAGNOSTIC PROCEDURES* in *ENGINE MANAGEMENT*.

Messages

The following messages can also be viewed in the multi-function display:

MESSAGE	DESCRIPTION
X 100 RPM	When the speedometer is in SPEED MODE, multi-function display will show "X 100 RPM" if the RPM mode is selected.
INVALID KEY	Indicates that you have used the wrong ignition key, use the proper key for this vehicle. It is also possible that the ignition key has a bad contact, remove and clean key.
PARK BRAKE	Is displayed when parking brake is applied for more than 15 seconds.
LO BATT	Low battery voltage, check battery voltage and charging system.
HI BATT	High battery voltage, check battery voltage and charging system.
LOW OIL (1)	Engine low oil pressure, stop engine immediately and check oil level.

MESSAGE	DESCRIPTION
HI TEMP (2)	Engine is overheating, refer to *ENGINE OVERHEAT* in *TROUBLESHOOTING*.
LIMP HOME	Serious fault on the engine that can change the normal operation of the engine, check engine indicator lamp will also blink, refer to *TROUBLESHOOTING* for more details.
CHECK ENGINE	EMS fault, check engine indicator lamp will also be ON, refer to *DIAGNOSTIC PROCEDURES* for more details.
MAINTENANCE SOON	Periodic maintenance required.
NO ECM COMMUNICATION	Communication error between speedometer and engine control module (ECM).

CAUTION: (1) If the light does not turn off right after engine starting, stop engine. Check engine oil level. Refill if necessary. Do not use the vehicle until repaired.

CAUTION: (2) If the light does not turn off right after engine starting, stop engine. Do not use the vehicle until repaired.

PROCEDURES

SPEEDOMETER

Outlander 400 Series

Test

Using a multimeter, measure the voltage between both RED/VIOLET and BLACK wires.

Turn ignition switch to ON. The obtained value should be between 12 and 14.5 Vdc.

- No voltage on speedometer:
  - Check wiring condition and electronic module connector. If good, change electronic module.
- Voltage on speedometer:
  - If VSS (Vehicle Speed Sensor) voltage is good, change speedometer.
  - No voltage on VSS. Check VSS and wiring condition from VSS to electronic module MPEM.

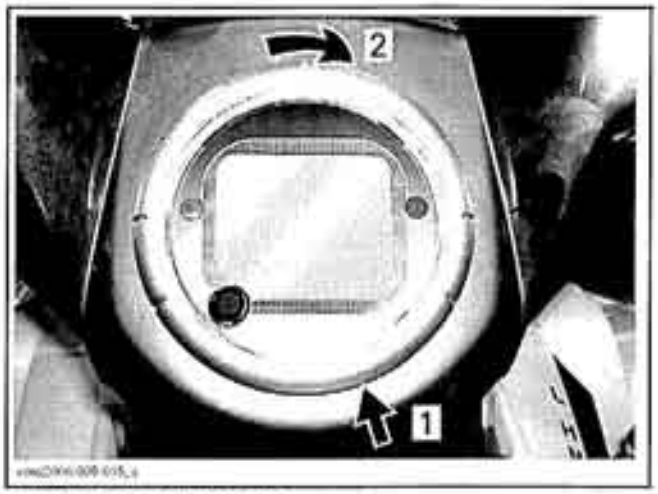
Bulbs Replacement

The speedometer is lighted with LEDs. If one LED burns, replace the speedometer. The LEDs are not available separately.

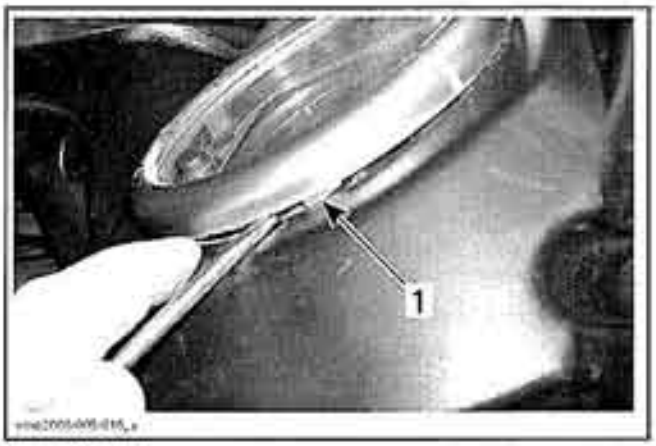
Removal

Slightly lift speedometer at the bottom using a small flat screwdriver until small locking tab is released from steering cover.

Turn speedometer clockwise until speedometer slightly pops-out from steering cover.



1. *Lift to release locking tab*
2. *Turn clockwise to release speedometer*



1. *Locking tab*

Unplug connector and remove speedometer.

Installation

For the installation, reverse the removal procedure.

Outlander 800 Series

Speedometer Pinout

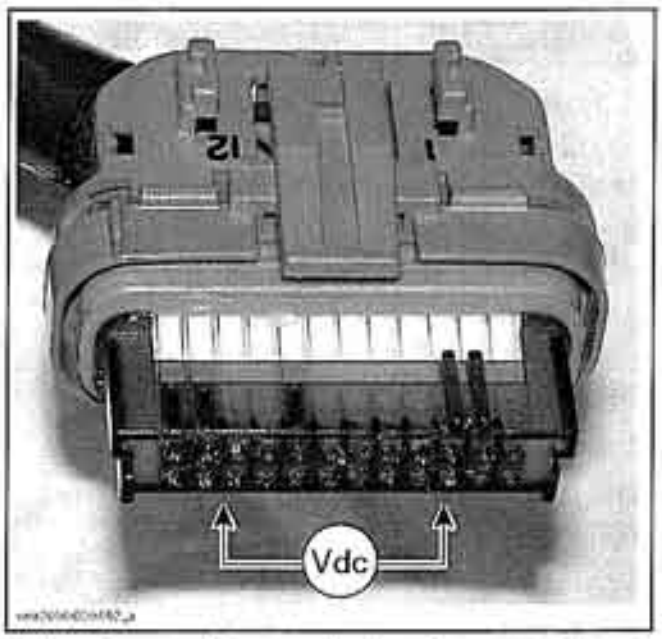
FUNCTION	PIN
Power 12 Vdc	8
Ground	11
CAN line	23
CAN line	24
Fuel level gauge supply	15
Fuel level gauge ground	12
2/4WD switch signal	17
HI beam signal	16

Voltage Test

QUICK CHECK	
OBSERVATION	POSSIBLE CAUSE
multi-function speedometer does not turn on	Burnt fuse (F8)
	Faulty relay (main)
	Burnt fuse (F4)
	ECM not powered: – burnt fuse (F6) – defective diode (D1) – defective ECM
	Defective multi-function speedometer
	Faulty multi-function switch or key
	Wiring/connectors

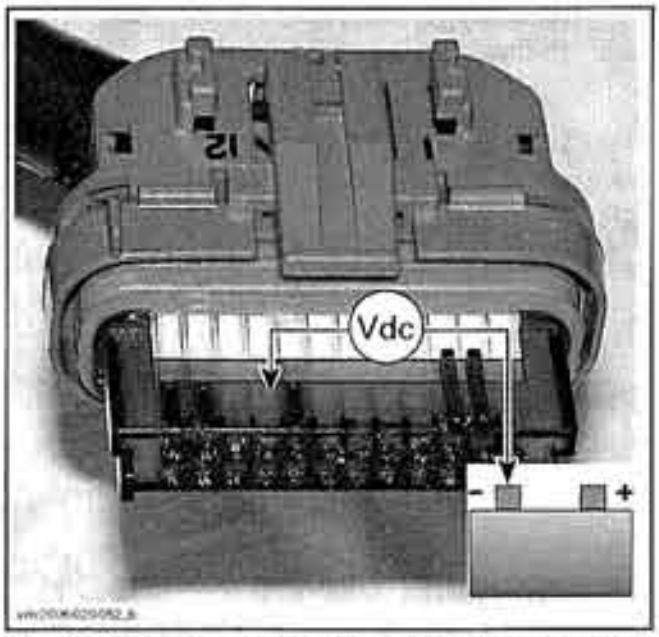
Disconnect speedometer connector. Turn ignition key ON and set engine run/stop switch to RUN. Read voltage from vehicle harness as follows.

SPEEDOMETER CONNECTOR (harness side)		VOLTAGE
Pin 8	Pin 11	Battery voltage



If there is no voltage, recheck voltage as follows.

SPEEDOMETER CONNECTOR (harness side)		VOLTAGE
Pin 8	Battery ground	Battery voltage



If voltage is not appropriate, check/repair wiring and/or connectors.

If battery voltage is good, check ground circuit (pin 11) wiring/connector. If they test good, temporarily connect pin 11 to battery ground. If multi-function speedometer turns on, try a new ECM.

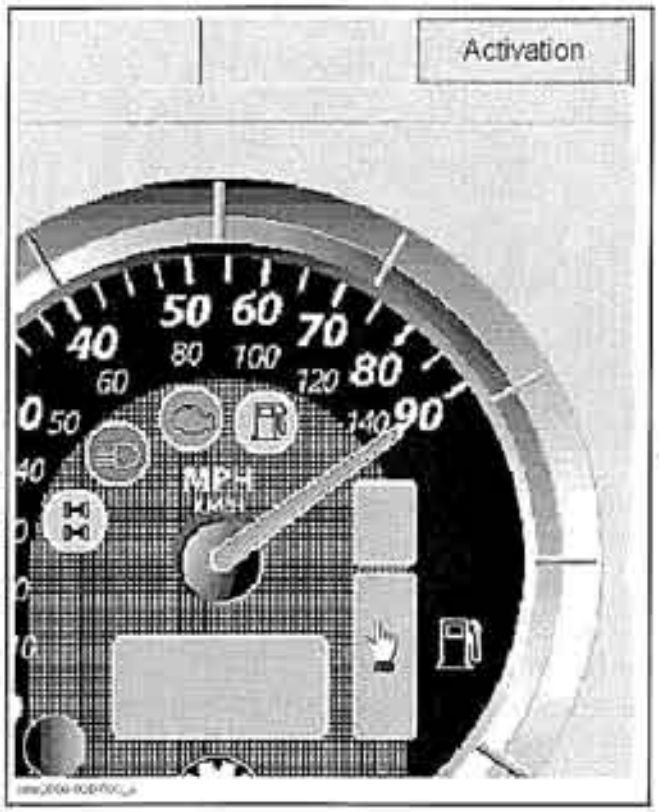
When everything else has been tested and multi-function still does not turn on, try a new one.

Function Display Problems

When the functions do not display, check for fault code(s). Refer to *DIAGNOSTIC PROCEDURES*. When a specific function does not work, proceed as follows.

Fuel Level

As a quick test with B.U.D.S., go in **Activation** tab and activate fuel level display area.

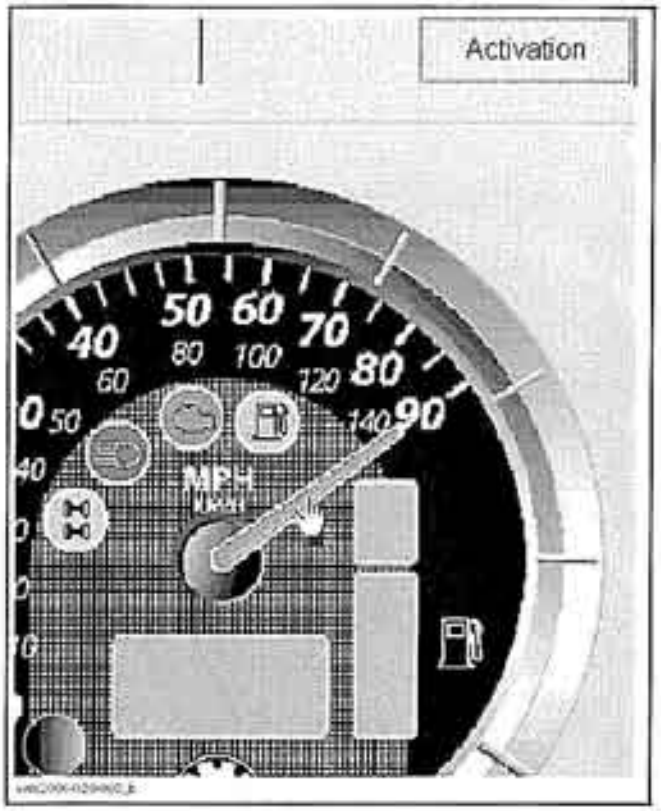


If it does not work, check wiring/connectors and if they are good, try a new multi-function speedometer.

If it works, check fuel level sender. Refer to procedure further in this section.

Speedometer Pointer

As a quick test with B.U.D.S., go in **Activation** tab and activate speedometer pointer. Hold mouse over pointer so that the pointer moves up to the maximum value.



If it does not work, try a new multi-function speedometer.

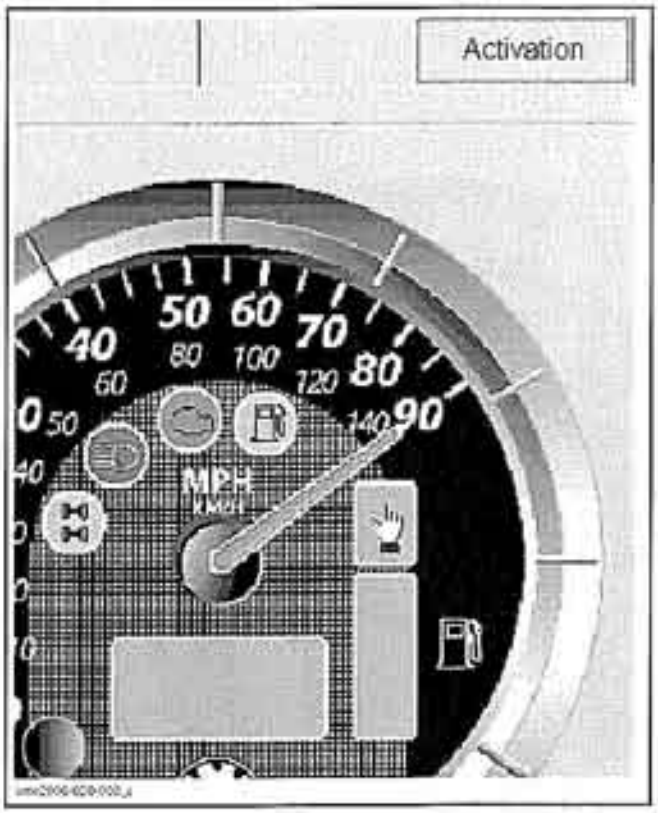
If it works, check speed sensor.

If speedometer pointer in speed mode is acting erratically, remove speed sensor and clean it.

Transmission Position Display

If the letter "E" is displayed in transmission position display, there is an electrical communication error. Refer to *GEARBOX*.

As a quick test with B.U.D.S., go in **Activation** tab and activate transmission position display area.

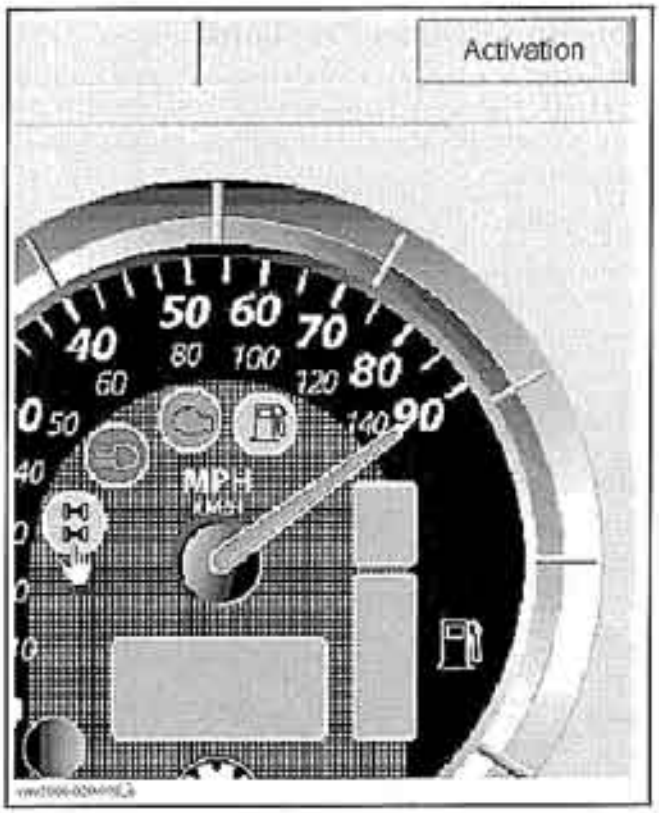


If it does not work, try a new multi-function speedometer.

If it works, check gearbox switches. Refer to *GEARBOX*.

2/4WD Pilot Lamp

As a quick test with B.U.D.S., go in **Activation** tab and activate 2/4WD lamp area.

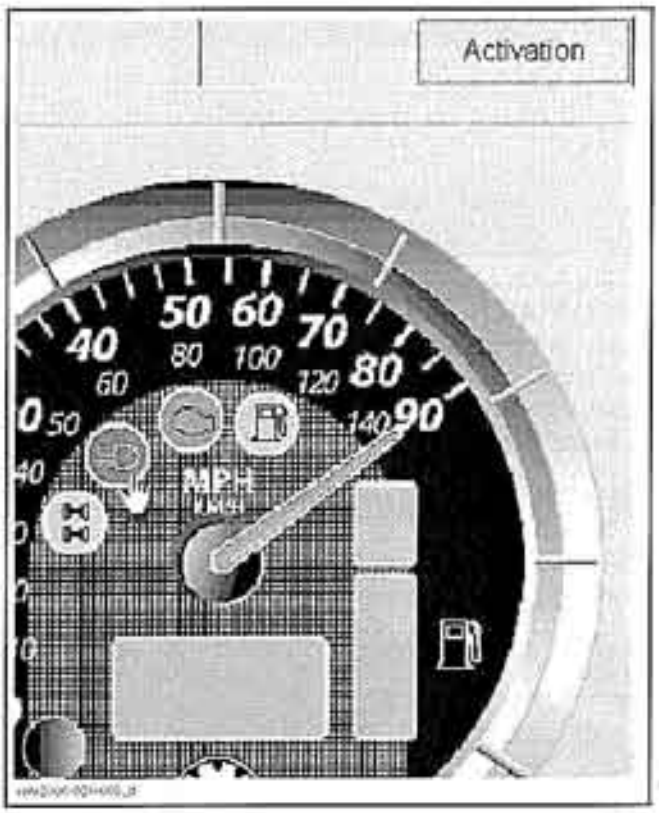


If it does not work, try a new multi-function speedometer.

If it works, check gearbox switch. Refer to *GEARBOX*.

HI Beam Pilot Lamp

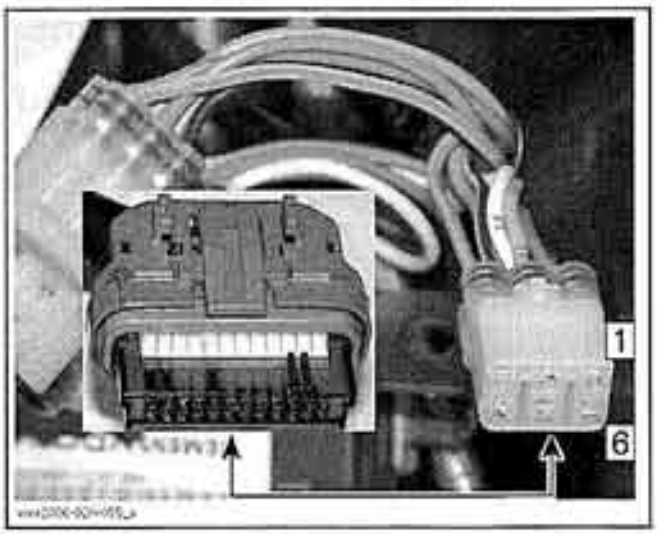
As a quick test with B.U.D.S., go in **Activation** tab and activate HI beam lamp area.



If it does not work, try a new multi-function speedometer.

If it works, check if headlamp work. If headlamp do not work, refer to *HEADLAMP*. If headlamp work, check wire/connectors between multi-function speedometer and low/hi beam switch.

WIRE CONTINUITY		
SPEEDOMETER CONNECTOR	MULTI-FUNCTION SWITCH CONNECTOR (MG2) (harness side)	RESISTANCE
Pin 16	Pin 5	Close to 0 Ω



If wire is faulty, replace/repair.

Removal

Remove center panel and dashboard. Refer to *BODY*.

Unplug speedometer connector.

Locate locking tab then push edge of dashboard to release tab.

While holding tab, rotate speedometer to unlock.

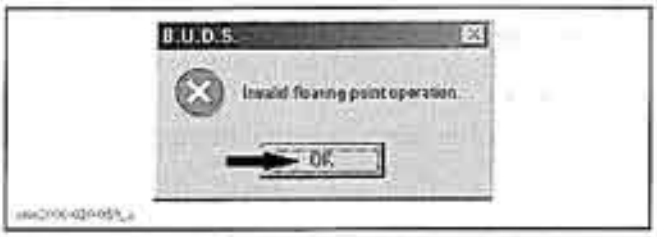
PULL SPEEDOMETER OUT
1. Tabs
2. Notch

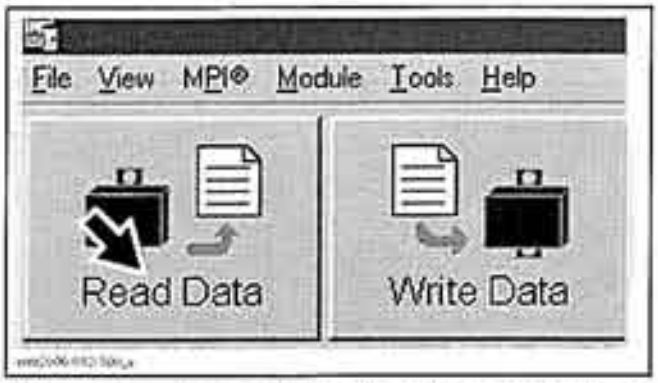
Installation

For the installation, reverse the removal procedure.

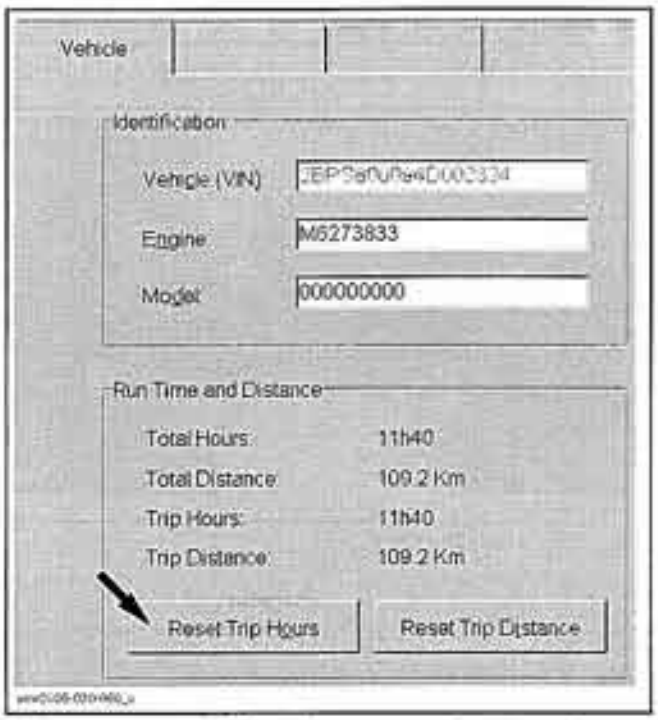
New Speedometer Registration (Cluster Coding)

NOTE: When a new speedometer is installed, the following message may appear when vehicle is connected to VCK and READ DATA is pressed. The computer will then stall there forever. If so, click OK then click read data again (even if there is an hourglass on the computer.

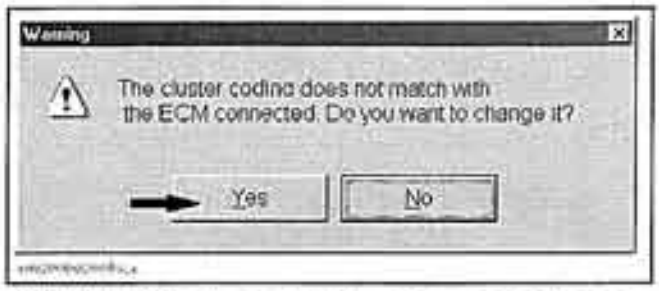




Then, computer and B.U.D.S. will be available as usual. Reset the **Trip hours** either from B.U.D.S. or on speedometer. The message will not appear anymore.



Whenever multi-function speedometer is replaced, it is required to use B.U.D.S. to register it in ECM. Simply click YES when the following message appears.

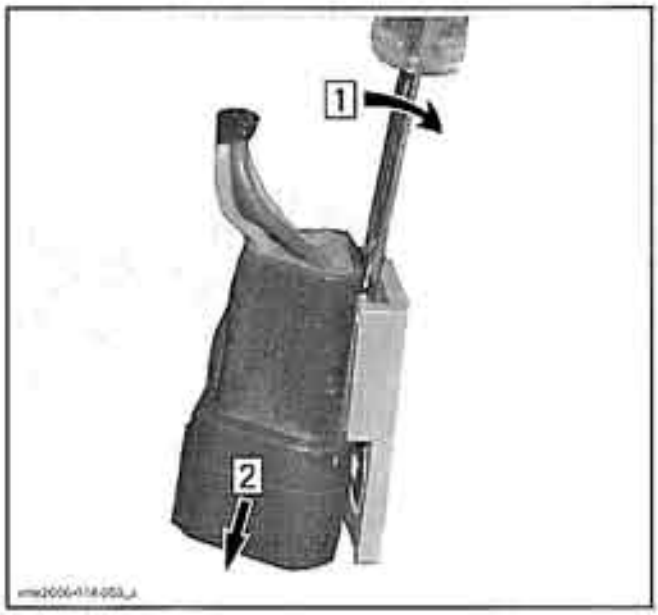


IMPORTANT: If a multi-function speedometer from another vehicle model is installed and is not registered in ECM through B.U.D.S., engine starting will not be allowed until speedometer is registered with proper coding.

VEHICLE SPEED SENSOR (VSS)

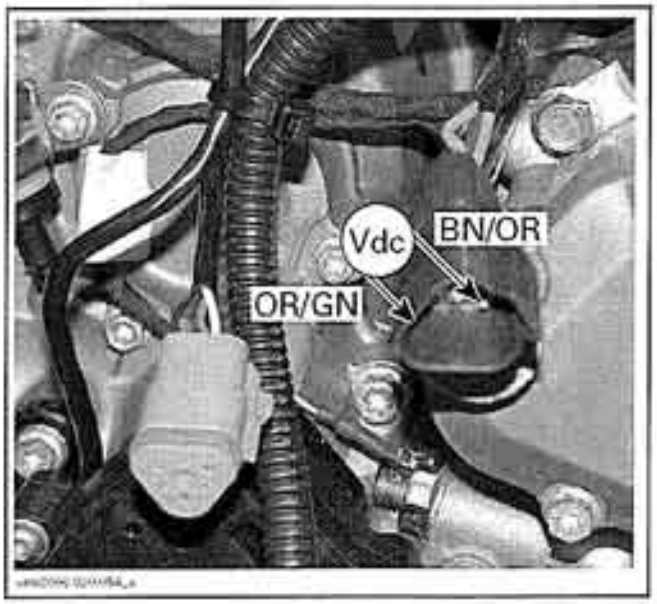
Disconnect speed sensor connector and detach from engine to ease access.

TYPICAL – V-810 ENGINE SHOWN



Turn ignition key ON and set engine run/stop switch to RUN. Read voltage from vehicle harness as follows.

SPEED SENSOR CONNECTOR (harness side)		VOLTAGE
ORANGE/ GREEN	BROWN/ ORANGE	Battery voltage



If voltage is not good, check/repair wiring/connectors.

If voltage is good, do the following test.

Reconnect speed sensor connector.

Lift rear of vehicle so that rear wheels are off the ground.

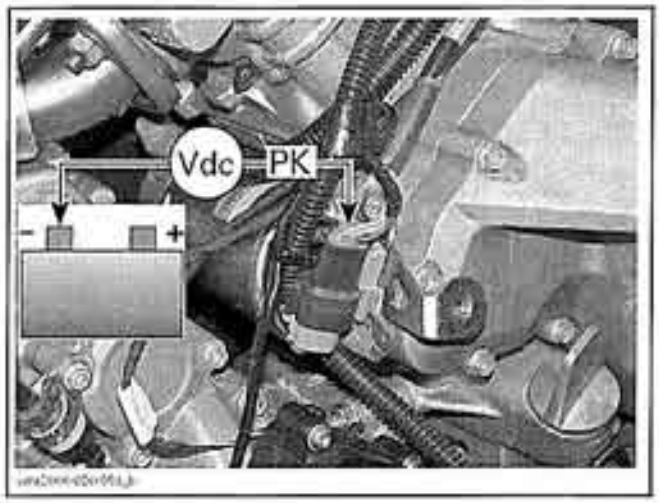
⚠ WARNING

Properly secure vehicle. Ensure to set transmission to 2WD.

Start engine and slowly depress throttle to make rear wheels turn at slow speed.

Probe wire and read voltage from vehicle harness as follows.

SPEED SENSOR CONNECTOR		VOLTAGE
PINK	Battery ground	From approx. 5 Vdc increasing as wheel speed increases



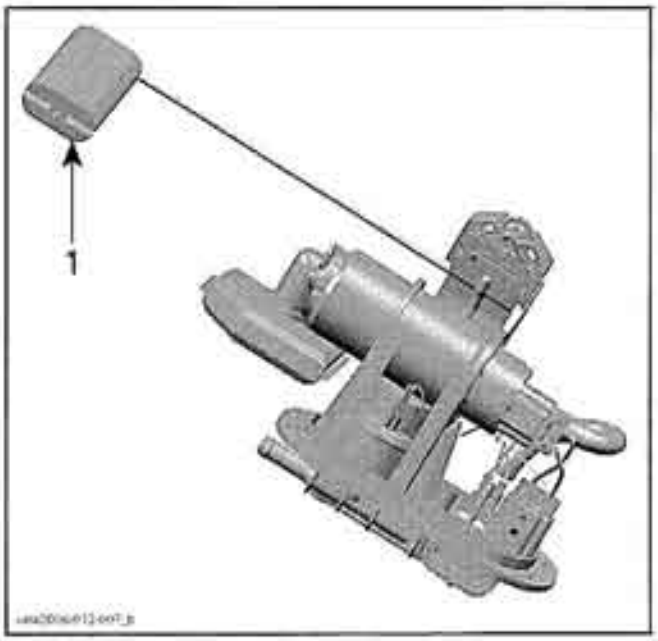
If voltage is appropriate, check/repair wiring/connector between sensor and ECM. If it is good, try a new ECM.

If voltage is wrong, try a new sensor.

FUEL LEVEL SENDER

Outlander 800 Series Only

The fuel level sender is part of the fuel pump module mounted inside the fuel reservoir.

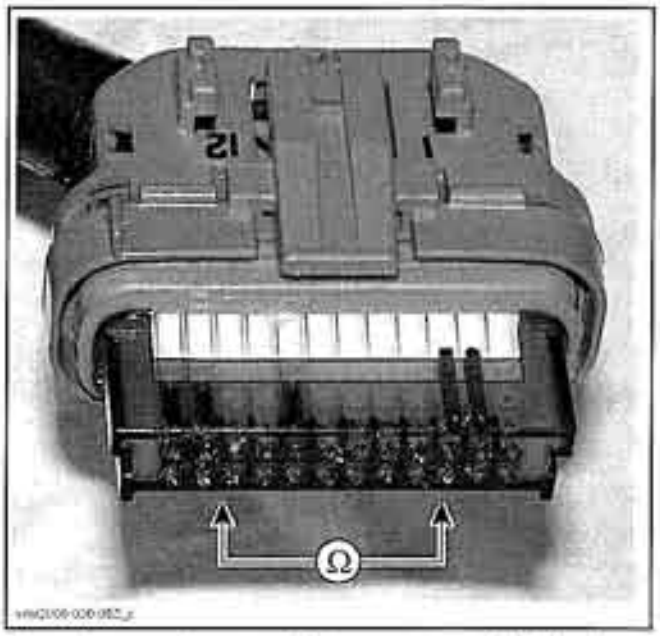


FUEL PUMP MODULE
1. Float and arm

Disconnect multi-function speedometer connector.

Measure resistance as per table.

FUEL LEVEL AT SPEEDOMETER CONNECTOR		FLOAT POSITION	RESISTANCE MEASUREMENT 20°C (68°F)
Pin 12	Pin 15	Float down (empty)	5 ± 2 Ω
		Float up (full)	100 ± 7 Ω

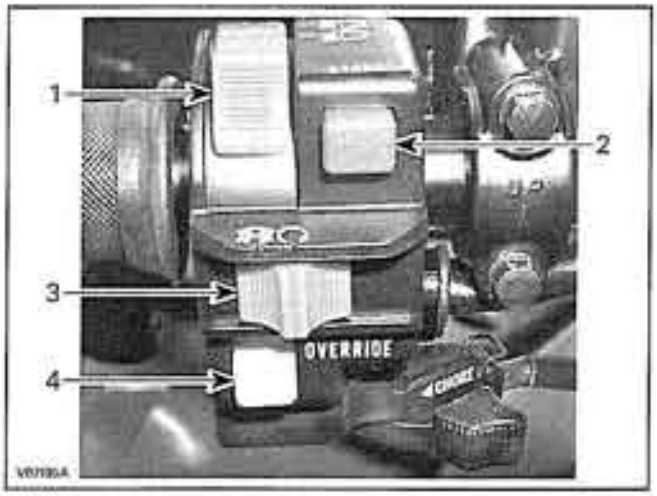


If resistance is not within empty and full values (depending on fuel quantity), check and repair wiring and/or connectors between multi-function speedometer and fuel level sender. If they test good, replace fuel pump module. Refer to *FUEL TANK AND FUEL PUMP*.

If fuel level sender and wiring/connectors are good, try a new multi-function speedometer.

MULTI-FUNCTION SWITCH

Apply parking brake, place transmission lever in NEUTRAL position and start engine.



1. Low/Hi beam switch
2. Start switch
3. Engine run/stop switch
4. Override switch

Outlander 400 Series

Low/Hi Beam Switch

Select low beam position on multi-function switch.

Using a multimeter, measure the voltage between GREEN and BLACK wires.

The obtained value should be between 12 and 14.5 Vdc.

Select high beam position on multi-function switch.

Measure the voltage between BLUE and BLACK wires. The obtained value should be between 12 and 14.5 Vdc.

- No voltage:
- Check wiring condition and low/hi beam switch.
- Voltage is good:
- Change headlamp bulb(s).

Using a multimeter, measure the resistance between the following wires.

POSITION	WIRE	RESISTANCE
Switch to LO	RED/YELLOW and GREEN	0.2 ± 0.2 Ω max.
Switch to HI	RED/YELLOW and BLUE	0.2 ± 0.2 Ω max.

Replace multi-function switch if defective.

Start Switch

Using a multimeter, measure the resistance between the following wires.

SWITCH	WIRE	RESISTANCE
Start switch released	RED/VIOLET and YELLOW/RED	Infinite (O.L)
Start switch pushed		0.2 ± 0.2 Ω max.

Replace multi-function switch if defective.

Engine Run/Stop Switch

Using a multimeter, measure the resistance between the following wires.

SWITCH	WIRE	RESISTANCE
STOP position	BLACK/WHITE and BLACK	0.2 ± 0.2 Ω max.
RUN position		Infinite (O.L)

Replace multi-function switch if defective.

Override Switch

Using a multimeter, measure the resistance between the following wires.

SWITCH	WIRE	RESISTANCE
Override switch pushed	VIOLET/GREY and VIOLET/GREY	Infinite (O.L)
Override switch released		0.2 ± 0.2 Ω max.

Replace multi-function switch if defective.

Outlander 800 Series

Start Switch

Refer to *STARTING SYSTEM.*

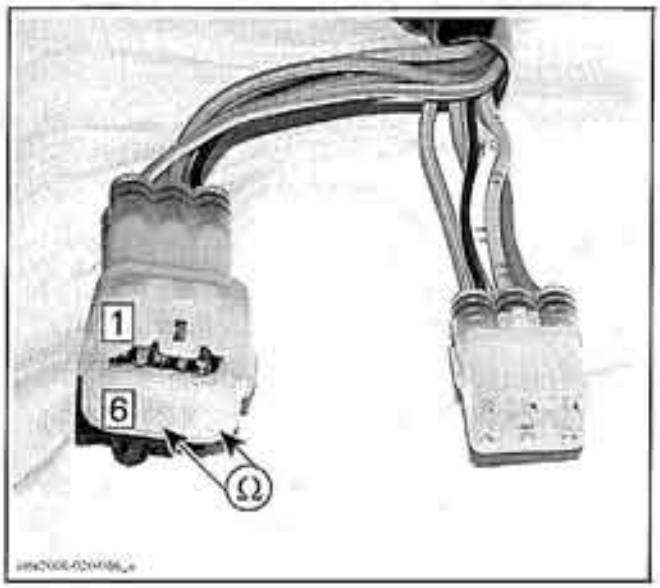
Engine Run/Stop Switch

Refer to *IGNITION SYSTEM.*

Low/HI Beam Switch

Using a multimeter, measure the resistance as follows.

POSITION	MULTI-FUNCTION SWITCH CONNECTOR (MG2)		RESISTANCE @ 20°C (68°F)
Switch to LO	Pin 2	Pin 4	0.2 Ω max.
Switch to HI	Pin 5	Pin 4	

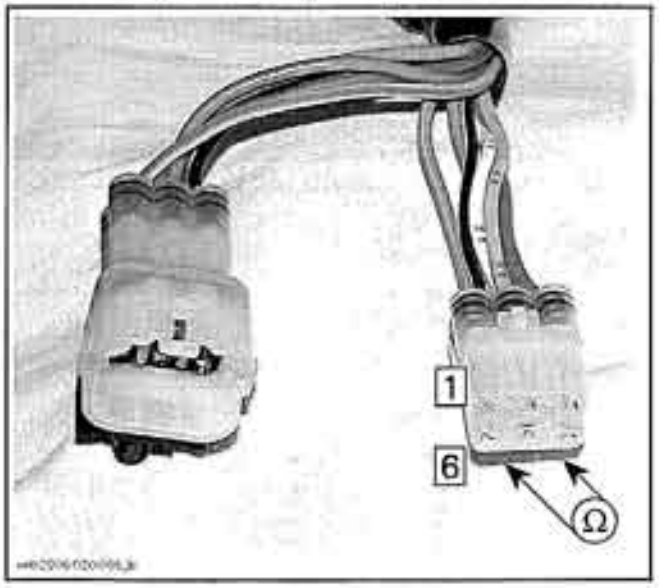


Replace multi-function switch if defective.

Override Switch

Using a multimeter, measure the resistance between the following wires.

SWITCH POSITION	MULTI-FUNCTION SWITCH CONNECTOR (MG1)		RESISTANCE @ 20°C (68°F)
Released	Pin 5	Pin 6	0.2 Ω max.
Pushed			Open (O.L)



Replace multi-function switch if defective.

12-VOLT AUXILIARY POWER OUTLET

The 12-volt auxiliary power outlet allows the installation of additional accessories.

Test

Outlander 400 Series

The wires are located behind the gauge on a 2-position connector.

NOTE: Turn ignition key ON.

Using a multimeter, measure the voltage between RED/VIOLET and BLACK wires.

The obtained value should be between 12 and 14.5 Vdc.

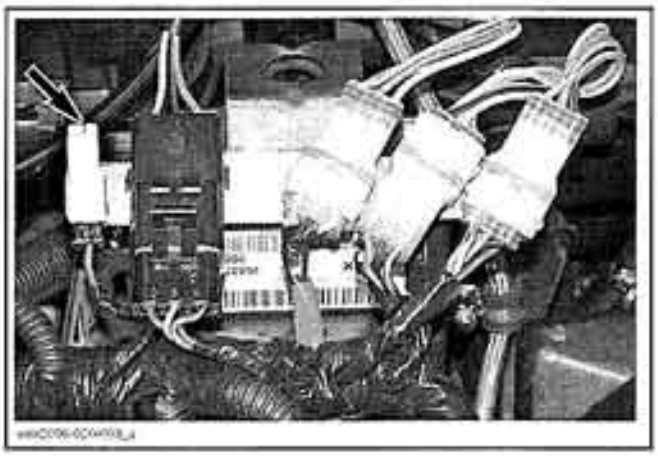
- No voltage:
  - Check wiring condition.
- Voltage is good:
  - Check accessories.

Outlander 800 Series

Remove center panel and dashboard. Refer to *BODY*.

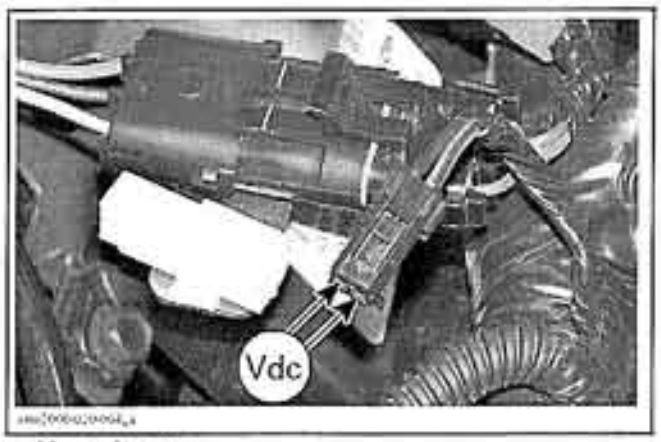
Turn ignition key on and set engine run/stop switch to RUN.

Unplug power outlet connector.



Using a multimeter, measure the voltage as follows.

WIRE COLOR		VOLTAGE
RED/BLACK	BLACK	12 - 14.5 Vdc



- No voltage:
  - Check fuses F4, F7, relay R3 (accessories) and wiring condition.
- Voltage is good:
  - Check accessories.

12-VOLT POWER OUTLET

Removal

Remove console. Refer to *BODY*.

Unplug the connectors of the power outlet.

Unscrew the retaining nut.

Installation

Reverse the removal procedure.

Test

Outlander 400 Series

NOTE: No key required.

Remove the console.

Unplug the power outlet connectors.

Using a multimeter, measure the voltage between RED/BLACK and BLACK wires.

The obtained value should be between 12 and 14.5 Vdc.

- No voltage:
  - Check accessories fuse (15 A) and wiring condition.
- Voltage is good:
  - Change power outlet.

Outlander 800 Series

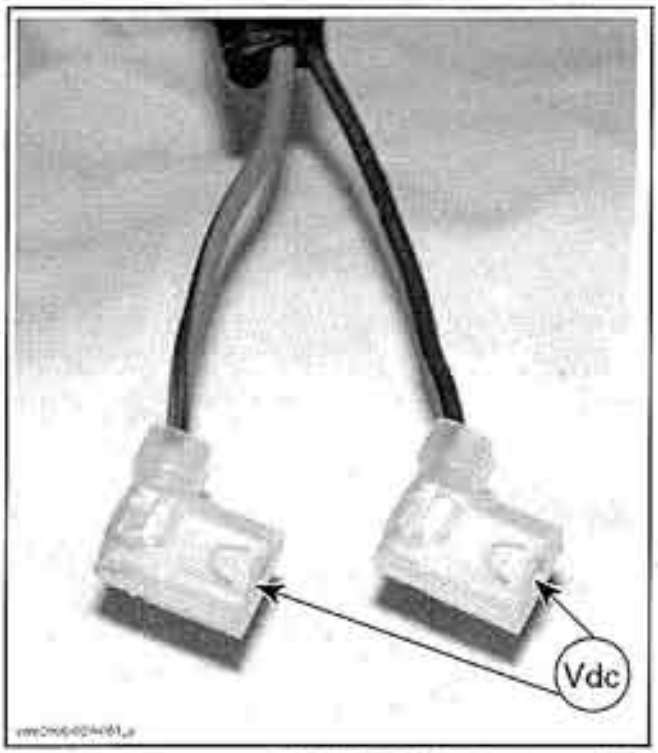
Remove center panel and dashboard. Refer to *BODY*.

Turn ignition key on and set engine run/stop switch to RUN.

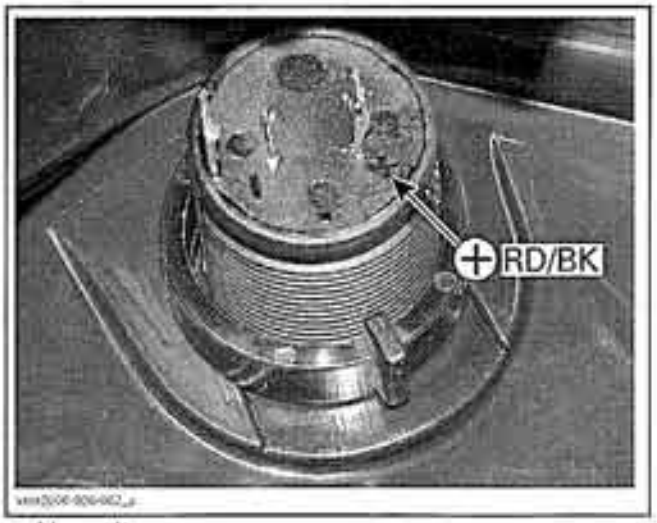
Unplug the power outlet connectors.

Using a multimeter, measure the voltage as follows.

WIRE COLOR		VOLTAGE
RED/BLACK	BLACK	12 - 14.5 Vdc



Ensure to reconnect RED/BLACK wire to positive terminal.



- No voltage:
  - Check fuses F4, F7, relay R3 (accessories) and wiring condition.
- Voltage is good:
  - Change power outlet.

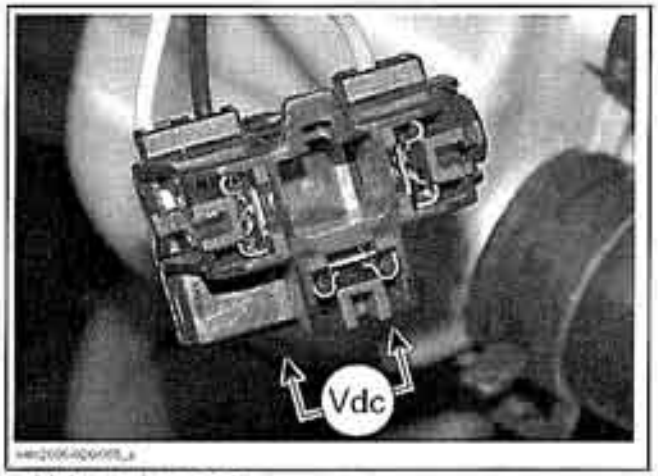
HEADLAMP

Test

Disconnect headlamp connector. Refer to *BULB REPLACEMENT*.

Using a multimeter, measure the voltage on headlamp connector as follows.

SWITCH POSITION	WIRE COLOR		VOLTAGE
LO beam	GREEN	BLACK	12 - 14.5 Vdc
HI beam	BLUE	BLACK	



- Voltage is good:
  - Change headlamp bulb(s).
- No voltage:

Outlander 400 Series

- Check wiring condition, ignition and low/hi beam switches.

NOTE: For ignition switch test, refer to *OUTLANDER 800 SERIES* below. For low/hi beam switch test, refer to *MULTI-FUNCTION SWITCH* elsewhere in this section.

Outlander 800 Series

- Check fuses F4, F7, relay R3 (accessories) and wiring condition.
- Check ignition switch as follows.

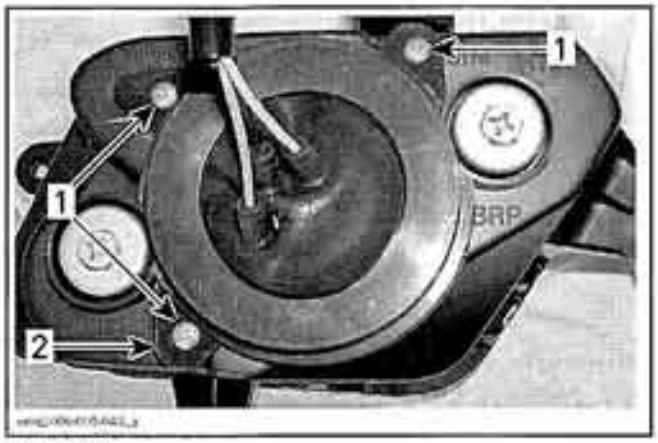
SWITCH POSITION	PIN		RESISTANCE @ 20°C (68°F)
OFF	A	F	Infinite (O.L)
ON with lights			1 Ω max.
ON without lights			Infinite (O.L)

- Check low/hi beam switch. refer to *MULTI-FUNCTION SWITCH* elsewhere in this section.

Bulb Replacement

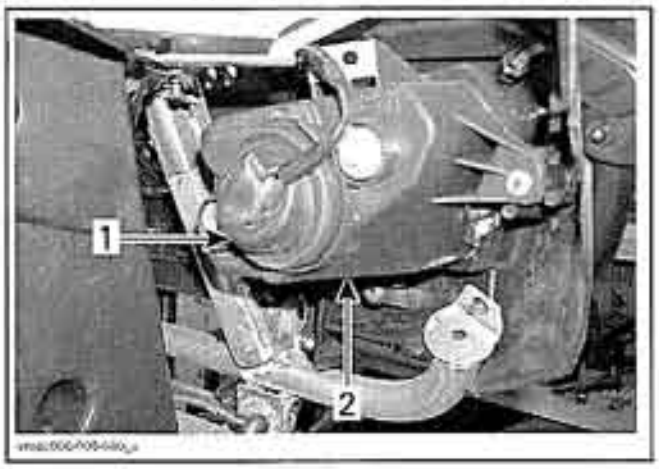
CAUTION: Never touch glass portion of an halogen bulb with bare fingers, it shortens its operating life. If glass is touched, clean it with isopropyl alcohol which will not leave a film on the bulb.

Remove cover screws.



1. Screws
2. Cover

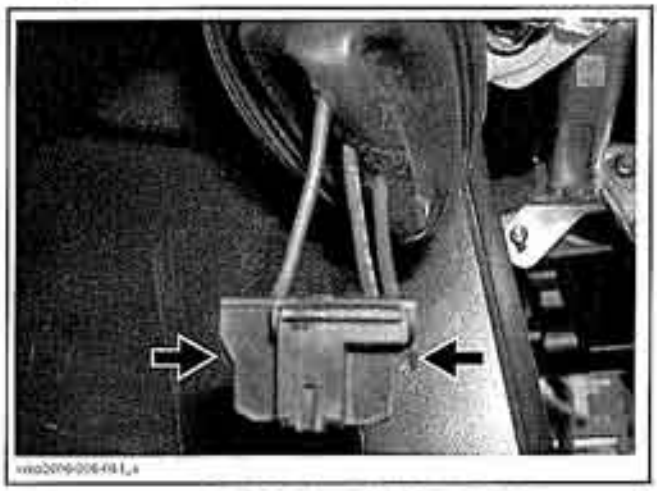
Remove rubber protector over headlamp housing.



1. Rubber protector
2. Headlamp housing

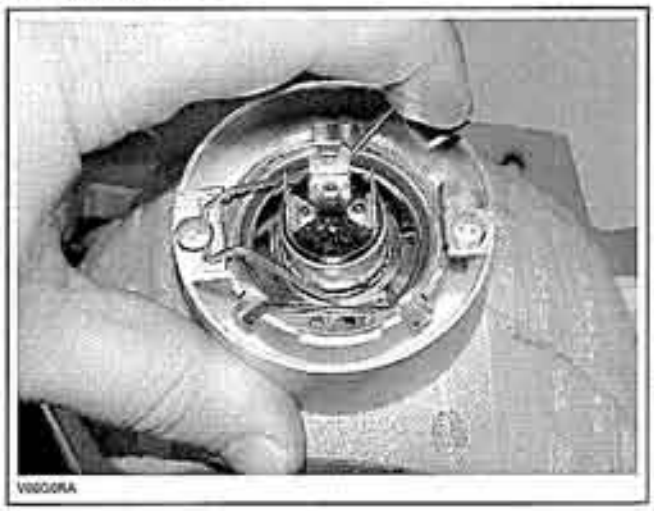
Unplug connector from headlamp.

NOTE: Use small locking tab to unlock connector then pull on connector.



PUSH ON LOCKING TAB TO UNLOCK CONNECTOR

Press the spindle then push it on the side to unlock headlamp bulb.



TYPICAL

Lift and hold the spindle then remove the bulb.

TYPICAL

Properly reinstall removed parts in the reverse order of their removal.

Validate headlamp operation.

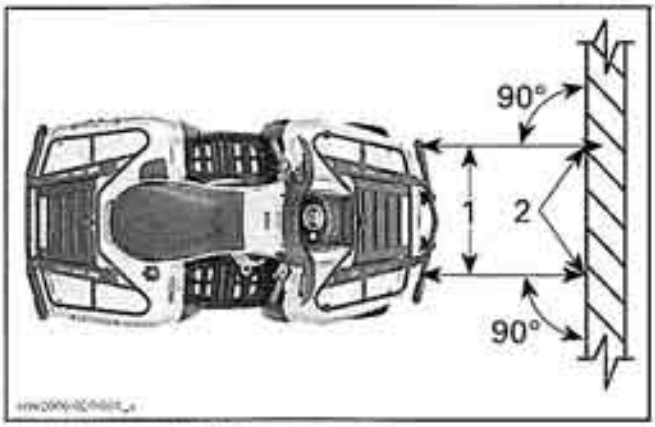
Headlamp Beam Aiming

Select high intensity.

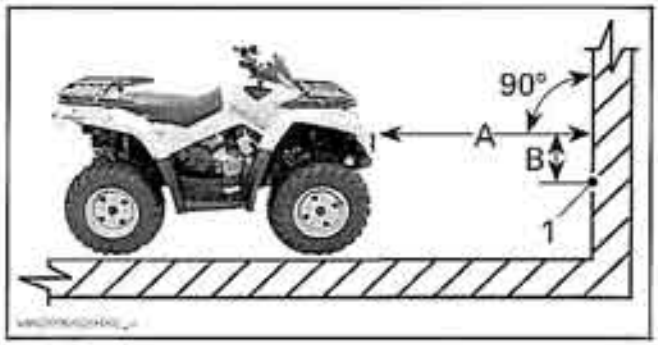
Beam aiming is correct when center of high beam is 131 mm (5 in) below the headlamp horizontal center line, scribed on a test surface, 5 m (17 ft) away.

NOTE: Sit down the driver or place the same weight on the vehicle.

Measure headlamp center distance from ground. Scribe a line at this height on test surface (wall or screen). Light beam center should be 131 mm (5 in) below scribed line.



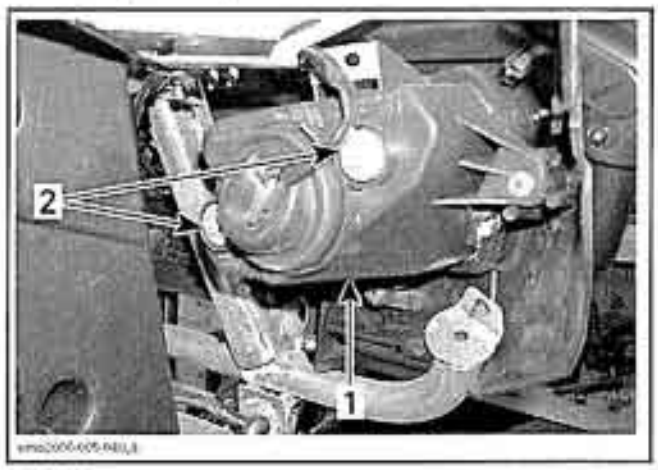
1. Headlamp center lines
2. Light beam center



1. Light beam center
A. 5 m (17 ft)
B. 131 mm (5 in)

Adjustment

Turn adjustment screws to adjust beam height and side orientation as described below. Adjust both headlamps evenly.

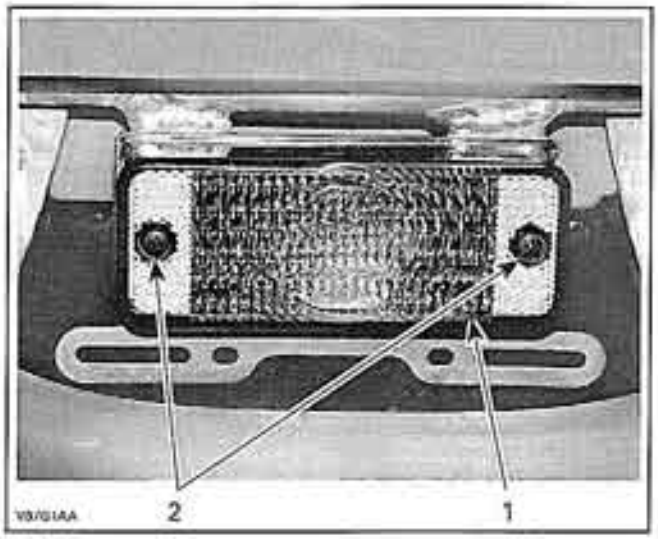


TYPICAL
1. Headlamp cover
2. Adjustment screws

TAILLIGHT

Bulb Replacement

Unscrew lens screws to expose bulb.



1. Lens
2. Screws

Push bulb in and hold while turning courterclockwise to release.

Install the new bulb by first pushing in while turning clockwise.

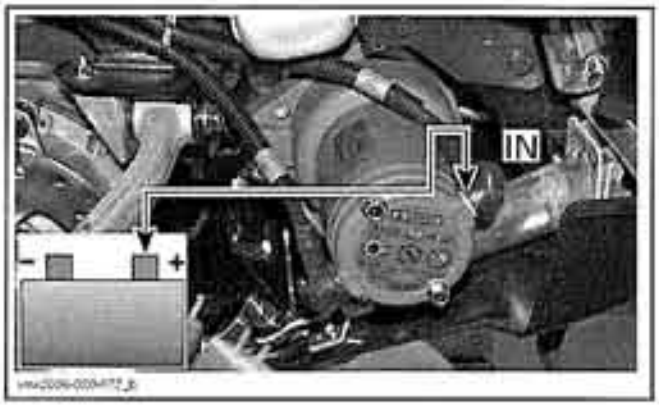
WINCH

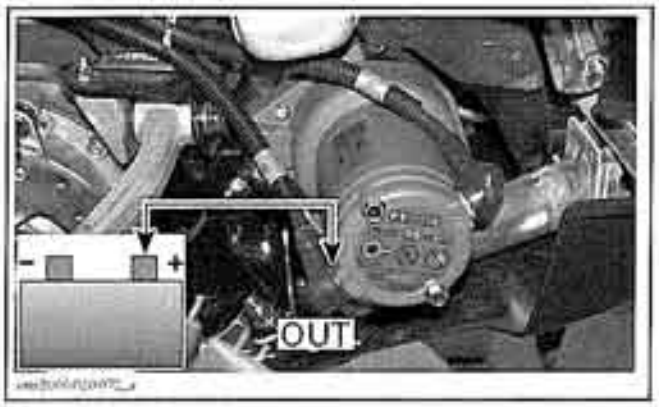
XT Models Only

Test

Winch Motor

Using boosting cables, connect battery power to IN post of winch then to OUT post.



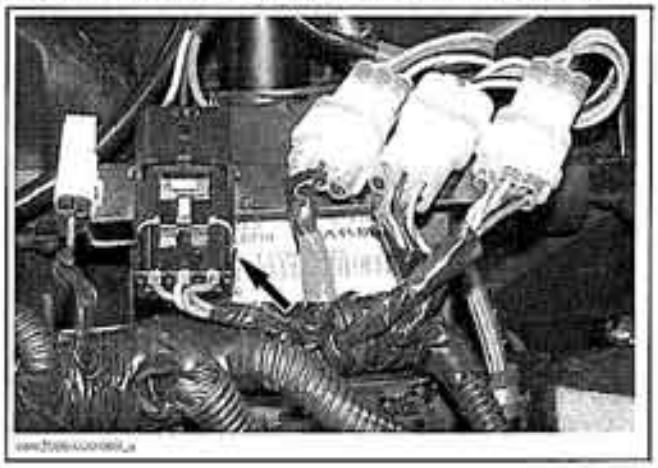


If motor does not turn in any test, replace motor. If it works, continue testing.

Voltage Supply to Switch

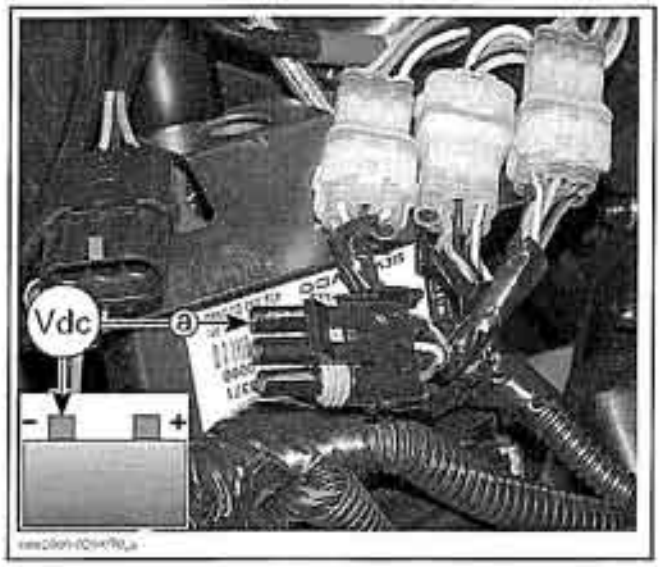
Remove center panel and dashboard. Refer to *BODY*.

Disconnect the winch control switch connector.



Using a multimeter, measure the resistance as follows.

WINCH SWITCH CONNECTOR (harness side)		VOLTAGE
Pin a	Battery ground	12 Vdc



If there is no voltage, check fuses F9, F7, relay R3 (accessories) and wiring condition.

If there is voltage, test switch as follows.

Winch Control Switch

Outlander 400 Series

Remove steering cover, refer to *BODY*.

Disconnect the winch control switch connector.

Using a multimeter, measure the resistance between the connector pin A (RED wire), B (BLACK wire) and C (GREEN wire).

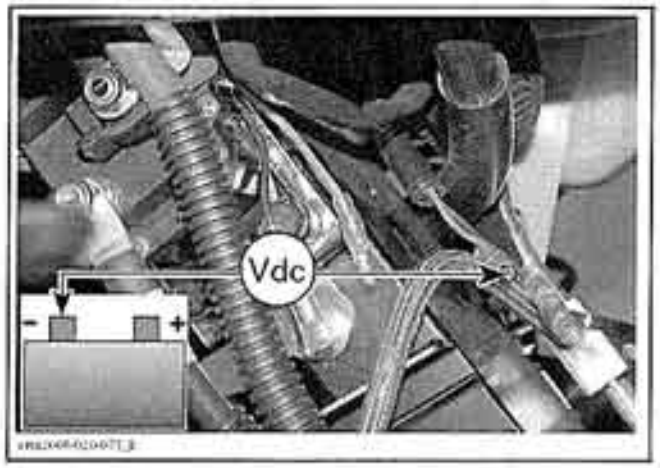
POSITION	CONNECTOR PIN	RESISTANCE
Switch to "IN"	A and C	< 5 Ω
Switch to "OUT"	A and B	< 5 Ω

If the resistance is above 5 Ω, replace the winch control switch.

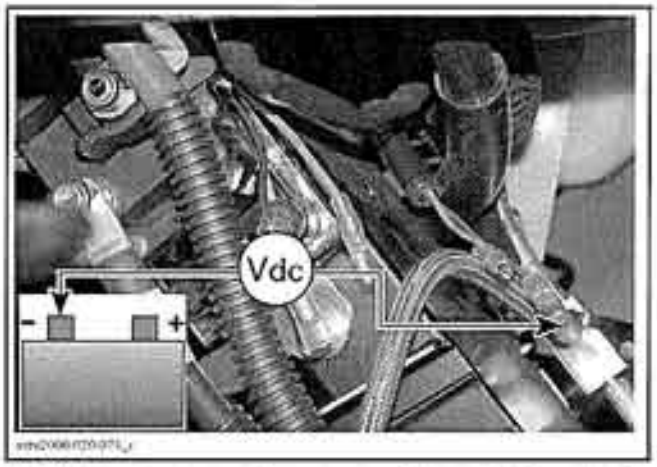
Outlander 800 Series

Disconnect terminals at winch relay.

POSITION	TERMINAL	VOLTAGE
Switch pressed to IN and held	LIGHT/BLUE and battery ground	12 Vdc



POSITION	TERMINAL	VOLTAGE
Switch pressed to OUT and held	GREEN/BLUE and battery ground	12 Vdc



If there is no voltage in either test, check wiring/connectors. If they are good, replace winch switch.

If there is voltage, test winch relay as follows.

Winch Relay

Reconnect terminals at winch relay.

Measure voltage drop between relay and motor as follows.

POSITION	RELAY TERMINAL	VOLTAGE DROP
Switch pressed to IN and held	Battery post and IN cable	0.2 Vdc max.

POSITION	RELAY TERMINAL	VOLTAGE DROP
Switch pressed to OUT and held	Battery post and OUT cable	0.2 Vdc max.

If voltage drop read is higher than specification in either test, check wiring/connectors. If they are good, replace winch relay.

If voltage read is battery voltage, the relay does not close. Replace with a new one.

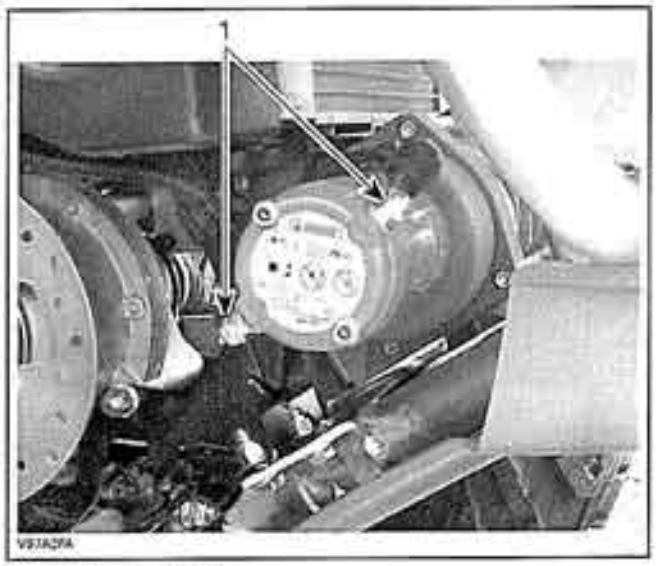
Removal

Disconnect, the battery BLACK (-) cable first, then the RED (+) cable.

⚠ WARNING

Always respect this order for disassembly; disconnect BLACK (-) cable first. Electrolyte or fuel vapors can be present in engine compartment and a spark may ignite them and possibly cause personal injuries.

Disconnect the winch power cables.

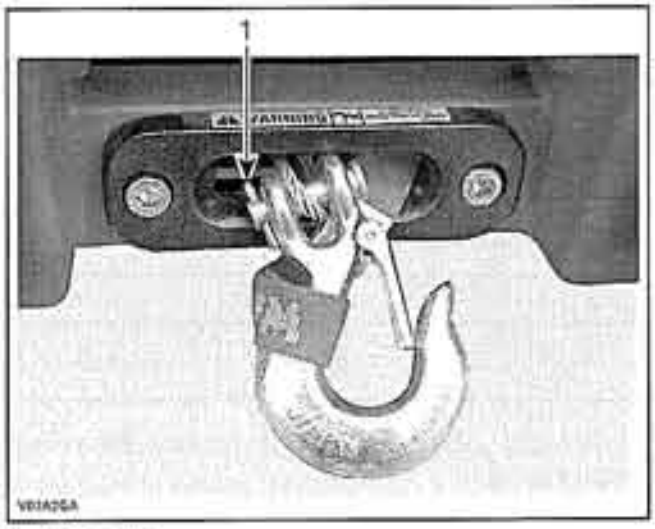


1. Power connections

NOTE: Note the position of the power cables for reinstallation.

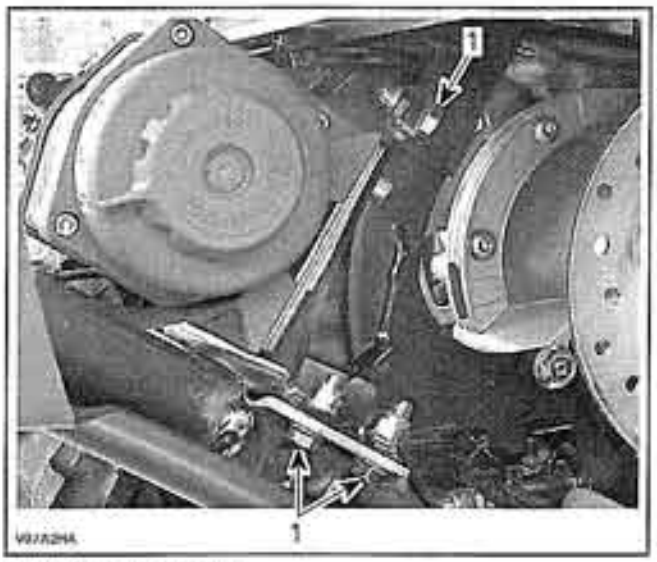
Remove:

- locking pin



1. Locking pin

- hook
- bolts retaining the winch from both LH and RH sides.



1. Bolts to be removed

Remove winch.

Installation

For the installation, reverse the removal procedure.

WINCH CONTROL SWITCH

Test

Refer to *WINCH* above.

Removal

Remove screws retaining winch control switch to handlebar.

Remove steering cover, refer to *BODY*.

Disconnect the winch control switch connector.

Installation

For the installation, reverse the removal procedure.

CONTINUOUSLY VARIABLE TRANSMISSION (CVT)

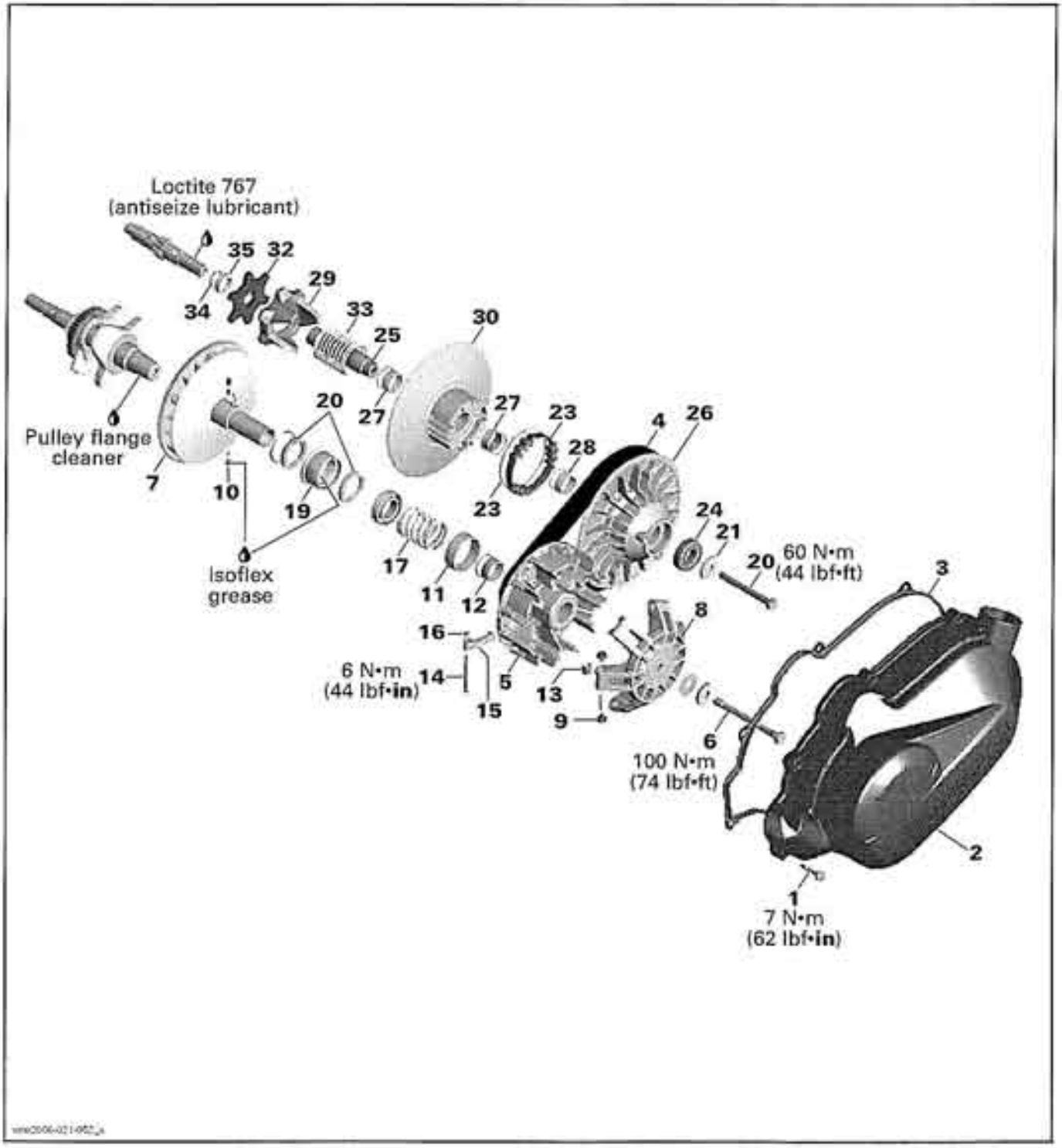
SERVICE TOOLS

Description	Part Number	Page
clutch holding tool	529 006 400	261, 266, 275
clutch holding tool	529 035 771	282
clutch puller	529 035 746	262
crankshaft locking bolt	529 035 617	261, 275
drive pulley puller	529 035 746	275
driven pulley expander	529 035 747	259, 273

SERVICE PRODUCTS

Description	Part Number	Page
Isoflex grease	293 550 021	266, 280–281
Loctite 5910	293 800 081	260
pulley flange cleaner	413 711 809	268, 277–278, 283

OUTLANDER 400 SERIES



GENERAL

NOTE: For a better understanding, the following illustrations are taken with engine out of vehicle. To perform the following instructions, it is not necessary to remove engine.

This CVT is lubrication free. Never lubricate any components except drive pulley one-way clutch.

During assembly/installation, use the torque values and service products as in the exploded views.

Clean threads before applying a threadlocker. Refer to *SELF-LOCKING FASTENERS* and *LOCTITE APPLICATION* at the beginning of this manual for complete procedure.

⚠ WARNING

Torque wrench tightening specifications must strictly be adhered to.
Locking devices (e.g.: locking tabs, elastic stop nuts, self-locking fasteners, cotter pin, etc.) must be installed or replaced with new ones where specified. If the efficiency of a locking device is impaired, it must be renewed.

⚠ WARNING

Never touch CVT while engine is running. Never drive vehicle when CVT cover is removed.

⚠ WARNING

Any drive pulley repairs must be performed by an authorized Bombardier ATV dealer. Subcomponent installation and assembly tolerances require strict adherence to procedures detailed.

⚠ WARNING

Never use any type of impact wrench at drive pulley removal and installation.

⚠ WARNING

The clutch assembly is a precisely balanced unit. Never replace parts with used parts from another clutch assembly.

CAUTION: These pulleys have metric threads. Do not use imperial thread puller. Always tighten puller by hand to ensure that the drive pulley has the same type of threads (metric vs imperial) before tightening completely.

PROCEDURES

DRIVE BELT

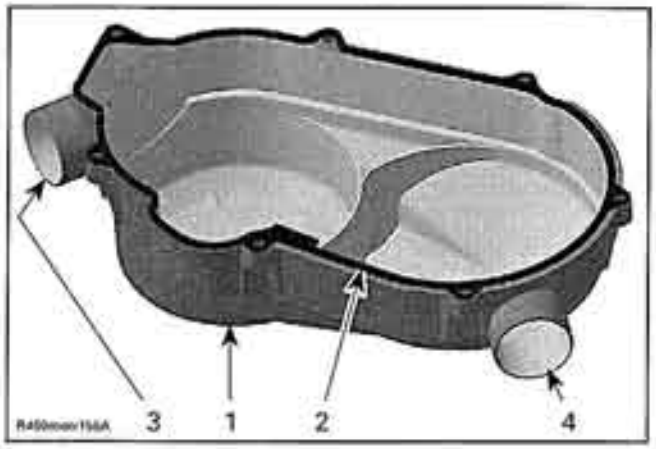
Removal

Remove:
- LH engine side panel
- LH footwell.

Unscrew clamps retaining CVT cover hoses.

Remove distance screws no. 1.

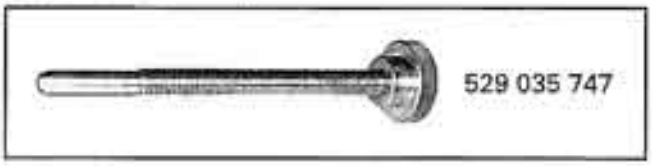
Remove CVT cover and its gasket.



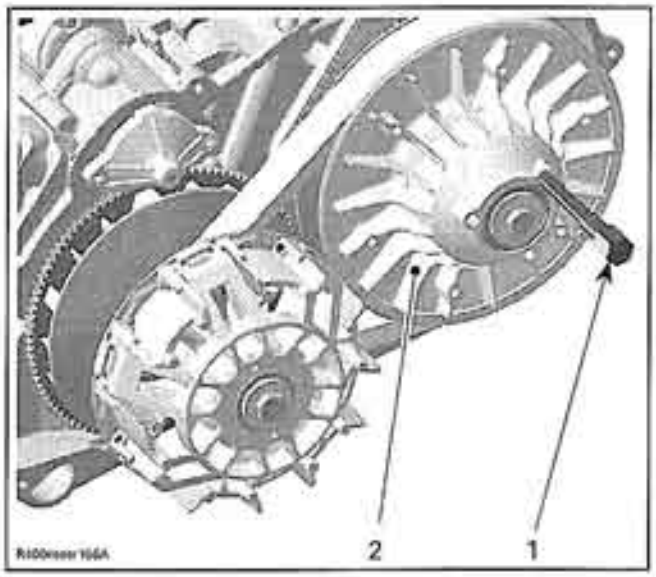
1. *CVT cover*
2. *Gasket*
3. *Intake for air cooling*
4. *Air outlet*

NOTE: Remove the center top screw last. This screw supports the cover no. 2 during removal.

Open driven pulley with the driven pulley expander (P/N 529 035 747).

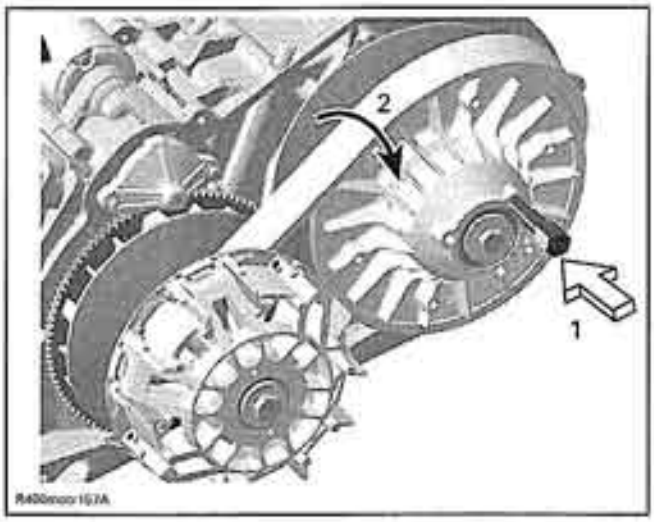


Screw tool in the threaded hole of driven pulley and tighten to open the pulley.



1. Driven pulley expander
2. Fixed half of driven pulley

To remove belt no. 4, slip the belt over the top edge of sliding half, as shown.



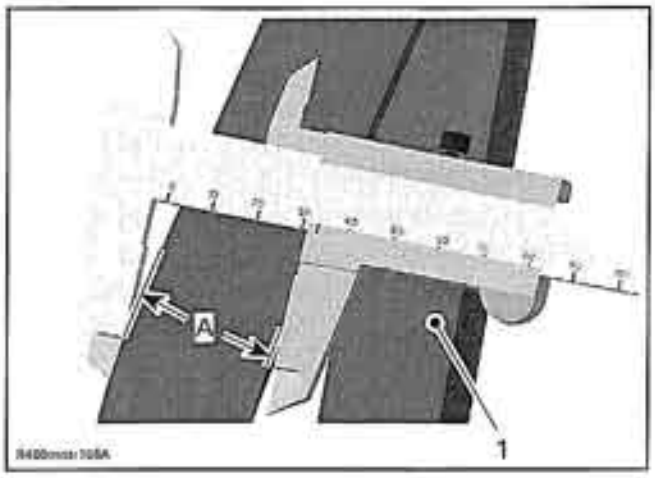
1. Screw in of driven pulley expander
2. Removal direction for belt

Inspection

Inspect belt for cracks, fraying or abnormal wear. Replace if necessary.

Check drive belt width at cord level. Replace if it is out of specification (see table below).

DRIVE BELT WIDTH	
SERVICE LIMIT	30.00 mm (1.181 in)



1. Drive belt
A. Belt width

Installation

For installation, reverse the removal procedure. Pay attention to following details.

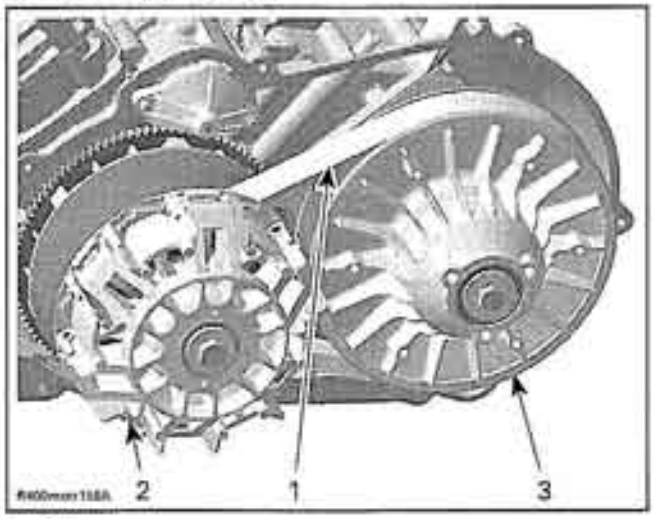
The maximum drive belt life span is obtained when the drive belt has the proper rotation direction. Install it so that the arrow printed on belt is pointing towards the back of the vehicle.

NOTE: Put a small amount of Loctite 5910 (P/N 293 800 081) in the groove of CVT cover to ease installation of CVT cover with gasket no. 3.

Install the center top screw of cover in first.

Install the other screws then torque them in a crisscross sequence.

DRIVE PULLEY



1. Belt
2. Drive pulley
3. Driven pulley

Removal

Remove belt no. 4.

NOTE: To remove drive pulley, two procedures can be followed.

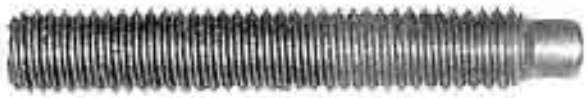
⚠ WARNING

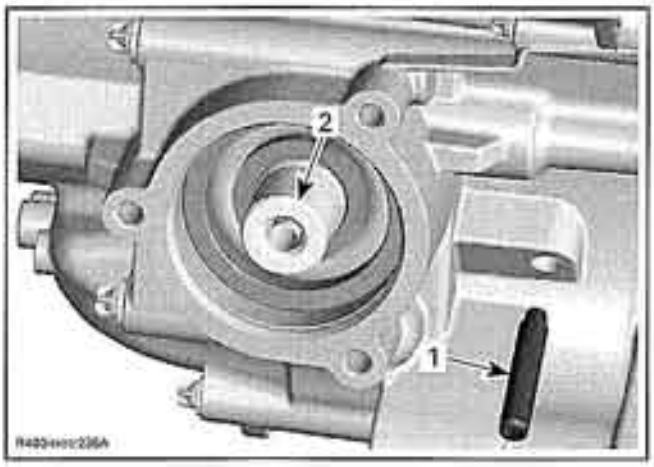
Drive pulley screw has a left-hand thread.

First possible procedure:

- Remove the spark plug.
- Put piston at TDC and lock crankshaft with the crankshaft locking bolt (P/N 529 035 617).

529 035 617



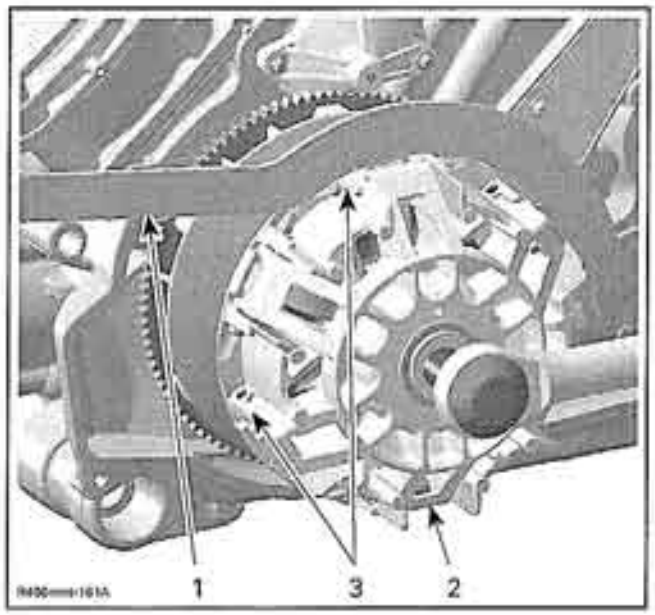


1. *Crankshaft locking bolt*
2. *Output shaft (front side)*

Second possible procedure:

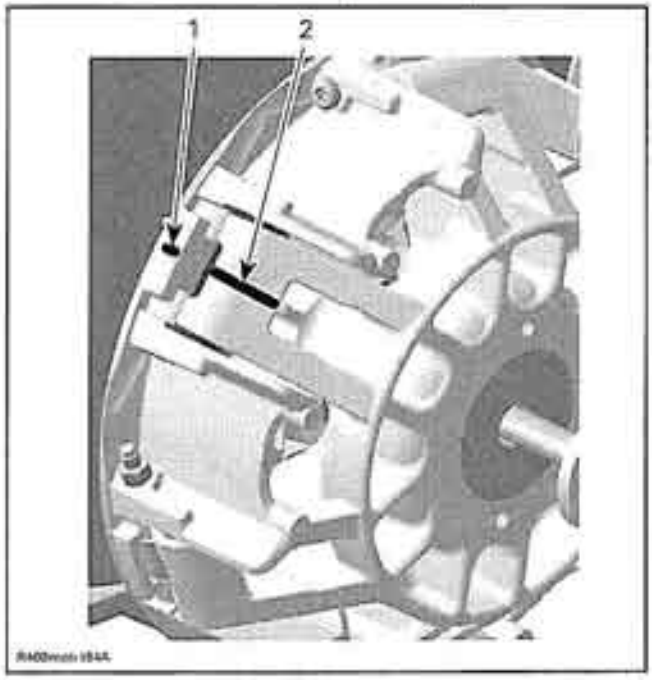
- Block drive pulley with the clutch holding tool (P/N 529 006 400).

529 006 400



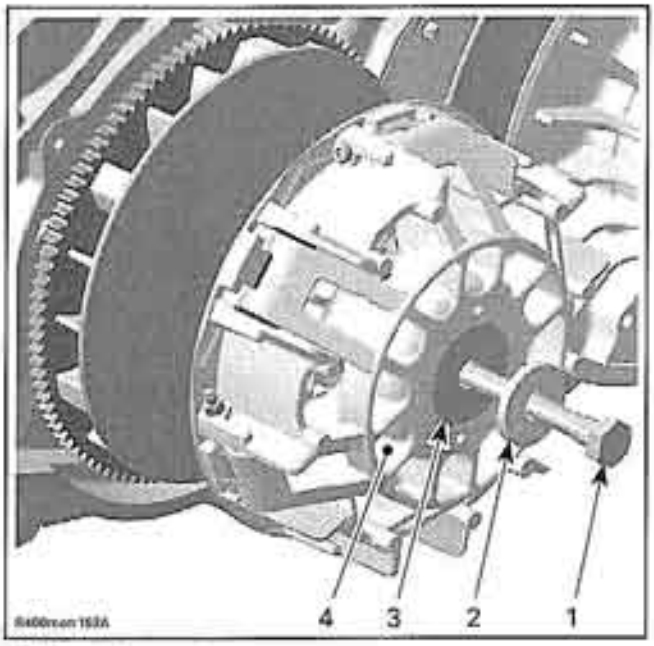
1. *Clutch holding tool*
2. *Drive pulley sliding half*
3. *Area to place holding tool hook*

CAUTION: Prior to removing the drive pulley, mark sliding half and governor cup together to ensure correct reinstallation. There are only 4 levers mounted out of 6 possible positions.



1. *Mark on drive pulley sliding half*
2. *Mark on governor cup*

Remove drive pulley screw, spring washer and thrust washer.



1. Drive pulley screw
2. Spring washer
3. Thrust washer
4. Drive pulley sliding half

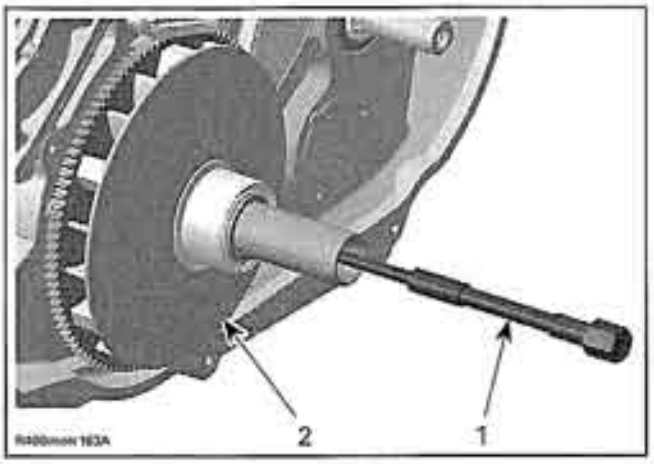
⚠ WARNING

Drive pulley screw has a left hand thread and the sliding half of drive pulley is spring loaded.

Push the sliding half no. 5 of the drive pulley by hand then remove the screw no. 6 completely.

Slowly release sliding half.

Screw the clutch puller (P/N 529 035 746) in fixed half no. 7 then withdraw fixed pulley.



1. Clutch puller
2. Fixed half

Disassembly

Governor Cup

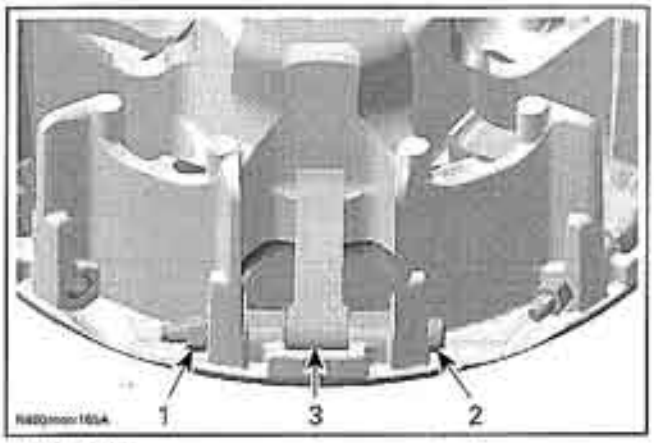
Carefully lift governor cup no. 8 until slider shoes no. 9 come at their highest position into guides.

Sliding Half

Unscrew lock nut and remove centrifugal lever pivot bolt.

NOTE: Outlander 400 shows 4 lever pivot bolts.

Remove centrifugal lever.



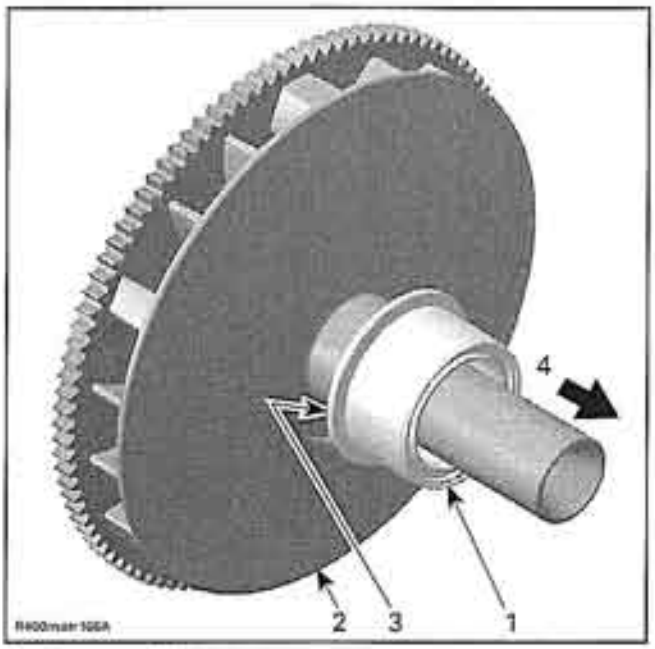
1. Lock nut
2. Centrifugal lever pivot bolt
3. Centrifugal lever

Fixed Half

⚠ WARNING

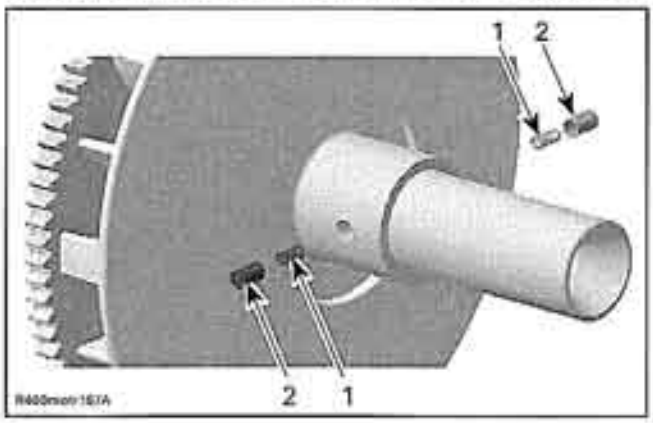
Always wear safety glasses to remove spring sleeves.

Pull one-way clutch slowly until the half of spring sleeves no. 10 is visible.



1. *One-way clutch*
2. *Fixed half*
3. *Spring sleeve area*
4. *Direction of removal*

Hold both spring sleeves with fingers and release them when one-way clutch is out of engagement.



1. *Spring*
2. *Spring sleeves*

Cleaning

Clean pulley faces and shaft with fine steel wool and dry cloth.

Using a paper towel with cleaning solvent, clean crankshaft tapered end and the taper inside of the fixed half of the drive pulley, crankshaft threads and threads of drive pulley screw no. 6.

⚠ WARNING

This procedure must be performed in a well-ventilated area.

CAUTION: To avoid damage, make sure cleaner does not contact the crankshaft seal.

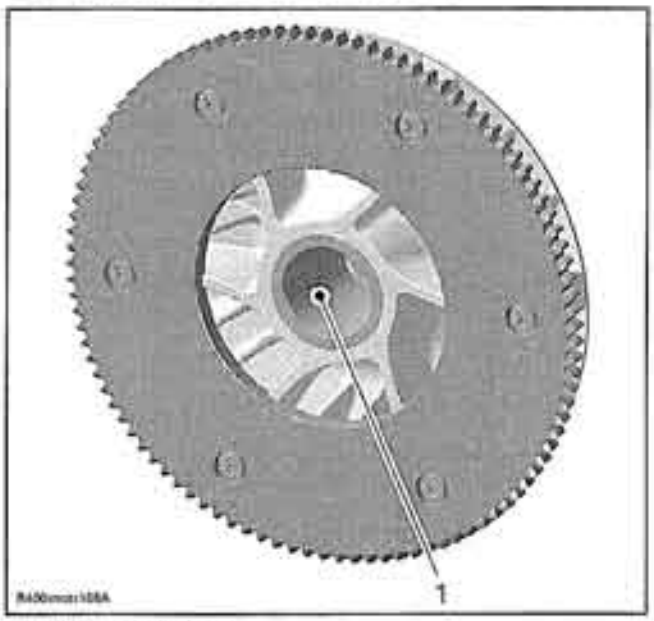
Remove all hardened oil deposits that have baked on crankshaft and pulley tapered surfaces with coarse or medium steel wool and/or sand paper no. 600.

CAUTION: Do not use any other type of abrasive.

Reclean mounting surfaces with paper towel and cleaning solvent.

Wipe off the mounting surfaces with a clean, dry paper towel.

CAUTION: Mounting surfaces must be free of any oil, cleaner or towel residue.



1. *Taper of fixed half*

Only use petrol base cleaner when cleaning bushings no. 11 and no. 12.

CAUTION: Do not use acetone to clean bushing.

Inspection

Drive Pulley

Drive pulley should be inspected annually.

Governor Cup

Check governor cup no. 8 for cracks or other visible damages. Replace if necessary.

Roller

Check each roller no. 13 for roundness of external diameter.

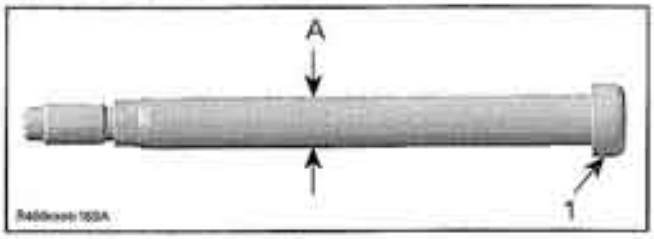
NOTE: Replace governor cup if the roller does not move freely.

Measure the roller diameter. If a roller is out of specification, replace all rollers.

ROLLER OUTER DIAMETER	
NOMINAL	13.70 to 13.90 mm (.539 to .547 in)
SERVICE LIMIT	13.20 mm (.519 in)
ROLLER INNER DIAMETER	
NOMINAL	8.05 to 8.15 mm (.317 to .321 in)
SERVICE LIMIT	9.00 mm (.354 in)

Centrifugal Lever Pivot Bolt

Measure diameter of centrifugal lever pivot bolt no. 14, replace if it is out of specification.



1. Centrifugal lever pivot bolt
A. Measure diameter here

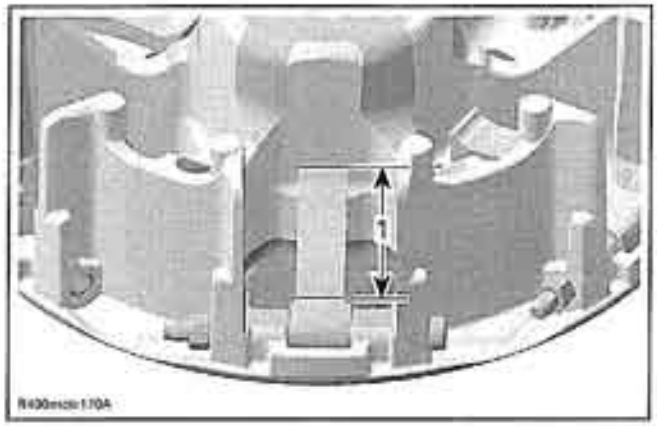
CENTRIFUGAL LEVER PIVOT BOLT DIAMETER	
NOMINAL	6.078 to 6.100 mm (.239 to .240 in)
SERVICE LIMIT	6.00 mm (.236 in)

Centrifugal Lever

Check bushing diameter in the centrifugal lever no. 15 for wear. If a centrifugal lever must be replaced, replace all levers at the same time.

CENTRIFUGAL LEVER BORE DIAMETER	
NOMINAL	6.035 to 6.078 mm (.238 to .239 in)
SERVICE LIMIT	6.200 mm (.244 in)

Replace centrifugal lever no. 15 with pivot bolts no. 14 and lock nuts no. 16 if the contact surfaces show heavy visible wear.



1. Contact surface to the roller

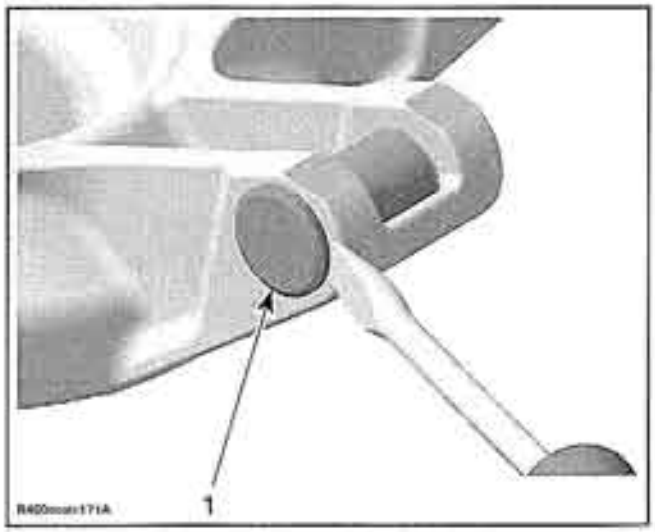
⚠ WARNING

Whenever replacing centrifugal levers, always replace all levers at the same time. Otherwise, the drive pulley will be unbalanced (because of lever differences).

Slider Shoe

Check slider shoes for visible wear and replace if damaged.

NOTE: If necessary, use a screwdriver to remove slider shoes.

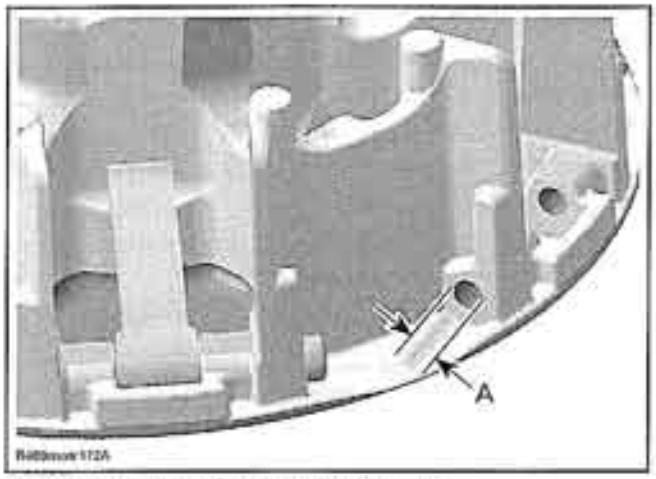


1. Slider shoe

Sliding Half

Check sliding half no. 5 for cracks and sliding contact surface for excessive wear. Replace sliding half if necessary.

Measure centrifugal lever pivot bolt bores. Replace sliding half if bores are out of specification or damaged.

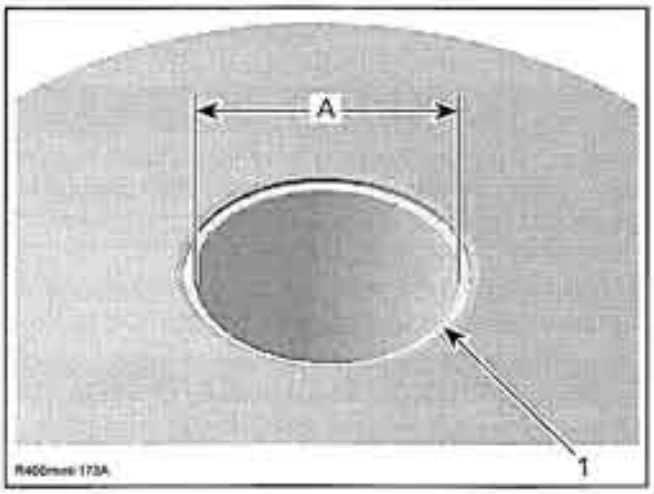


A. Centrifugal lever pivot bolt bore diameter

CENTRIFUGAL LEVER PIVOT BORE DIAMETER	
NOMINAL	6.113 to 6.171 mm (.241 to .243 in)
SERVICE LIMIT	6.300 mm (.248 in)

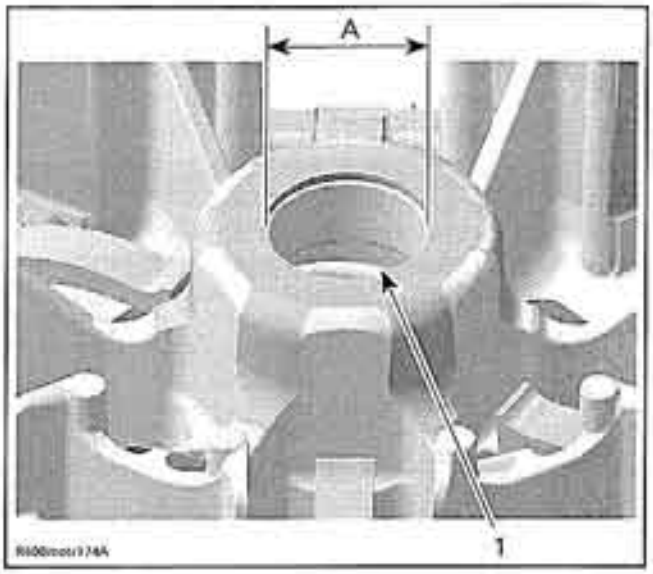
Measure bushing diameters of sliding half.

Use a dial bore gauge to measure bushing diameter. Measuring point must be at least 5 mm (1/4 in) from bushing edge.



1. Bushing on fixed half side
A. Bore diameter of bushing

SLIDING HALF LARGE BUSHING	
NOMINAL	55.000 to 55.020 mm (2.165 to 2.166 in)
SERVICE LIMIT	55.200 mm (2.173 in)



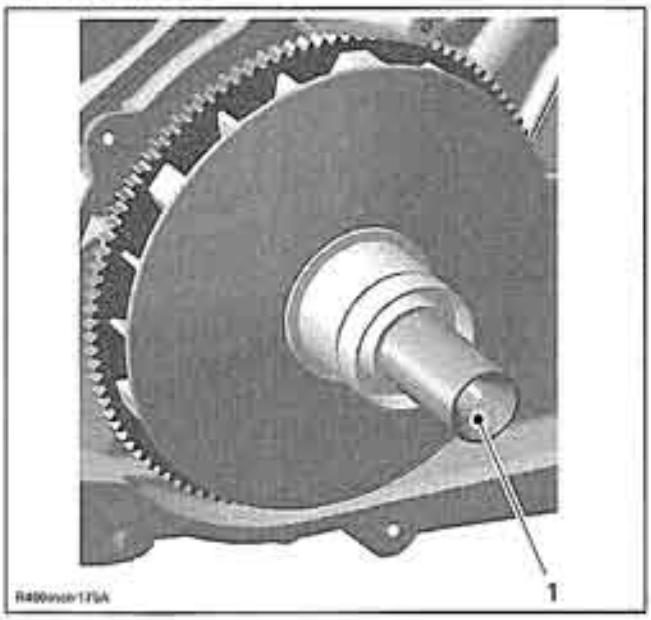
1. Bushing on governor cup side
A. Bore diameter of bushing

SLIDING HALF SMALL BUSHING	
NOMINAL	30.000 to 30.020 mm (1.181 to 1.182 in)
SERVICE LIMIT	30.200 mm (1.189 in)

Replace sliding half if bushings no. 11 and/or no. 12 is(are) out of specification. Visually inspect coatings.

Fixed Half

Check fixed half contact surface to the governor cup for scoring and other damages. If so, replace fixed half no. 7.



1. Visually check here

Check for any marks on fixed half plate. Replace if necessary.

Check ring gear teeth for excessive wear or other damage. Replace fixed half if necessary.

⚠ WARNING

Fixed half and ring gear are balanced together. Always replace both parts together otherwise severe injury and/or damages may occur.

Spring

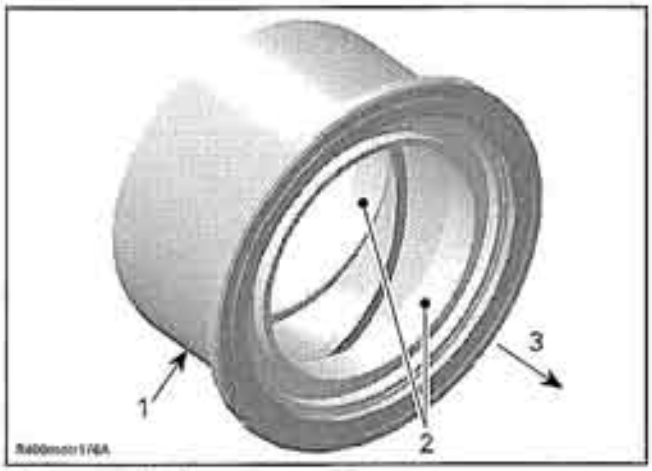
Measure spring free length and squareness. If spring **no. 17** is out of specification, replace by a new.

SPRING FREE LENGTH	
SERVICE LIMIT	75 mm (2.953 in)
CLUTCH SPRING SQUARENESS	
SERVICE LIMIT	4 mm (.157 in)

One-Way Clutch

Check bearings **no. 18** for excessive play and smooth operation. Replace one-way clutch **no. 19** if necessary.

CAUTION: Be careful not to damage the inside of one-way clutch during bearing removal.



1. *One-way clutch*
2. *Bearings*
3. *Drive pulley sliding half side*

Measure length of spring sleeve **no. 10** and check if edges on top of the spring sleeve are excessively worn. If out of specifications, replace both spring sleeves and springs at the same time.

SPRING SLEEVE LENGTH	
SERVICE LIMIT	9 mm (.276 in)

Assembly

For assembly, reverse the disassembly procedure. Pay attention to following details.

Apply Isoflex grease (P/N 293 550 021) on spring sleeves **no. 10** and their springs then between one-way clutch bearings.

CAUTION: Centrifugal lever and rollers must move easily after installation.

Insert slider shoes **no. 9** into governor cup to properly slide in guides.

Installation

For installation, reverse the removal procedure. Pay attention to the following details.

⚠ WARNING

Do not apply antiseize or any lubricant on crankshaft and drive pulley tapers.
Never use any type of impact wrench at drive pulley removal and installation.

Clean mounting surfaces as described in *CLEANING* above.

Install drive pulley on crankshaft extension.

Install spring washer with its concave side towards drive pulley then install drive pulley screw **no. 6.**

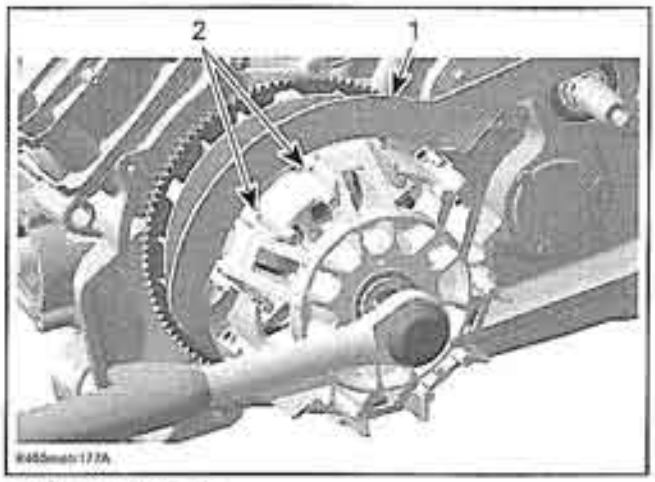
⚠ WARNING

Never substitute spring washer and/or screw with jobber ones. Always use BRP genuine parts for this particular case.

Install the clutch holding tool (P/N 529 006 400) and torque screw to 100 N•m (74 lbf•ft).

⚠ WARNING

Drive pulley screw has a left-hand thread.

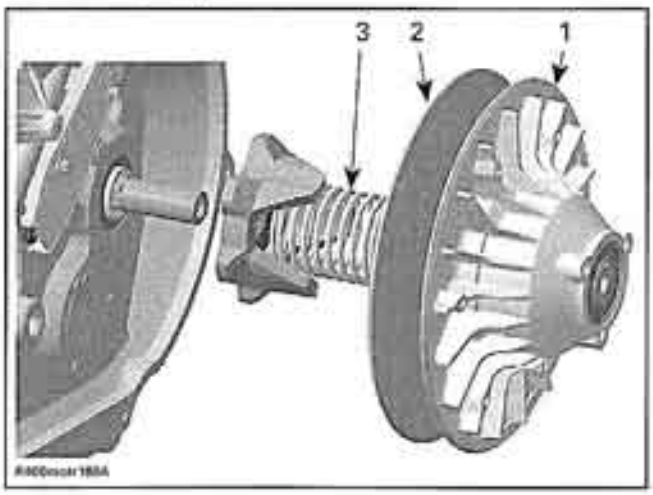


1. Clutch holding tool
2. Drive pulley removal/installation area

DRIVEN PULLEY

Removal

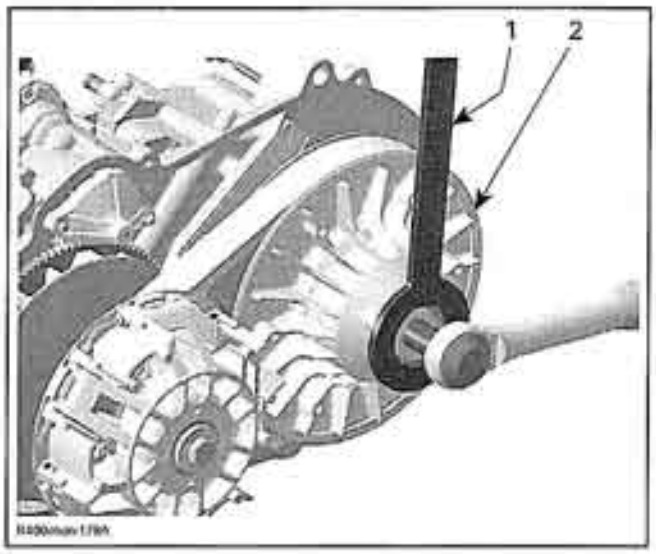
Remove:
- belt no. 4 (see *DRIVE BELT* above)
- driven pulley.



1. Fixed half of driven pulley
2. Sliding half of driven pulley
3. Spring

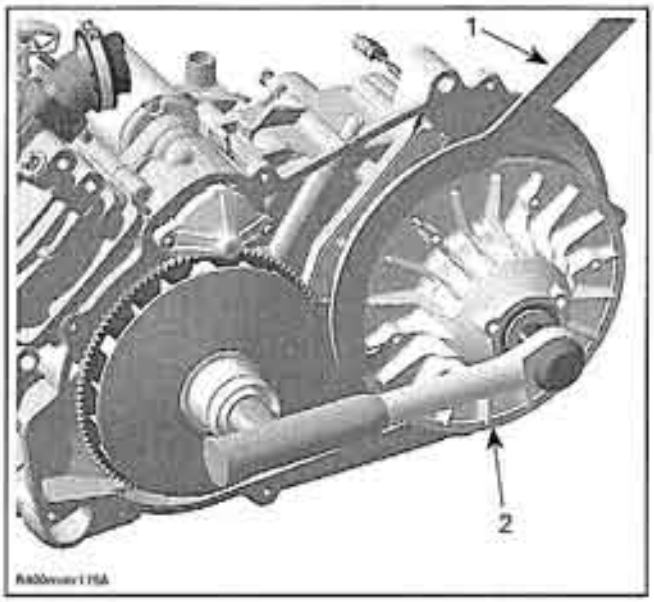
NOTE: Two procedures can be carried out to remove driven pulley.

First possible procedure:
- Block driven pulley fixed half with clutch holding tool (P/N 529 035 771) then remove the driven pulley bolt no. 20 and the washer no. 21.



1. Clutch holding tool
2. Driven pulley fixed half

Second possible procedure:
- Block driven pulley with clutch holding tool (P/N 529 006 400) then remove the driven pulley bolt no. 20 and the washer no. 21.



1. Clutch holding tool
2. Driven pulley fixed half

Disassembly

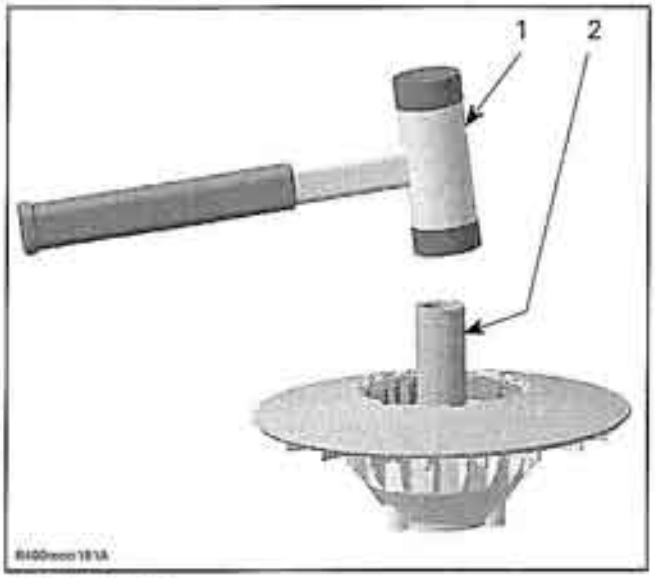
Fixed Half

Remove retaining ring no. 22 and lift torque gear no. 23.

NOTE: The following procedure is not necessary except if ball bearing no. 24 or shaft no. 25 must be removed. Refer to *INSPECTION* before proceeding.

Heat ball bearing area up to 100°C (212°F) before removing ball bearing.

Use a soft hammer to push shaft with bearing out of fixed half no. 26.



1. *Soft hammer*
2. *Shaft*

Remove shaft from ball bearing.

Cleaning

To remove a dust deposit from cam or shaft, use a dry cloth.

Clean pulley faces and shaft with fine steel wool and dry cloth.

Use pulley flange cleaner (P/N 413 711 809) to clean driven pulley.

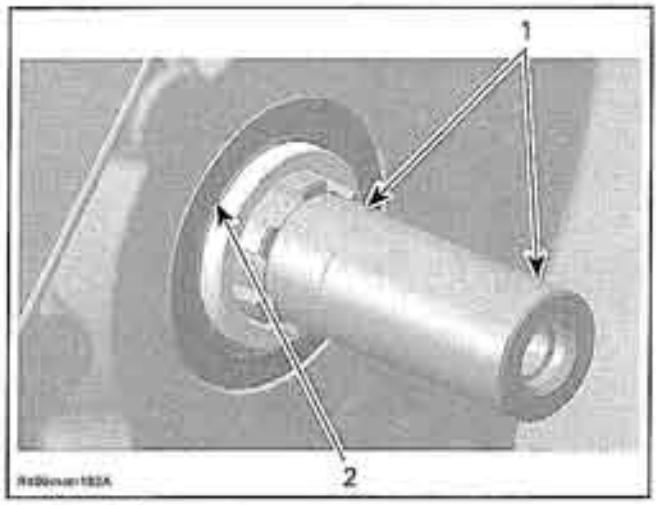
Clean the CVT crankcase area from contamination.

Using a paper towel with cleaning solvent to clean main shaft end and the inside of the shaft no. 25.

⚠ WARNING

This procedure must be performed in a well-ventilated area.

CAUTION: To avoid damage, make sure cleaner does not contact the countershaft seal.



1. *Main shaft supports*
2. *Sealing lip of countershaft oil seal*

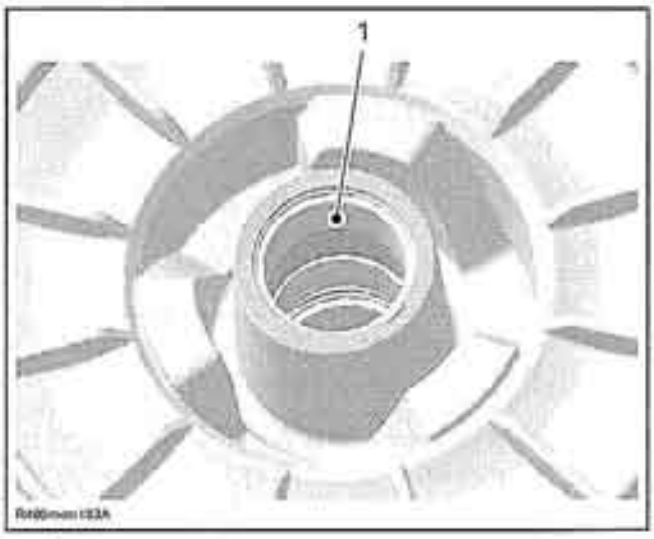
Inspection

Sliding Half

Check bushings no. 27 for cracks, scratch and for free movement when assembled to sliding half.

Using a dial bore gauge, measure bushing diameters. Measuring point must be at least 5 mm (1/4 in) from bushing edges.

These bushings are not replaceable. Replace sliding half if bushings are out of specification. Visually inspect coatings.



1. *Bushing*

BUSHINGS BORE DIAMETER	
NOMINAL	30.000 to 30.020 mm (1.181 to 1.182 in)
SERVICE LIMIT	30.200 mm (1.189 in)

Fixed Half

Check ball bearing no. 24 for free play and smooth operation. Replace if necessary.

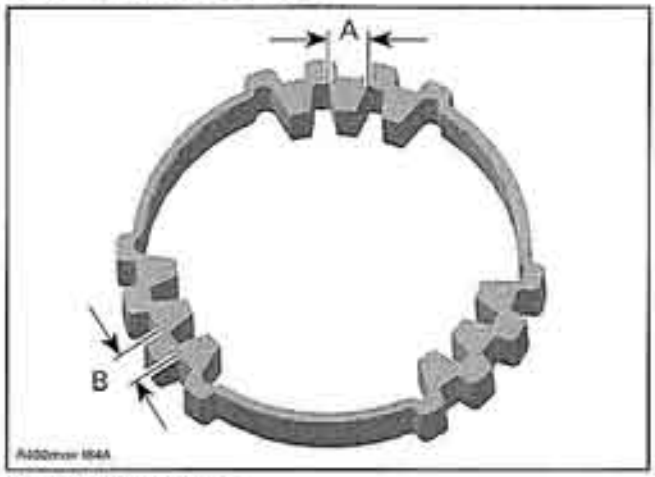
Check shaft no. 25 for heavy wear or visible damage. Replace if necessary.

If the shaft is removed, measure bushing diameter with a dial bore gauge. Measuring point must be at least 5 mm (1/4 in) from bushing edge.

This bushing is not replaceable. Replace fixed half if bushing no. 28 is out of specification. Visually inspect coatings.

BUSHING BORE DIAMETER	
NOMIAL	30.000 to 30.020 mm (1.181 to 1.182 in)
SERVICE LIMIT	30.200 mm (1.189 in)

Check torque gear no. 23 for visible damage and wear limit with a caliper.

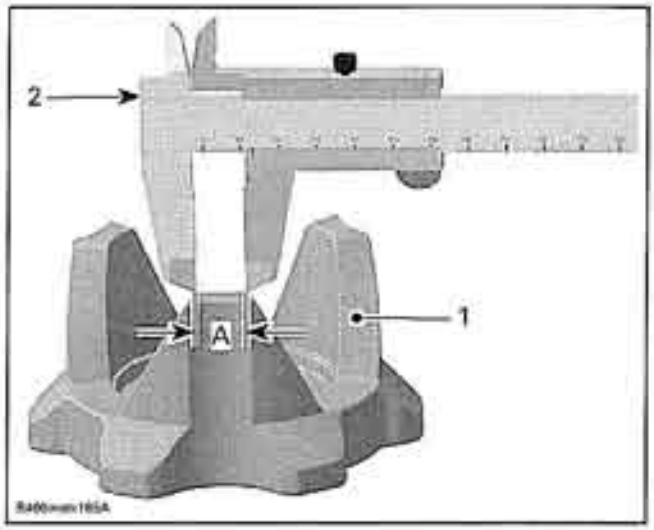


A. Measurement inside
B. Measurement outside

WEAR ON TEETH BOTH SIDES	
SERVICE LIMIT	7.500 mm (.295 in)

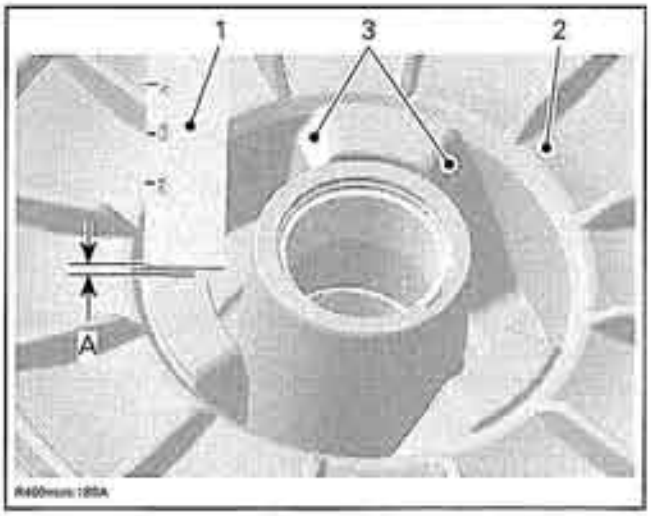
Cam

Check cam no. 29 for visible damage and wear limit with a caliper.



1. Contact surfaces for power train
2. Caliper
A. Width to be measured due to wear on contact surface

WIDTH ON TOP SURFACE	
SERVICE LIMIT	6.000 mm (.236 in)



1. Caliper
2. Sliding half
3. Contact surface
A. Wear to be measured

WEAR ON CONTACT SURFACE	
SERVICE LIMIT	2.000 mm (.079 in)

Spring

Measure spring free length and squareness. If spring no. 33 is out of specification, replace by a new.

SPRING FREE LENGTH	
SERVICE LIMIT	164 mm (6.457 in)

CLUTCH SPRING SQUARENESS	
SERVICE LIMIT	3.8 mm (.150 in)

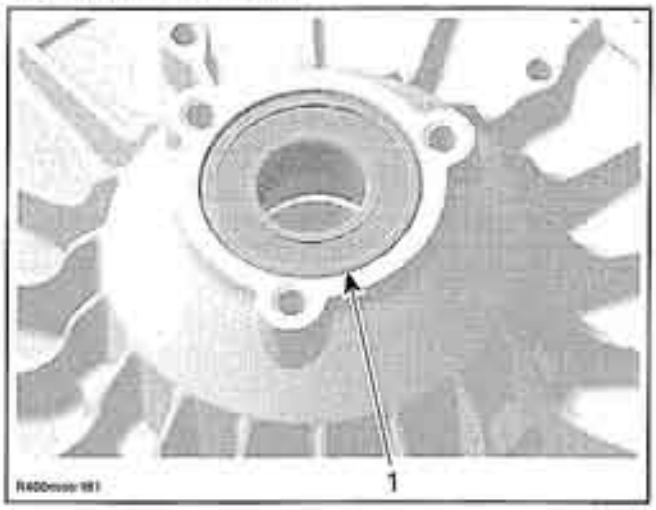
Assembly

For installation, reverse the removal procedure. Pay attention to following details.

Heat ball bearing area up to 100°C (212°F) before ball bearing installation.

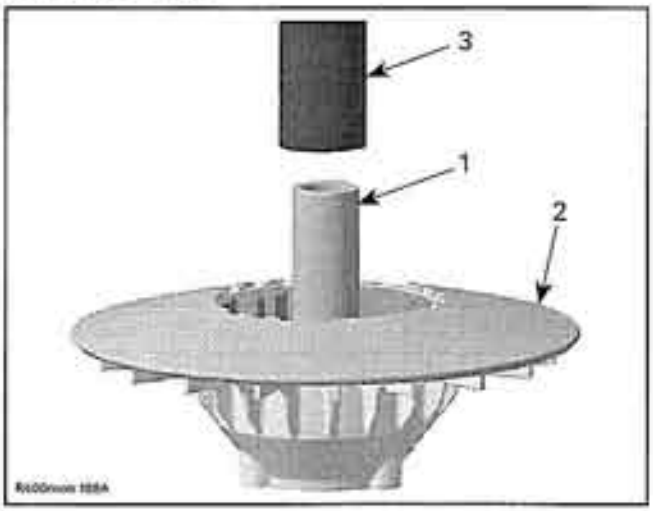
NOTE: Place new ball bearing in a freezer for 10 minutes before installation.

Install ball bearing with the writing on top and push only on the outer ring.



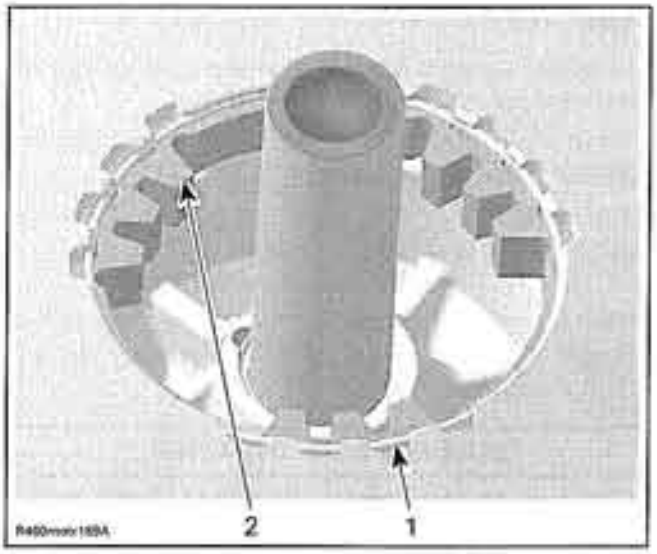
1. Ball bearing

CAUTION: Do not use a hammer, use a press machine only.



1. Shaft
2. Fixed half
3. Press machine

Install torque gear then secure it with retaining ring.



1. Retaining ring
2. Torque gear

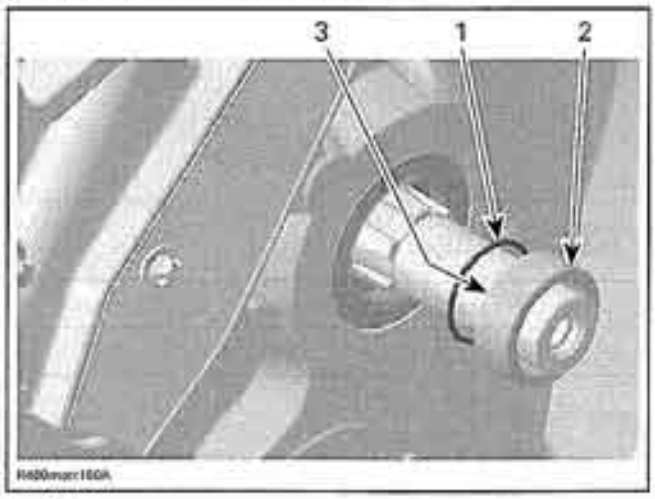
Installation

For installation, reverse the removal procedure. Pay attention to the following details.

Install sliding half no. 30 into fixed half no. 26.

Place O-ring no. 34 on main shaft splines and move it with spacer no. 35 in end position.

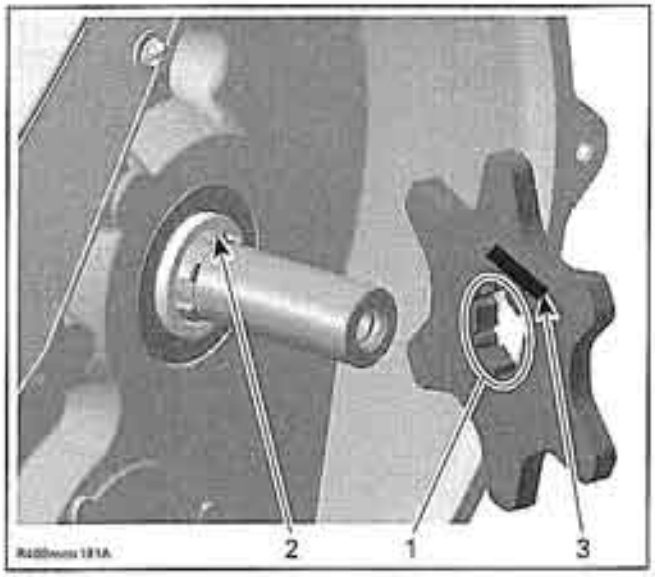
CAUTION: Chamfer on inside diameter of the spacer must face engine side.



1. O-ring
2. Distance sleeve
3. Chamfered area of distance sleeve

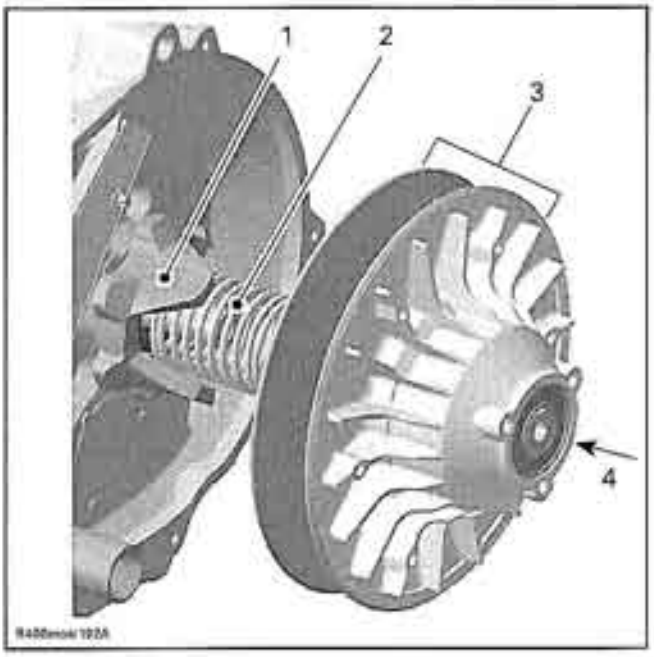
Install cam retainer no. 32 on main shaft end the right way then install cam no. 29.

NOTE: Place cam retainer no. 32 with printed mark ENGINE SIDE towards the engine.



1. *Sharp edge of cam retainer to engine side*
2. *Main shaft spline*
3. *Inscription*

Place spring behind sliding half then align driven pulley with cam.



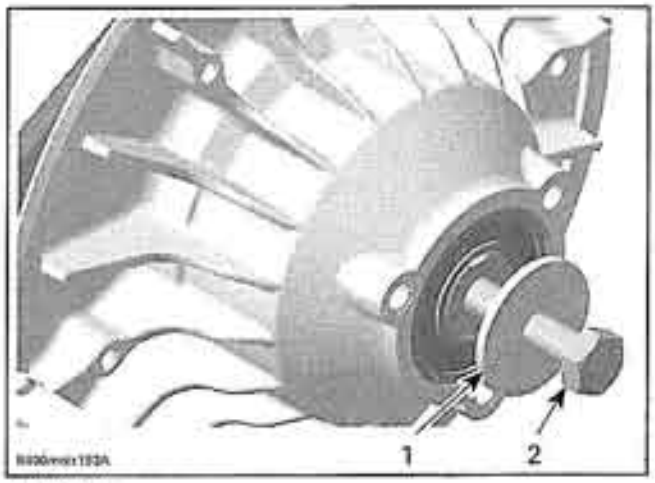
1. *Cam*
2. *Spring*
3. *Driven pulley*
4. *Location for pushing during screw installation*

Push the driven pulley by hand. Install the driven pulley screw no. 20 and its washer no. 21.

⚠ WARNING

Driven pulley is a spring loaded system.

CAUTION: Always place washer at the time of driven pulley installation.

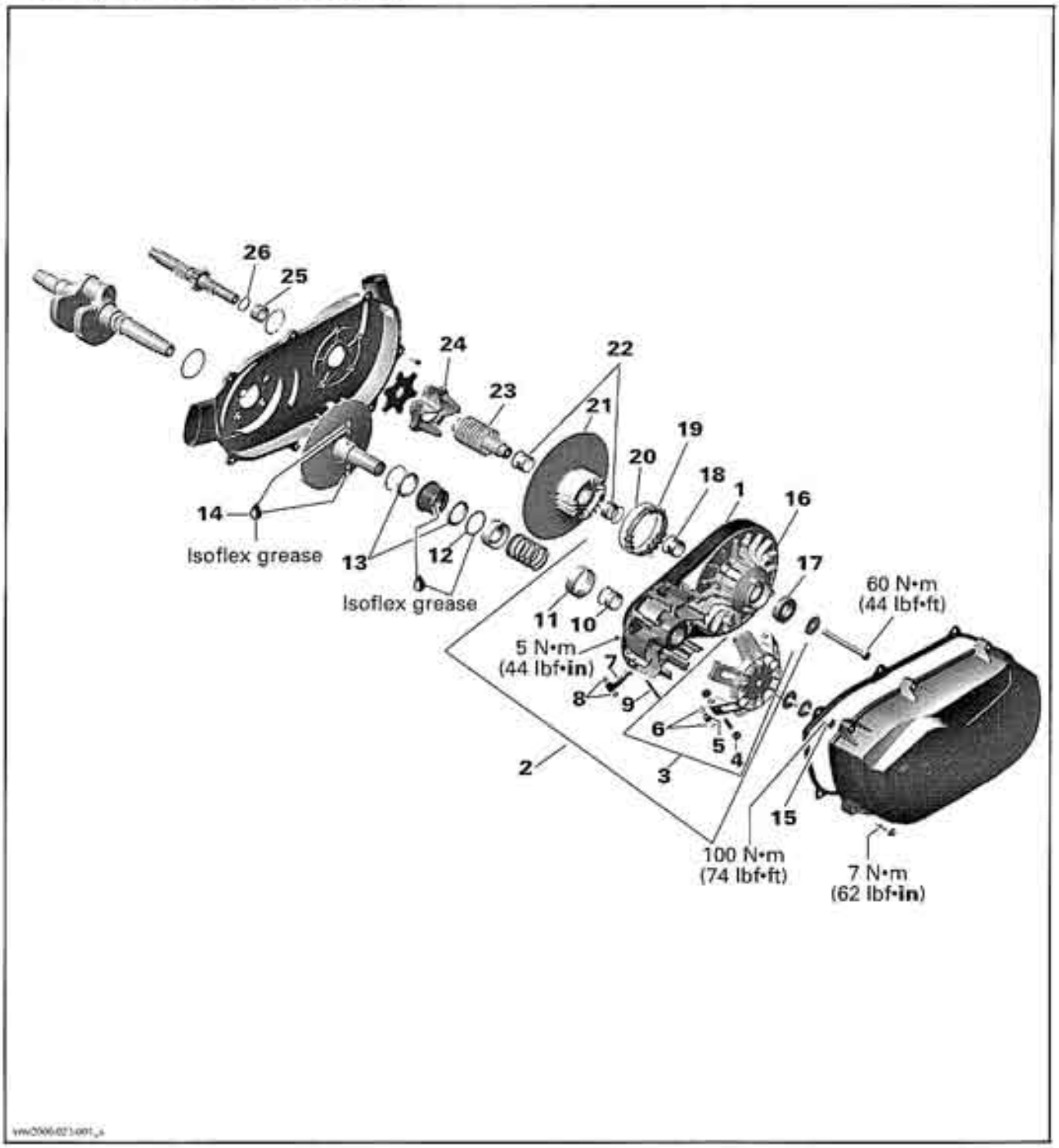


1. *Washer*
2. *Driven pulley screw*

NOTE: Driven pulley end-play is 0 (zero).

Torque driven pulley screw.

OUTLANDER 800 SERIES



GENERAL

NOTE: For a better understanding, the following illustrations are taken with engine out of vehicle. To perform the following instructions, it is not necessary to remove engine.

This CVT is lubrication free. Never lubricate any components except drive pulley one-way clutch and friction washer.

During assembly/installation, use the torque values and service products as in the exploded views.

Clean threads before applying a threadlocker. Refer to *SELF-LOCKING FASTENERS* and *LOCTITE APPLICATION* at the beginning of this manual for complete procedure.

⚠ WARNING

Torque wrench tightening specifications must strictly be adhered to.
Locking devices (e.g.: locking tabs, elastic stop nuts, self-locking fasteners, cotter pin, etc.) must be installed or replaced with new ones where specified. If the efficiency of a locking device is impaired, it must be renewed.

⚠ WARNING

Never touch CVT while engine is running. Never drive vehicle when CVT cover is removed.

⚠ WARNING

Any drive pulley repairs must be performed by an authorized Bombardier ATV dealer. Subcomponent installation and assembly tolerances require strict adherence to procedures detailed.

⚠ WARNING

Never use any type of impact wrench at drive pulley removal and installation.

⚠ WARNING

The clutch assembly is a precisely balanced unit. Never replace parts with used parts from another clutch assembly.

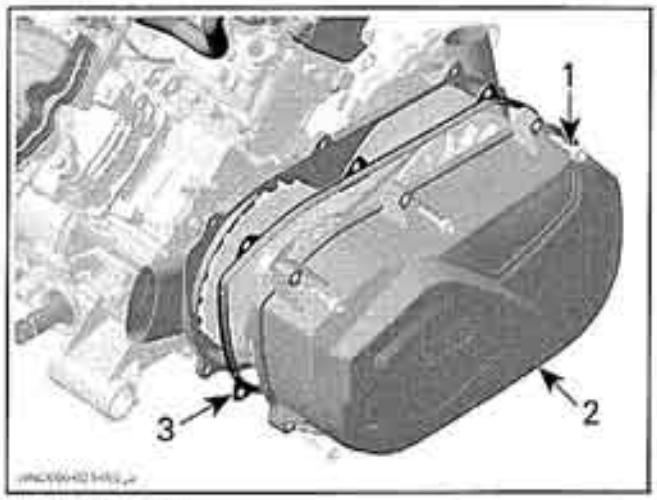
CAUTION: These pulleys have metric threads. Do not use SAE threads puller. Always tighten puller by hand to ensure that the drive pulley has the same type of threads (metric vs SAE) prior to fully tightening.

PROCEDURES

DRIVE BELT

Removal

Remove:
- distance screws
- CVT cover and gasket.

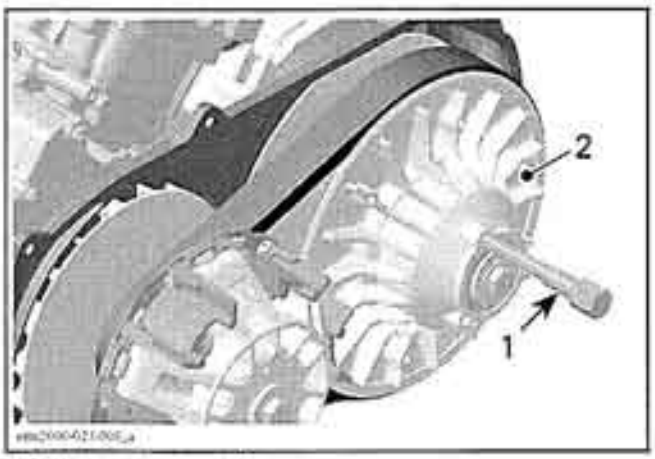


1. Distance screw
2. CVT cover
3. Gasket

NOTE: Remove the center top screw last. This screw allows to support the cover during removal.

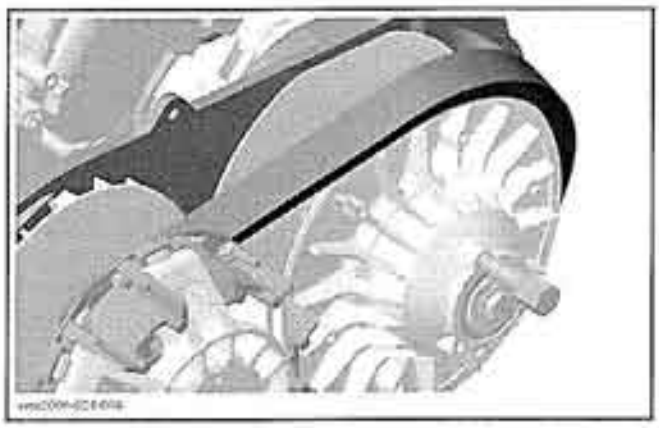
Open driven pulley with the driven pulley expander (P/N 529 035 747).

Screw tool in the threaded hole of driven pulley and tighten to open the pulley.



1. Driven pulley expander
2. Fixed half of driven pulley

To remove belt, slip the belt over the top edge of fixed half, as shown.

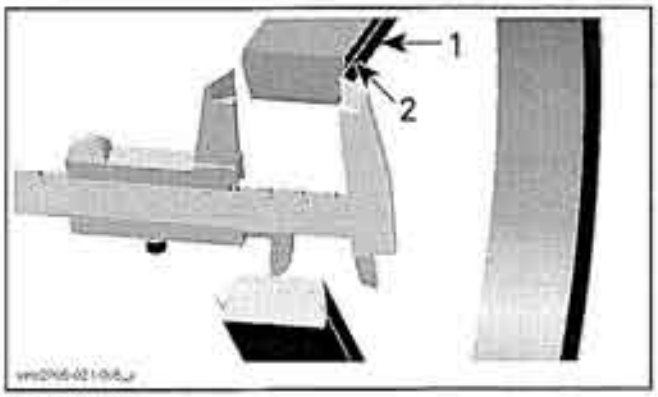


Inspection

Inspect belt for cracks, fraying or abnormal wear. Replace if necessary.

Check drive belt width at cord level. Replace if it is out of specification (see table below).

DRIVE BELT WIDTH	
SERVICE LIMIT	30.00 mm (1.181 in)

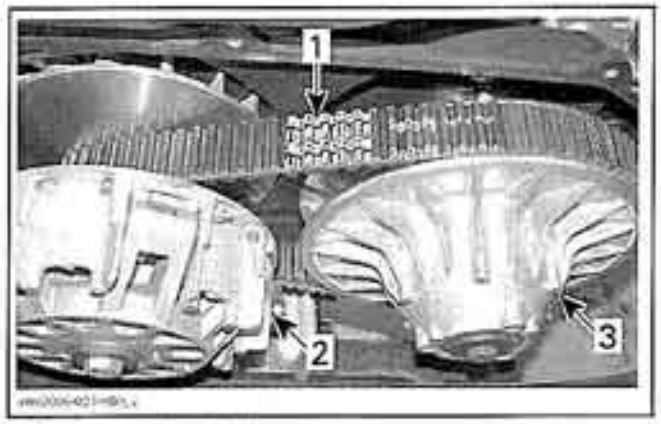


1. Drive belt
2. Cord in drive belt

Installation

For installation, reverse the removal procedure. Pay attention to following details.

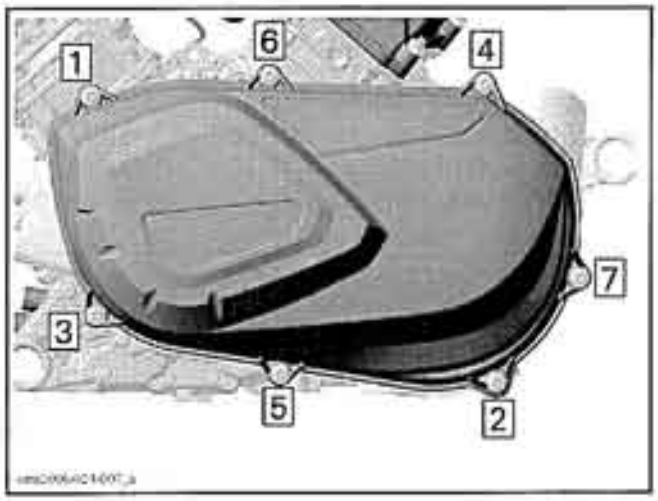
The maximum drive belt life span is obtained when the drive belt has the proper rotation direction. Install it so that the arrow printed on belt is pointing towards front of the vehicle, viewed from top.



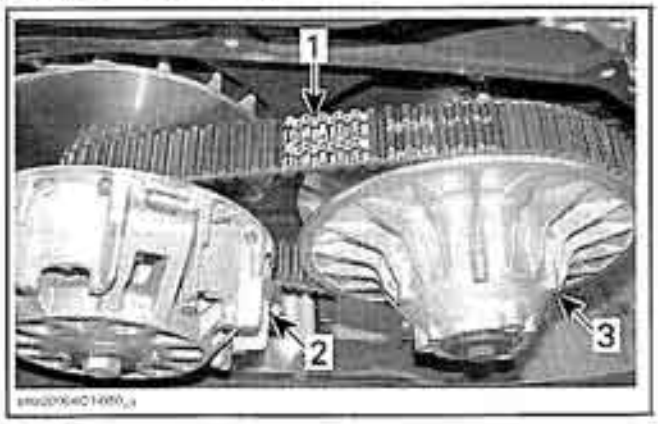
1. Arrow printed on belt
2. Drive pulley (front)
3. Driven pulley (rear)

Install the center top screw of cover in first.

Tighten the distance screws as per following sequence.



DRIVE PULLEY



1. Belt
2. Drive pulley
3. Driven pulley

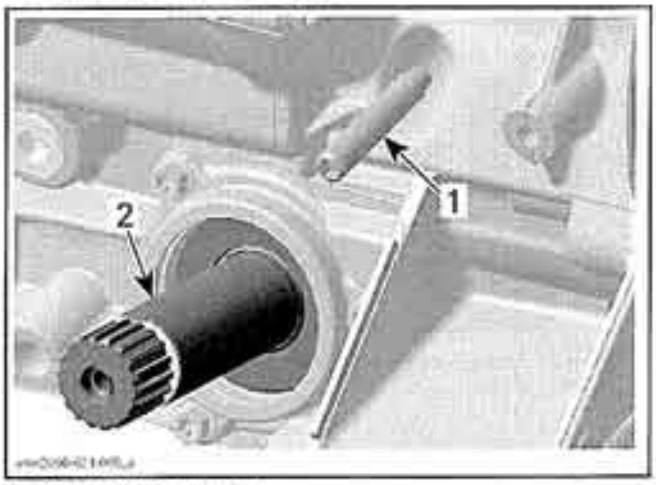
Removal

Remove belt no. 1.

Block the drive pulley. To do this, two procedures can be followed.

First Possible Procedure:

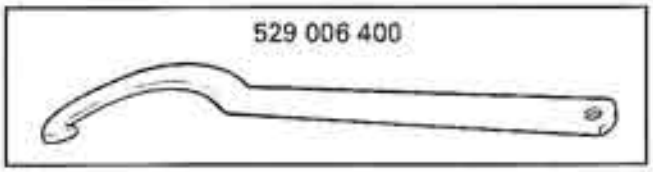
- Remove spark plugs.
- Lock crankshaft at TDC position with crankshaft locking bolt (P/N 529 035 617). Refer to *CYLINDER AND HEAD* section.

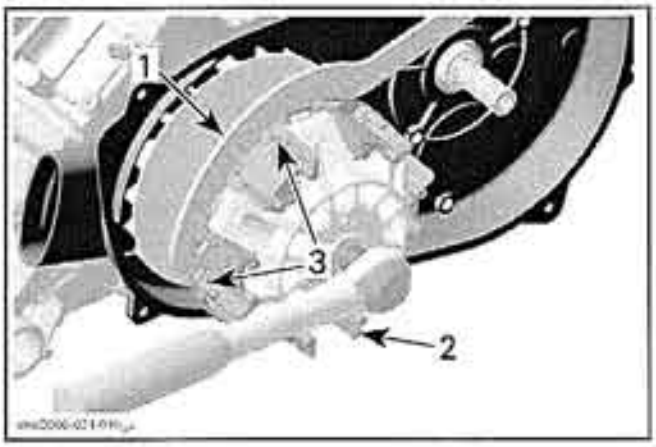


1. Crankshaft locking bolt
2. Engine drive shaft (front side)

Second Possible Procedure:

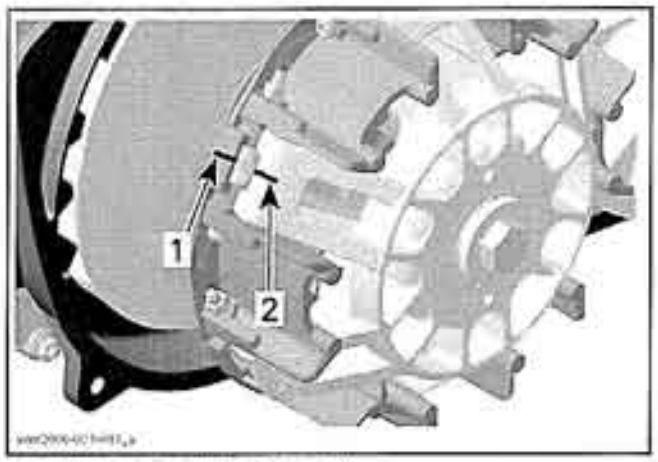
- Block drive pulley with the clutch holding tool (P/N 529 006 400).





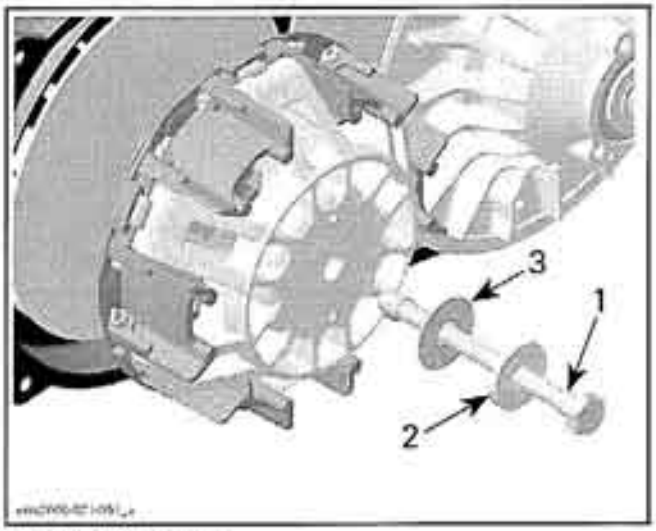
1. Clutch holding tool
2. Drive pulley sliding half
3. Area to place holding tool hook

When the drive pulley is blocked, mark sliding half and governor cup to ensure correct reinstallation.



1. Mark on drive pulley sliding half
2. Mark on governor cup

Unscrew the drive pulley screw, then remove it as well as the conical spring washer and thrust washer.



1. Drive pulley screw
2. Conical spring washer
3. Thrust washer

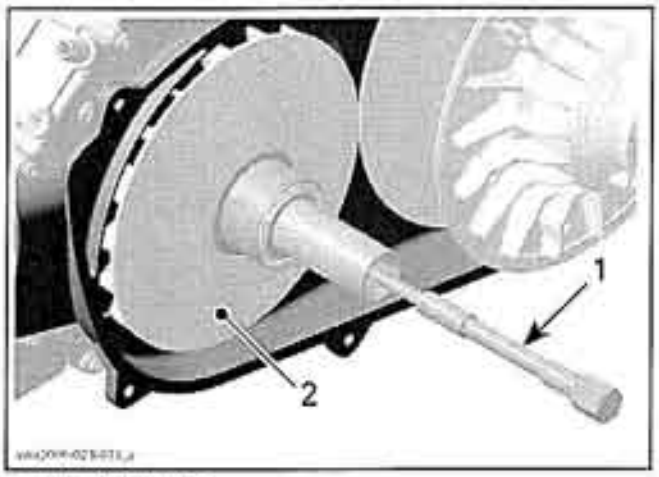
⚠ WARNING

Sliding half of drive pulley is spring loaded.

Push with your hand the sliding half no. 2 of the drive pulley then remove the screw completely.

Slowly release sliding half.

Screw drive pulley puller (P/N 529 035 746) in fixed half and remove fixed pulley.



1. Drive pulley puller
2. Fixed half

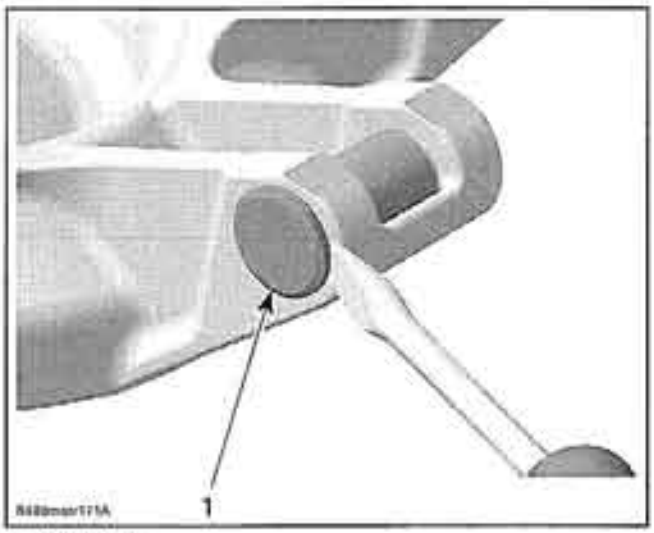
Disassembly

Governor Cup

Carefully lift governor cup no. 3 until slider shoes no. 4 come at their highest position into guides.

NOTE: The following procedure is not necessary except if roller must be removed. Refer to *INSPECTION* before proceeding.

– Remove slider shoes out of each bearing sleeve. Use a flat screwdriver if necessary.



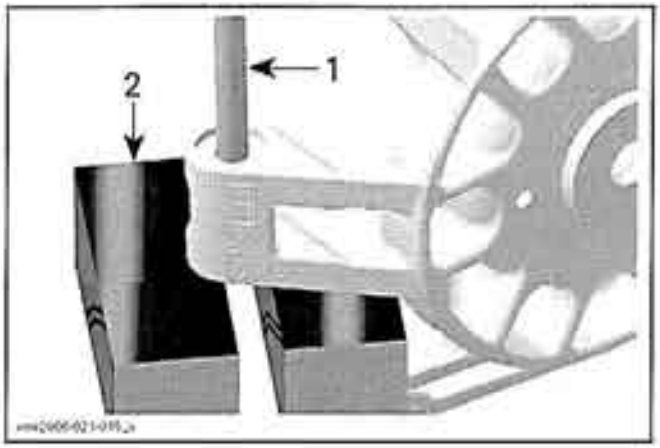
1. Slider shoe

– Put governor cup on a vice to push out bearing sleeve of roller in the foreseen direction (against arrow). Use an appropriate punch (diameter of punch must be smaller than the bearing sleeve diameter).

CAUTION: Do not clamp the governor cup in the vice to push out bearing sleeve. Governor cup will be damaged.

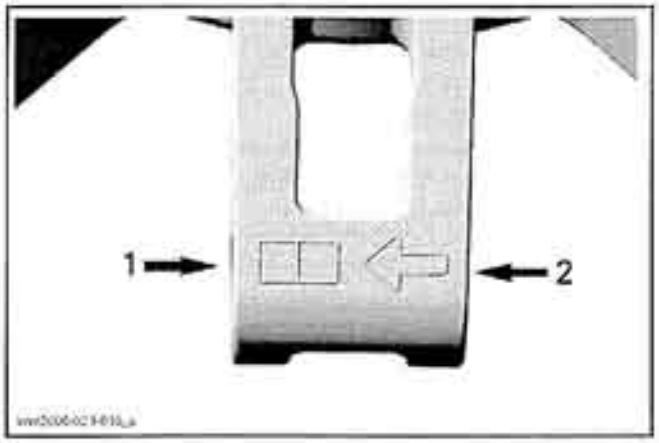
NOTE: Use protection plates to avoid marks and/or damages to the governor cup.

CAUTION: Always replace all rollers at the same time. Partly worn rollers may cause damage to the CVT system.



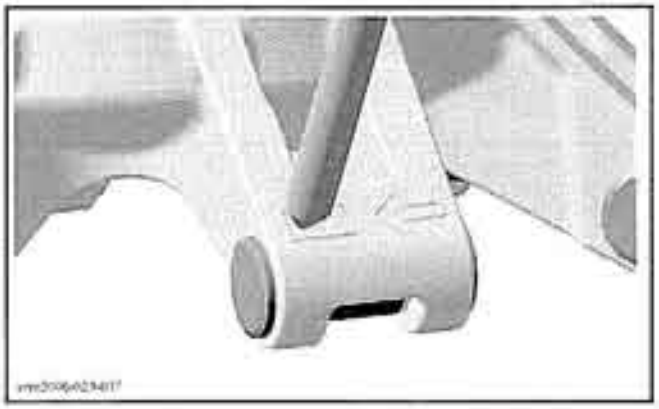
1. Punch
2. Vice

– Each time when replacing the bearing sleeves sign the foreseen box with a punch.

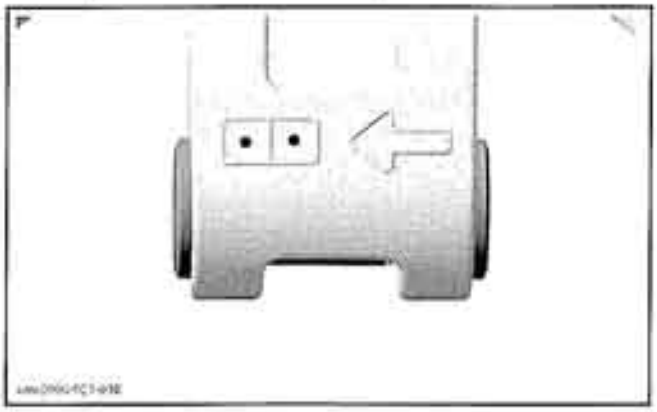


1. Removal direction
2. Assembly direction

CAUTION: Make a visible mark in the box, but do not push too hard. Violent damage of the governor cup may appear.



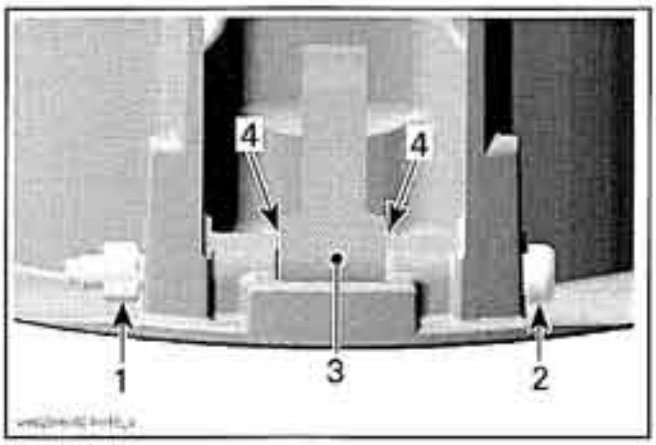
NOTE: Whenever removing a governor cup with already two marked boxes replace it by a new one.



Sliding Half

Unscrew lock nut and remove centrifugal lever pivot bolt. This drive pulley is equipped with 6 levers.

Remove centrifugal lever no. 7 and both thrust washers no. 8.



1. *Lock nut*
2. *Centrifugal lever pivot bolt*
3. *Centrifugal lever*
4. *Thrust washers*

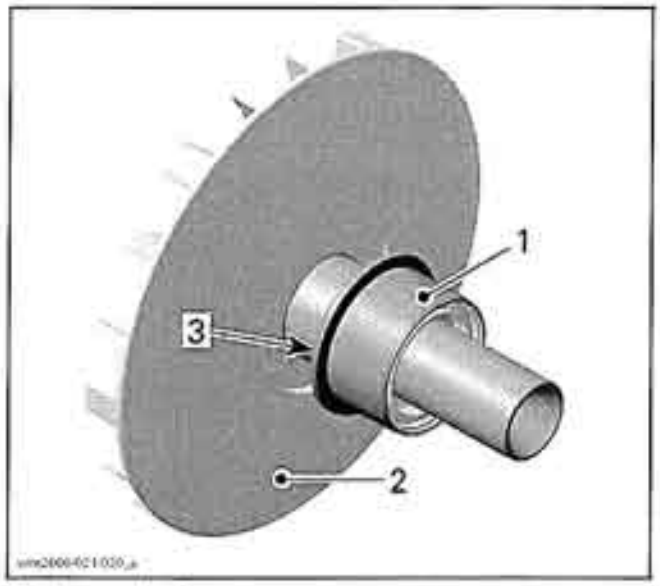
Fixed Half

Remove friction washer no. 12.

⚠ WARNING

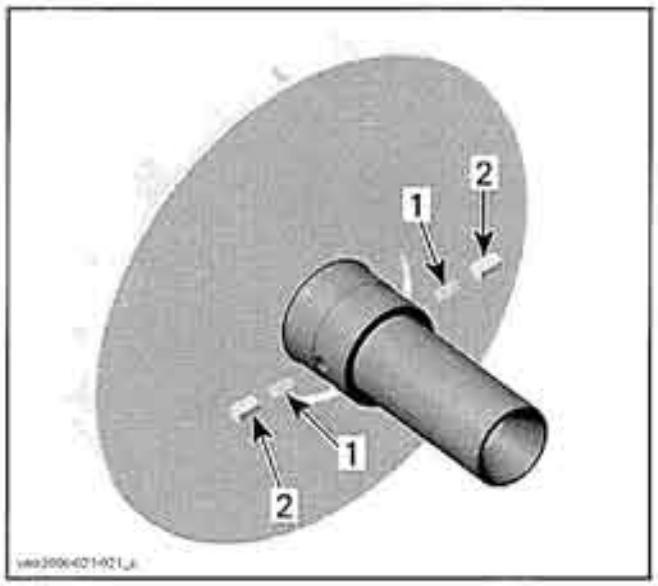
Always wear safety glasses to remove spring sleeves.

Pull and rotate one-way clutch slowly until the half of spring sleeves are visible.



1. *One-way clutch*
2. *Fixed half*
3. *Spring sleeve area*

Hold both spring sleeves with fingers and release when one-way clutch is disengaged.



1. *Springs*
2. *Spring sleeves*

Cleaning

Clean pulley faces and shaft with fine steel wool and dry cloth.

Using a paper towel with pulley flange cleaner (P/N 413 711 809) cleaning solvent, clean crankshaft tapered end and the taper inside the fixed half of the drive pulley, crankshaft threads and threads of drive pulley screw no. 15.

⚠ WARNING

This procedure must be performed in a well-ventilated area.

CAUTION: Avoid contact between cleaner and crankshaft seal because damage may occur.

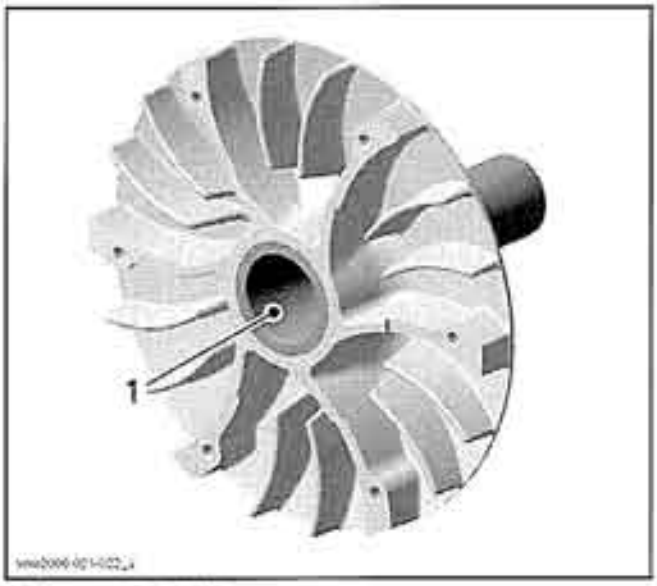
Remove all hardened oil deposits that have baked on crankshaft and pulley tapered surfaces with coarse or medium steel wool and/or sand paper no. 600.

CAUTION: Do not use any other type of abrasive.

Reclean mounting surfaces with paper towel and pulley flange cleaner (P/N 413 711 809).

Wipe off the mounting surfaces with a clean, dry paper towel.

CAUTION: Mounting surfaces must be free of any oil, cleaner or towel residue.



1. Taper of fixed half

Only use petrol base cleaner when cleaning bushings no. 10 and no. 11.

CAUTION: Do not use acetone to clean bushing.

Inspection

Drive Pulley

Drive pulley should be inspected annually.

Governor Cup

Check governor cup for cracks or other visible damages. Replace if necessary.

Roller and Slider Shoe

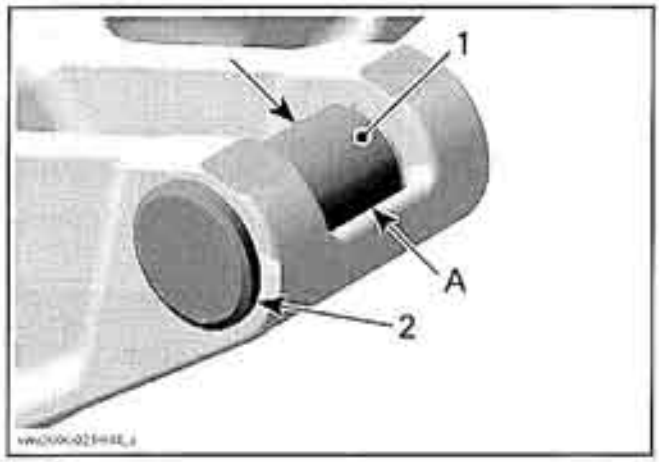
Check each roller for roundness of external diameter.

Check if rollers move freely.

CAUTION: Whenever replacing rollers and slider shoes, always replace all rollers and slider shoes at the same time.

Check slider shoes for visible wear and replace if damaged.

NOTE: If necessary, use a screwdriver to remove slider shoes.

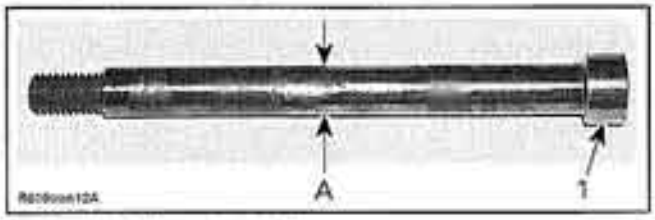


1. Roller
2. Slider shoe
A. Roller outer diameter

ROLLER OUTER DIAMETER	
NEW	13.70 to 13.80 mm (.539 to .543 in)
SERVICE LIMIT	13.20 mm (.519 in)
ROLLER INNER DIAMETER	
NEW	8.05 to 8.15 mm (.317 to .321 in)
SERVICE LIMIT	9.00 mm (.354 in)

Centrifugal Lever Pivot Bolt

Measure diameter of centrifugal lever pivot bolt no. 9, replace if it is out of specification.



1. Centrifugal lever pivot bolt
A. Measure diameter here

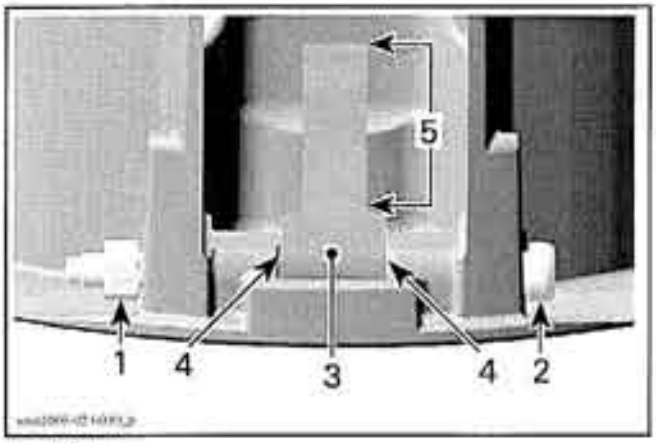
CENTRIFUGAL LEVER PIVOT BOLT DIAMETER	
NOMINAL	6.078 to 6.100 mm (.239 to .240 in)
SERVICE LIMIT	6.00 mm (.236 in)

Centrifugal Lever

Check bushing diameter in the centrifugal lever no. 7 for wear. Replace centrifugal lever if necessary.

CENTRIFUGAL LEVER BORE DIAMETER	
NOMINAL	6.035 to 6.078 mm (.238 to .239 in)
SERVICE LIMIT	6.200 mm (.244 in)

Replace centrifugal lever with thrust washers, screws and lock nuts if the contact surfaces show heavy visible wear.



1. *Lock nut*
2. *Centrifugal lever pivot bolt*
3. *Centrifugal lever*
4. *Thrust washers*
5. *Contact surface to the roller*

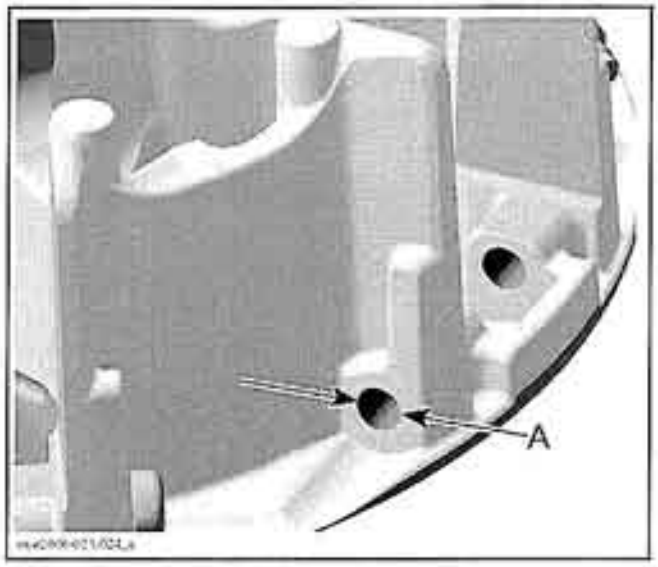
⚠ WARNING

Whenever replacing centrifugal levers, always replace all lever at the same time. Otherwise, drive pulley misbalancing will occur because of levers difference.

Sliding Half

Check sliding half for cracks and sliding contact surface for excessive wear. Replace sliding half if necessary.

Measure centrifugal lever pivot bolt bores. Replace sliding half if bores are out of specification or otherwise damaged.

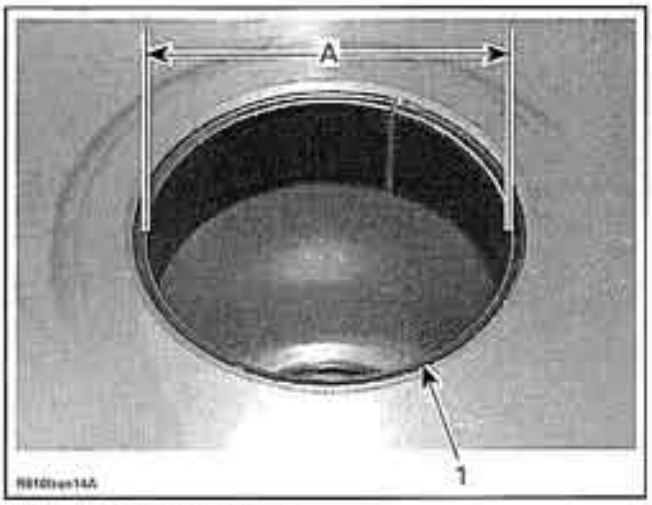


A. Centrifugal lever pivot bolt bore diameter

CENTRIFUGAL LEVER PIVOT BOLT BORE DIAMETER	
NOMINAL	6.113 to 6.171 mm (.241 to .243 in)
SERVICE LIMIT	6.300 mm (.248 in)

Measure bushing diameters of sliding half.

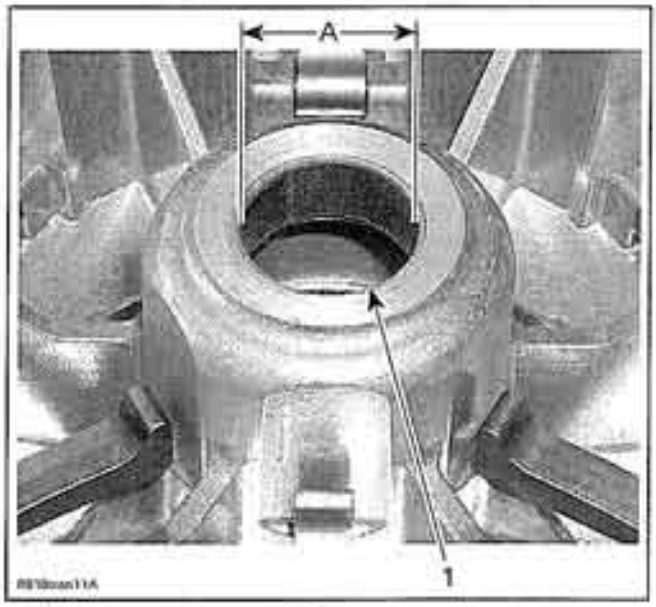
Use a dial bore gauge to measure bushing diameter. Measuring point must be at least 5 mm (1/4 in) from bushing edge.



1. *Bushing on fixed half side*

A. Bore diameter of bushing

SLIDING HALF LARGE BUSHING	
NOMINAL	55.000 to 55.040 mm (2.165 to 2.167 in)
SERVICE LIMIT	55.200 mm (2.173 in)



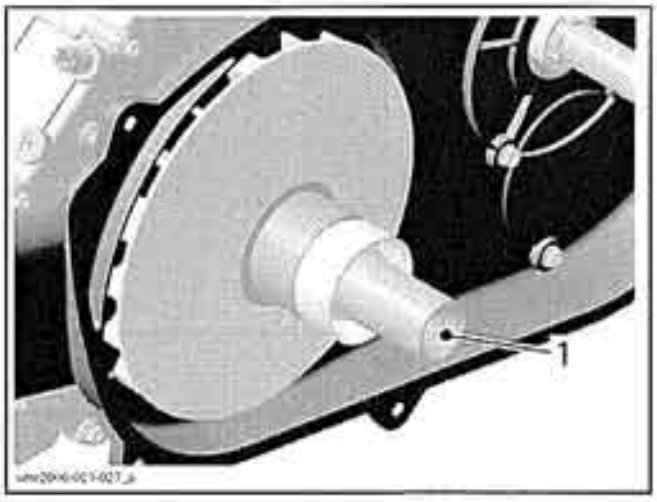
1. Bushing on governor cup side
A. Bore diameter of bushing

SLIDING HALF SMALL BUSHING	
NOMINAL	30.000 to 30.040 mm (1.181 to 1.183 in)
SERVICE LIMIT	30.200 mm (1.189 in)

Replace sliding half if bushings no. 10 and/or no. 11 is (are) out of specification. Visually inspect coatings.

Fixed Half

Check fixed half contact surface to the governor cup for scorings and other damages. If so, replace fixed half.



1. Visually check here

Check for any marks on fixed half plate. Replace if necessary.

Spring

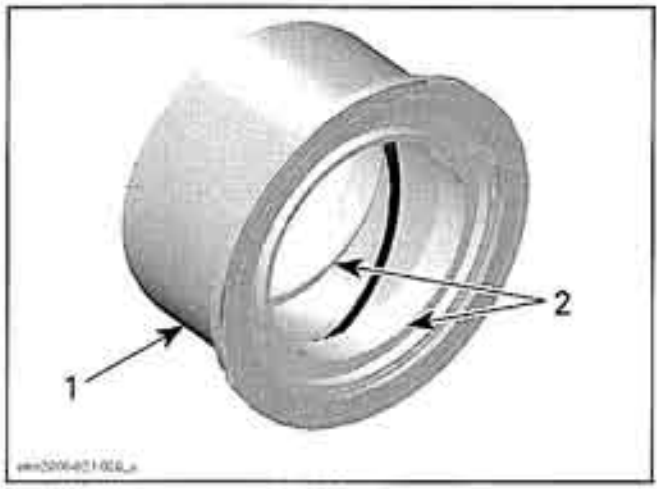
Measure spring free length and squareness. If spring is out of specification, replace by a new one.

SPRING FREE LENGTH	
SERVICE LIMIT	85 mm (3.347 in)
CLUTCH SPRING SQUARENESS	
SERVICE LIMIT	4 mm (.157 in)

One-Way Clutch

Check bearings for excessive play and smooth operation. Replace one-way clutch if necessary.

CAUTION: Be careful not to damage the inside of one-way clutch during bearing removal.



1. One-way clutch
2. Bearings

Measure length of spring sleeve no. 14 and check if edges on top of the spring sleeve are excessively worn. If they out of specifications, replace both spring sleeve at the same time.

SPRING SLEEVE LENGTH	
NOMINAL	9.2 to 9.4 mm (.362 to .370 in)
SERVICE LIMIT	9 mm (.276 in)

Assembly

For assembly, reverse the disassembly procedure. Pay attention to following details.

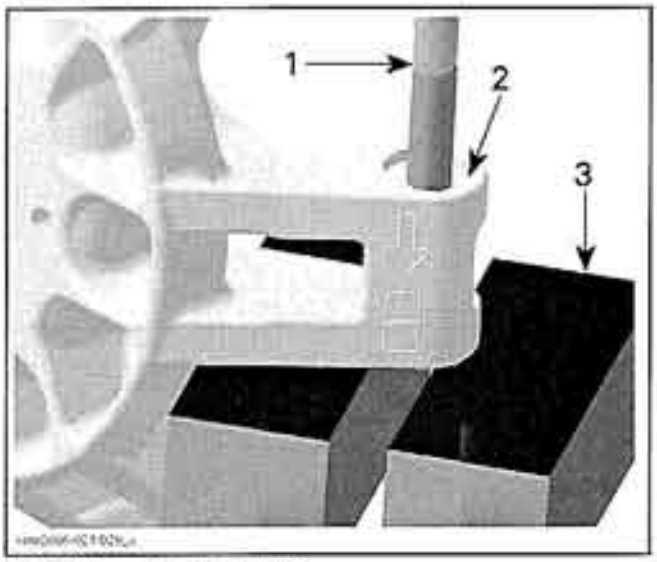
NOTE: Using Isoflex grease (P/N 293 550 021), lubricate spring and spring sleeve no. 14 and between one way clutch bearings no. 13.

NOTE: Apply Isoflex grease (P/N 293 550 021) on both sides of friction washer no. 12.

CAUTION: Centrifugal levers no. 7 must move easily after installation.

Rebuild governor cup with new bearing sleeves, thrust washers no. 6, rollers and slider shoes.

CAUTION: Final position has to be aligned with the contact surface of the slider shoes (no protrusion).



1. Top edge of bearing sleeve
2. Mating surface of slider shoes
3. Vice

CAUTION: Rollers must move easily after installation.

Insert slider shoes into governor cup to properly slide in guides.

Installation

For installation, reverse the removal procedure. Pay attention to the following details.

⚠ WARNING

Do not apply antiseize or any lubricant on crankshaft and drive pulley tapers.

⚠ WARNING

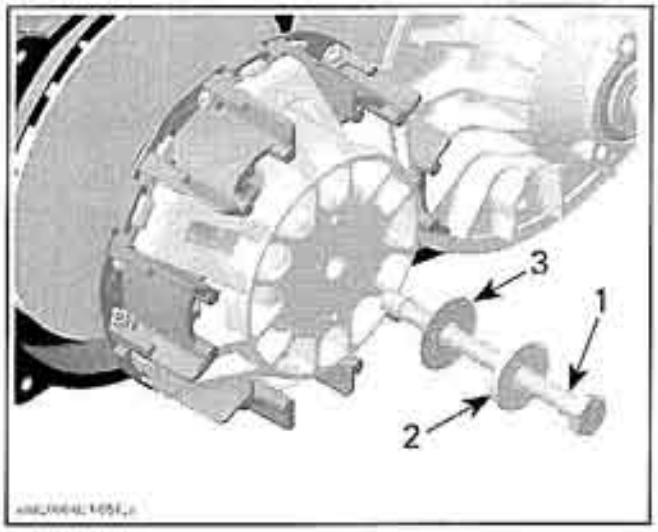
Never use any type of impact wrench at drive pulley removal and installation.

Clean mounting surfaces as described in *CLEANING* above.

Install drive pulley on crankshaft extension.

CAUTION: Do not forget to place thrust washer prior to install conical spring washer.

Install conical spring washer with its concave side towards drive pulley then install drive pulley screw.



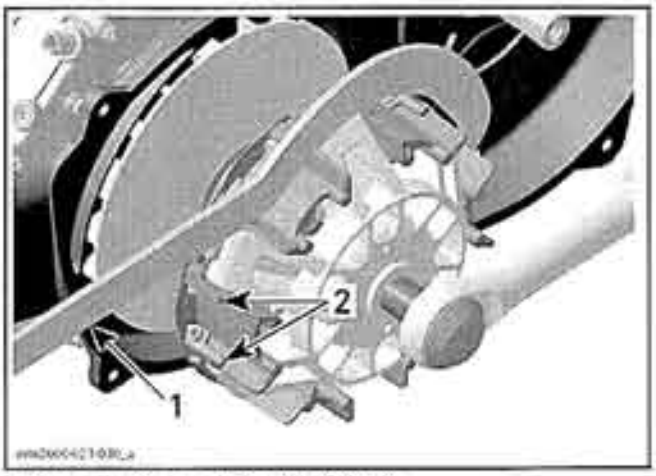
1. Drive pulley screw
2. Conical spring washer
3. Thrust washer

⚠ WARNING

Never substitute conical spring washer and/or screw with jobber ones. Always use BRP genuine parts for this particular case.

To torque the drive pulley screw, block the drive pulley. Refer at the beginning of this section for the two possible procedures.

When the drive pulley is blocked, torque screw to 100 N•m (74 lbf•ft).



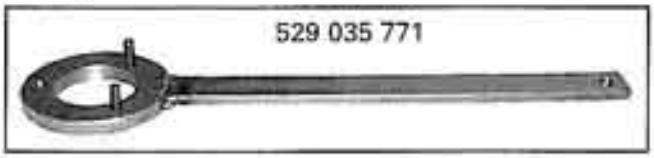
1. Clutch holding tool (P/N 529 006 400)
2. Drive pulley removal/installation area

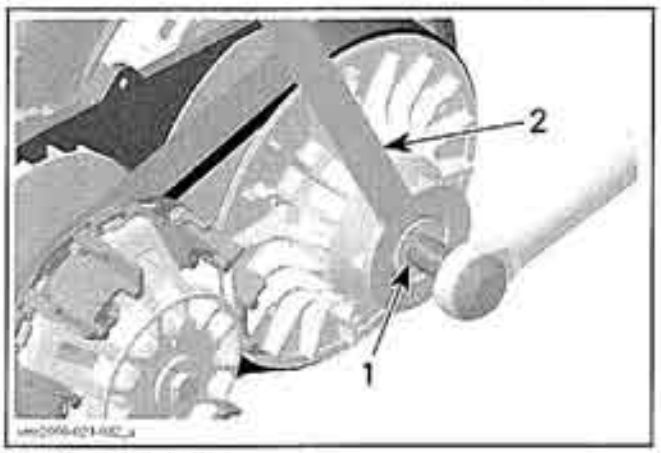
DRIVEN PULLEY

Removal

Remove drive belt (see *DRIVE BELT* above).

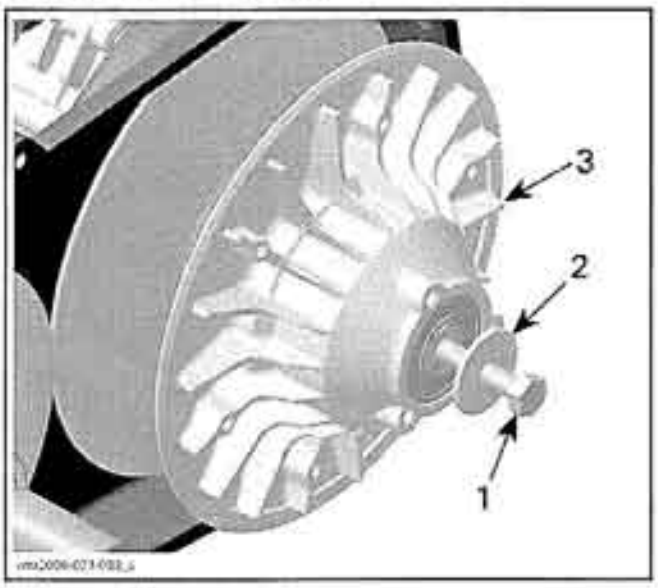
Using the clutch holding tool (P/N 529 035 771), hold the driven pulley during the removal of the driven pulley screw. **Do not remove screw completely.**





1. *Driven pulley screw*
2. *Clutch holding tool*

Push the driven pulley and maintain it in this position during the removal of screw. Remove driven pulley screw and washer.

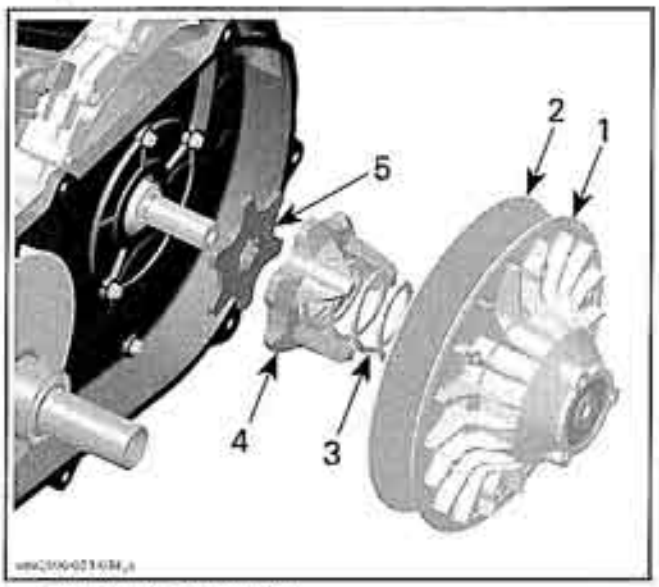


1. *Driven pulley screw*
2. *Thrust washer*
3. *Driven pulley fixed half*

⚠ WARNING

Driven pulley is spring loaded. Hold driven clutch pulley tight and slowly remove the driven pulley screw to release spring tension.

Remove the driven pulley with the spring, cam and the plate.

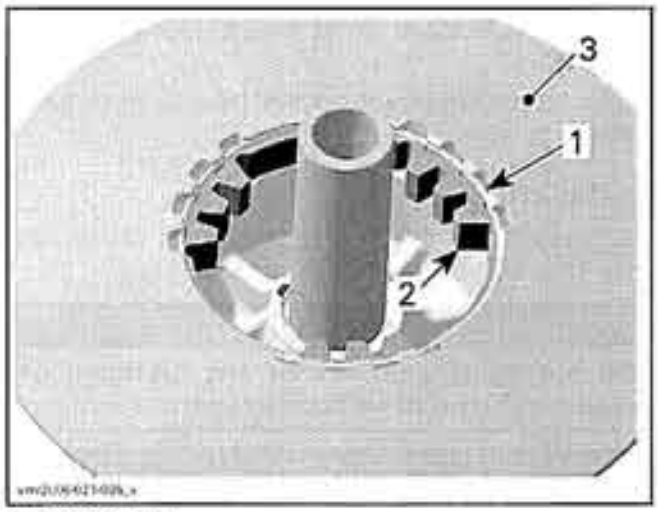


1. *Fixed half of driven pulley*
2. *Sliding half of driven pulley*
3. *Spring*
4. *Cam*
5. *Plate*

Disassembly

Fixed Half

Remove retaining ring and lift torque gear.

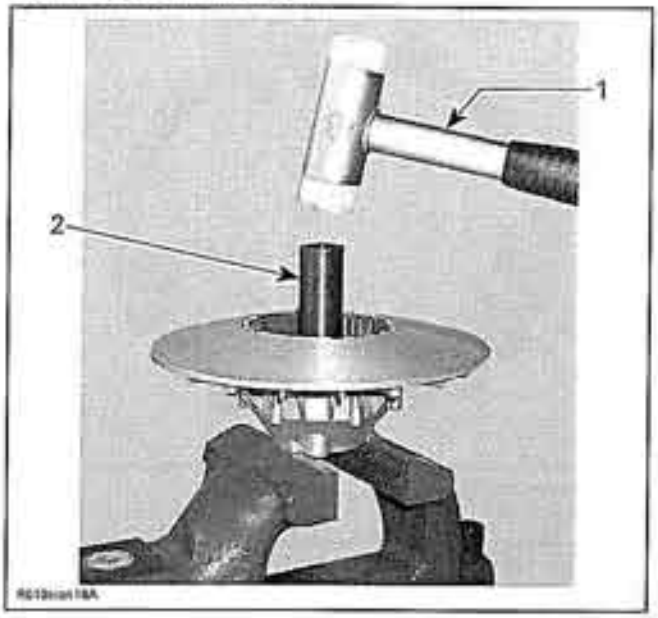


1. *Retaining ring*
2. *Torque gear*

NOTE: The following procedure is not necessary except if ball bearing or shaft must be removed. Refer to *INSPECTION* before proceeding.

Heat ball bearing area up to 100°C (212°F) before removing ball bearing.

Use a soft hammer to push shaft with bearing no. 17 out of fixed half.

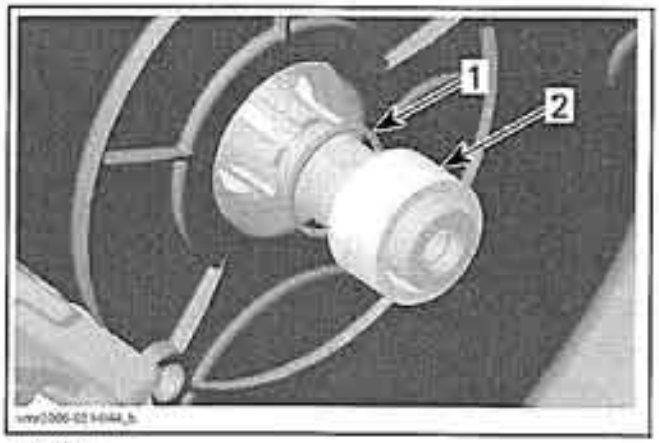


1. Soft hammer
2. Shaft

Remove shaft from ball bearing.

Remove distance sleeve and O-ring no. 26 from countershaft.

Replace O-ring if brittle, hard or damaged.



1. O-ring
2. Distance sleeve

Cleaning

When a dust deposit has to be removed from the cam or the shaft, use dry cloth.

Clean pulley faces and shaft with fine steel wool and dry cloth.

Use pulley flange cleaner (P/N 413 711 809) to clean driven pulley.

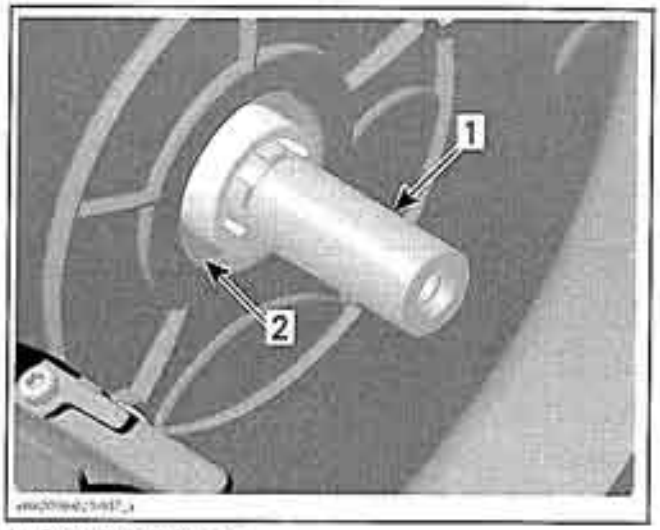
Clean the CVT air guide area from contamination.

Using a paper towel with pulley flange cleaner (P/N 413 711 809) to clean countershaft end and the inside of the shaft no. 23.

⚠ WARNING

This procedure must be performed in a well-ventilated area.

CAUTION: To avoid damage, make sure cleaner does not contact the countershaft oil seal.



1. Countershaft support
2. Countershaft oil seal

Inspection

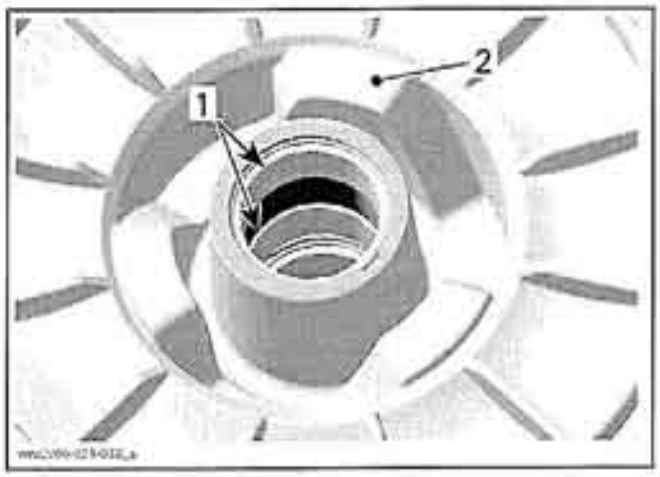
Sliding Half

Check sliding half for cracks and sliding contact surface for excessive wear. Replace sliding half if necessary.

Check bushings no. 22 for cracks, scratch and for free movement when assembled to sliding half.

Using a dial bore gauge measure bushing diameter. Measuring point must be at least 5 mm (1/4 in) from bushing edge.

This bushing can not be replaced. Replace sliding half if bushings no. 22 are out of specification. Visually inspect coatings.



1. Bushings
2. Backside of sliding half of driven pulley

BUSHINGS BORE DIAMETER	
NOMINAL	30.060 to 30.100 mm (1.183 to 1.185 in)
SERVICE LIMIT	30.200 mm (1.189 in)

Fixed Half

Check fixed half for cracks and excessive wear. Replace fixed half if necessary.

Check ball bearing for free play and smooth operation. Replace if necessary.

Check shaft for heavy wear or visible damage. Replace if necessary.

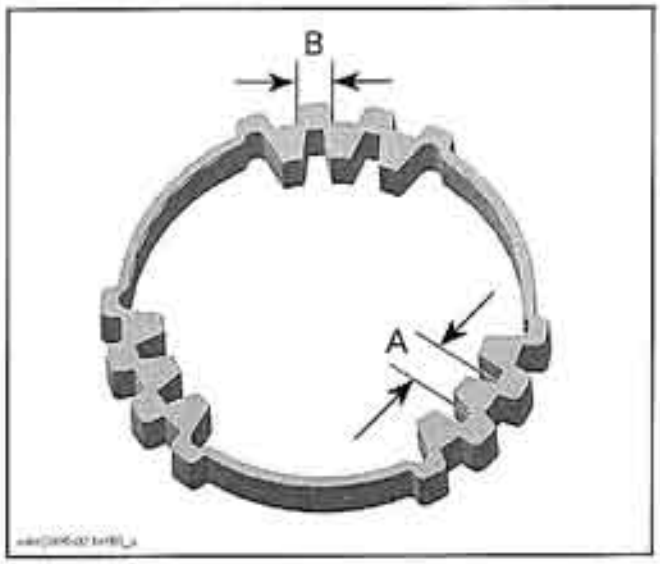
If the shaft is removed, using a dial bore gauge, measure bushing diameter. Measuring point must be at least 5 mm (1/4 in) from bushing edge.

This bushing can not be replaced. Replace fixed half if bushing no. 18 is out of specification. Visually inspect coatings.

BUSHING BORE DIAMETER	
NOMINAL	30.060 to 30.100 mm (1.183 to 1.185 in)
SERVICE LIMIT	30.200 mm (1.189 in)

Check torque gear for visible damage and cracks.

Measure wear limit with a caliper.

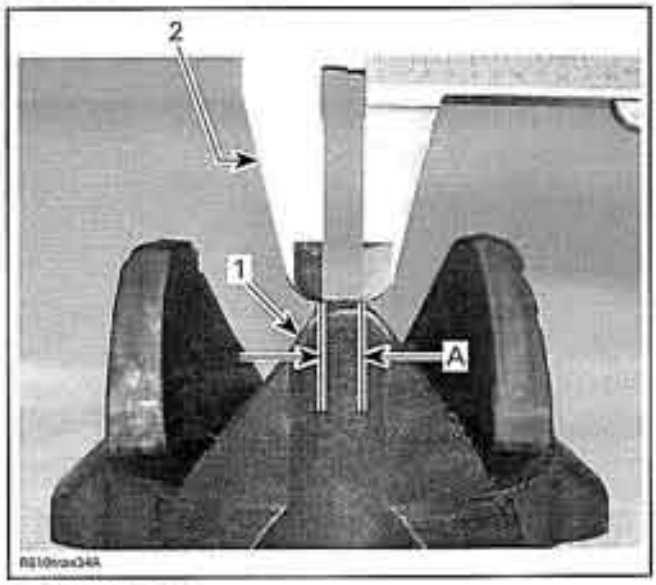


A. Measurement inside
B. Measurement outside

WEAR ON TEETH BOTH SIDES	
SERVICE LIMIT	7.500 mm (.295 in)

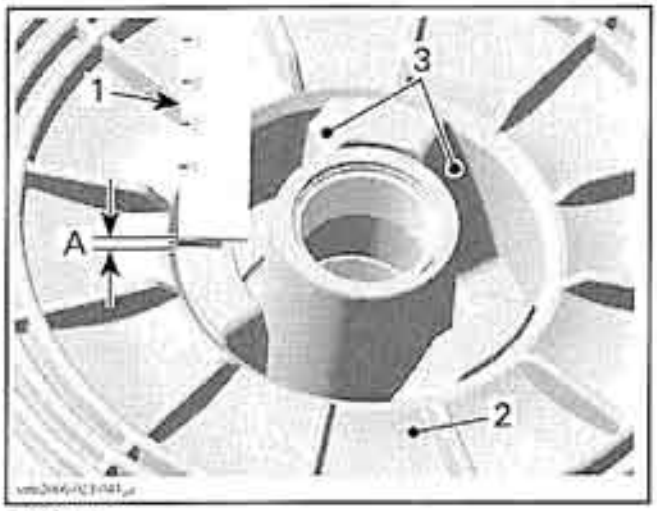
Cam

Check cam for visible damage and wear limit with a caliper.



1. Contact surface
2. Caliper
A. Width to be measured due to wear on contact surface

WIDTH ON TOP SURFACE	
SERVICE LIMIT	9.00 mm (.354 in)



1. *Caliper*
2. *Sliding half*
3. *Contact surface*

A. Wear to be measured

WEAR ON CONTACT SURFACE	
SERVICE LIMIT	1.00 mm (.039 in)

Spring

Measure spring free length and squareness. If spring is out of specification, replace by a new.

SPRING FREE LENGTH	
SERVICE LIMIT	125 mm (4.921 in)
CLUTCH SPRING SQUARENESS	
SERVICE LIMIT	3.8 mm (.150 in)

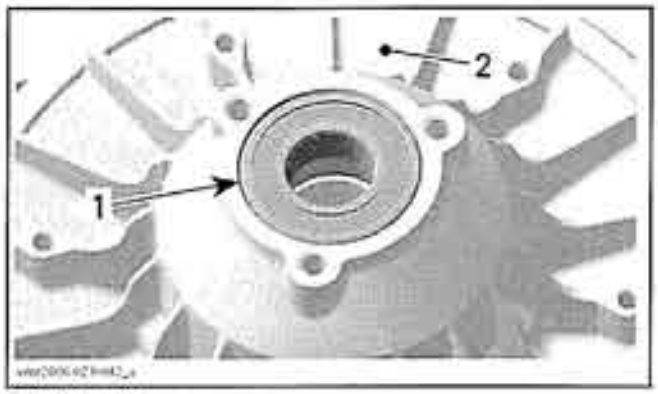
Assembly

For installation, reverse the removal procedure. Pay attention to following details

Heat ball bearing area up to 100°C (212°F) before ball bearing installation.

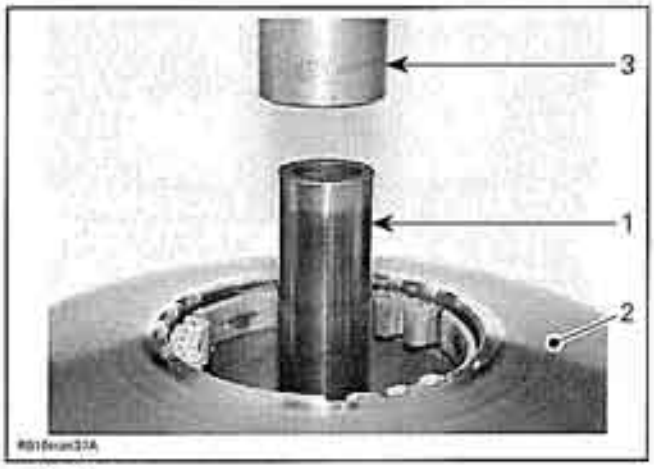
NOTE: Place new ball bearing in a freezer for 10 minutes before installation.

Install ball bearing with the writing on top and push only on the outer ring.



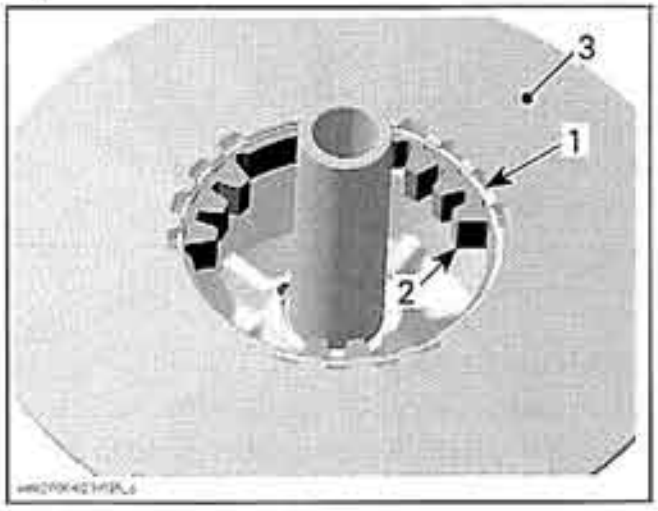
1. *Ball bearing*
2. *Fixed half of driven pulley*

CAUTION: Do not use hammer, use press machine only.



1. *Shaft*
2. *Fixed half*
3. *Press machine*

Install torque gear then secure it with retaining ring.



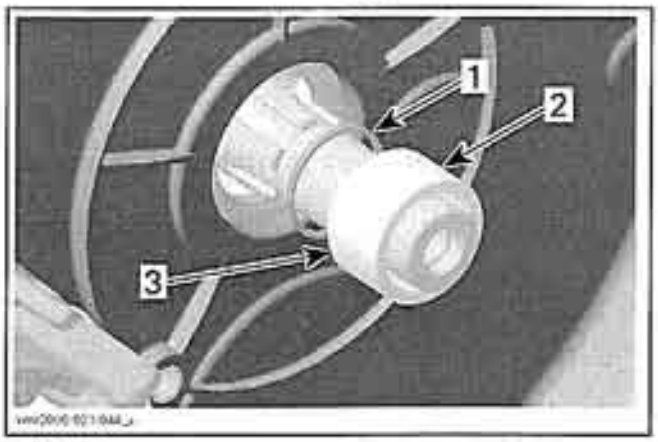
1. *Retaining ring*
2. *Torque gear*
3. *Fixed half of driven pulley*

Installation

For installation, reverse the removal procedure. Pay attention to the following details.

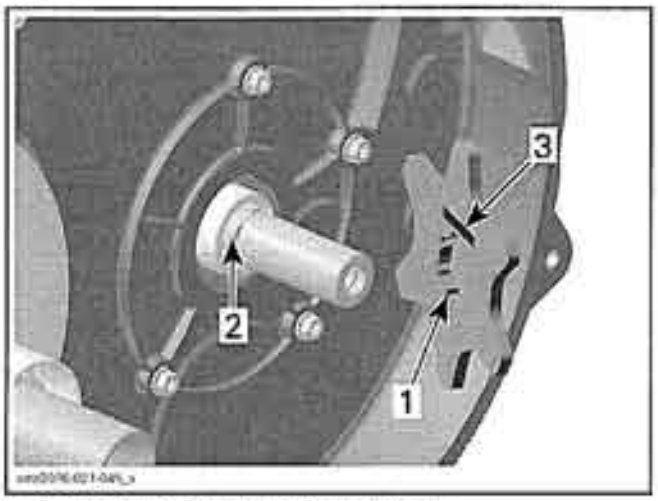
Place O-ring no. 26 on countershaft splines and move it with distance sleeve no. 25 in end position.

CAUTION: Chamfer on inside diameter of the distance sleeve must face gearbox side.



1. O-ring
2. Distance sleeve
3. Chamfered area of distance sleeve

Install cam retainer on countershaft end the right way.

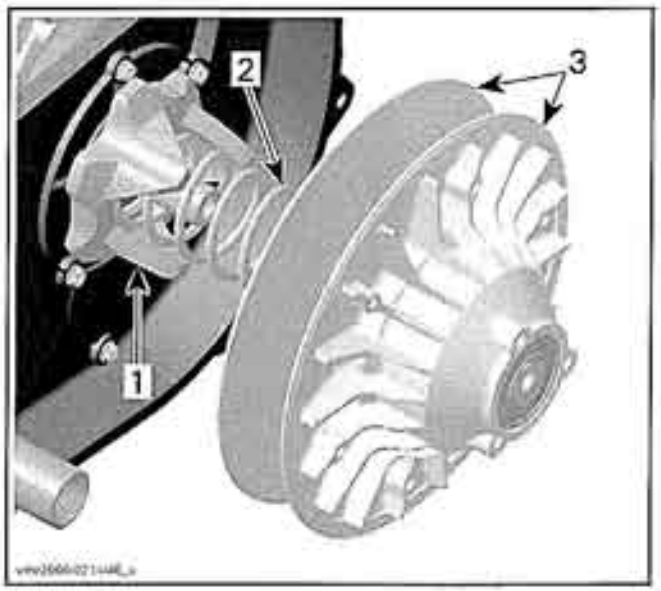


1. Sharp edge of cam retainer to engine side
2. Countershaft spline
3. Inscription

Install cam no. 24.

Install sliding half no. 21 into fixed half no. 16.

Place spring behind sliding half then align driven pulley with cam.

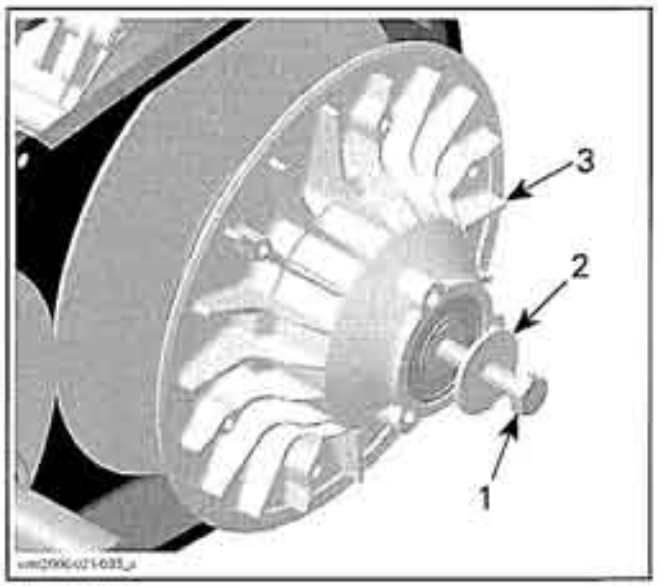


1. Cam
2. Spring
3. Driven pulley

With your hand, push the driven pulley on the shaft to compress the spring. Install the driven pulley screw and thrust washer.

⚠ WARNING

Driven pulley is a spring loaded system.



1. Driven pulley screw
2. Thrust washer
3. Driven pulley fixed half

NOTE: Driven pulley end-play is 0 (zero).

Torque driven pulley screw.

CVT AIR GUIDE

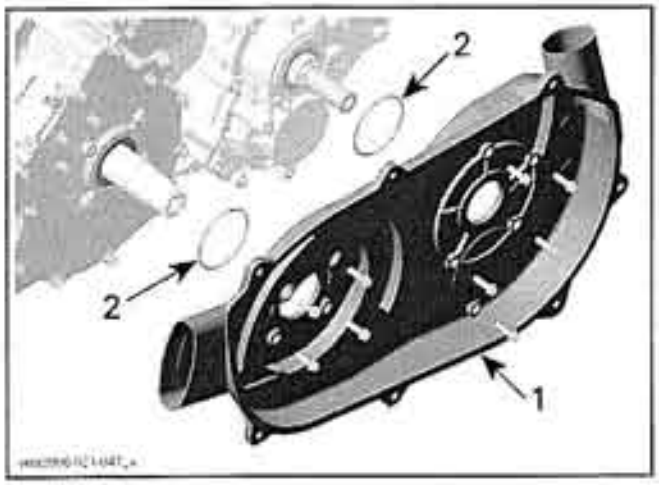
Removal:

Remove
- CVT cover
- drive belt
- drive pulley
- driven pulley
- unscrew the clamps retaining the CVT air hoses
- remove CVT air guide.

Inspection

Clean CVT air guide from contamination

Check O-rings if brittle, hard or damaged. Replace if necessary.



1. CVT air guide
2. O-rings

Installation

For installation reverse the removal procedure.

GEARBOX AND 4X4 COUPLING UNIT

SERVICE TOOLS

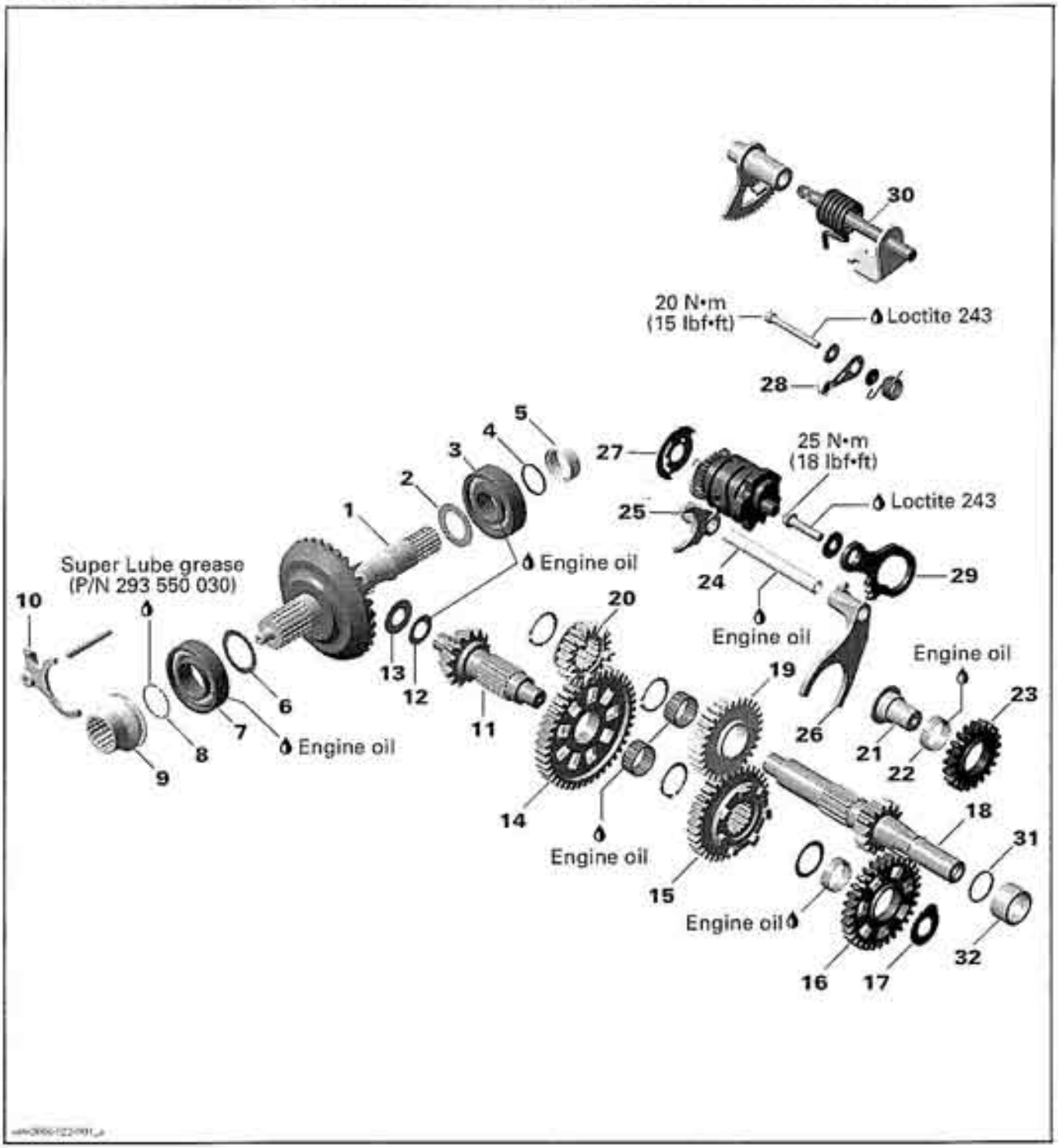
Description	Part Number	Page
backlash measurement tool	529 036 030	302
backlash measurement tool	529 036 030	299
bevel gear needle bearing installer	529 035 763	315
installer handle	420 877 650	297, 315
main shaft needle bearing installer	529 035 762	315
multimeter FLUKE 111	529 035 868	297
oil seal installer	529 035 758	297
oil seal installer	529 036 028	296, 318
oil seal protection sleeve	529 036 029	318

SERVICE PRODUCTS

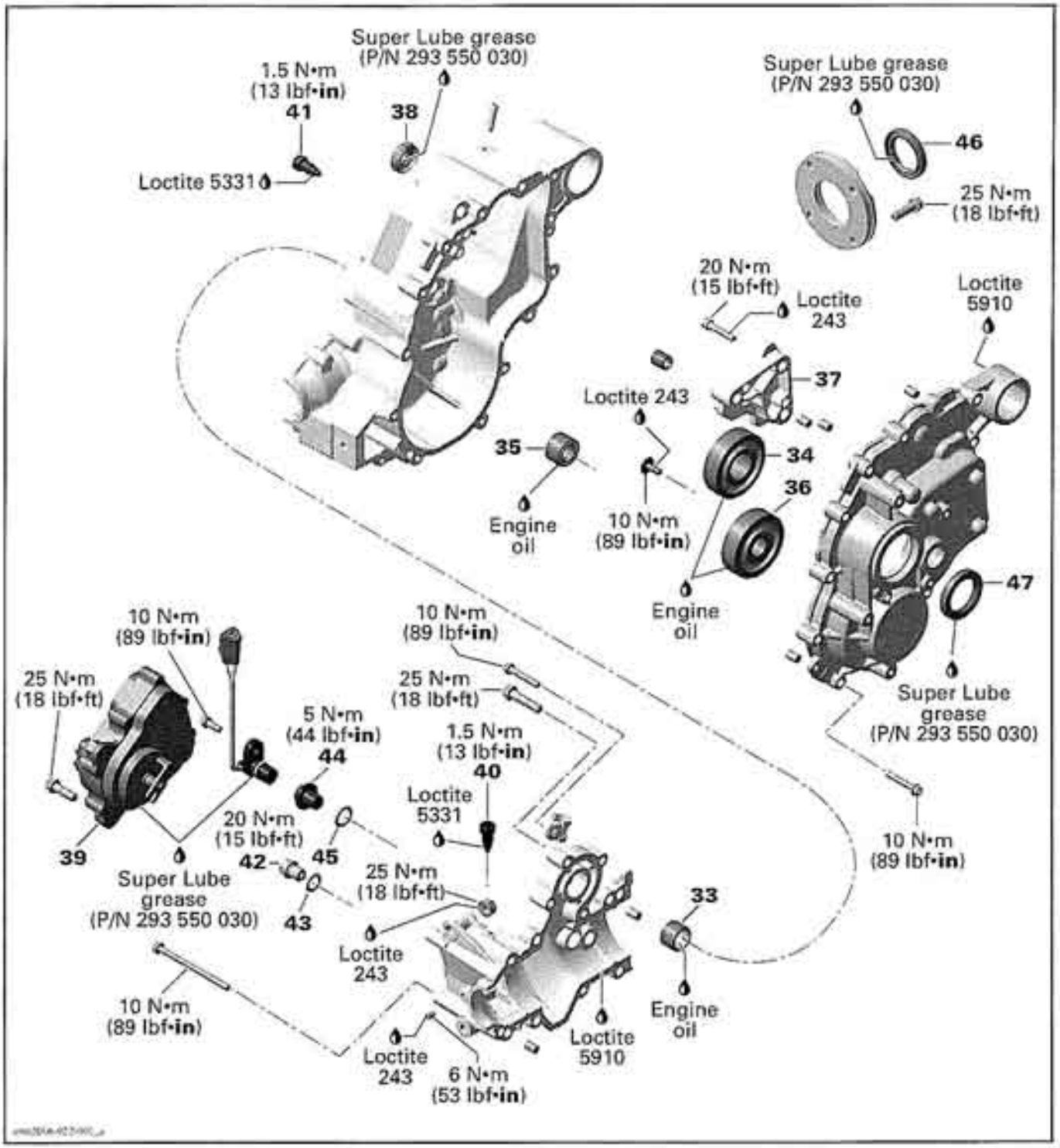
Description	Part Number	Page
Loctite 5910	293 800 081	303-304, 317
Loctite chisel	413 708 500	303, 311, 317
Super Lube grease	293 550 030	298, 304
XP-S chaincase oil	413 801 900	294
XP-S synthetic chaincase oil	413 803 300	294

OUTLANDER 800 SERIES

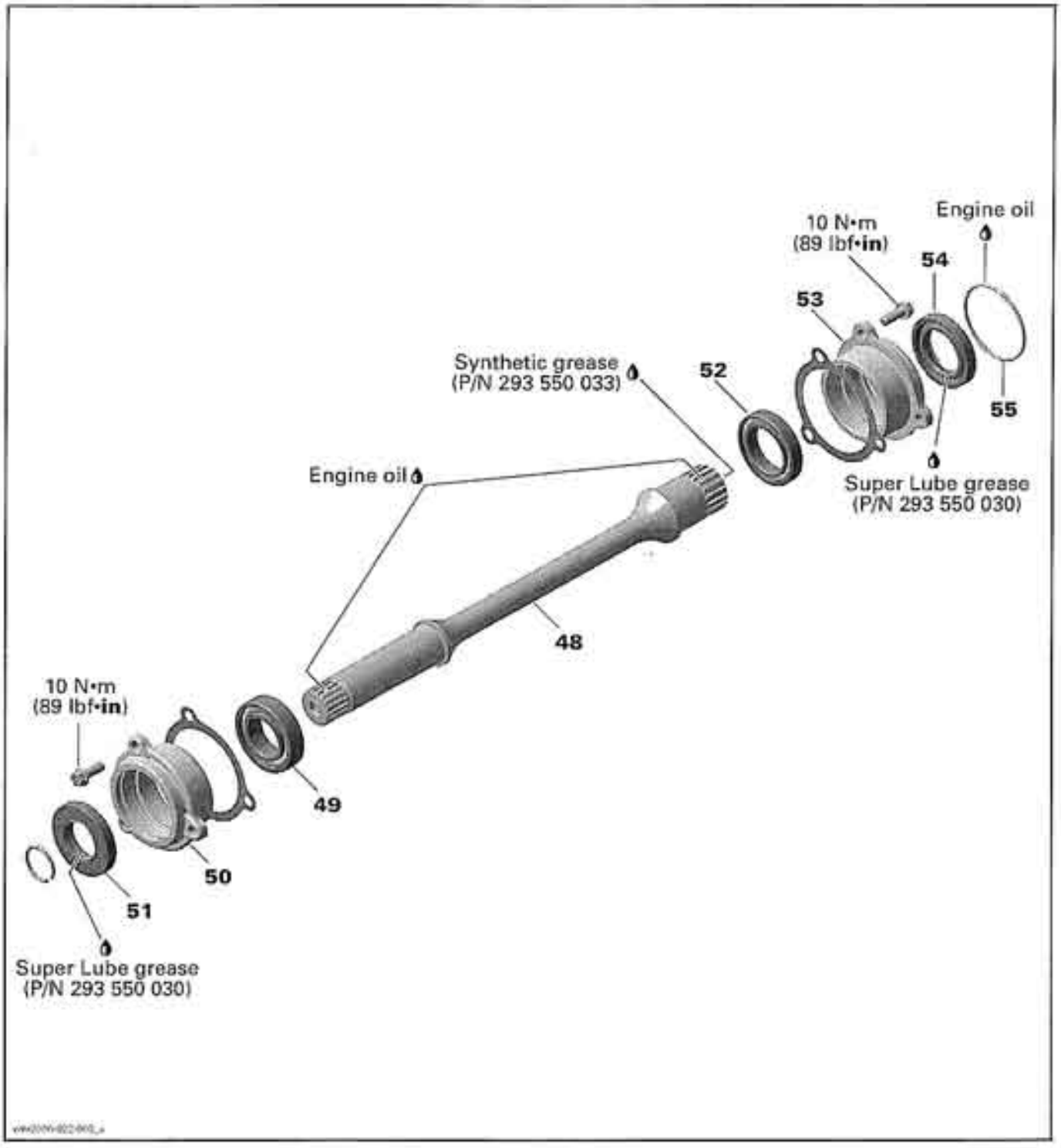
GEARBOX COMPONENTS AND 4X4 COUPLING MECHANISM



GEARBOX HOUSING AND 4X4 ACTUATOR UNIT



ENGINE DRIVE SHAFT



GENERAL

During assembly/installation, use the torque values and service products as in the exploded views.

Clean threads before applying a threadlocker. Refer to *SELF-LOCKING FASTENERS* and *LOCTITE APPLICATION* at the beginning of this manual for complete procedure.

⚠ WARNING

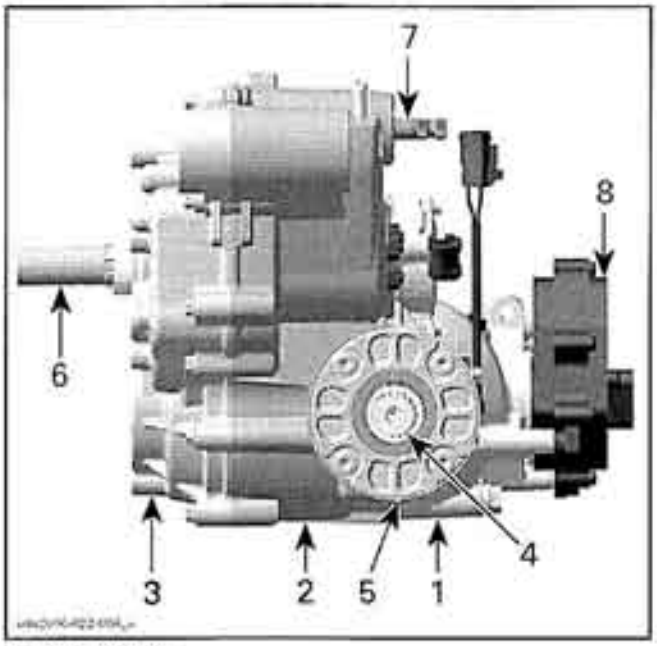
Torque wrench tightening specifications must strictly be adhered to.
Locking devices (e.g.: locking tabs, elastic stop nuts, self-locking fasteners, etc.) must be installed or replaced with new ones where specified. If the efficiency of a locking device is impaired, it must be renewed.

Always drain the gearbox before working on it.

To remove gearbox, the engine removal is necessary. Refer to *REMOVAL AND INSTALLATION*.

Remove drive and driven CVT and CVT air guide, refer to *CVT*.

Overview



1. *Right housing*
2. *Center housing*
3. *Left housing*
4. *Output shaft*
5. *Bearing cover*
6. *Countershaft*
7. *Shift shaft*
8. *Actuator*

MAINTENANCE

OIL CHANGE

Draining Procedure

Prior to change the oil, ensure vehicle is on a level surface.

Oil change should be done with a warm engine.

⚠ WARNING

The gearbox oil can be very hot.

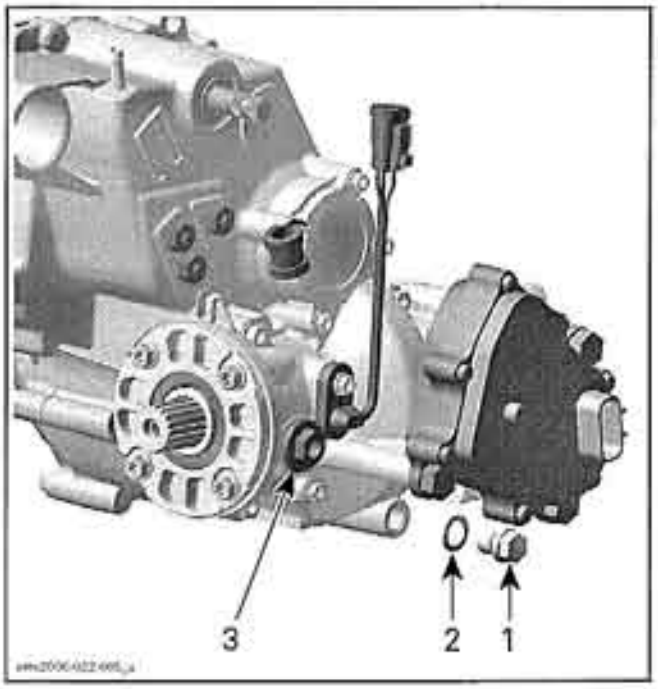
Place a drain pan under the gearbox drain plug area.

Clean drain plug area and remove magnetic drain plug no. 42 with its sealing ring no. 43 to drain gearbox oil.

Remove oil filler screw no. 44 including its O-ring no. 45.

CAUTION: Pay attention not to loose O-ring on drain plug screw.

Wait a while to allow oil flow out of gearbox.



1. *Magnetic dram plug*
2. *Sealing ring*
3. *Oil filler screw*

Dispose gearbox oil as per your local environmental regulations.

Inspection

Oil condition gives information about the teeth condition inside the gearbox. See *TROUBLESHOOTING* section.

Clean the magnetic drain plug from metal shavings and dirt. Presence of debris gives an indication of failure inside the gearbox. Check *GEARBOX* to correct the problem.

Change gasket ring **no. 43** on the magnetic drain plug if damaged.

Replace O-ring **no. 45** if brittle, hard or otherwise damaged.

Filling Procedure

Make sure that magnetic drain plug **no. 42** is reinstalled and tight.

With the vehicle on a level surface, fill the gearbox through the oil filler hole with XP-S chaincase oil (P/N 413 801 900) or XP-S synthetic chaincase oil (P/N 413 803 300) or with an equivalent product (ISO VG 100) until the oil reaches the lower threads of the oil filler hole (around 400 mL (13.5 oz U.S.)).

PROCEDURES

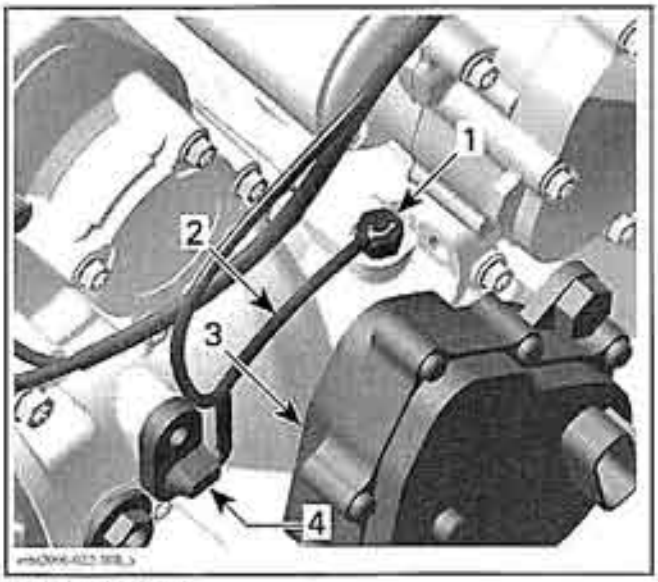
SHIFTING INDICATOR SWITCH

NOTE: The gearbox removal is not necessary to reach the shifting indicator switches.

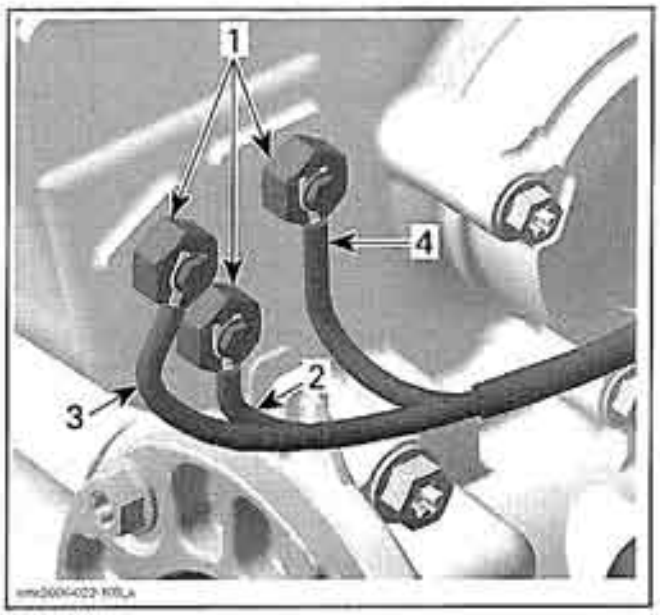
Removal

To reach the shifting indicator switches **no. 41**, remove the rear engine cover.

Remove screw retaining shifting indicator switch wire of the wiring harness.



1. Indicator switch
2. BLACK/YELLOW wire for contact to 2WD
3. Actuator
4. Speed sensor



1. Indicator switches
2. BROWN/GREY wire
3. WHITE/GREY wire
4. ORANGE/GREY wire

Test

Check if shifting indicator switches work properly as per following procedure:

- Put vehicle in park, reverse, neutral, high or low position.
- Use a multimeter to measure the electric passage from specific shifting indicator switch to engine ground.

Indicator switches are in contact as per following table:

	INDICATOR SWITCH		
	BROWN/ GREY	WHITE/ GREY	ORANGE/ GREY
Low	X		X
High			X
Neutral		X	X
Park	X		
Reverse	X	X	

- Shift to 2WD position and measure the electric passage from specific shifting indicator switch (BLACK/YELLOW wire) to engine ground.

If the resistance is infinite (O.L.), replace the shifting indicator switch.

NOTE: Remove the shifting indicator switches one at a time.

If the shifting indicator switch is good, check the vehicle harness and/or indicator lights.

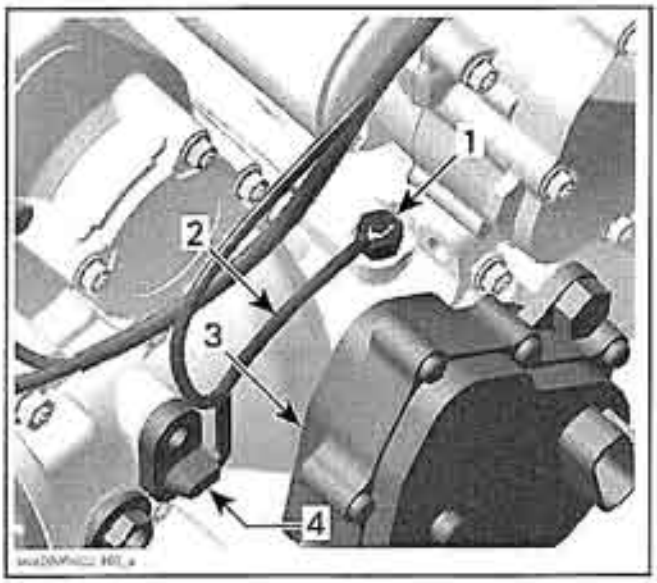
Installation

For installation, reverse the removal procedure. Pay attention to the following details.

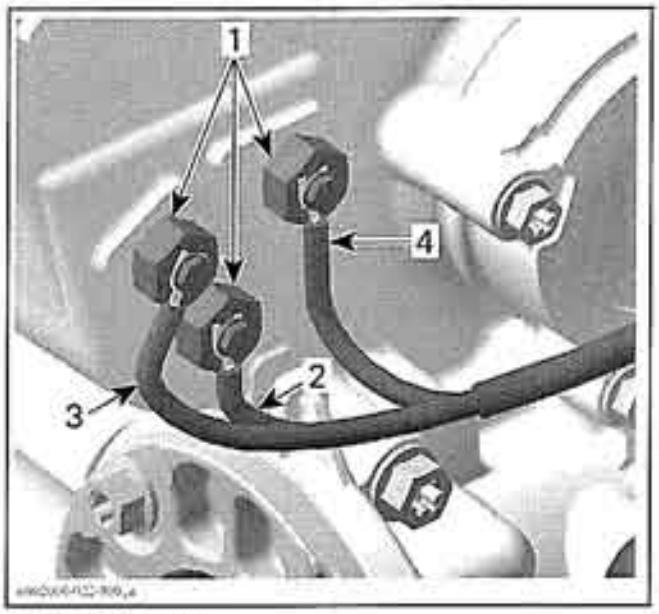
Take care do not damage shifting indicator switches threads during installation.

Apply Loctite 5331 on threads of shifting indicator switches.

If all switches are removed, make sure to put the wires back in the right location.



1. Indicator switch
2. BLACK/YELLOW wire for contact to 2WD
3. Actuator
4. Speed sensor



1. Indicator switches
2. BROWN/GREY wire
3. WHITE/GREY wire
4. ORANGE/GREY wire

OIL SEALS

Removal

Replace oil seals if they are brittle, hard or damaged.

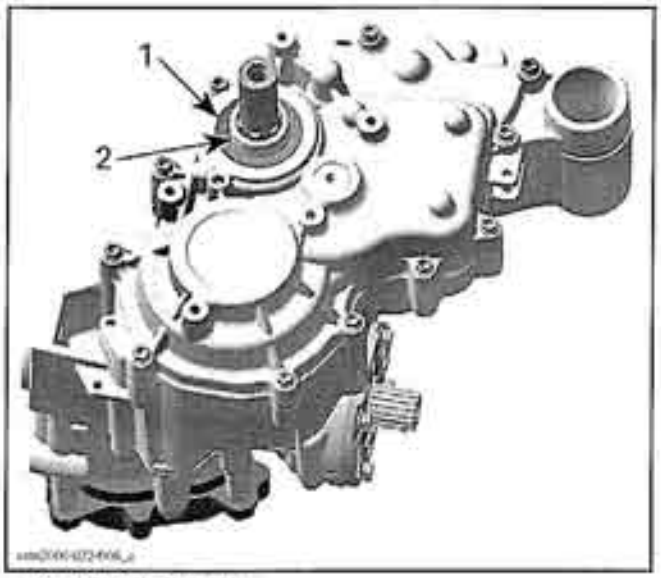
A small flat screwdriver can be used to remove most of these oil seals.

CAUTION: Avoid scoring housings, bearing cover, shift shaft, distance sleeve of countershaft or output shaft during oil seal removal.

Countershaft Oil Seal

The countershaft oil seal **no. 47** can be removed without removing gearbox from vehicle. Remove drive and driven pulley and CVT air guide.

NOTE: When oil seal is removed also inspect O-ring **no. 31**.



1. Countershaft oil seal
2. Distance sleeve

Shift Shaft Oil Seal

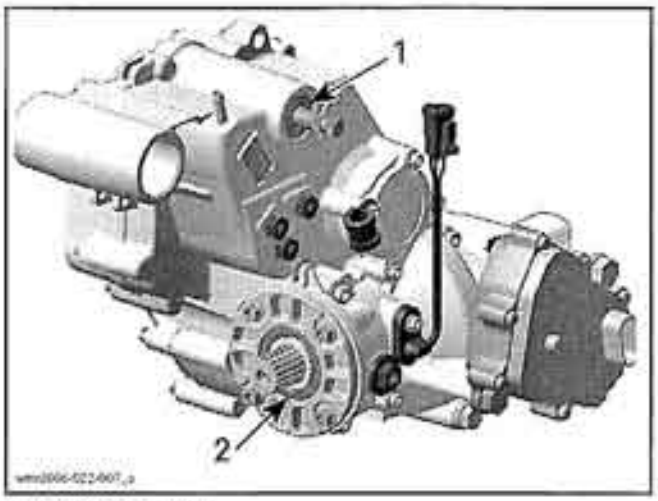
The shift shaft oil seal no. 38 can be removed without removing the gearbox from the vehicle.

Remove side panel and the shifting plate from shift shaft to reach the oil seal.

Output Shaft Oil Seal

Removal of output shaft oil seal no. 46 requires that the rear propeller shaft is separated from the output shaft (refer to *DRIVE TRAIN* section). The removal of the gearbox or bearing cover is not necessary.

NOTE: When oil seal is removed also inspect O-ring no. 4.



1. Shift shaft oil seal
2. Output shaft oil seal

Engine Drive Shaft Oil Seal

To remove the front oil seal no. 51, no need to remove the engine. Lift the front of vehicle to avoid engine oil spillage. Separate the front propeller shaft from engine (refer to *FRONT DRIVE*).

For the rear oil seal no. 54, the gearbox removal is necessary.

Inspection

Check bearings behind each oil seal for contamination and/or metal shavings.

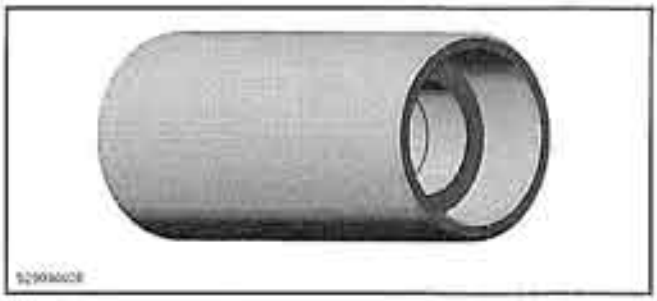
Check oil seal running surfaces for scratches. Replace if necessary (see *GEARBOX* below).

Check if the countershaft O-ring no. 31 and the output shaft O-ring no. 4 are brittle, hard or damaged. Replace if necessary.

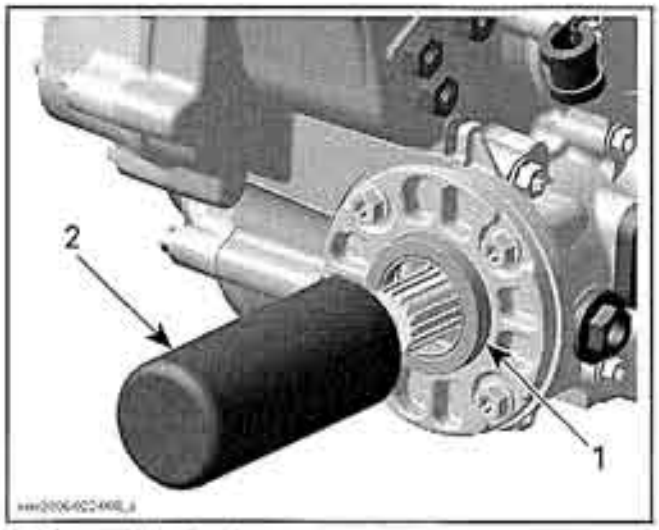
Installation

The installation is the reverse of removal procedure. Pay attention to the following details.

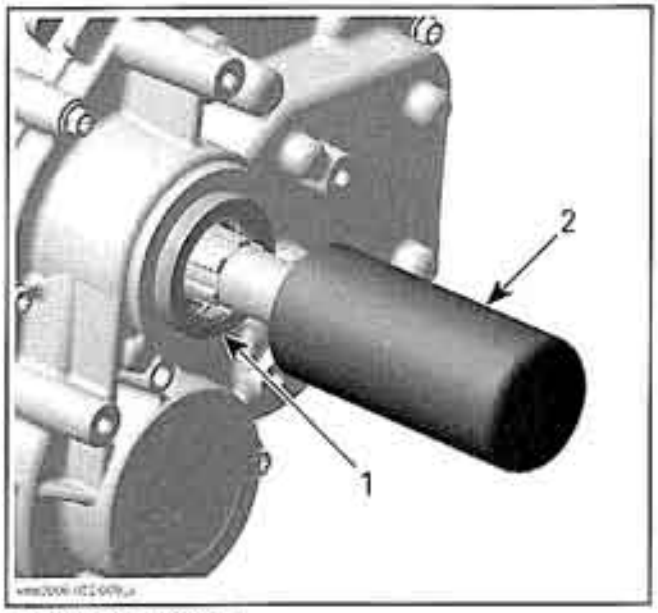
Install output shaft oil seal and countershaft oil seal with the oil seal installer (P/N 529 036 028).



OIL SEAL INSTALLER

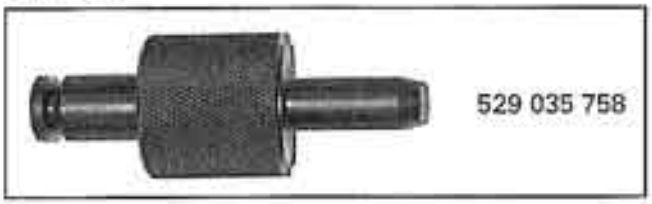


1. Output shaft oil seal
2. Oil seal installer



1. Countershaft oil seal
2. Oil seal installer

Install shift shaft oil seal with oil seal installer (P/N 529 035 758) and installer handle (P/N 420 877 650).



CAUTION: Oil seal must be installed with sealing lip toward gearbox.

ACTUATOR

Test

Remove the rear engine cover.

Unplug actuator connector.

Using the multimeter FLUKE 111 (P/N 529 035 868), check if the 2WD/4WD switch works properly.

- Turn ignition key ON.
- Select 2WD position, install the RED probe to the WHITE wire connector and the BLACK probe to the WHITE/BLACK wire connector. The obtained value should be 12 Vdc.
- Select 4WD position, install the RED probe to the WHITE/BLUE wire connector and the BLACK probe to the WHITE wire connector. The obtained value should be 12 Vdc.

If the selector is out of specifications, check wires, connectors and replace the selector if necessary.

If the selector is good, check the vehicle harness.

If the vehicle harness is good, replace the actuator no. 39.

Removal

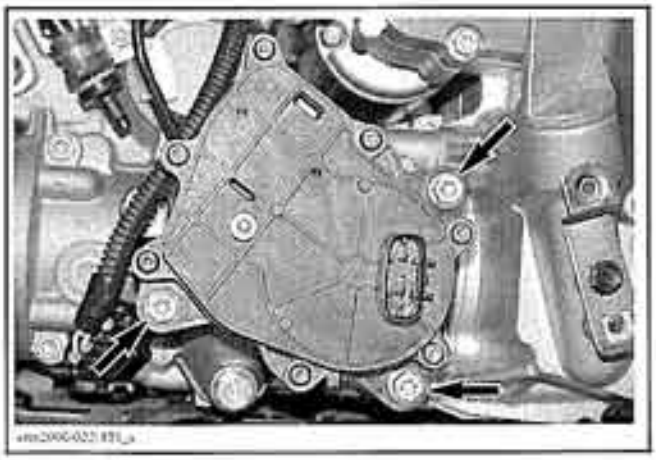
NOTE: Before beginning any servicing on the actuator, make sure the vehicle is in 4WD position. No need to remove engine from vehicle.

Remove the RH footrest and the rear engine cover. Refer to *BODY*

Unplug actuator connector.

Place a drain pan under actuator.

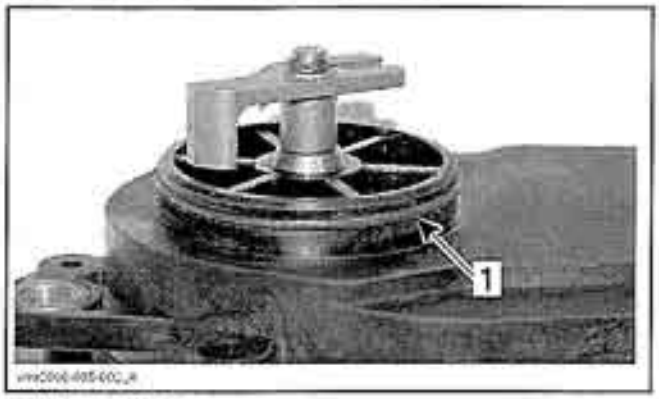
Unscrew actuator bolts.



When all actuator bolts are removed, pull the actuator out of housing.

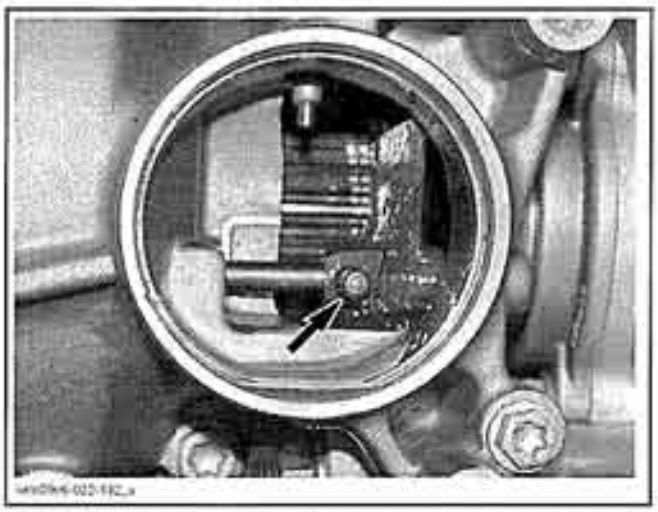
Installation

Apply a small amount of Super Lube grease (P/N 293 550 030) on actuator O-ring.

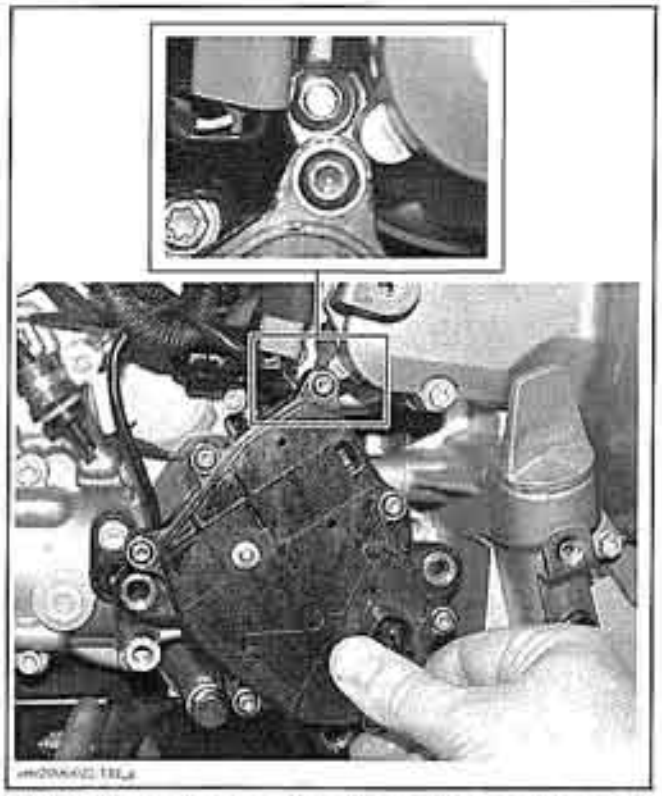


1. Actuator O-ring

Verify if shifting fork no. 10 is in 4WD position. The shifting fork should be positioned toward the front of vehicle.



Align the actuator fork with the dog on shifting fork no. 10 then push the actuator in the housing. See the following illustration to position the actuator correctly.



Rotate the actuator counterclockwise until it orients itself to mounting position.

CAUTION: Do not cut or break the actuator O-ring.

Install all actuator bolts then torque them to 25 N•m (18 lbf•**in**).

Connect actuator.

Lift the front of vehicle.

Turn front wheels. The front propeller shaft should not turn (the PARK position must be selected).

If the front propeller shaft turns, the actuator is not installed correctly. Remove actuator and reinstall it.

Place ignition switch to ON position and select the 2WD position.

Turn front wheel again. The front propeller shaft. The shaft should turn easily.

If the front propeller shaft does not turn, the actuator is not installed correctly. Remove actuator and reinstall it.

Install all other removed parts.

OUTPUT SHAFT AND COUPLING MECHANISM

Remove gearbox. Refer to *GEARBOX* further in this section.

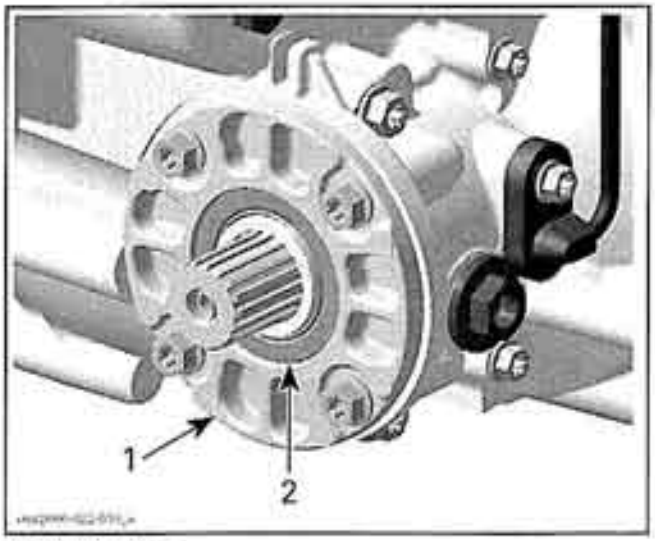
Before removing the right housing and output shaft no. 1 measure the backlash on output shaft. This measure will indicate if output shaft adjustment is necessary.

Backlash Procedure

Engage PARK position on the gear shaft to block gearbox.

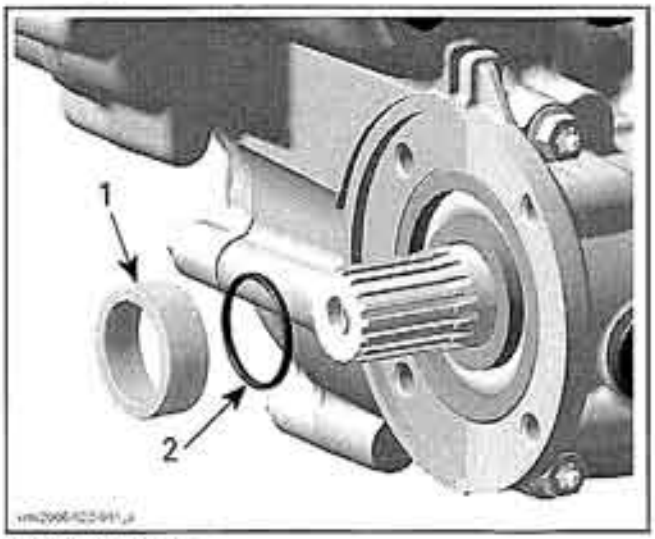
Remove:

- bearing cover with oil seal



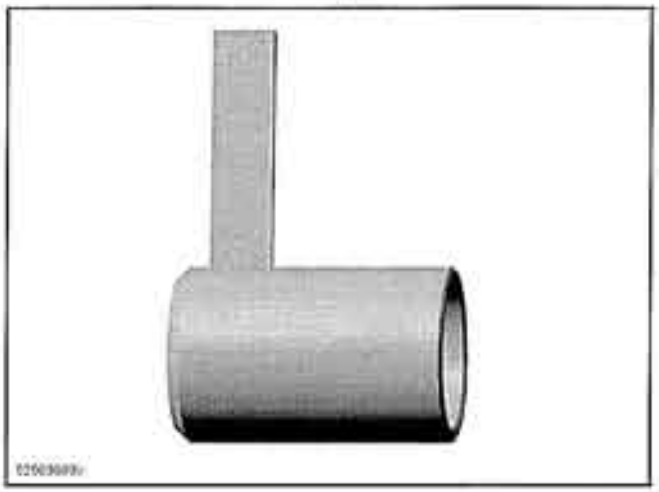
1. Bearing cover
2. Oil seal

- distance sleeve
- O-ring.

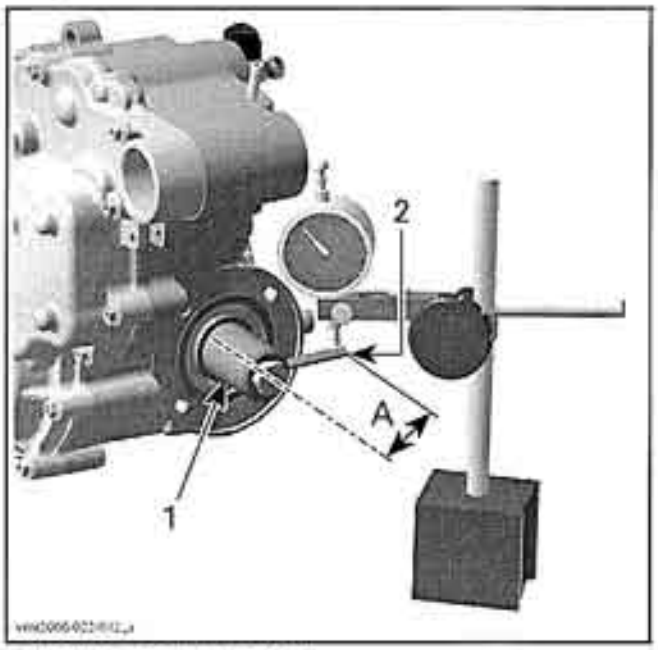


1. Distance sleeve
2. O-ring

Install the backlash measurement tool (P/N 529 036 030) at the end of output shaft.



From center of tool bolt, measure 47 mm (1.85 in) and place a mark on the tab.



1. Backlash measurement tool
2. Mark on tab
A. 47 mm (1.85 in)

Position the head of the dial indicator, against the tab at a 90° angle and on the line. Then, gently rotate the output shaft.

This reading gives the backlash measurement. Refer to the following table for backlash specifications.

OUTPUT SHAFT BACKLASH	
NEW	0.10 to 0.20 mm (.0039 to .0079 in)
SERVICE LIMIT	0.25 mm (.0098 in)

If the backlash is out of the specifications, perform an output shaft adjustment.

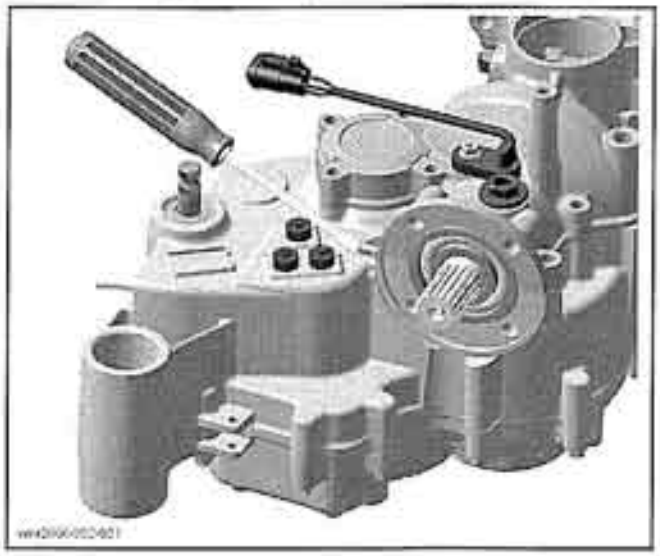
Removal

Remove actuator **no. 39**.

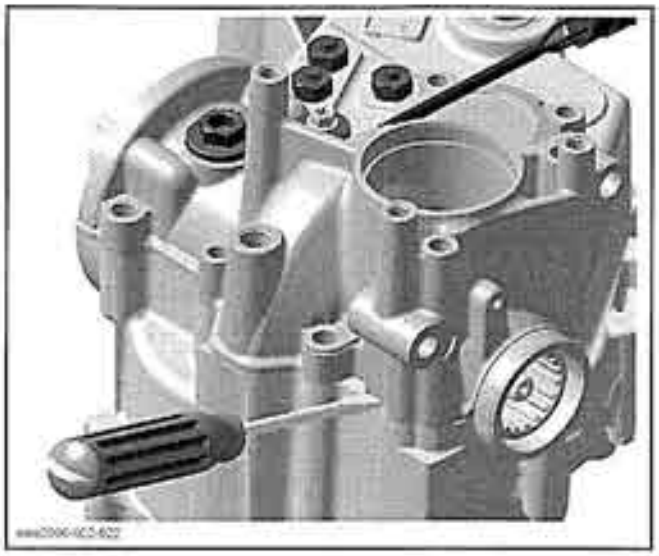
Remove the bearing cover with oil seal.

Unscrew all bolts retaining the right housing to the center housing.

To remove right housing, use 2 big screwdrivers.



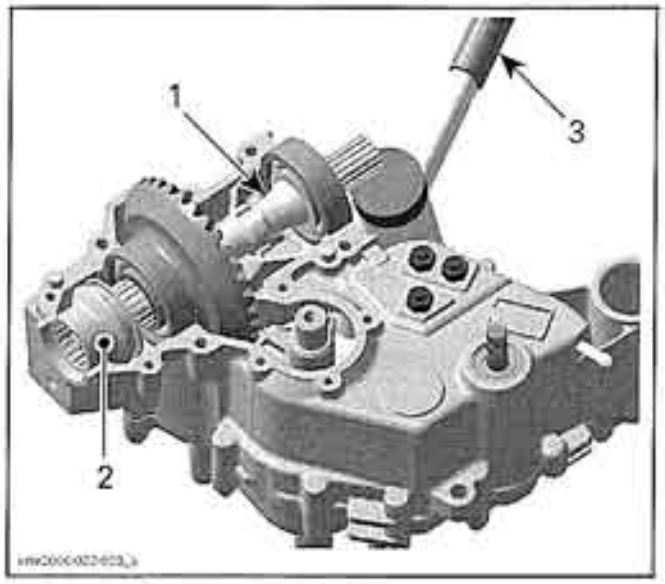
POSITION FOR BIG FLAT SCREWDRIVER



POSITION FOR BIG FLAT SCREWDRIVER

Remove output shaft.

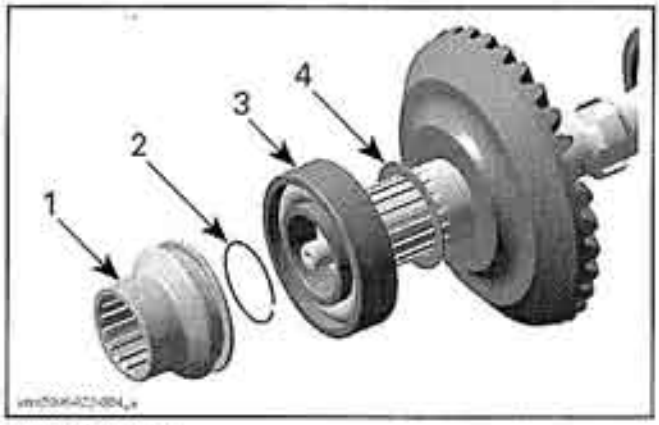
CAUTION: Use a soft hammer to remove output shaft from center housing.



1. Output shaft
2. Shifting sleeve
3. Soft hammer

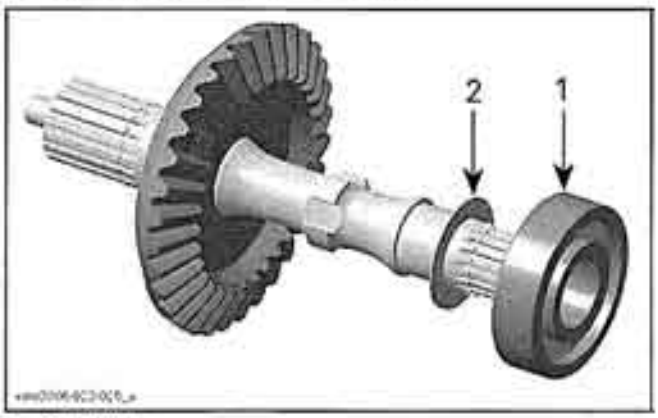
Continue removal procedure by removing:

– shifting sleeve, O-ring, ball bearing and shim.



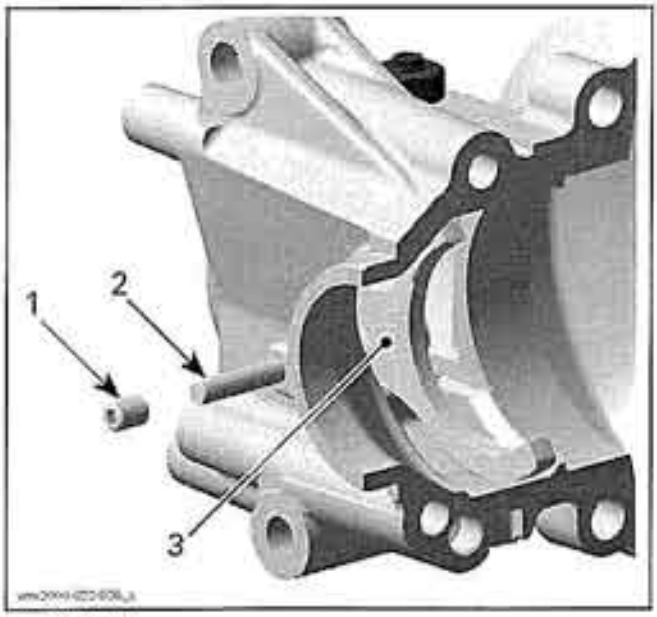
1. Shifting sleeve
2. O-ring
3. Ball bearing
4. Shim

– ball bearing and thrust washer



1. Ball bearing
2. Thrust washer

– set screw, pin and shifting fork.



1. Set screw
2. Pin
3. Shifting fork

Inspection

Check output shaft no. 1 and its gear for cracks, bend, pitting or other visible damages.

Check output shaft splines for wear or other damages.

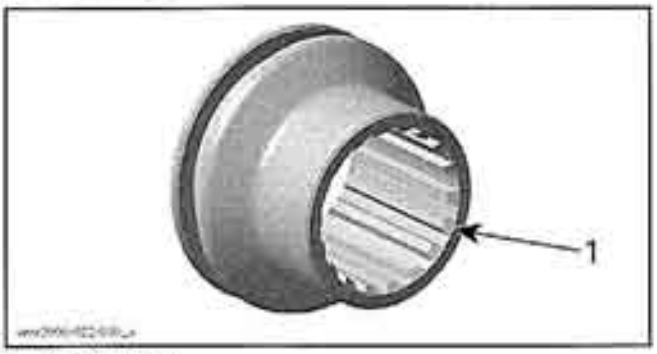
CAUTION: Always replace output shaft and bevel gear shaft at the same time. Proceed also with the *BEVEL GEAR ADJUSTMENT*.

Check if the output shaft bearings no. 3 and no. 7 turn freely and smoothly. Replace if necessary.

Replace oil seal no. 46 if brittle, hard or damaged.

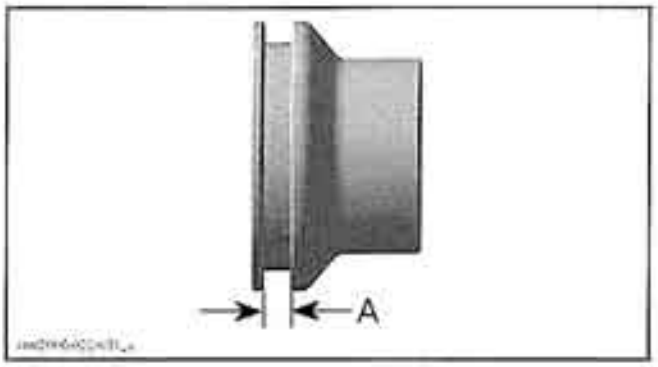
Replace O-rings no. 4 and no. 8 if brittle, hard or damaged.

Check splines of coupling sleeve no. 9 for wear or other damages.



1. Inspect splines

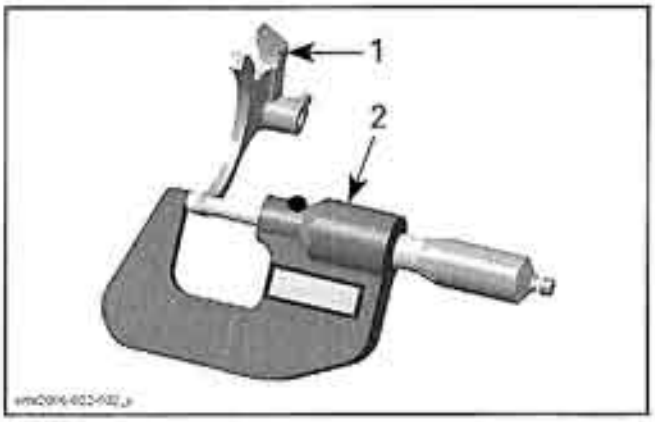
Measure the shifting sleeve groove width.



A. Groove width

SHIFTING SLEEVE GROOVE WIDTH	
NEW	5.25 to 5.35 mm (.207 to .211 in)
SERVICE LIMIT	5.50 mm (.217 in)

Check shifting fork claw thickness.



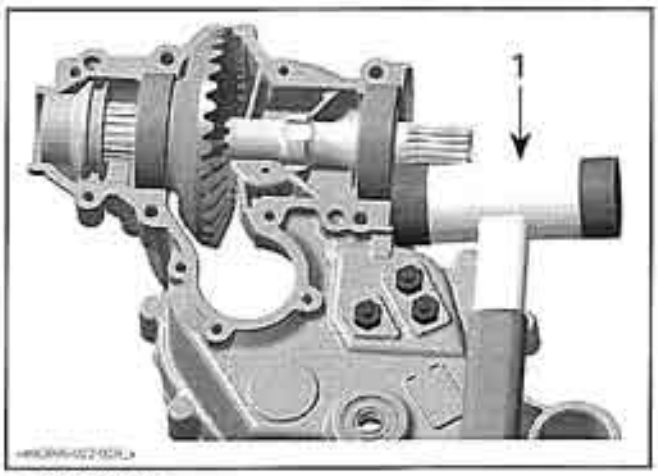
1. Shifting fork
2. Micrometer

SHIFTING FORK CLAW THICKNESS	
NEW	4.95 to 5.05 mm (.195 to .199 in)
SERVICE LIMIT	4.80 mm (.189 in)

Clean housing split surface and especially the bearing areas from metal particles or other contamination.

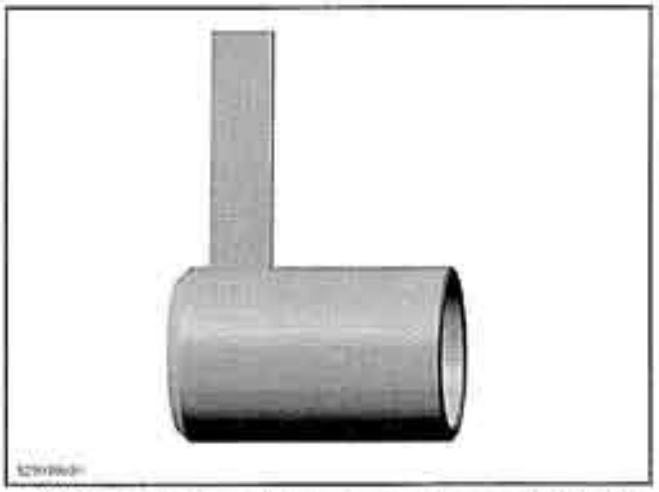
Installation

- Install shim no. 6, bearing no. 7, O-ring no. 8 and shifting sleeve no. 9 onto the output shaft
- Install thrust washer no. 2 and ball bearing no. 3. O-ring no. 4 and distance sleeve no. 5 are not installed at this time.
- Place the output shaft into the center housing.
- Use soft hammer to put bearing exactly in place against center housing.



1. Soft hammer

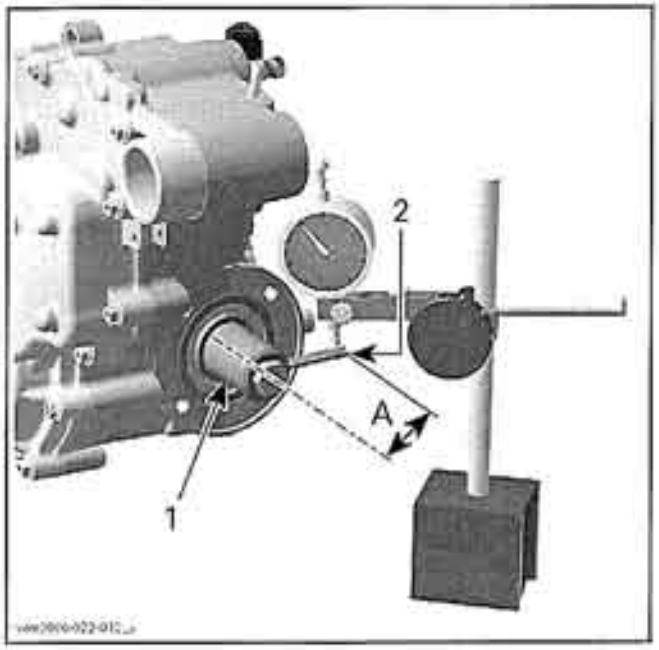
- Clean the bearing cover location then attach bearing cover with oil seal to the housing.
- Install the backlash measurement tool (P/N 529 036 030).



- Temporarily install the right housing with the four (4) M8 TORX screws beside bearing seats.

NOTE: Prior to tightening the TORX screws, tap on the gear end of output shaft with a soft hammer to take up all gear free play.

- Position the head of dial indicator against the tab at a 90° angle and on the line. Then, gently rotate the output shaft.



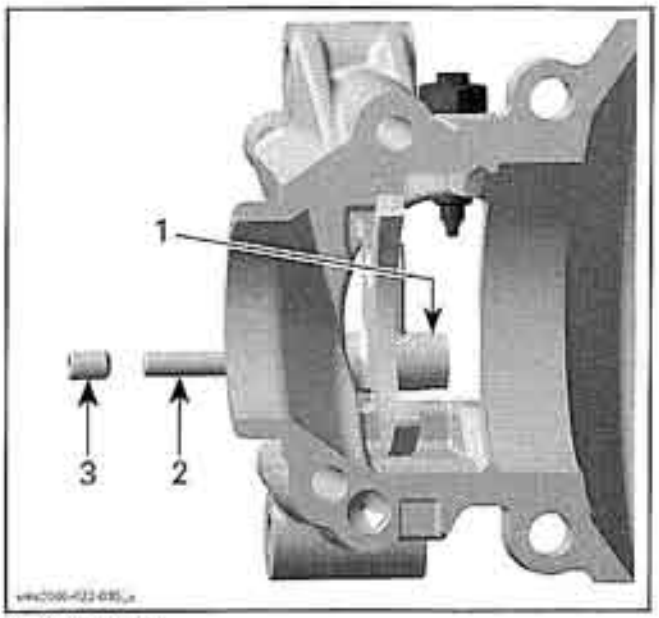
1. Backlash measurement tool
2. Mark on tab
A. 47 mm (1.85 in)

If backlash is not within the specification, remove the output shaft and select the next larger or smaller shim previously selected to "fine tune" the clearance to get closer to the specifications.

NOTE: Use next larger shim to increase backlash and next smaller shim to reduce backlash.

If backlash is within specifications, remove dial indicator, backlash measuring tool, bearing cover and right housing.

NOTE: Install shifting fork, pin and set screw in right housing before applying sealant to the mating surface.



1. *Shifting fork*
2. *Pin*
3. *Set screw*

Clean all metal components in a solvent.

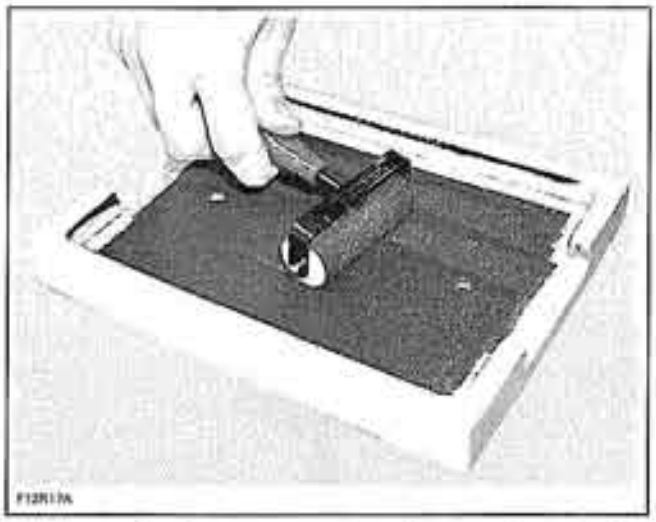
Housing mating surfaces are best cleaned using a combination of Loctite chisel (P/N 413 708 500) and a brass brush. Brush a first pass in one direction then make the final brushing perpendicularly (90°) to the first pass cross (hatch).

CAUTION: Do not wipe with rags. Use a new clean hand towel only.

IMPORTANT: When beginning the application of sealant, the assembly and the first torquing should be done within 10 minutes. It is suggested to have all you need on hand to save time.

Use Loctite 5910 (P/N 293 800 081) on mating surfaces.

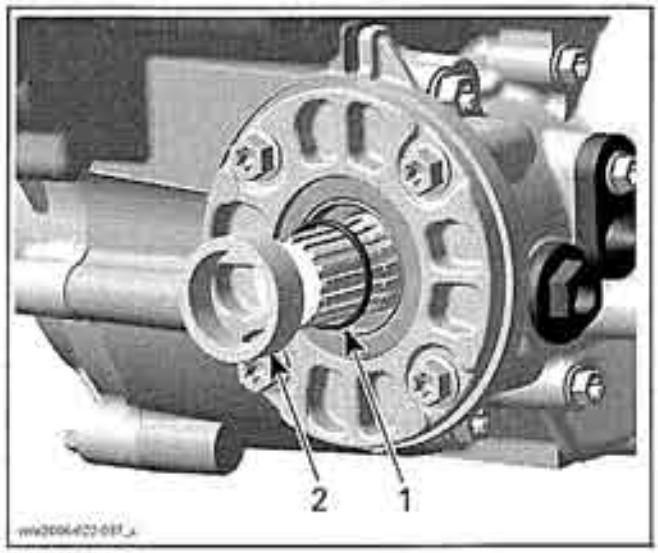
Use a plexiglass plate and apply some sealant on it. Use a soft rubber roller (50 - 75 mm (2 - 3 in)), available in arts products suppliers for printing, and roll the sealant to get a thin uniform coat on the plate (spread as necessary). When ready, apply the sealant on housing mating surfaces.



Do not apply in excess as it will spread out inside housings.

NOTE: It is recommended to apply this specific sealant as described here to get a uniform application without lumps. If you do not use the roller method, you may use your finger to uniformly distribute the sealant (using a finger will not affect the adhesion).

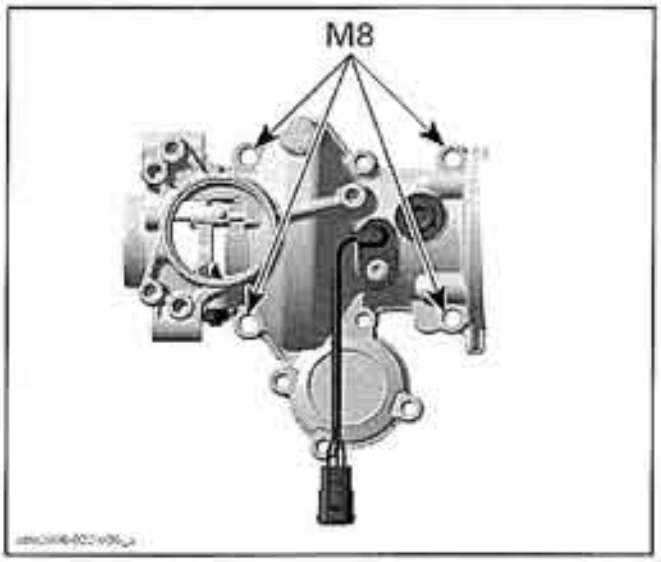
Install all other screws on right housing then the O-ring no. 4 and the distance sleeve no. 5 on end of output shaft. Chamfered bore of distance sleeve has to face the engine.



1. *O-ring*
2. *Distance sleeve*

NOTE: To install the right housing align the shifting fork no. 10 with the groove in the shifting sleeve no. 9.

First, torque the four (4) M8 Torx screws in a criss-cross sequence by hand then retighten to 25 N•m (18 lbf•ft).



Tighten all M6 Torx screws to 10 N•m (89 lbf•**in**)

Before installing bearing cover, apply Loctite 5910 (P/N 293 800 081) on the housing and Super Lube grease (P/N 293 550 030) on seal.

Install the actuator, refer to *ACTUATOR*.

Once this is done, complete final assembly.

GEARBOX

Removal

Remove engine from vehicle and place it on footrest support. Refer to *REMOVAL AND INSTALLATION* for the procedure.

Drain gearbox. Refer to *OIL CHANGE* in *MAINTENANCE* of this section for the procedure.

Unscrew the three (3) nuts that attach the gearbox to the engine.

Pull gearbox to separate it from engine.

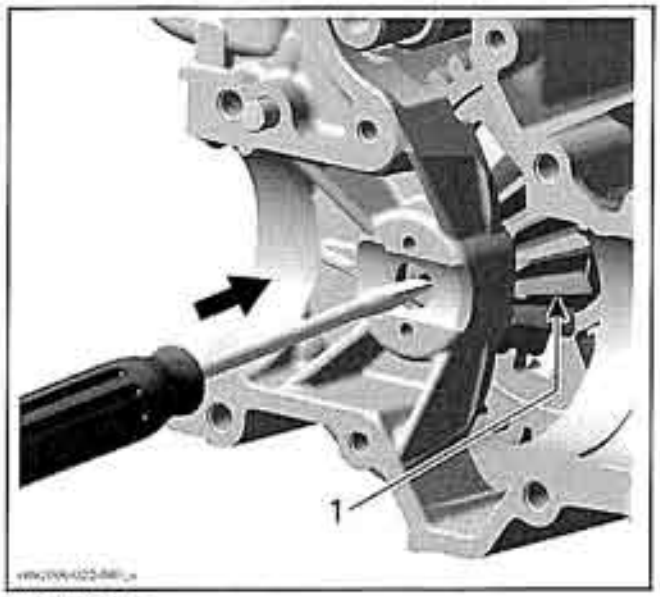
Disassembly

NOTE: During gearbox disassembly, inspect the condition of each part closely.

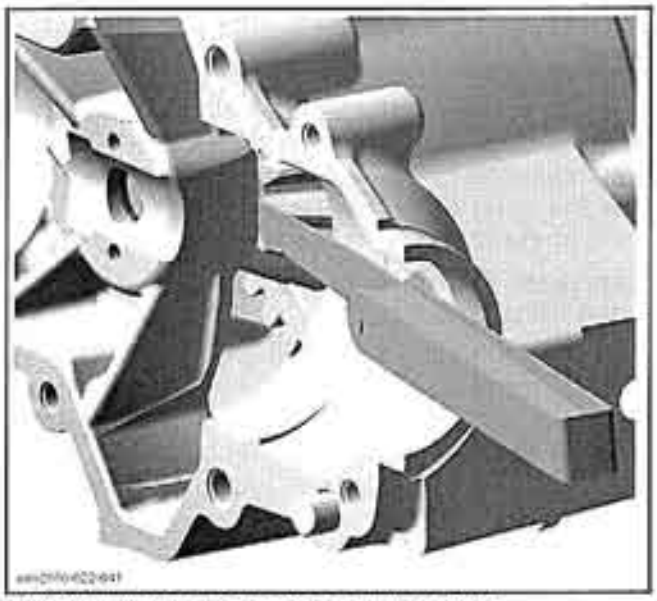
Remove the output shaft. Refer to *OUTPUT SHAFT AND COUPLING MECHANISM* in this section.

Push bevel gear no. 11 with a pin slightly down and measure the axial clearance of bevel gear with a feeler gauge.

NOTE: Bevel gear axial clearance must be measured before center and left housings separation.



1. Bevel gear



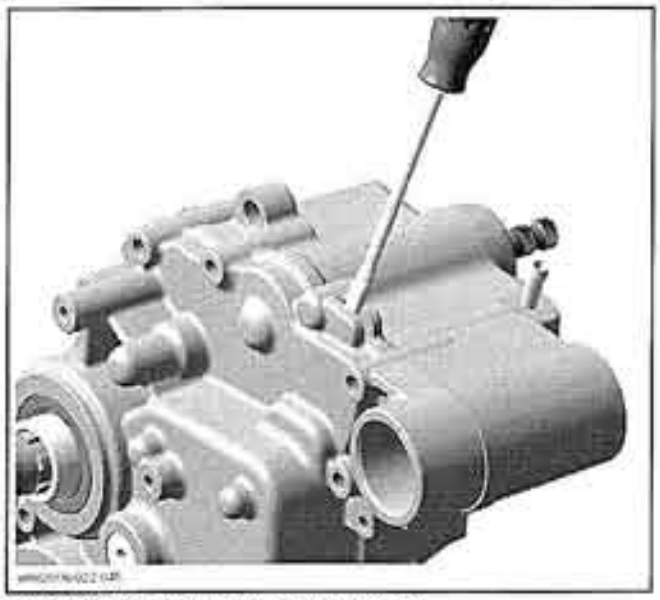
MEASURE AXIAL CLEARANCE OF BEVEL GEAR

BEVEL GEAR AXIAL CLEARANCE	
NEW	0.02 to 0.15 mm (.00079 to .0059 in)
SERVICE LIMIT	0.19 mm (.0075 in)

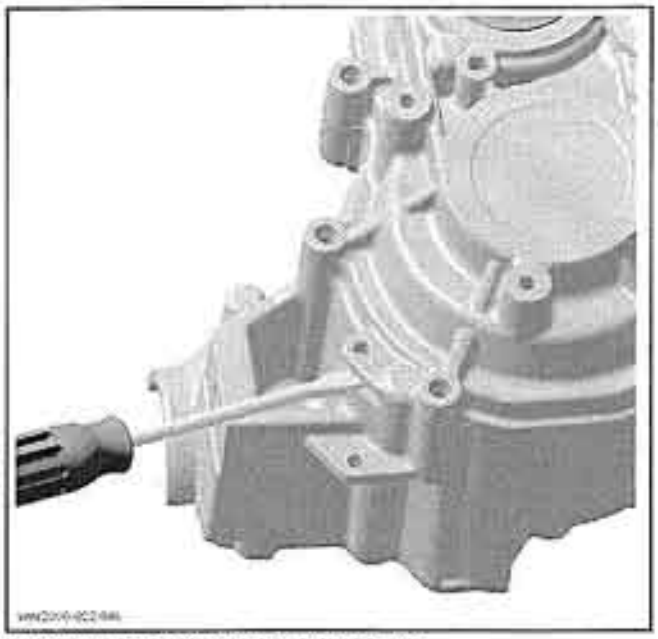
Unscrew the left housing screws.

Place the left housing on a wood stand, center housing pointing upwards.

Using 2 big flat screwdrivers, lift the center housing.



POSITION FOR BIG FLAT SCREWDRIVER

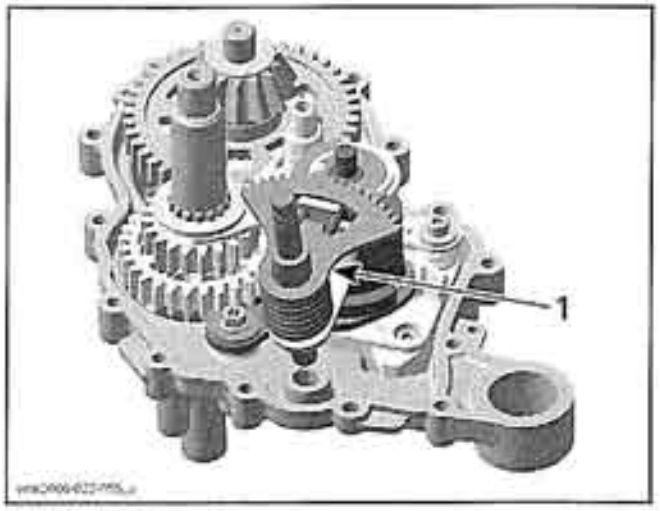


POSITION FOR BIG FLAT SCREWDRIVER

Remove center housing completely.

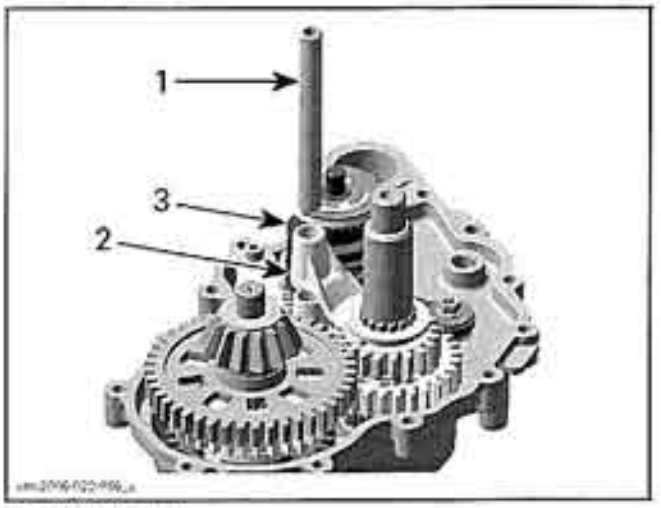
Remove:

- shift shaft assembly



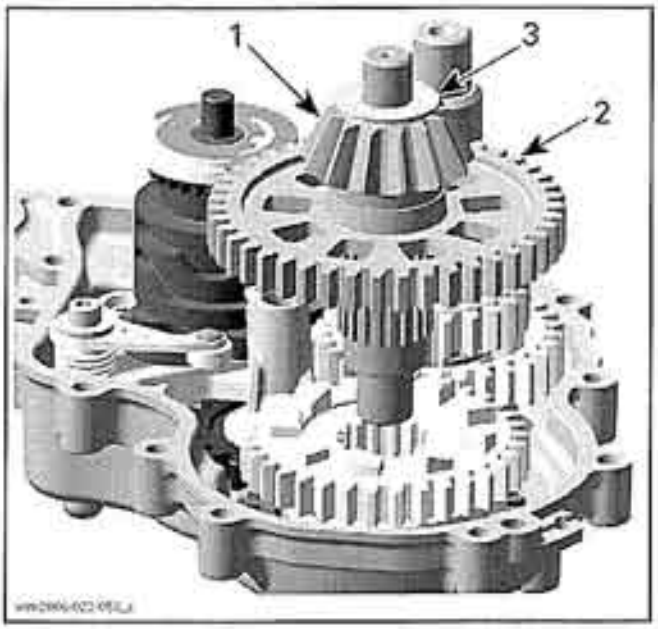
1. Shift shaft assembly

- shift fork shaft
- disengage shift fork from shift drum



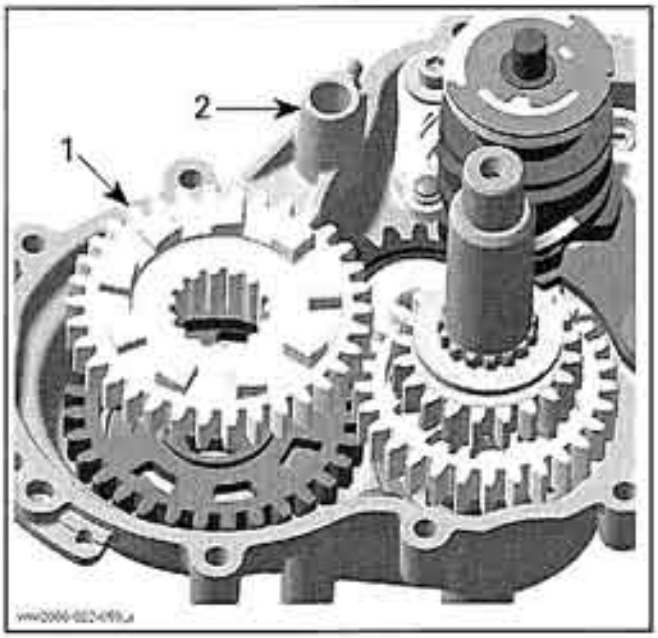
1. Shift fork shaft
2. Shift fork
3. Shift drum

- bevel gear shaft with low range gear assembly and thrust washer



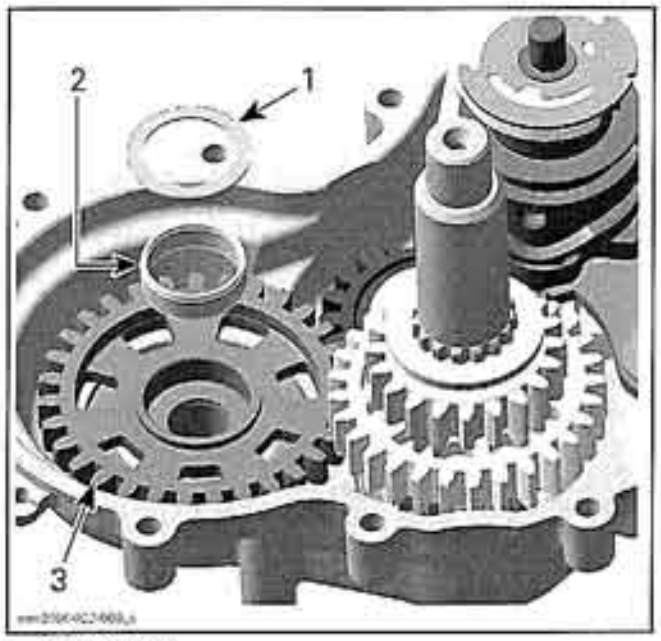
1. *Bevel gear*
2. *Low range gear*
3. *Thrust washer*

– sliding gear with shift fork



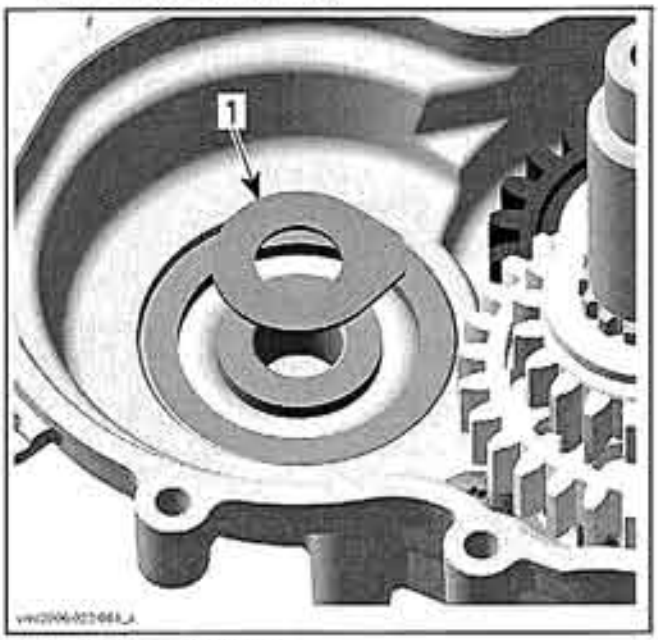
1. *Sliding gear*
2. *Shift fork*

– thrust washer, needle bearing and reverse gear



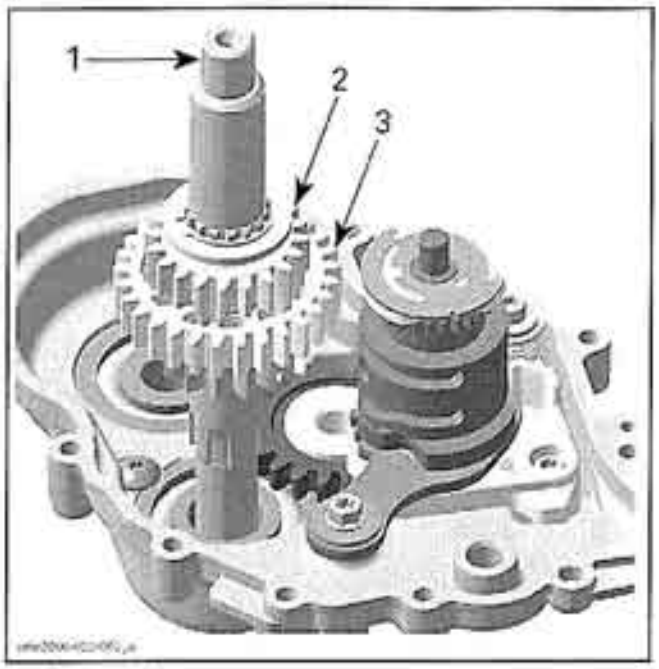
1. *Thrust washer*
2. *Needle bearing*
3. *Reverse gear*

– thrust washer CVT side



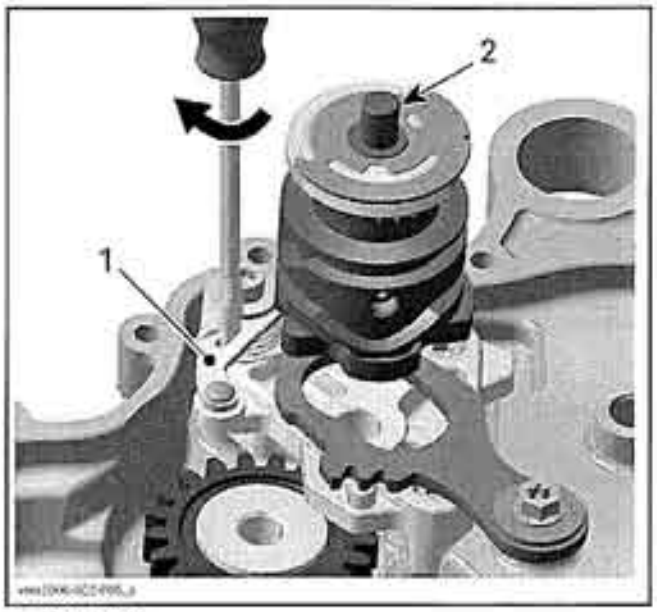
1. *Thrust washer CVT side*

– countershaft no. 18 with low range gear and high range gear assembly.



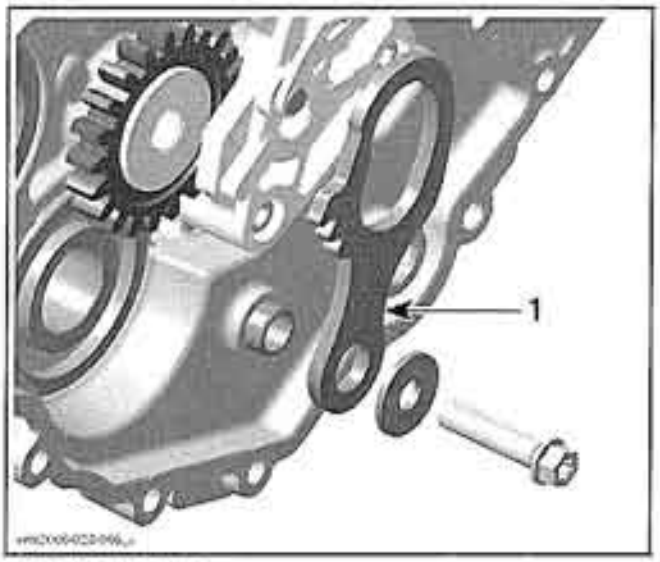
1. *Countershaft*
2. *Low range gear*
3. *High range gear*

Insert a flat screwdriver in the slot of index lever. Turn screwdriver clockwise and remove shift drum.



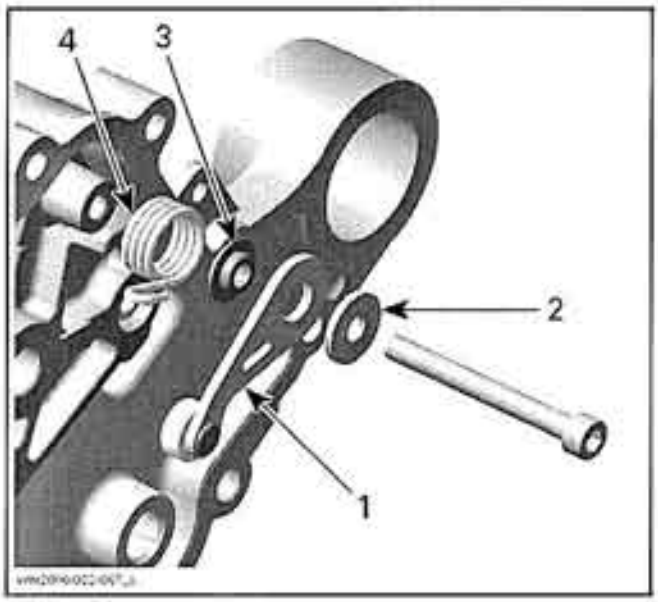
1. *Index lever*
2. *Shift drum*

Continue by removing the following:
- parking lock lever



1. *Parking lock lever*

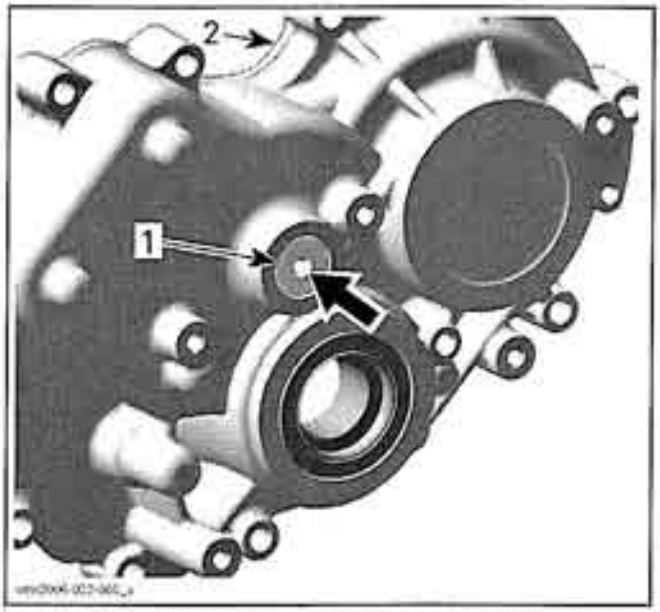
- index lever with washer, step ring and spring



1. *Index lever*
2. *Washer*
3. *Step ring*
4. *Index spring*

- support flange no. 37.

To remove intermediate gear no. 23 and needle bearing no. 22, use a press bench to push out the intermediate gear shaft no. 21.



PRESS SHAFT IN THE DIRECTION AS SHOWN BY THE ARROW
1. *Intermediate gear shaft*
2. *Left housing*

Bearing Removal in Housing

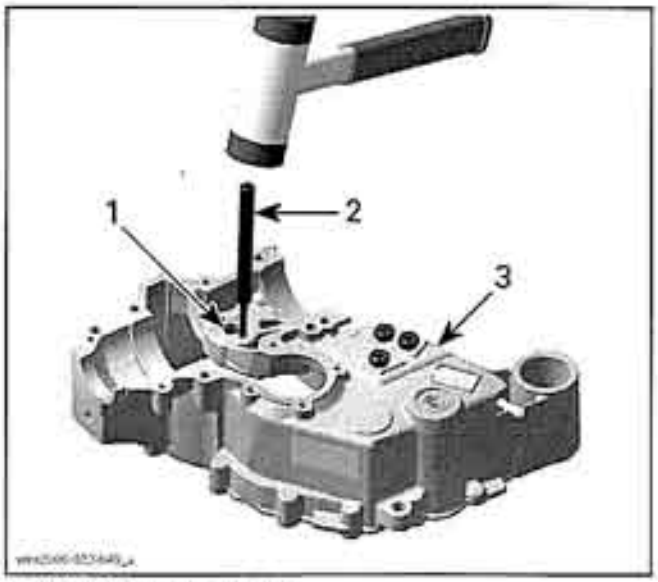
If necessary heat housing up to 100°C (212°F) before removing ball bearings or needle bearings.

⚠ WARNING

Clean oil, outside and inside, from housing before heating.

CAUTION: Always support gearbox housings properly when ball bearings or needle bearings are removed. Housing damages may occur if this procedure is not performed correctly.

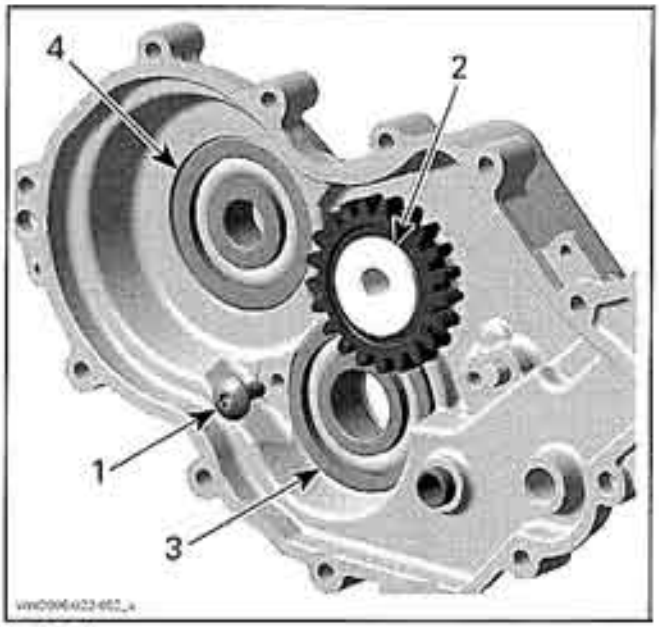
To remove bevel gear needle bearing use a punch.



1. *Bevel gear needle bearing*
2. *Punch*
3. *Center housing*

To remove ball bearings of bevel gear no. 36 and needle bearing of countershaft no. 33, use a blind hole bearing puller.

For countershaft ball bearing , remove screw and intermediate gear shaft, then push with a suitable puller from outside in.



1. *Screw*
2. *Intermediate gear shaft*
3. *Ball bearing counter shaft*
4. *Bevel gear ball bearing*

Inspection

Always verify for the following when inspecting gearbox components:

- gear teeth damage
- worn or scoured bearing surfaces
- worn or scoured shift fork
- worn or scoured shift fork shaft
- rounded engagement dogs and slots
- bent shift forks
- bent shift fork shaft
- worn shift fork engagement pins
- worn tracks on shift drum
- worn shift fork engagement groove
- worn splines on shafts and gears.

Bearings

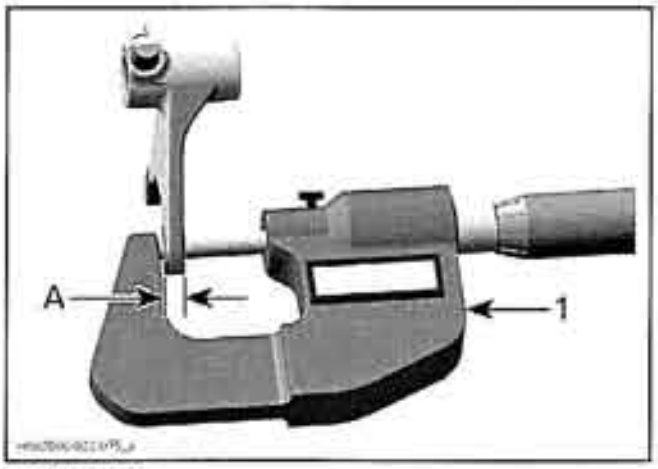
Check if bearings no. 34 and no. 36 as well as needle bearings no. 33 and no. 35 turn freely and smoothly.

Check all bearings, bearing points, tooth flanks, taper grooves and annular grooves. Annular grooves must have sharp edges.

Shift Forks

Check both shift forks for visible damage, wear or bent shift fork claws.

Measure the shift fork claw thickness.



1. Micrometer
A. Shift fork claw thickness

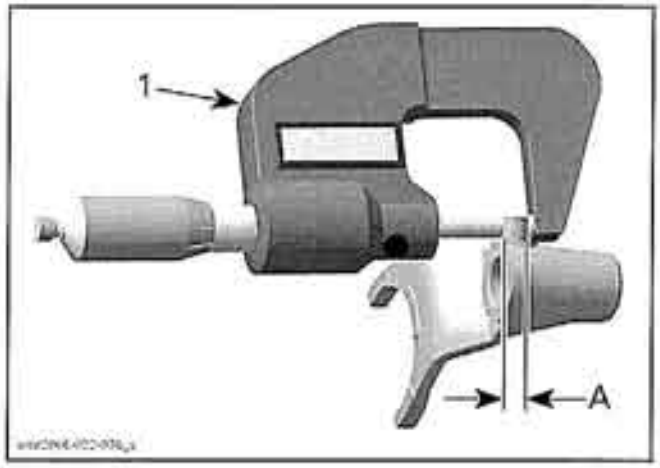
– Shift fork no. 25 for high gear shifting.

SHIFT FORK CLAW THICKNESS (high gear shifting)	
NEW	4.80 to 4.90 mm (.189 to .193 in)
SERVICE LIMIT	4.70 mm (.185 in)

– Shift fork no. 26 for low/reverse gear shifting.

SHIFT FORK CLAW THICKNESS (low/reverse gear shifting)	
NEW	5.10 to 5.20 mm (.200 to .205 in)
SERVICE LIMIT	5.00 mm (.197 in)

Measure shift fork pins.



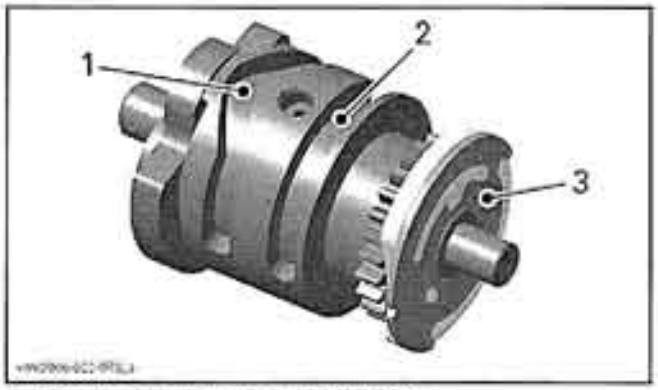
1. Micrometer
A. Shift fork pin diameter

SHIFT FORK PIN DIAMETER	
NEW	6.920 to 6.970 mm (.272 to .274 in)
SERVICE LIMIT	6.850 mm (.270 in)

Shift Drum

Check shift drum tracks for scouring or heavy wear, like rounded engagement slots.

Replace isolating washer no. 27 if there are signs of wear or visible damages.



1. Track for the low/reverse gear shift fork
2. Track for the high gear shift fork
3. Isolating washer on the shift drum

Levers

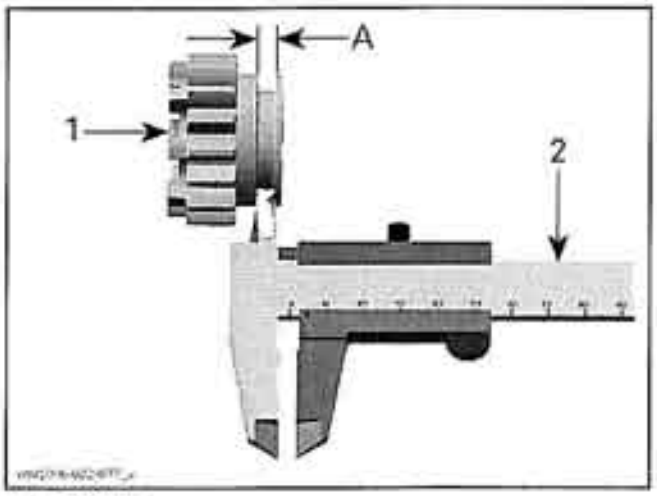
Check parking lever no. 29 for cracks or other damages.

Index lever with roller no. 28 must move freely.

Gears

NOTE: Replace gears only together with the corresponding meshing gears. Always replace circlips and use special pliers to install them.

Measure the width of shift fork engagement groove.



1. Main gear
2. Caliper
A. Width for engagement of shift fork

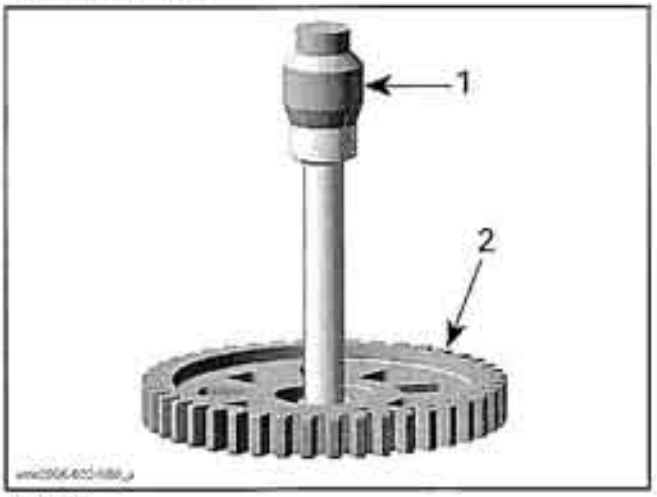
– Gear no. 20 for high gear shifting.

WIDTH OF SHIFT FORK ENGAGEMENT GROOVE (high gear shifting)	
NEW	5.00 to 5.10 mm (.197 to .201 in)
SERVICE LIMIT	5.20 mm (.205 in)

– Gear no. 15 for low/reverse gear shifting.

WIDTH OF SHIFT FORK ENGAGEMENT GROOVE (low/reverse gear shifting)	
NEW	5.30 to 5.40 mm (.209 to .213 in)
SERVICE LIMIT	5.50 mm (.217 in)

Check free pinions no. 14, no. 16, no. 19 and no. 23 for wear.



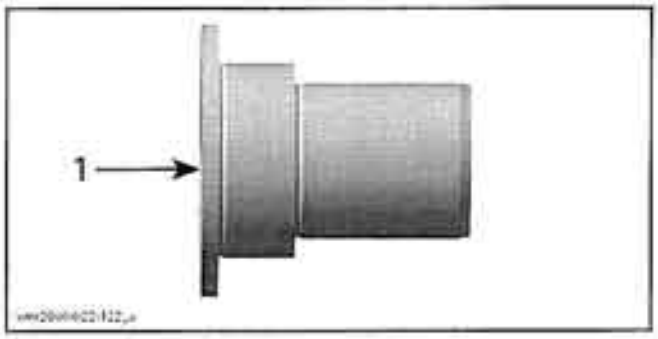
TYPICAL
1. Micrometer
2. Free pinion

DIAMETER FREE PINION	
NEW	29.000 to 29.013 mm (1.1417 to 1.1422 in)
SERVICE LIMIT	29.015 mm (1.1423 in)

Shafts

Check shift shaft no. 30 for worn splines and gears.

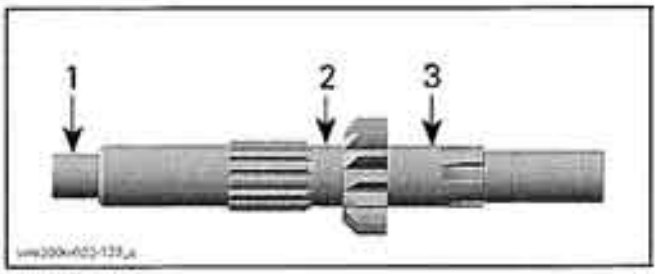
Check intermediate shaft for wear.



1. Intermediate gear bearing

INTERMEDIATE GEAR SHAFT	
NEW	24.979 to 25.000 mm (.9834 to .9842 in)
SERVICE LIMIT	24.977 mm (.9833 in)

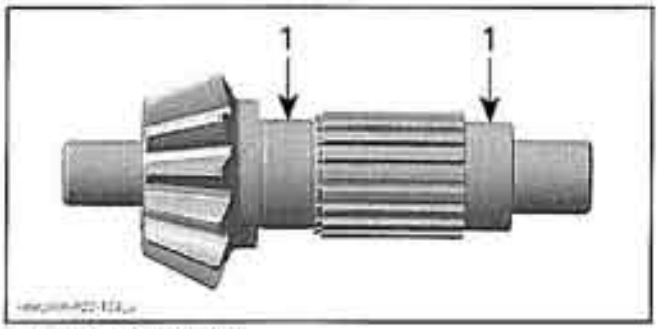
Check countershaft for wear.



1. MAG side
2. Free pinion bearing
3. CVT side

COUNTERSHAFT	
SERVICE LIMIT	
MAG side	17.990 mm (.708 in)
Free pinion bearing	24.970 mm (.983 in)
CVT side	24.970 mm (.983 in)

Check bevel gear shaft.

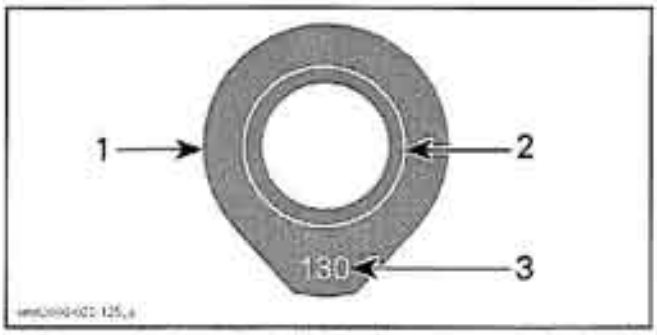


1. Free pinion bearings

BEVEL GEAR SHAFT	
SERVICE LIMIT	
Free pinion bearing	24.984 mm (.9836 in)

Shims

Always replace shim by a new one with the same thickness, when reassembling the gearbox with existing output shaft no. 1 and bevel gear shaft no. 11.



1. Thrust washer for adjusting the bevel gear on center housing side
2. Area where wear signs appear
3. Thickness of the washer

If using a new output shaft no. 1 and bevel gear shaft no. 11, proceed with the *BEVEL GEAR ADJUSTMENT* below to use shim of the proper thickness.

Adjustment

Bevel Gear Adjustment

Use following course of calculation to adjust bevel gear in place between center and left housings.

NOTE: Only necessary if the output shaft backlash and axial clearance of the bevel gear is out of specification or if parts are changed (output shaft, bevel gear shaft or housing).

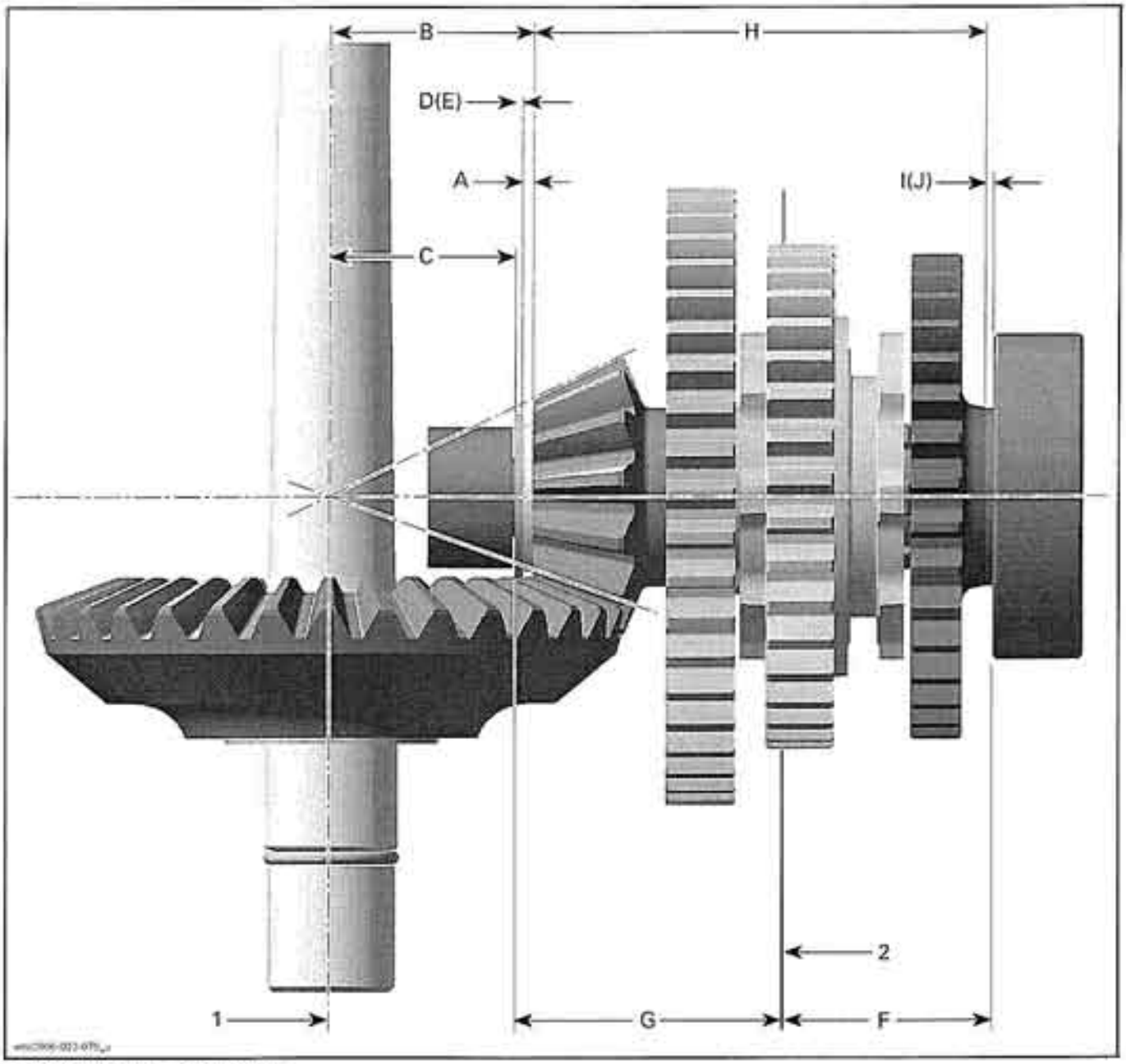
Clean all metal components in a solvent before beginning.

Housing mating surfaces are best cleaned using a combination of Loctite chisel (P/N 413 708 500) and a brass brush. Brush a first pass in one direction then make the final brushing perpendicularly (90°) to the first pass cross (hatch).

CAUTION: Do not wipe with rags. Use a new clean hand towel only.

Measure following items as per next illustration and enter measurement in the following list:

LETTER	MEASUREMENT 1	MEASUREMENT 2
A	2 mm (.0787 in)	2 mm (.0787 in)
B		
C		
D		
E		
F		
G		
H		
I		
J		

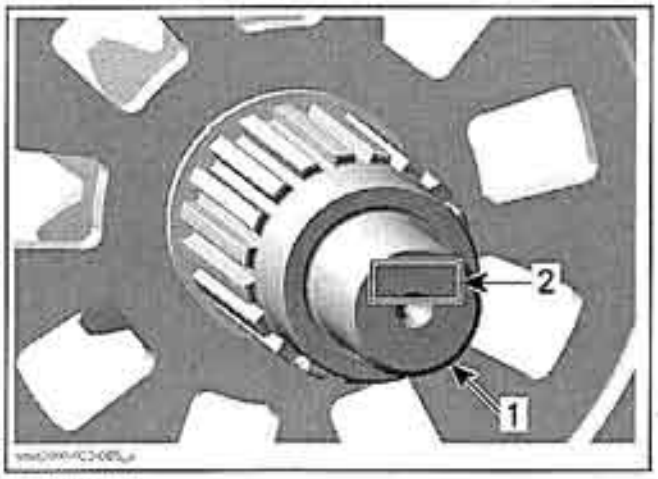


1. *Mating surface — output shaft*
2. *Mating surface — left housing*

To determine the shim thickness E on center housing:

- A = 2 mm (.0787 in) nominal thickness of axial needle bearing no. 24.
- B = The distance between the thrust surface of the bevel gear and the theoretical center of its taper. This is defined by manufacturer and is written on the bevel gear shaft.

This bevel gear reference number could be between - 10 and + 10.



1. Bevel gear
2. Area of written value K to find out value B

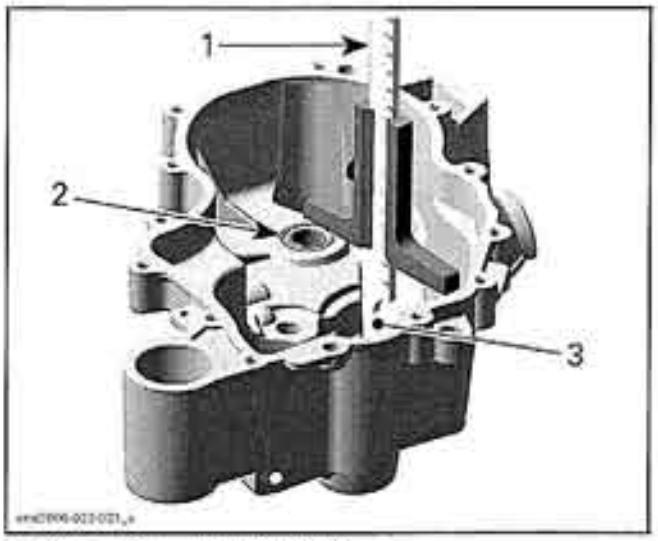
Use following formula to find out value B.

$$B = (\frac{\text{Bevel gear reference}}{100}) + 37.8$$

For example, bevel gear reference = -3 so -0.03 mm (-0.0012 in) to the nominal value of 37.8 mm (1.488 in).

B = (- 3/100) + 37.8 = 37.77

- C = Distance between the shim thrust surface in the center housing and the mating surface to left housing.



1. Deep gauge — measurement C
2. Thrust washer surface in center housing
3. Mating surface to left housing

- D = Theoretical shim thickness.

Use following course of calculation to get the theoretical thickness D for washer no. 13.

D = B - C - A

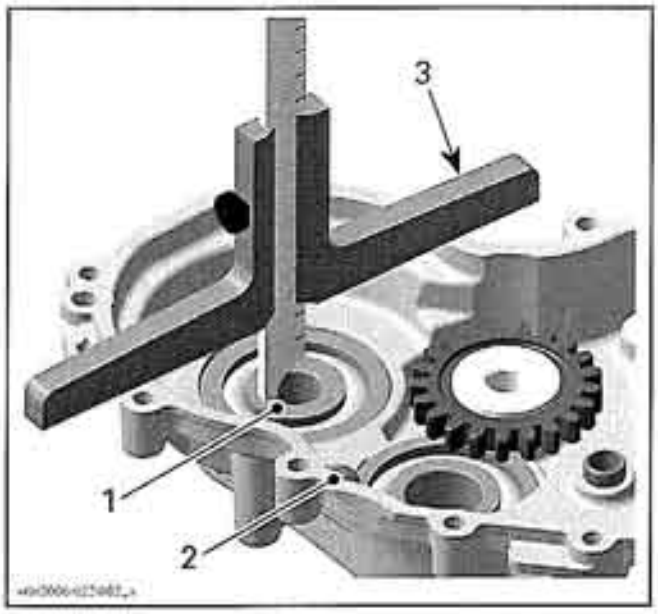
NOTE: Take theoretical value D and choose shim E (center housing shim) from the below table.

CALCULATED THICKNESS (D)	SHIM NUMBER (E)
1.20 mm to 1.29 mm (.0472 to .0508 in)	120
1.30 mm to 1.39 mm (.0512 to .0547 in)	130
1.40 mm to 1.49 mm (.0551 to .0587 in)	140
1.50 mm to 1.59 mm (.0591 to .0626 in)	150
1.60 mm to 1.69 mm (.0630 to .0665 in)	160
1.70 mm to 1.79 mm (.0669 to .0705 in)	170
1.80 mm to 1.89 mm (.0709 to .0744 in)	180

NOTE: For example, if the measured thickness is 1.53 mm (.0602 in), choose the shim 150. The shim number 150 represents a value equal to 1.50 mm (.0591 in).

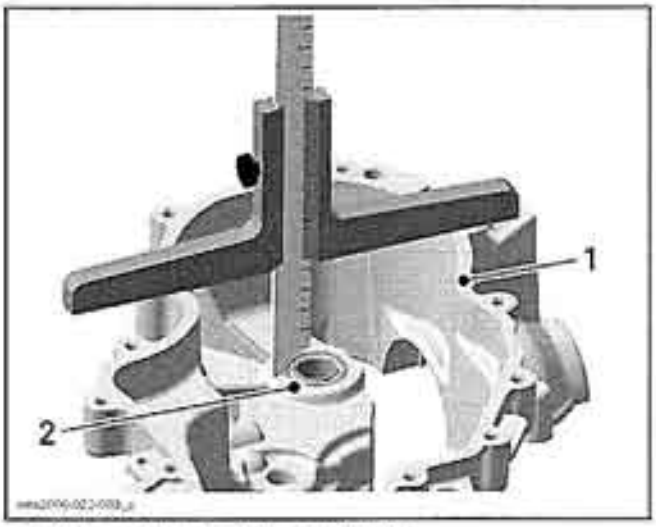
To determine the shim thickness on left housing:

- F = Distance between mating surface of left housing to ball bearing inner race.



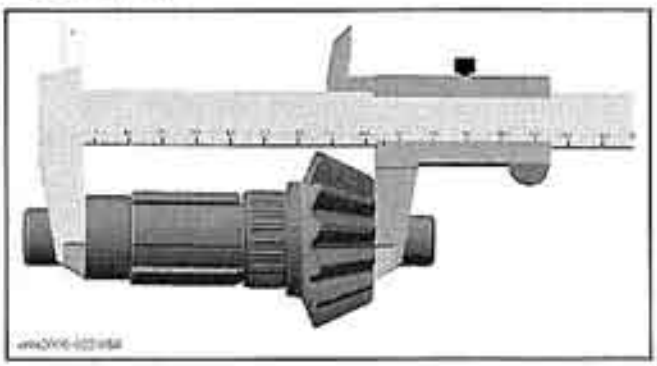
1. *Ball bearing inner race*
2. *Mating surface of left housing*
3. *Depth gauge*

- G = Distance between mating surface of center housing and thrust washer surface.



1. *Mating surface of center gear housing*
2. *Thrust washer surface*

- H = Distance between thrust surfaces of bevel gear shaft.



- I = Theoretical shim thickness.

Use following course of calculation to get the theoretical thickness I for washer no. 17.

I = F + G - H - A - E

NOTE: Take theoretical value I and choose shim J (CVT side shim) from the below table.

CALCULATED THICKNESS (I)	SHIM NUMBER (J)
1.22 mm to 1.31 mm (.0480 to .0516 in)	120
1.32 mm to 1.41 mm (.0519 to .0555 in)	130
1.42 mm to 1.51 mm (.0559 to .0594 in)	140
1.52 mm to 1.61 mm (.0598 to .0634 in)	150
1.62 mm to 1.71 mm (.0638 to .0673 in)	160
1.72 mm to 1.81 mm (0.677 to .0713 in)	170
1.82 mm to 1.91 mm (0.717 to .0752 in)	180

NOTE: For example, if the measured thickness is 1.53 mm (.0602 in), choose the shim 150.

NOTE: Bevel gear axial clearance of 0.02 to 0.11 mm (.00079 to .00433 in) is included in the above table.

EXAMPLE:

LETTER	MEASUREMENT 1
A	2 mm (.0787 in)
B	37.760 mm (1.487 in)
C	34.040 mm (1.340 in)
D	1.72 mm (.068 in)
E	170
F	51.800 mm (2.039 in)
G	39.080 mm (1.539 in)
H	85.680 mm (3.373 in)
I	1.500 mm (.059 in)
J	140

Shim on MAG side:

The measure A is 2 mm (.0787 in).

Note the measure indicates on bevel gear in the box B. Example: 37.760 mm (1.487 in).

Measure the distance C then indicates its value in the box C. Example: 34.040 mm (1.340 in).

B - C - A = D

(37.760 - 34.040 - 2 = 1.72 mm).

In accordance with the appropriate table, you need a shim number 170.

Shim on center housing:

Measure the distance F. Indicate this value in the box F. Example: 51.800 mm (2.039 in).

Measure the distance G. Note this value in the box G. Example: 39.080 mm (1.539 in).

Measure the distance between both butting surface of bevel gear shaft. This is the value H. Example: 85.680 mm (3.373 in).

F + G - H - A - E = I

(51.800 + 39.080 - 85.680 - 2 - 1.70 = 1.50 mm).

NOTE: The shim number 170 represents a value equal at 1.70 mm (.0669 in). If a shim 160 was required, its value would be 1.60 mm (.0630 in).

In accordance with the appropriate table, you need a shim number 140.

Assembly

The assembly of gearbox is essentially the reverse of disassembly procedure. However, pay attention to the following details.

Bearing Installation in Housing

Unless otherwise instructed, never use hammer to install ball bearings or needle bearings. Use press machine only.

If necessary heat housings up to 100°C (212°F) before installing ball bearings or needle bearings.

⚠ WARNING

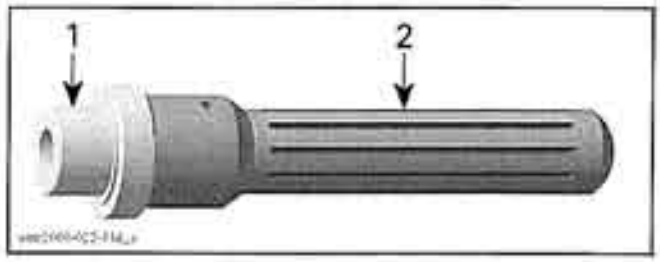
Clean oil, outside and inside, from housing before heating.

Place new bearing in freezer for 10 minutes before installation.

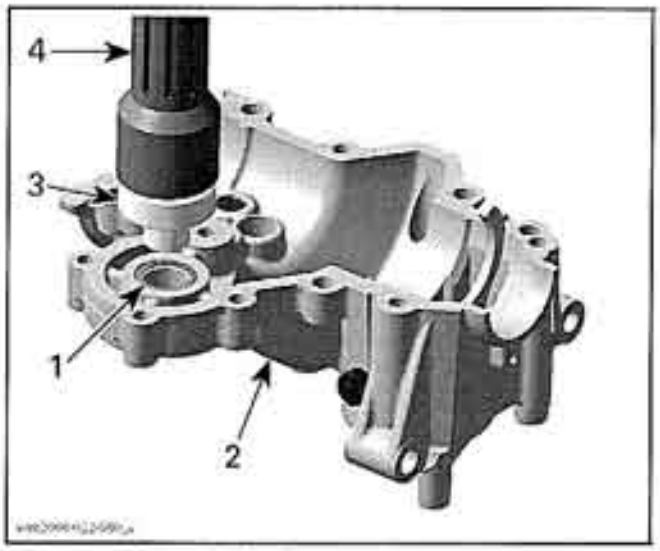
Use a suitable installer for installing ball bearings of countershaft and bevel gear.

NOTE: Place gearbox housings on a wood stand before installing bearings no. 34 and no. 36.

Install countershaft needle bearing no. 33 with the main shaft needle bearing installer (P/N 529 035 762) and the installer handle (P/N 420 877 650) in right housing.

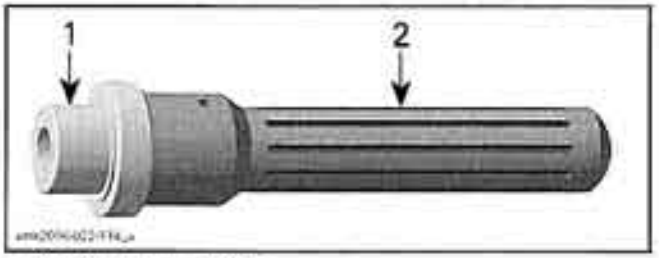


1. *Needle bearing installer*
2. *Installer handle*

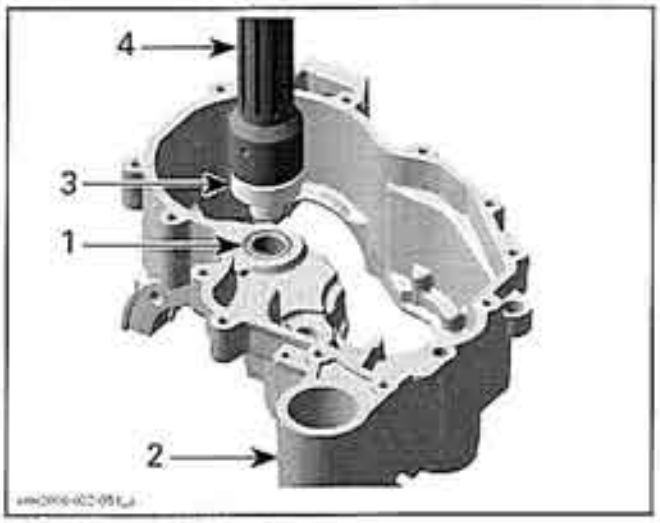


1. *Countershaft needle bearing*
2. *Right housing*
3. *Needle bearing installer*
4. *Installer handle*

Install bevel gear needle bearing no. 35 using the bevel gear needle bearing installer (P/N 529 035 763) and the installer handle (P/N 420 877 650).



1. *Needle bearing installer*
2. *Installer handle*



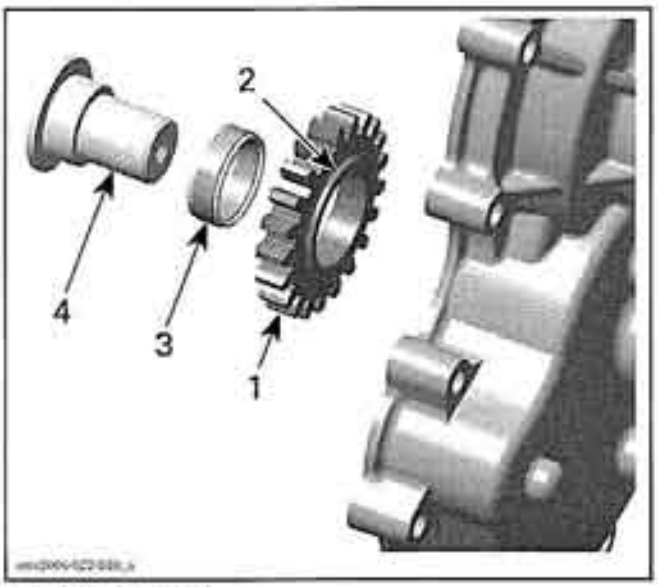
1. *Bevel gear needle bearing*
2. *Center housing*
3. *Needle bearing installer*
4. *Installer handle*

Install new oil seals with the proper installer (refer to *OIL SEALS* above).

Other Gearbox Components

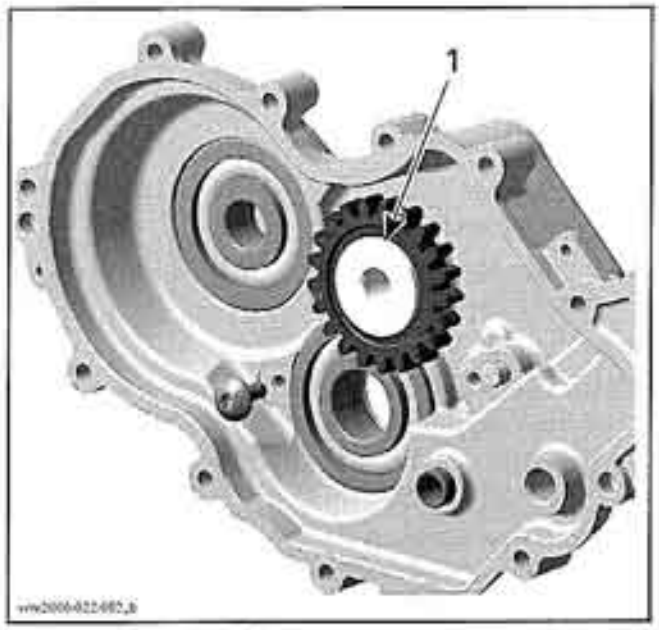
Fit intermediate gear **no. 23** with needle bearing **no. 22** on intermediate gear shaft **no. 21**.

NOTE: Fit gear with collar to housing side on the intermediate shaft.



1. *Intermediate gear*
2. *Collar facing housing*
3. *Needle bearing*
4. *Intermediate gear shaft*

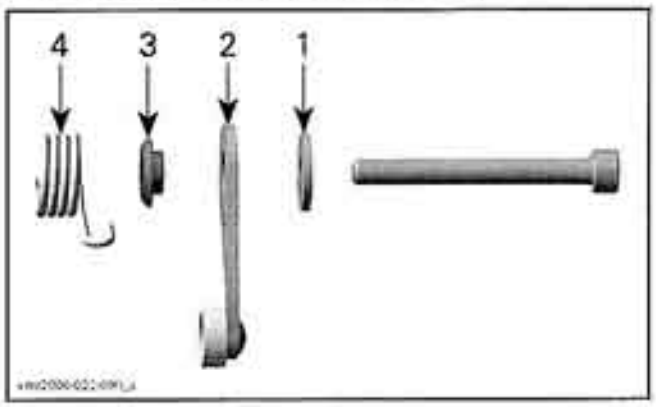
Press intermediate gear shaft in the left housing.



1. *Intermediate gear shaft*

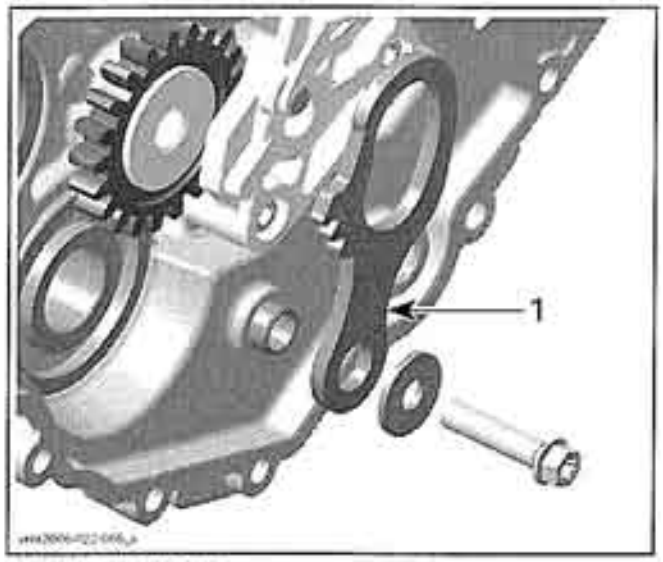
Fit support flange **no. 37** in the left housing and install index lever.

NOTE: Fit step ring into index lever.



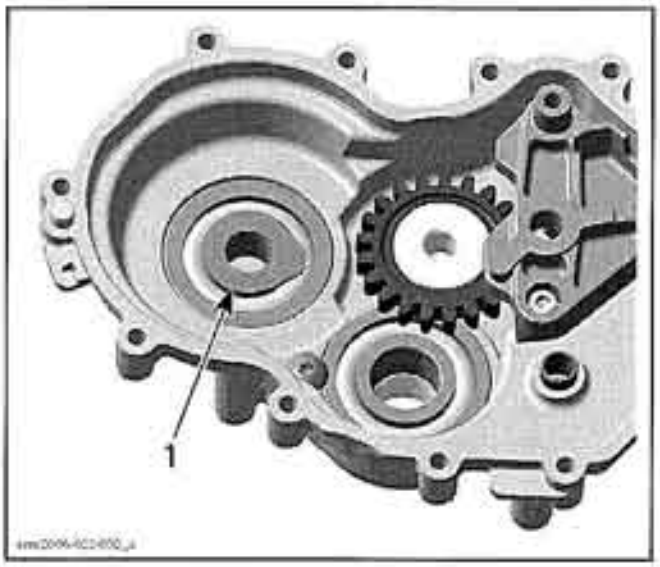
1. *Shim*
2. *Index lever*
3. *Step ring*
4. *Index spring*

Install parking lock lever, teeth showing to countershaft.



1. Parking lock lever

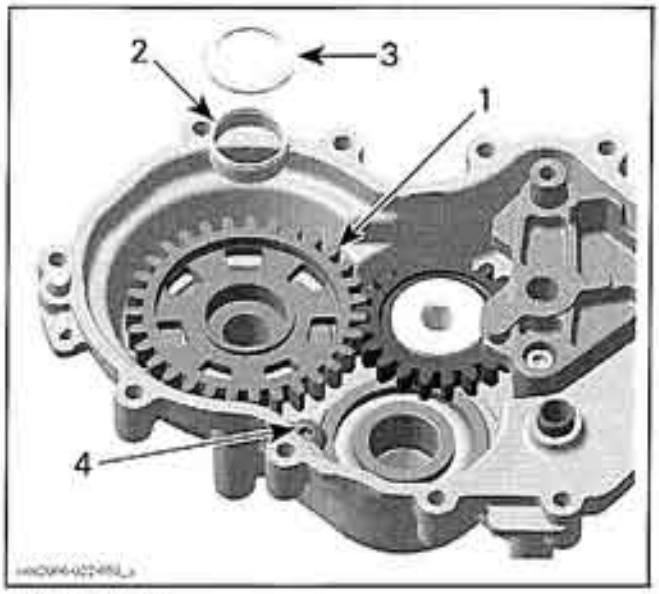
Place thrust washer CVT side on bearing.



1. Thrust washer CVT side

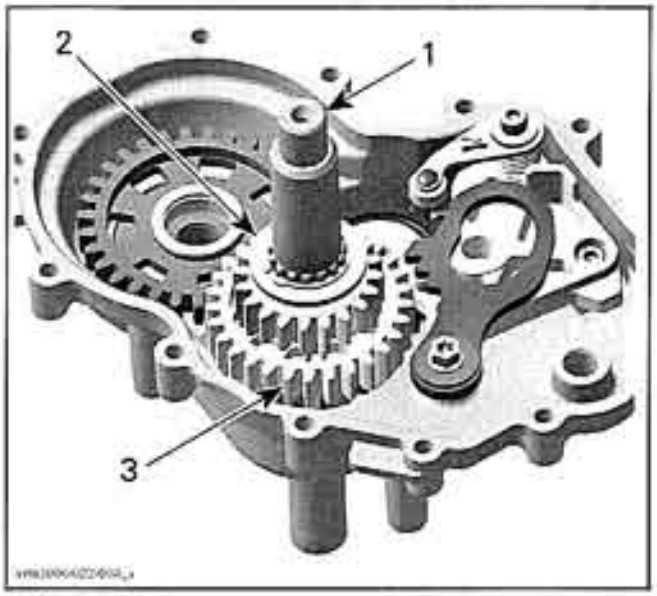
Place reverse gear with needle bearing and thrust washer.

NOTE: Check if the screw to secure countershaft bearing is installed.



1. Reverse gear
2. Needle bearing
3. Thrust washer
4. Countershaft bearing screw

Install countershaft with low gear and high gear assembly.

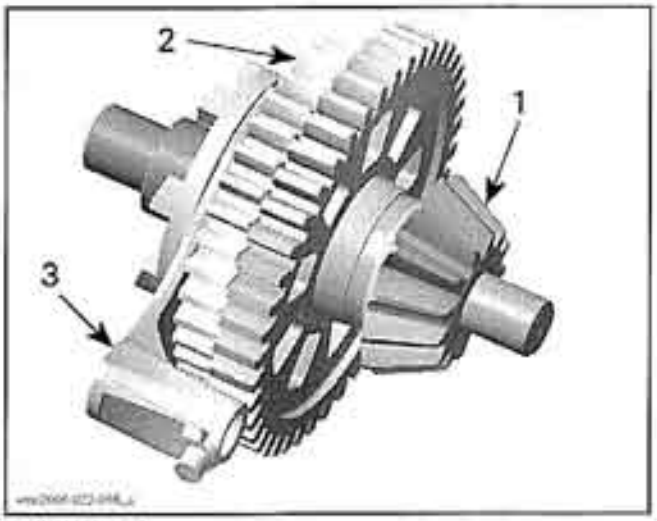


1. Countershaft
2. Low gear
3. High gear

Install a new shim no. 17 onto bevel gear shaft, fork side.

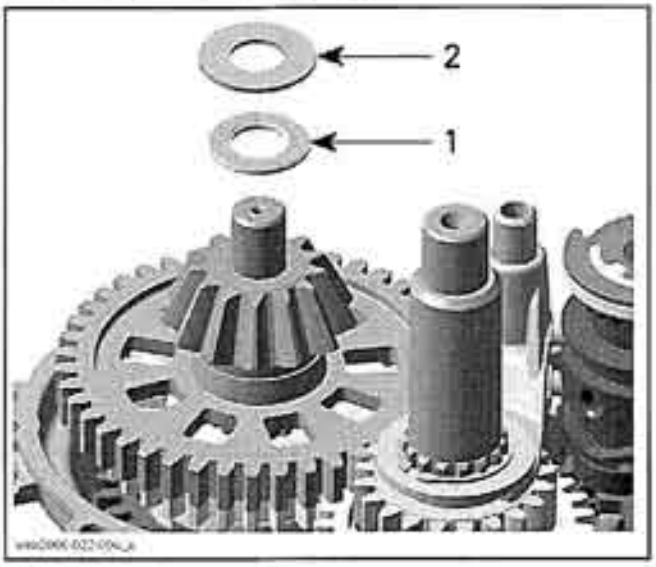
Install bevel gear with sliding gear assembly together with shift fork.

NOTE: If a new bevel gear and output shaft are used, it is necessary to verify the shim adjustment prior to finalize assembly. Refer to *BEVEL GEAR ADJUSTMENT* in *ADJUSTMENT*. If the existing bevel gear is used, it is mandatory to use a new shim no. 17 with the same thickness, a new needle bearing no. 12 and thrust washer no. 13.



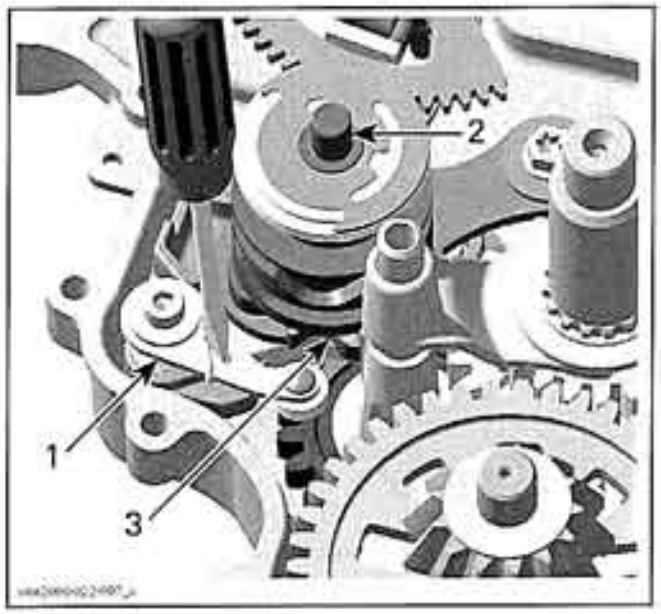
1. *Bevel gear*
2. *Sliding gear*
3. *Shift fork*

Install a new needle bearing and thrust washer.

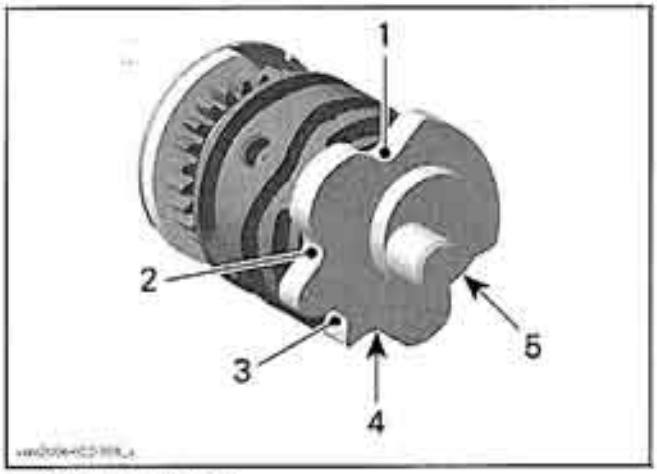


1. *Needle bearing*
2. *Thrust washer*

Insert a flat screwdriver in the slot of the index lever, turn screwdriver clockwise and install shift drum on neutral position as per following illustration.



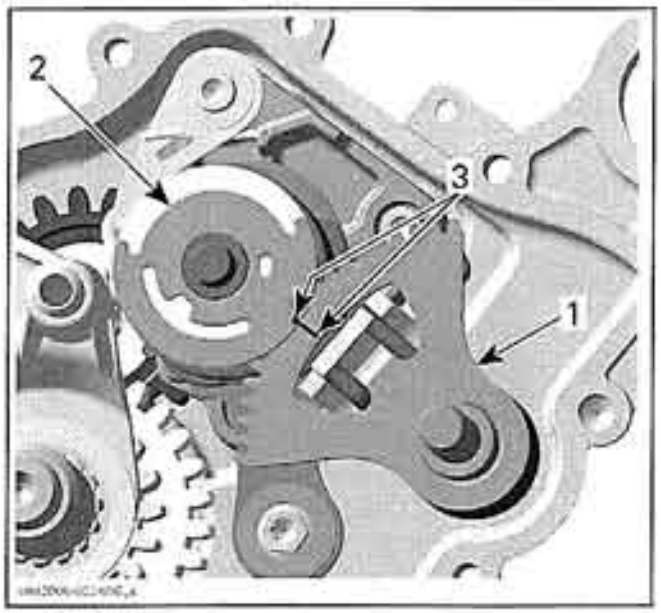
1. *Index lever*
2. *Shift drum*
3. *Neutral position*



1. *Parking stop location*
2. *Reverse stop location*
3. *Neutral stop location*
4. *High gear stop location*
5. *Low gear stop location*

Install shift shaft assembly.

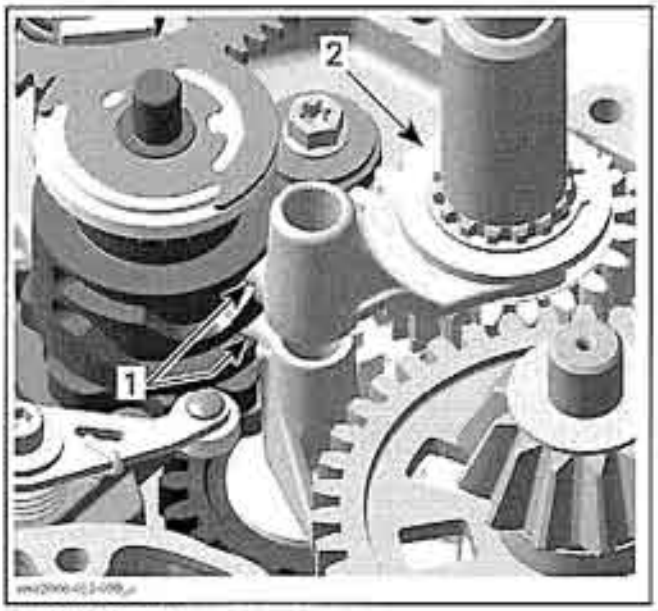
NOTE: Marks on shift drum/isolating washer and shift shaft must align.



1. Shift shaft assembly
2. Isolating washer
3. Marks

Install shift fork **no. 25** then engage both shift fork pins in their corresponding groove on the shift drum.

NOTE: Move sliding gears to facilitate engagement of pins inside grooves.



1. Shift fork pins
2. Sliding gear

Install shift fork shaft **no. 24**.

NOTE: Run all gears as a final function check before installing center housing.

Now, close the housings by doing the following:

Clean all metal components in a solvent.

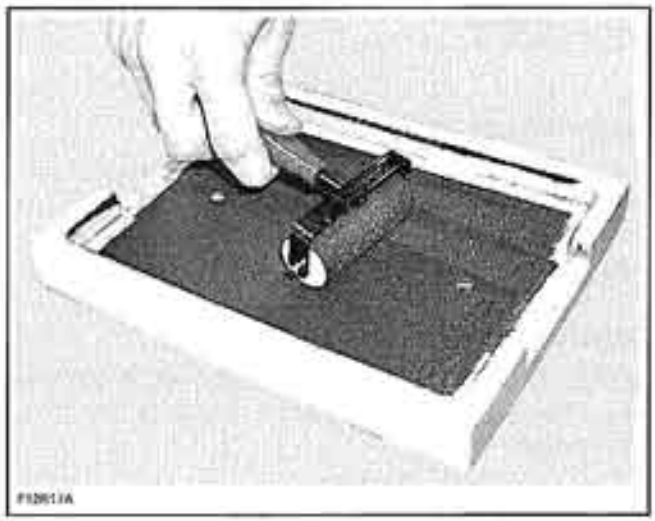
Gearbox housing mating surfaces are best cleaned using a combination of Loctite chisel (P/N 413 708 500) and a brass brush. Brush a first pass in one direction then make the final brushing perpendicularly (90°) to the first pass cross (hatch).

CAUTION: Do not wipe with rags. Use a new clean hand towel only.

IMPORTANT: When beginning the application of the gear housing sealant, the assembly and the first torquing should be done within 10 minutes. It is suggested to have all you need on hand to save time.

Use Loctite 5910 (P/N 293 800 081) on mating surfaces.

Use a plexiglass plate and apply some sealant on it. Use a soft rubber roller (50 - 75 mm (2 - 3 in)), available in arts products suppliers for printing, and roll the sealant to get a thin uniform coat on the plate (spread as necessary). When ready, apply the sealant on gear housing mating surfaces.



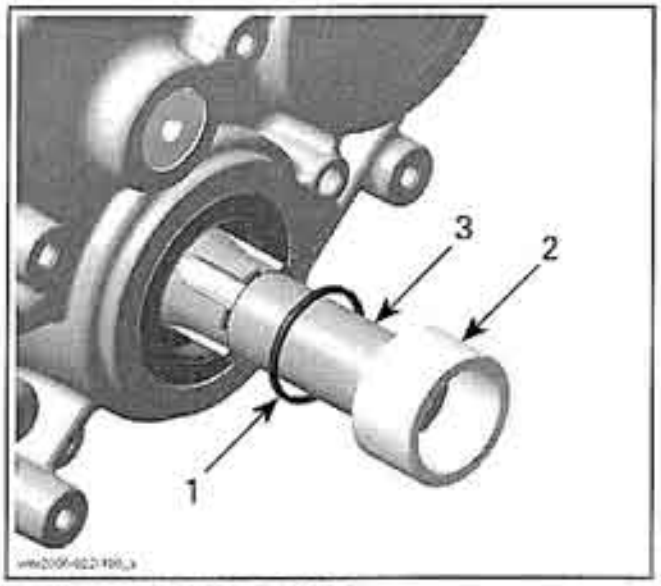
Do not apply in excess as it will spread out inside gear housing.

NOTE: It is recommended to apply this specific sealant as described here to get a uniform application without lumps. If you do not use the roller method, you may use your finger to uniformly distribute the sealant (using a finger will not affect the adhesion).

Hand-torqued gear housing screws in a crisscross sequence. Repeat procedure, retightening all screws to 10 N•m (89 lbf•**in**).

Install O-ring **no. 31** including distance sleeve **no. 32** on countershaft CVT side.

CAUTION: Place O-ring including distance sleeve right away. Chamfered bore of distance sleeve has to face the gearbox.



COUNTERSHAFT END CVT SIDE
1. *O-ring*
2. *Distance sleeve*
3. *Countershaft end CVT side*

Installation

The installation is the reverse of the removal procedure.

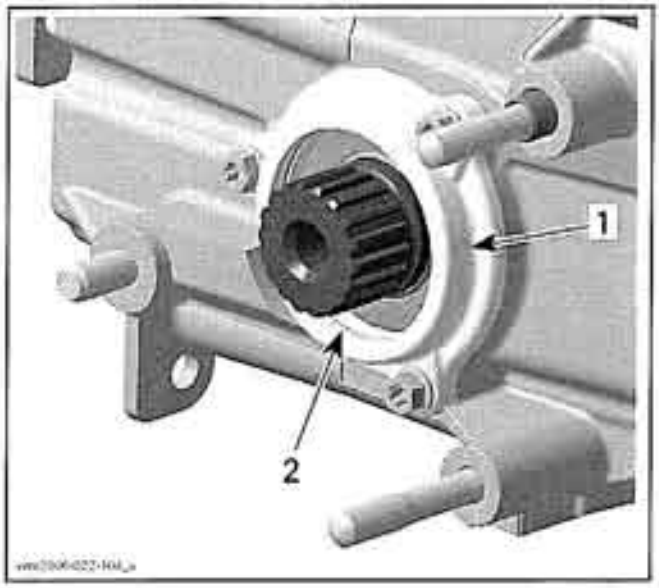
ENGINE DRIVE SHAFT

Removal

NOTE: The engine drive shaft no. 48 is located into engine and comes through it to drive the front differential.

Separate gearbox from engine.

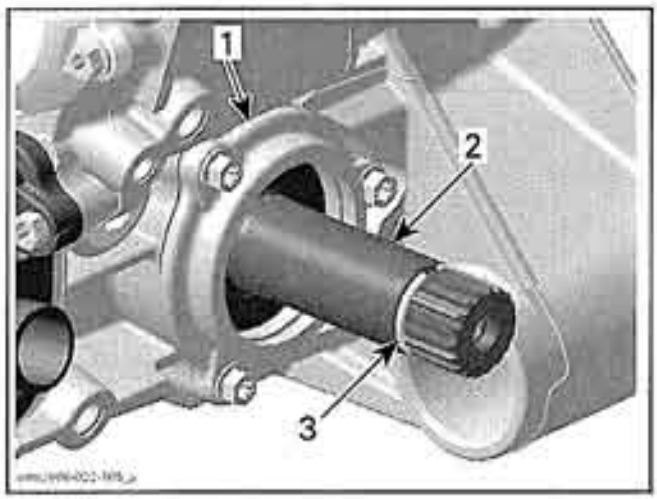
To the rear of engine, remove the bearing cover and its O-ring.



1. *Bearing cover*
2. *O-ring*

Pull out drive shaft no. 48.

CAUTION: Check ends of the circlip for sharp edges or burr before removing the drive shaft, to avoid damaging the oil seal.



1. *Bearing cover gearbox side*
2. *Drive shaft*
3. *Circlip*

Remove the other bearing cover no. 50 at the front of engine.

Inspection

Replace oil seals no. 51 and no. 54 and/or O-ring no. 55 if they are brittle, hard or damaged.

Check drive shaft bearings no. 49 and no. 52 behind each oil seal for contamination and/or metal shavings.

Check if drive shaft bearings turn freely and smoothly. Replace if necessary.

Check drive shaft for cracks, bend, pitting or other visible damages.

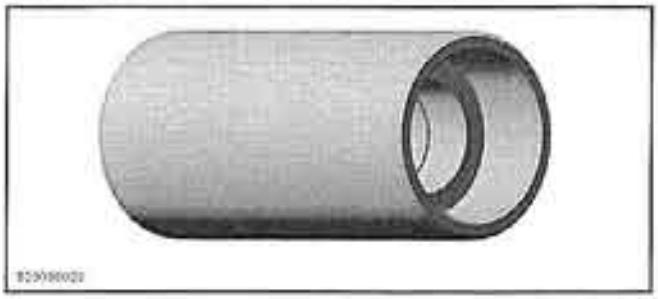
Check drive shaft splines for wear or damages.

Check oil seal running surface of the drive shaft for scratches. Replace if necessary.

Installation

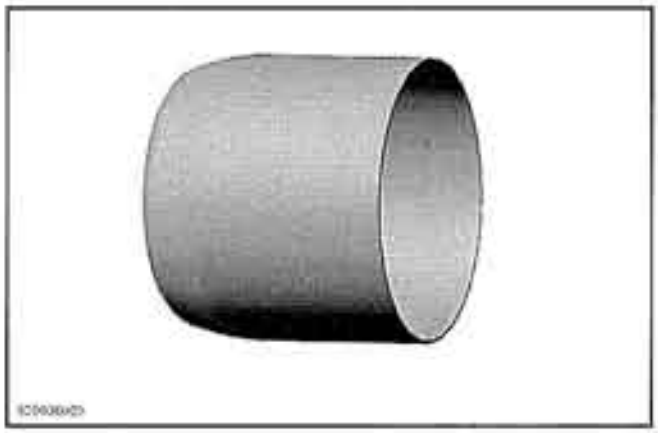
The installation is the reverse of removal procedure. Pay attention to the following details.

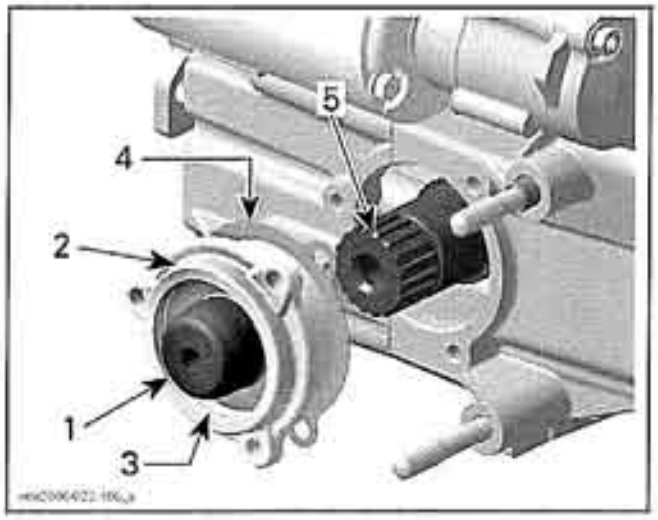
Install drive shaft oil seals no. 51 and no. 54 with the oil seal installer (P/N 529 036 028).



Use a suitable installer for installing bearings.

To install bearing cover no. 53, fit oil seal protection sleeve (P/N 529 036 029) into oil seal.





1. *Protection sleeve*
2. *Bearing cover*
3. *O-ring*
4. *Gasket*
5. *Drive shaft*

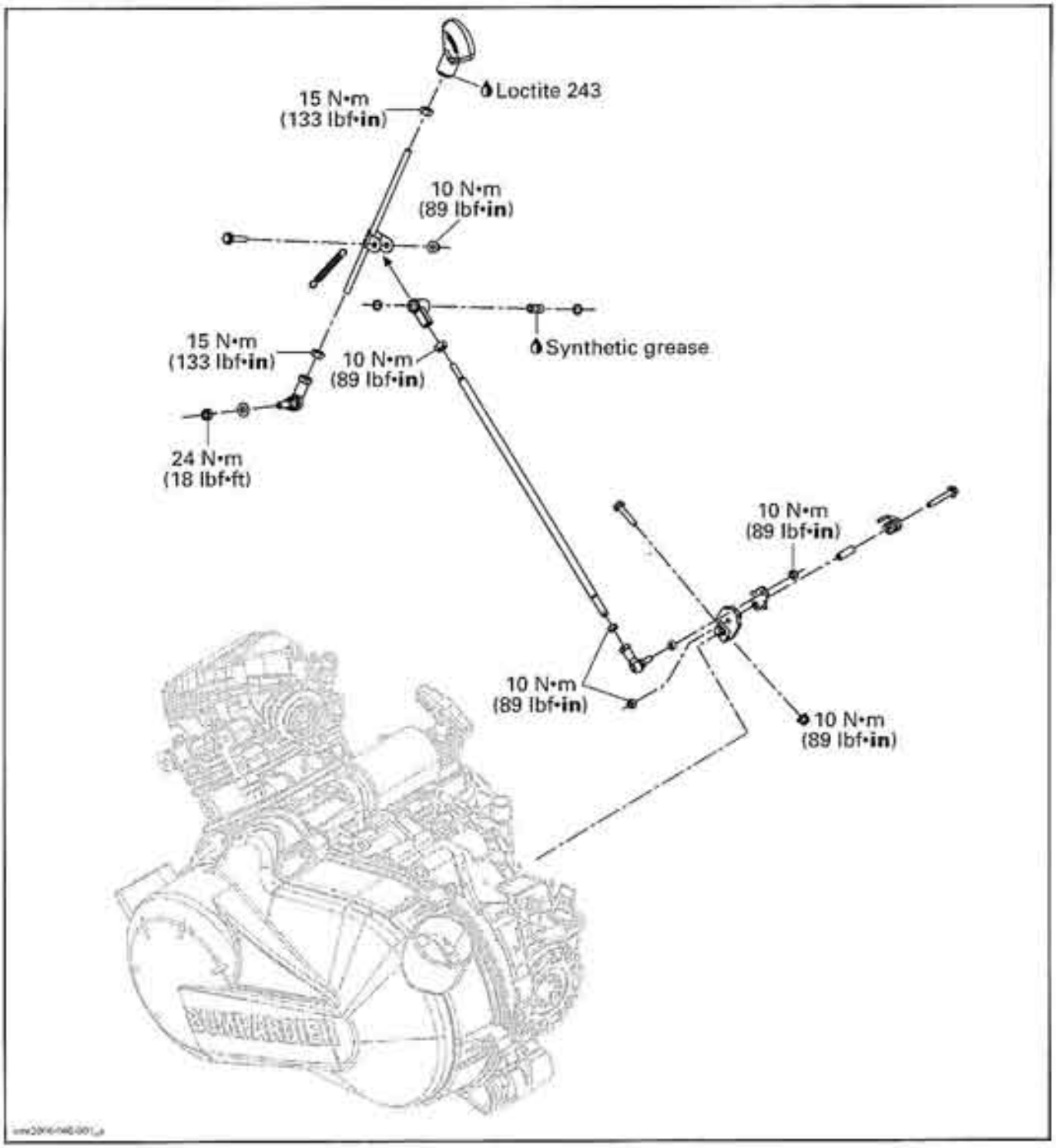
Install bearing cover then place the O-ring no. 55 inside cover.

TRANSMISSION LINKAGE

SERVICE PRODUCTS

Description	Part Number	Page
Loctite 243 (blue)	293 800 060	325, 330
synthetic grease	293 550 010	326

OUTLANDER 400 SERIES



GENERAL

Before performing any servicing on the transmission linkage system, be sure the transmission lever is on NEUTRAL position and the parking brake is applied.

During assembly/installation, use the torque values and services products as in the exploded view.

Clean threads before applying a threadlocker. Refer to *SELF-LOCKING FASTENERS* and *LOCTITE APPLICATION* at the beginning of this manual for complete procedure.

⚠ WARNING

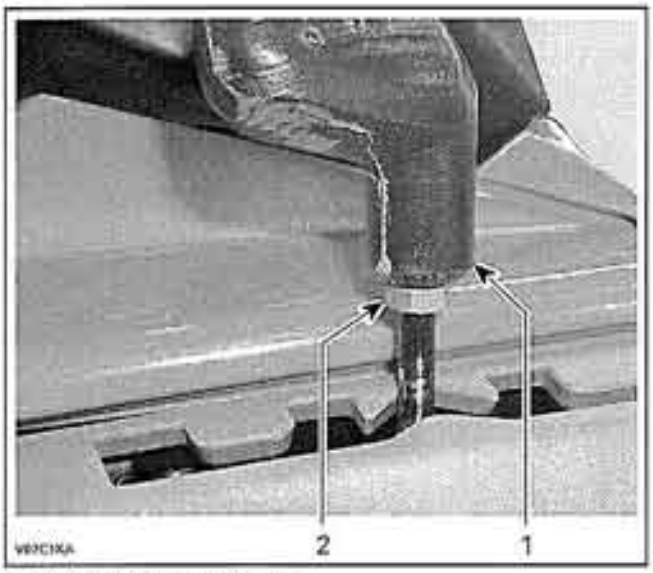
Torque wrench tightening specifications must strictly be adhered to.
Locking devices (e.g.: locking tabs, elastic stop nuts, self-locking fasteners, cotter pins, etc.) must be installed or replaced with new one where specified. If the efficiency of a locking device is impaired, it must be renewed.

PROCEDURES

TRANSMISSION LEVER HANDLE

Removal

Unscrew the nut under transmission lever handle.



1. *Transmission lever handle*
2. *Handle nut*

Unscrew transmission lever handle.

Installation

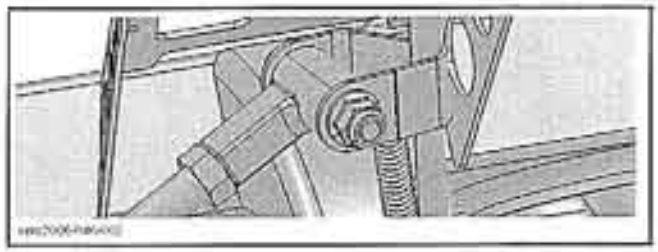
The installation is the reverse of removal procedure.

Apply Loctite 243 (blue) (P/N 293 800 060) on transmission lever threads then screw the transmission lever handle completely. Lock it by torquing the handle nut to 15 N•m (133 lbf•**in**).

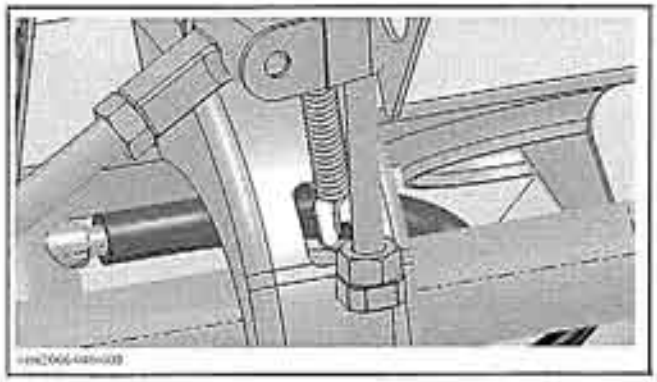
TRANSMISSION LEVER

Removal

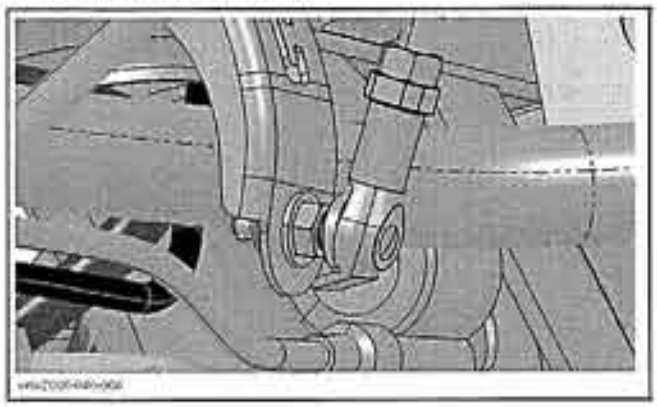
Remove:
- RH side panel (refer to *BODY*)
- transmission lever handle
- link rod bolt



- tension spring



- tie rod from bracket.



Then remove the transmission lever.

Inspection

Check the transmission lever for bending or cracks.

Check the tie-rod at the end of lever.

Replace the lever or the tie-rod if necessary.

Installation

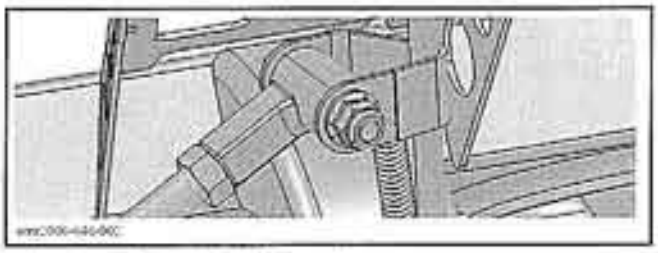
For installation, reverse the removal procedure.

LINK ROD

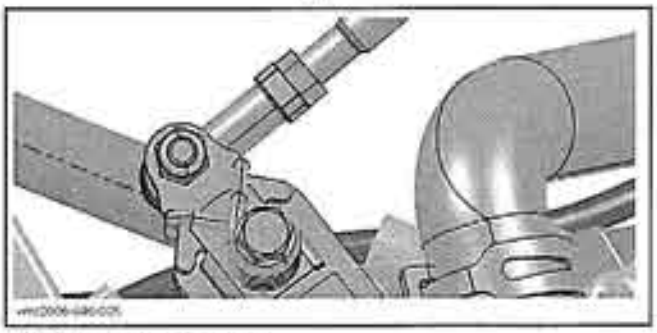
Removal

Remove:

- RH side panel (refer to *BODY*)
- link rod bolt



- link rod from shifting plate.



Remove the link rod.

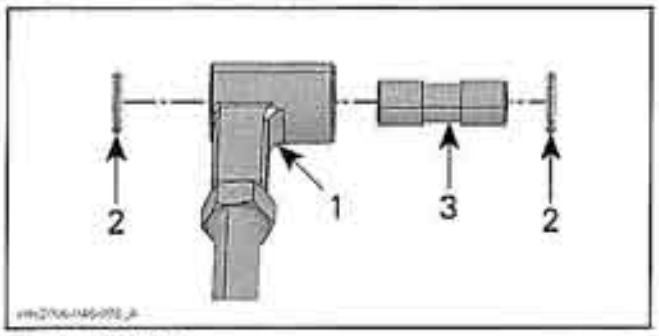
Inspection

Check the link rod for bending or cracks.

Check the tie-rod at the end of link rod.

Replace the link rod if necessary.

Check both O-rings on threaded fitting and apply synthetic grease (P/N 293 550 010) on the bushing inside threaded fitting. Replace O-rings if necessary.



1. *Threaded fitting*
2. *O-rings*
3. *Bushing*

Installation

For installation, reverse the removal procedure. However, pay attention to the following details.

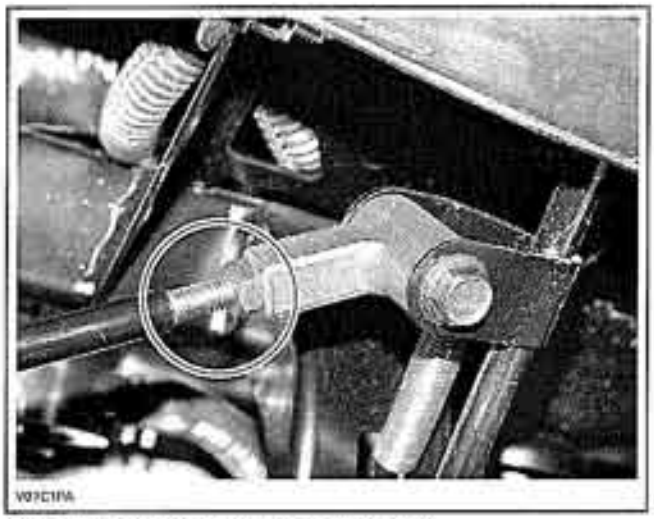
NOTE: The engine must be engaged on NEUTRAL before working on shifting system.

Place the transmission lever on NEUTRAL position.

Install link rod.

Adjust the link rod so that the transmission lever is located in the middle of NEUTRAL slot.

Torque jam nuts.



ONE NUT ON BOTH SIDES OF LINK ROD

Verify if the transmission lever moves into the PARK and LOW slots.

Install the side panel and test drive to confirm all is working well.

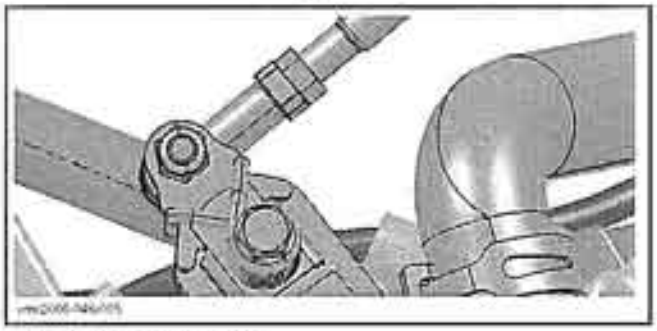
SHIFTING PLATE

Removal

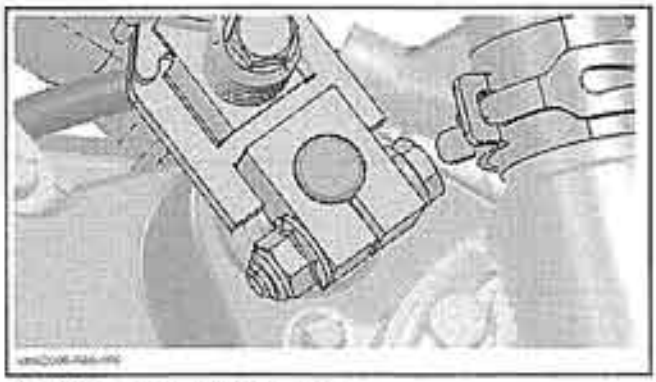
Remove the RH side panel (refer to *BODY*).

Remove the following:

- link rod from shifting plate



- shifting plate bolt.



Remove the shifting plate.

NOTE: Mark the location of shifting plate before removing it from shift shaft.

Inspection

Check shifting plate for cracks, bending or other damages. Replace if necessary.

Installation

Align shifting plate mark with shift shaft mark or if no marks are visible (new parts), turn ignition key ON and check if the NEUTRAL light is on.

NOTE: The engine must be engaged on NEUTRAL to perform the following procedure.

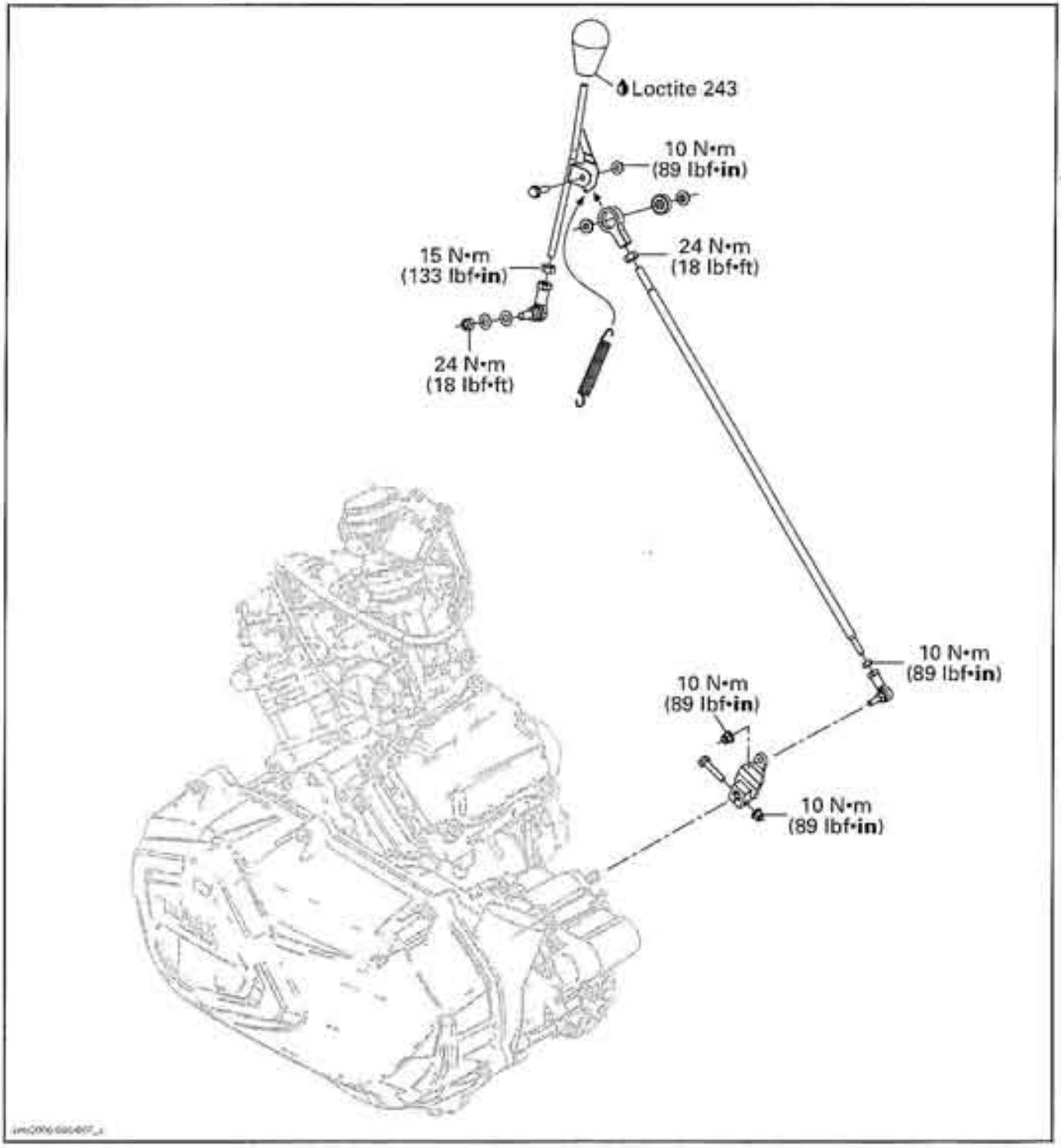
Align the shifting plate slot with the location without splines on shift shaft.

Install the shifting plate bolt.

Install link rod and adjust it (refer to *LINK ROD* above).

Install side panel and check if the system works well.

OUTLANDER 800 SERIES



GENERAL

Before performing any servicing on the transmission linkage system, be sure the transmission lever is on NEUTRAL position and the parking brake is applied.

During assembly/installation, use the torque values and services products as in the exploded view.

Clean threads before applying a threadlocker. Refer to *SELF-LOCKING FASTENERS* and *LOCTITE APPLICATION* at the beginning of this manual for complete procedure.

⚠ WARNING

Torque wrench tightening specifications must strictly be adhered to.
Locking devices (e.g.: locking tabs, elastic stop nuts, self-locking fasteners, cotter pins, etc.) must be installed or replaced with new one where specified. If the efficiency of a locking device is impaired, it must be renewed.

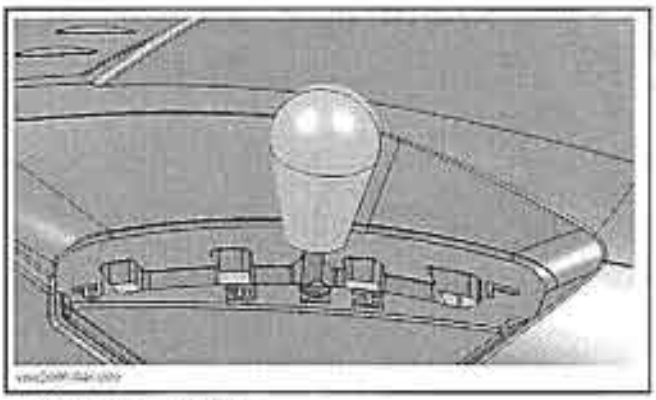
PROCEDURES

TRANSMISSION LEVER

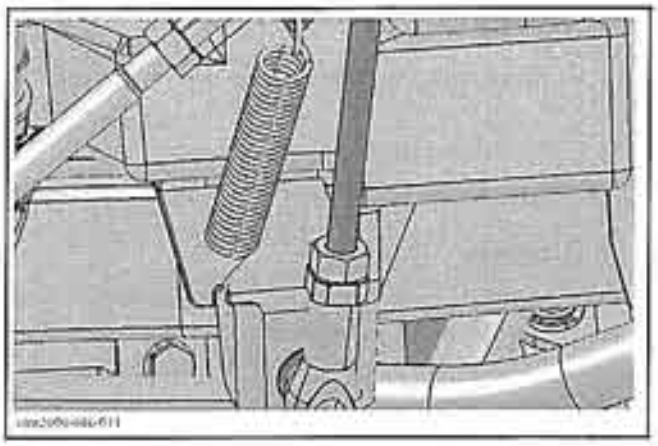
Removal

To remove the transmission lever, do the following:

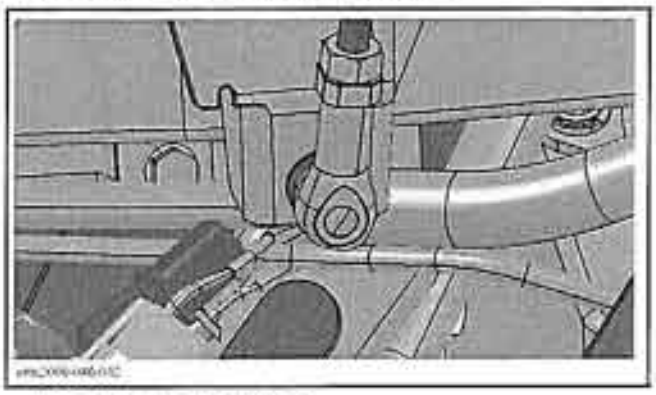
- Remove the RH side panel.
- Unscrew the transmission lever handle.



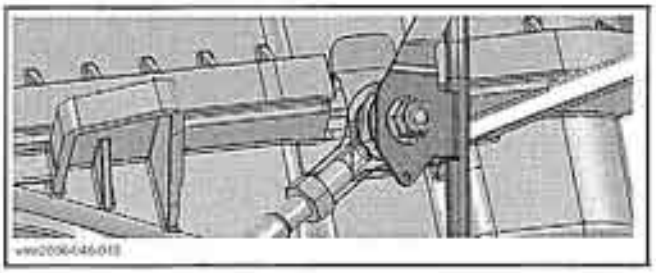
- Remove console.
- Detach tension spring from bracket.



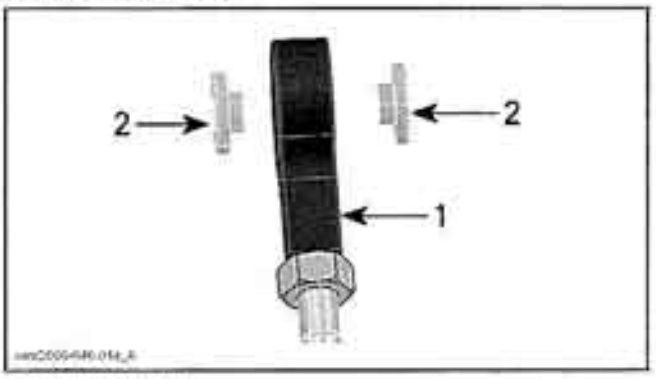
- Detach tie-rod end from bracket.



- Unscrew link rod bolt.



Pull link rod out of transmission lever bracket, pay attention not to loose bushings located each side of link rod anchor.



1. Link rod anchor
2. Bushings

Inspection

Check the transmission lever for bending or cracks.

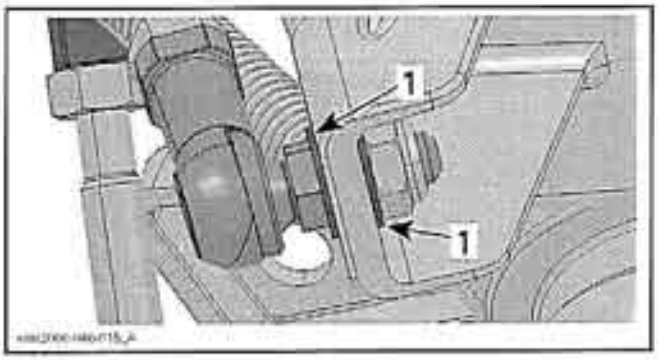
Check the tie-rod at the end of lever.

Replace the lever or the tie-rod if necessary.

Installation

The installation is the reverse of the removal procedure. However, pay attention to the following.

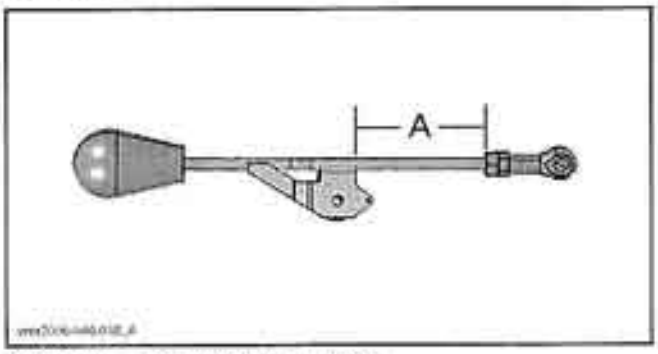
Place a washer on both sides of bracket when installing tie-rod end on bracket.



1. Washers

Apply Loctite 243 (blue) (P/N 293 800 060) on transmission lever threads before installing the handle.

If the tie-rod end replacement is necessary, use the following illustration to position the tie-rod properly.



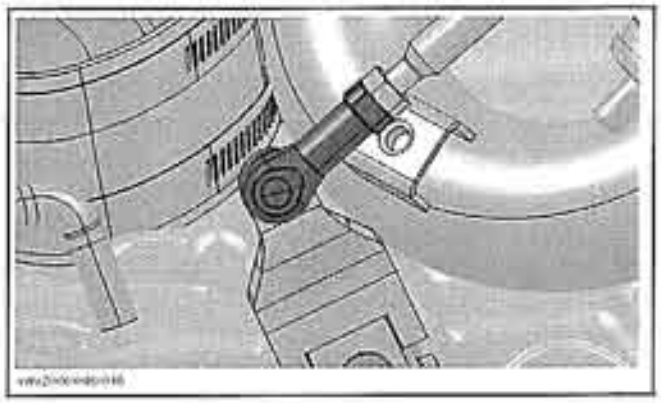
A. 75 mm ± 1 mm (2.95 in ± .039 in)

LINK ROD

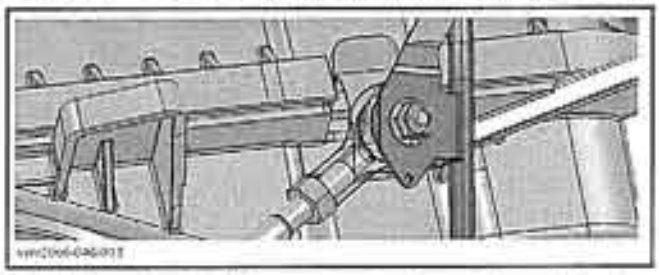
Removal

Remove RH side panel and rear engine cover.

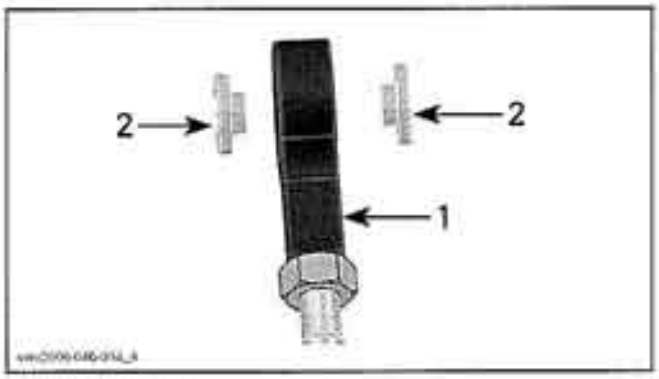
Remove link rod from shifting plate.



At the other end of link rod, unscrew link rod bolt.



Pull link rod out of transmission lever bracket, pay attention not to loose bushings located each side of link rod anchor.

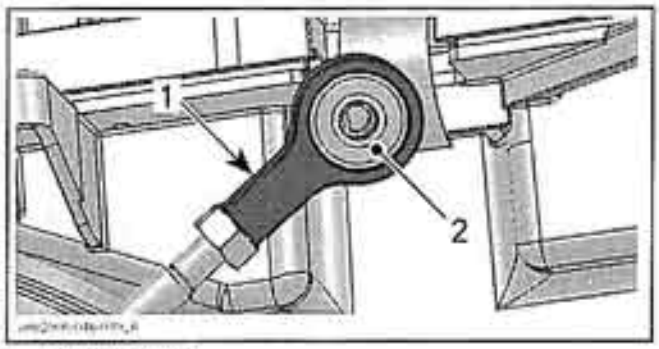


1. Link rod anchor
2. Bushings

Inspection

Check link rod for bending or cracks.

Check ball bearing in link rod anchor. The bearing should turn smoothly and freely.



1. *Link rod anchor*
2. *Ball bearing*

Check tie-rod end for wear and excessive play.

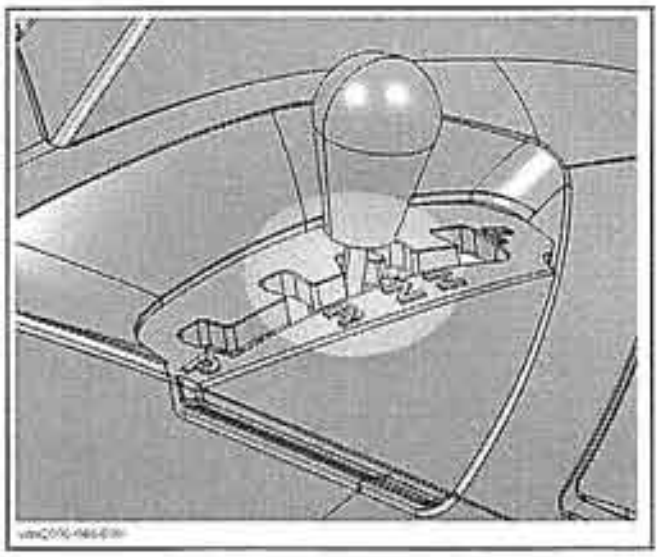
Replace all defective parts.

Installation

If no new parts are installed, reverse the removal procedure.

If a new link rod, link rod anchor or a new tie-rod end is installed, do the following:

- Screw the tie-rod end and the link rod anchor completely on the link rod.
- Install the tie-rod end on shifting plate and link rod anchor on transmission lever.
- Be sure gearbox is engaged on NEUTRAL position.
- Turn link rod until the transmission lever is located in the middle of the NEUTRAL slot.

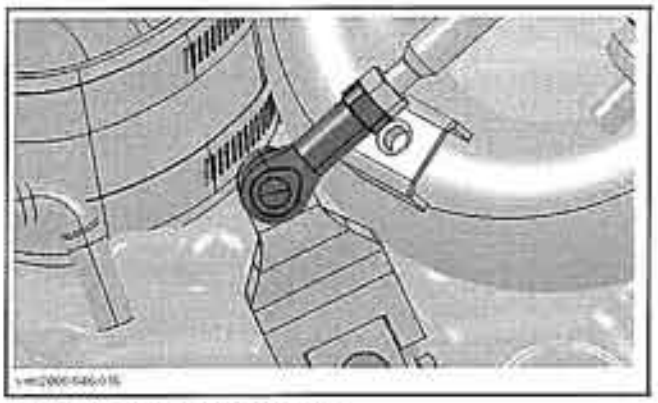


- Torque jam nuts, one on both ends of link rod.
- Verify if the transmission lever moves into the PARK and LOW slots. If not, the gearbox was not engaged on NEUTRAL. Place gearbox on NEUTRAL position and redo the procedure.
- Install removed parts and test drive to confirm all is working well.

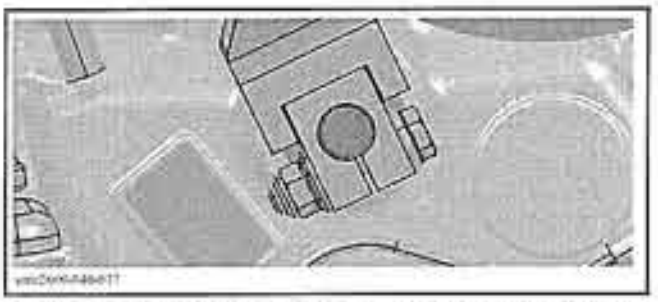
SHIFTING PLATE

Removal

Remove link rod from shifting plate.



Remove shifting plate bolt.



NOTE: Mark the location of shifting plate before removing it from shift shaft.

Inspection

Check shifting plate for cracks, bending or other damages. Replace if necessary.

Installation

The installation is the reverse of the removal procedure. However, pay attention to the following.

Be sure the gearbox is engaged on NEUTRAL before performing this procedure.

Align shifting plate mark with shift shaft mark. If new parts are used, align shifting plate slot with the shift shaft location without splines.

Install all removed parts and test drive to confirm all is working well.

4X4 COUPLING UNIT

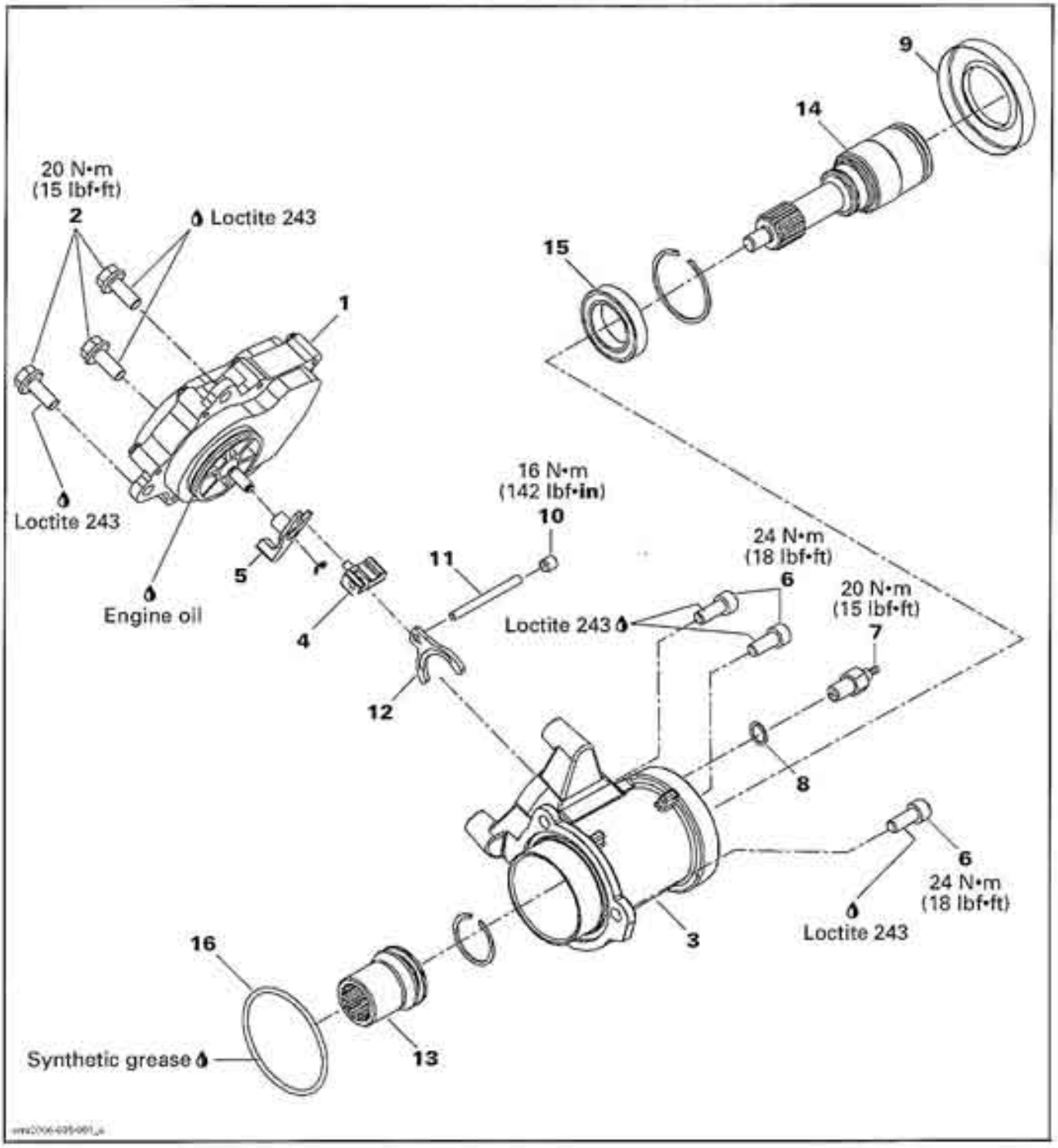
SERVICE TOOLS

Description	Part Number	Page
multimeter FLUKE 111	529 035 868	335-336

SERVICE PRODUCTS

Description	Part Number	Page
Loctite 243 (blue)	293 800 060	336
synthetic grease	293 550 010	341

OUTLANDER 400 SERIES



GENERAL

During assembly/installation, use the torque values and services products as in the exploded view(s).

Clean threads before applying a threadlocker. Refer to *SELF-LOCKING FASTENERS* and *LOCTITE APPLICATION* at the beginning of this manual for complete procedure.

⚠ WARNING

Torque wrench tightening specifications must strictly be adhered to.
Locking devices (e.g.: locking tabs, elastic stop nuts, self-locking fasteners, etc.) must be installed or replaced with new ones where specified. If the efficiency of a locking device is impaired, it must be renewed.

PROCEDURES

NOTE: For the Outlander 800 Series, procedures for the 4 x 4 coupling unit are covered in the *GEARBOX AND 4X4 COUPLING UNIT* subsection.

ACTUATOR

Test

Remove LH inner fender.

Unplug disconnect unit connector.

Using the multimeter FLUKE 111 (P/N 529 035 868), check if the 2WD/4WD switch works properly.

529 035 868

- Turn ignition key ON.
- Select 2WD position, install the RED probe to the WHITE wire connector and the BLACK probe to the WHITE/BLACK wire connector. The obtained value should be 12 Vdc.
- Select 4WD position, install the RED probe to the WHITE/BLUE wire connector and the BLACK probe to the WHITE wire connector. The obtained value should be 12 Vdc.

If the selector is out of specifications, check wires, connectors and replace the selector if necessary.

If the selector is good, replace the actuator.

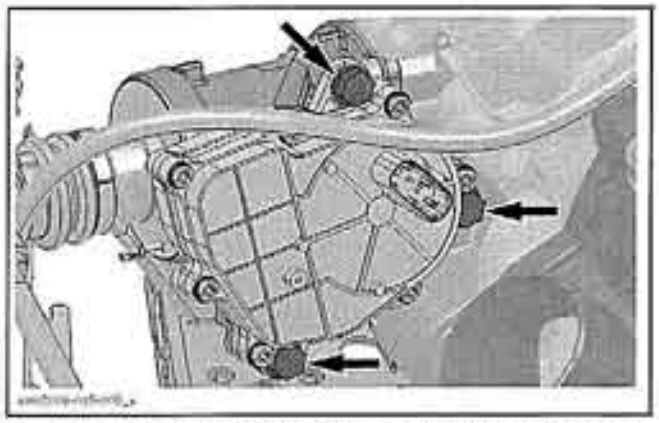
Removal

NOTE: Before beginning any servicing on the actuator, make sure the vehicle is in 2WD position.

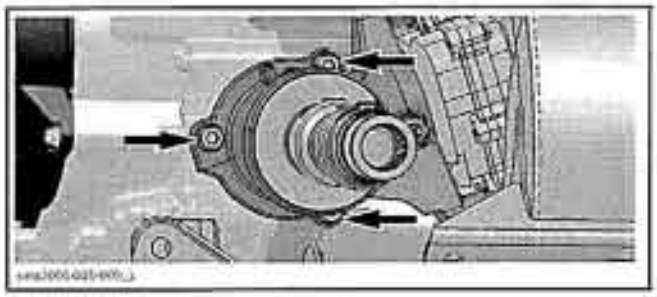
Remove the LH and RH footrests.

Unplug actuator connector.

Unscrew actuator bolts no. 2.



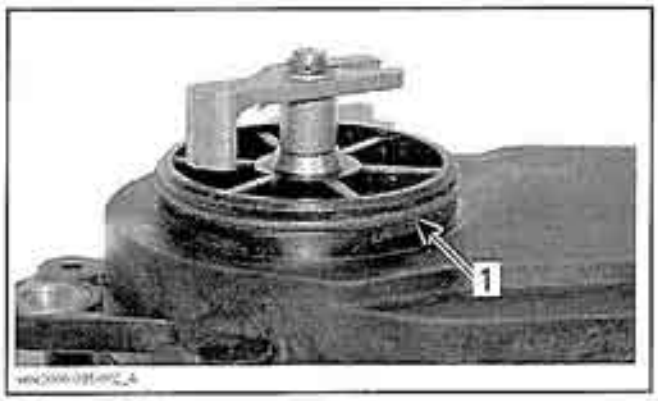
To reach the third bolt behind CVT housing, unscrew coupling unit housing no. 3 from engine then rotate the actuator.



When all actuator bolts are removed, pull the actuator out of housing.

Installation

Apply a small amount of engine oil on actuator O-ring.



1. Actuator O-ring

Verify if sliding sleeve no. 4 is in 2WD position. The sliding sleeve should be pointed toward the front of vehicle.

Turn the actuator 37 degrees clockwise from the mounting position.

FROM RH SIDE — ACTUATOR POSITIONS AT 37 DEGREES

Align the actuator fork no. 5 with the dog on sliding sleeve no. 4 then push the actuator in the housing.

Rotate the actuator counterclockwise until it orients itself to mounting position.

CAUTION: Do not cut or break the actuator O-ring.

Apply Loctite 243 (blue) (P/N 293 800 060) on actuator bolts then torque them to 20 N•m (15 lbf•**in**).

Apply Loctite 243 (blue) (P/N 293 800 060) on coupling unit housing bolts no. 6 then torque them to 24 N•m (17 lbf•**in**).

Connect actuator.

Lift the front of vehicle until front wheels turn freely.

Try to turn the front propeller shaft. The shaft should turn easily.

Place ignition switch to ON position and select the 4WD position.

The front propeller shaft should not turn (the PARK position must be selected).

If the front propeller shaft turns, the actuator is not installed correctly. Remove actuator and reinstall it.

Install all other removed parts.

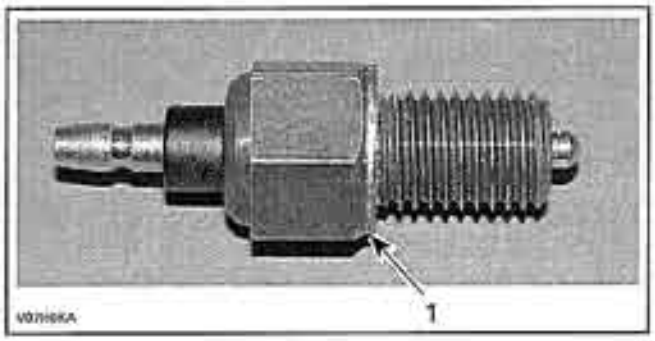
2WD/4WD SWITCH

Removal

Remove RH footrest.

Unplug the 2WD/4WD switch connector.

Unscrew the switch from coupling unit housing. Remove switch with its sealing ring.

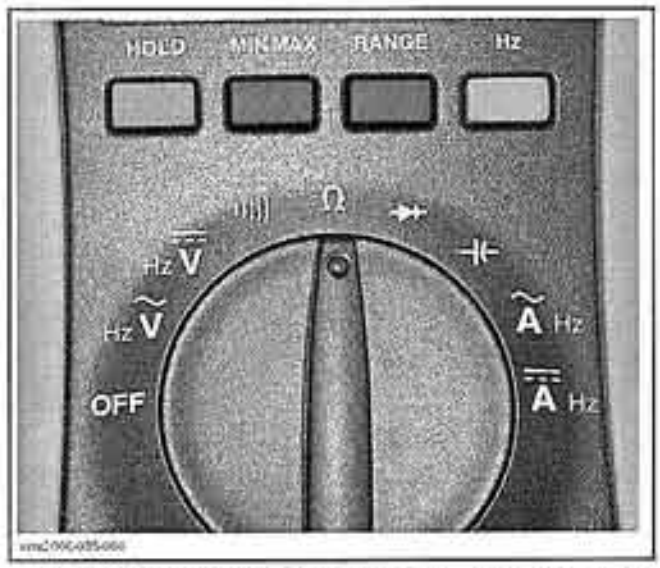


1. Sealing ring

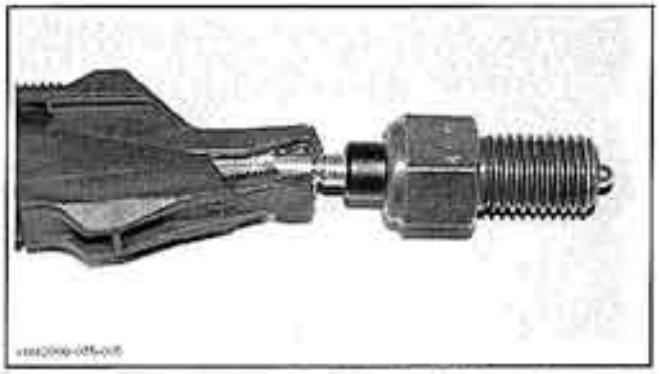
Test

Using the multimeter FLUKE 111 (P/N 529 035 868), do the following to check the switch.

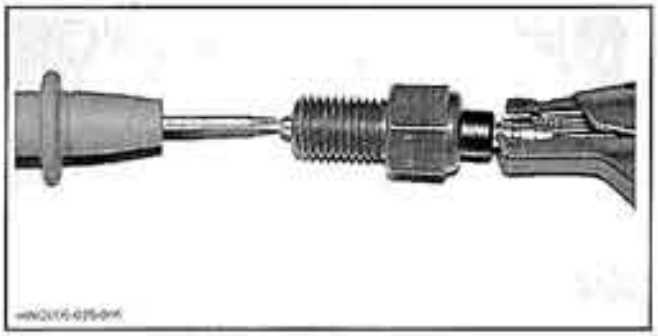
- Place the multimeter selector on Ω.



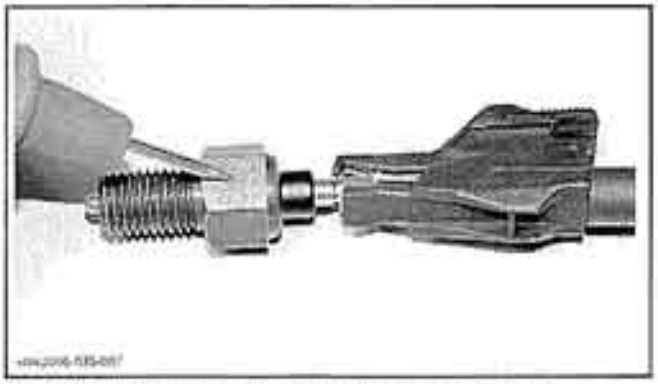
- Using an alligator clip, place the BLACK probe on the external pin.



- Touch the contact pin with the RED probe. The multimeter should indicate ±1Ω.



- Apply the RED probe on switch body. The measure should be O.L.



If switch is out of specifications, replace it.

Installation

The installation is the reverse of the removal procedure.

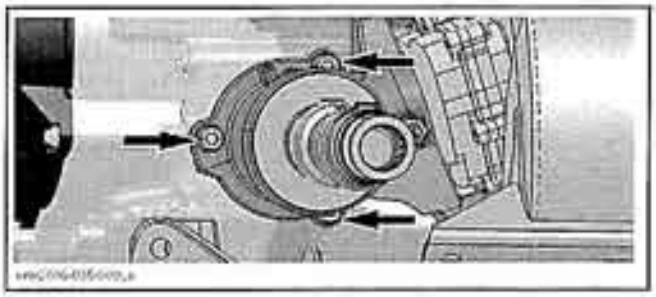
COUPLING UNIT

Removal

Remove front propeller shaft. Refer to *FRONT DRIVE*.

Unplug coupling unit connector and 2WD/4WD switch connector.

Unscrew bolts **no. 6** retaining the coupling unit housing **no. 3** to the engine.



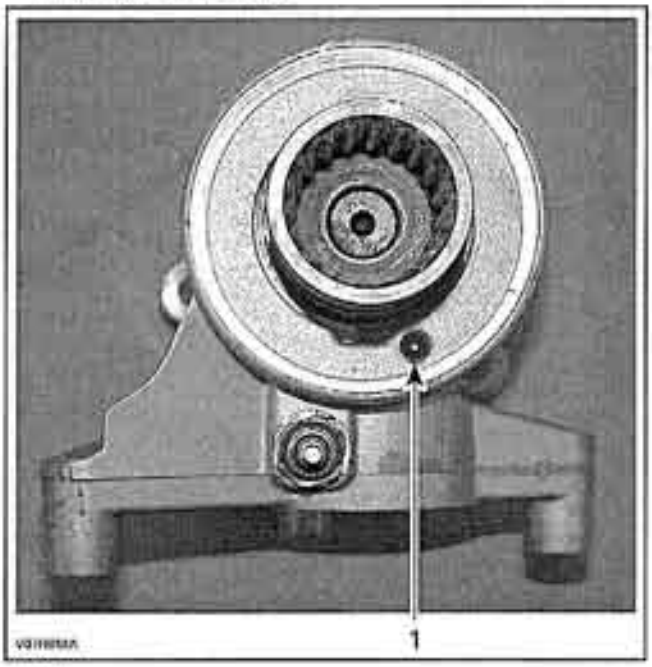
TYPICAL

Pull out the coupling unit.

Disassembly

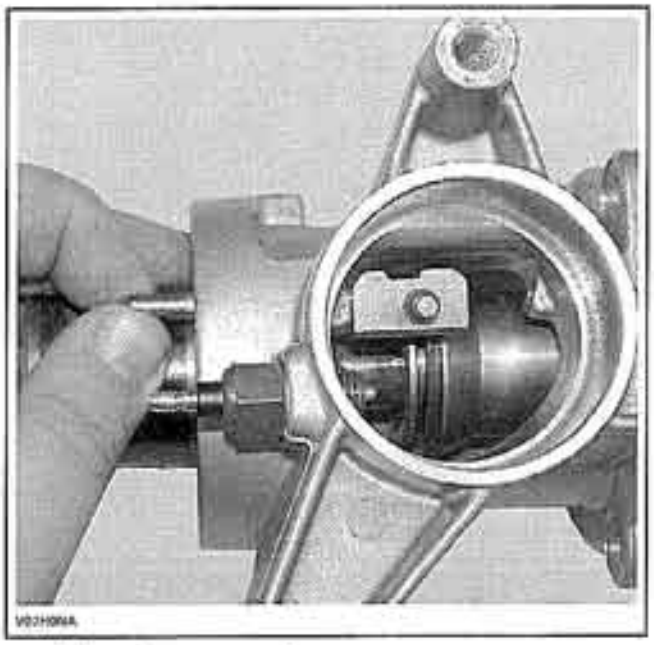
Remove:

- oil seal **no. 9**
- Allen screw **no. 10**

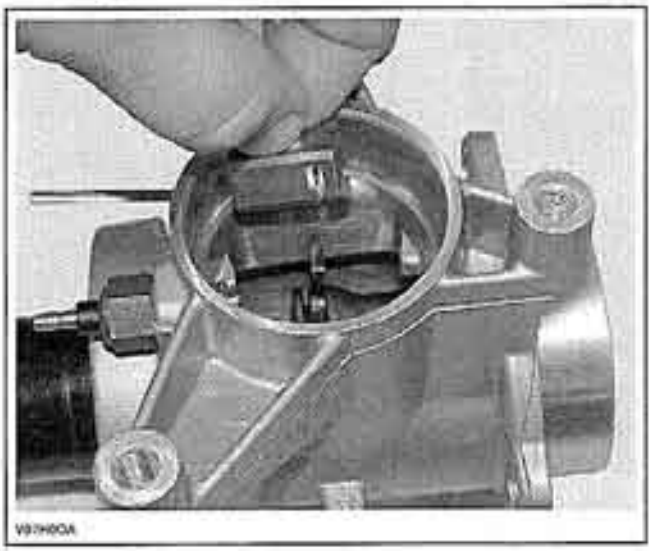


1. Allen screw

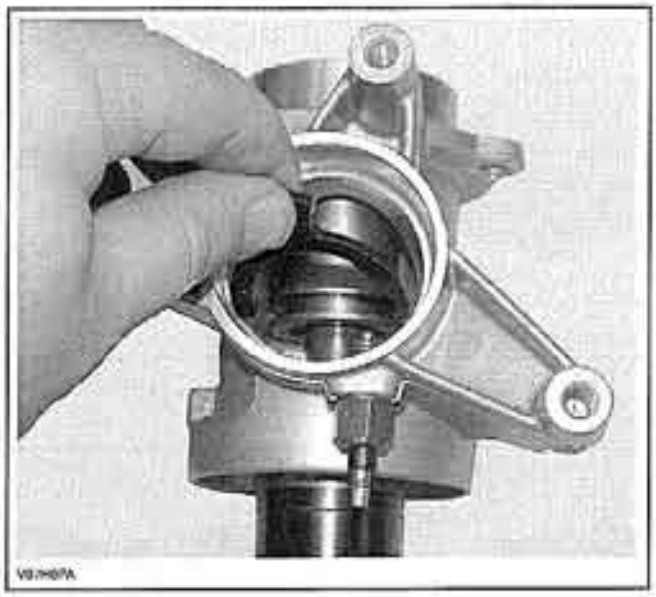
- pin **no. 11**



– sliding sleeve no. 4

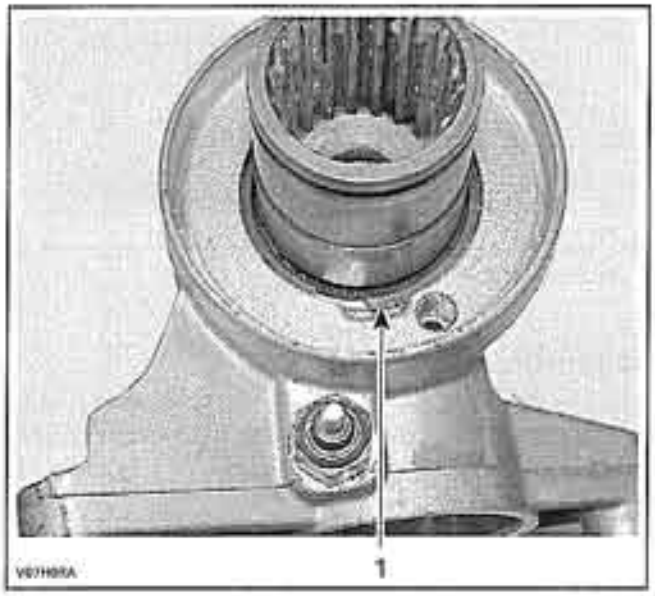


– shifter plate no. 12



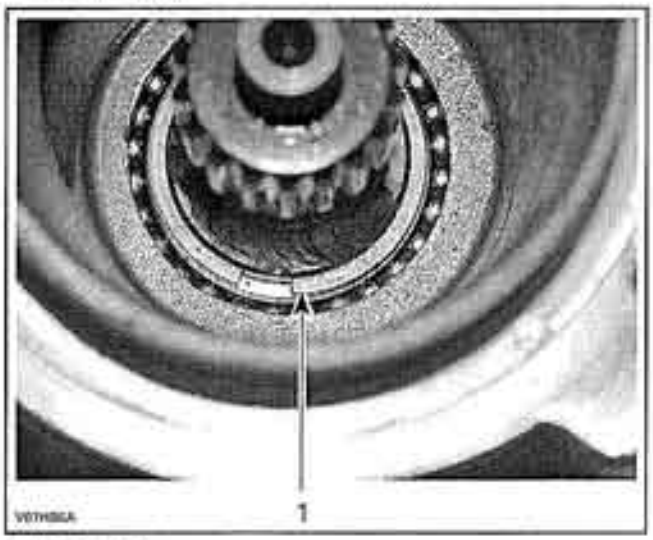
– coupling sleeve no. 13

– outer circlip



1. Outer circlip

– inner circlip



1. Inner circlip

– shaft no. 14.

Using a suitable puller, remove the ball bearing no. 15.

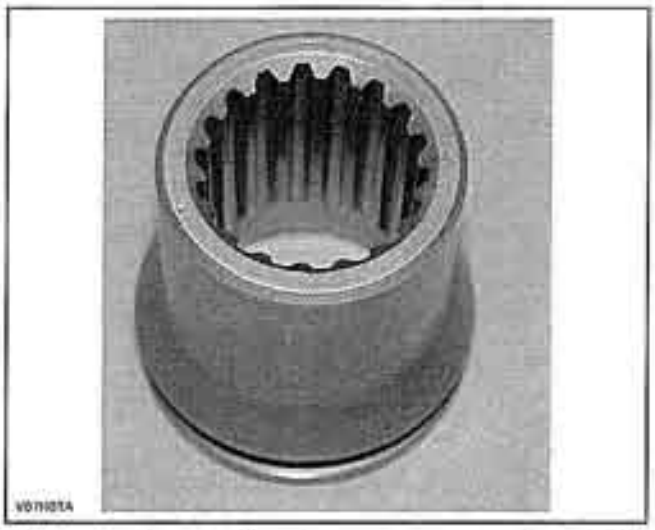
NOTE: Remove the ball bearing only if it does not turn freely and smoothly.

Inspection

Check disconnect unit housing and actuator for cracks or other damages. Replace defective part(s) if necessary.

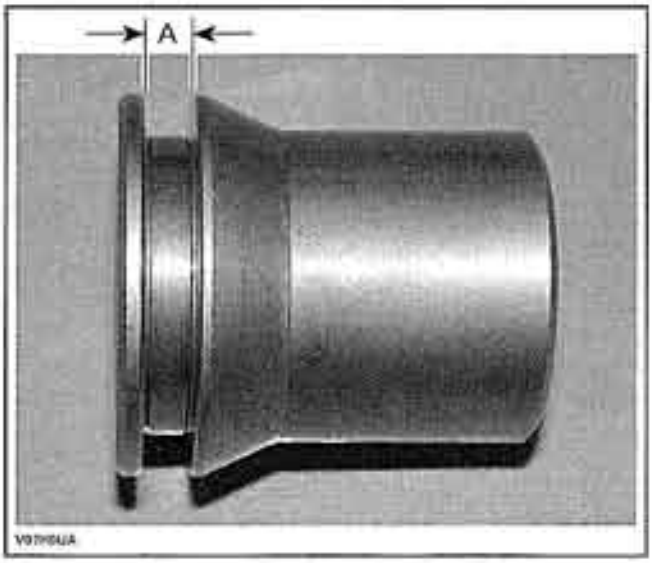
Check if the actuator O-ring and the coupling unit housing O-ring no. 16 are brittle, hard or damaged.

Check splines of coupling sleeve no. 13 for wear or other damages. Replace if splines are damaged.



Measure the coupling sleeve groove. If the width of groove is out of specification replace the coupling sleeve.

COUPLING SLEEVE GROOVE WIDTH	
Service limit	5.00 mm (.197 in)



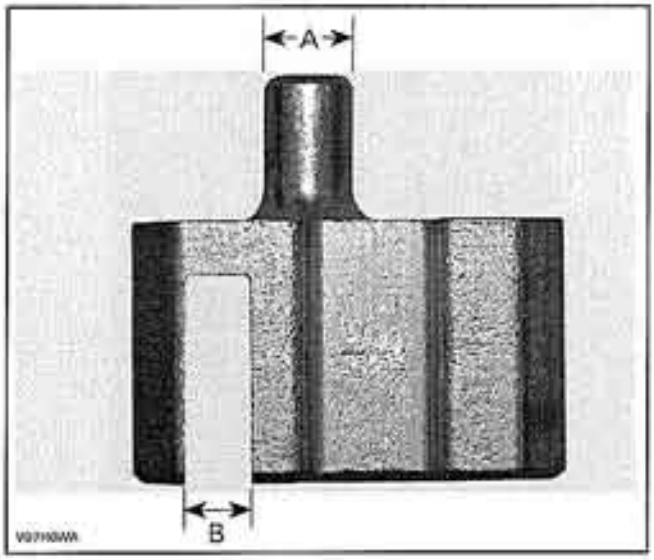
A. Groove width

Check sliding sleeve dog for bend and measure it.

SLIDING SLEEVE DOG THICKNESS	
Service limit	4.80 mm (.189 in)

Measure the sliding sleeve groove.

SLIDING SLEEVE GROOVE WIDTH	
Service limit	3.60 mm (.142 in)

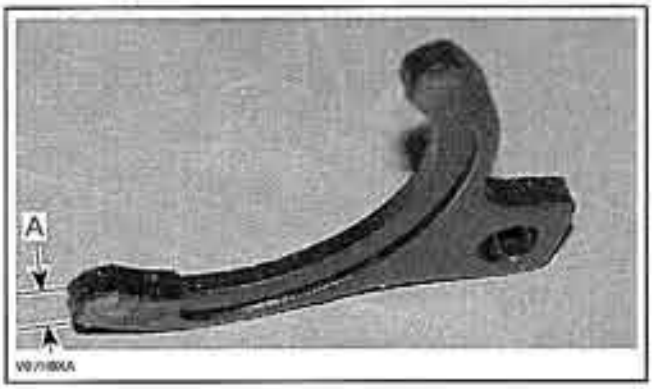


A. Sliding sleeve dog thickness
B. Sliding sleeve groove width

Check shifter plate for visible damage, wear or bent claws.

Measure the shifter plate claw thicknesses.

SHIFTER PLATE CLAWS THICKNESS	
Service limit	2.93 mm (.115 in)

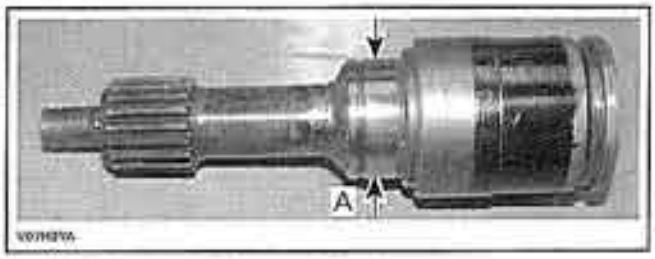


A. Shifter plate thickness

Check inner and outer shaft splines for wear or other damages. Replace shaft if necessary.

Measure shaft for wear limit.

SHAFT	
Service limit	29.995 mm (1.181 in)



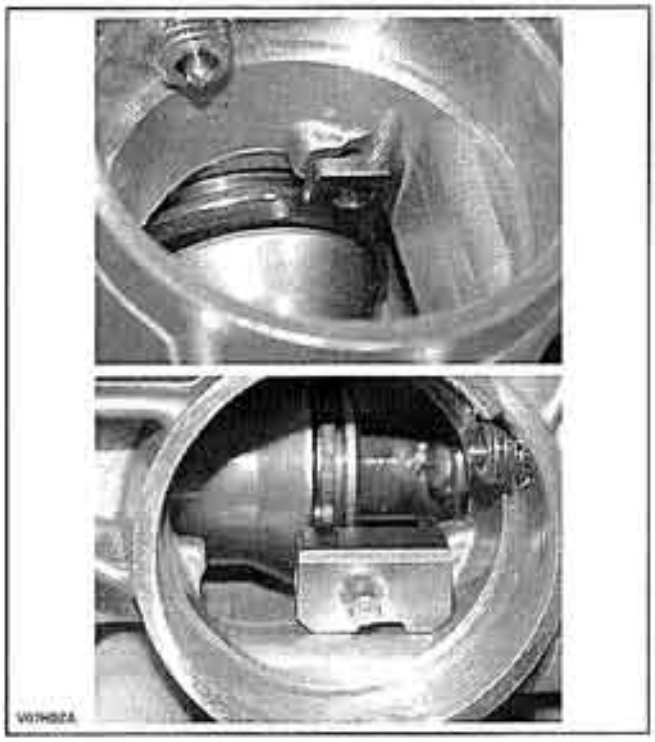
A. Shaft diameter in the area of bearing

Assembly

The assembly is the reverse of the disassembly procedure. Pay attention to the following details.

Apply engine oil on moving parts.

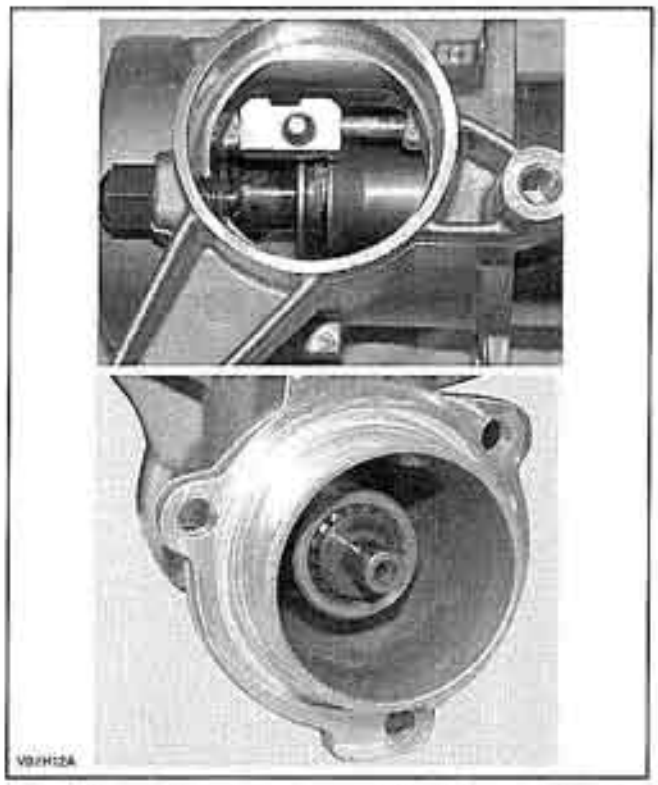
Install the shifter plate and coupling sleeve as per the following illustrations.



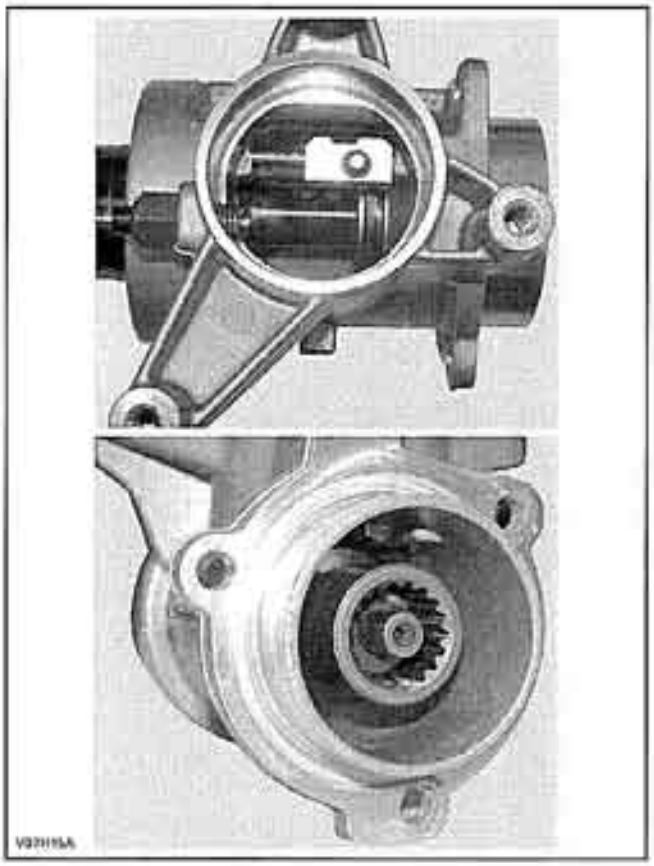
Insert pin and install Allen screw.

Check if the shifter plate and the coupling sleeve are installed properly.

When the sliding sleeve is positioned on left side, the coupling sleeve is equal with the end of the shaft splines.



Move the sliding sleeve on right side and check if the coupling sleeve is flush with the end of shaft.



To install the actuator on housing, refer to actuator *INSTALLATION* procedure above in this section.

Installation

The installation is the reverse of removal procedure.

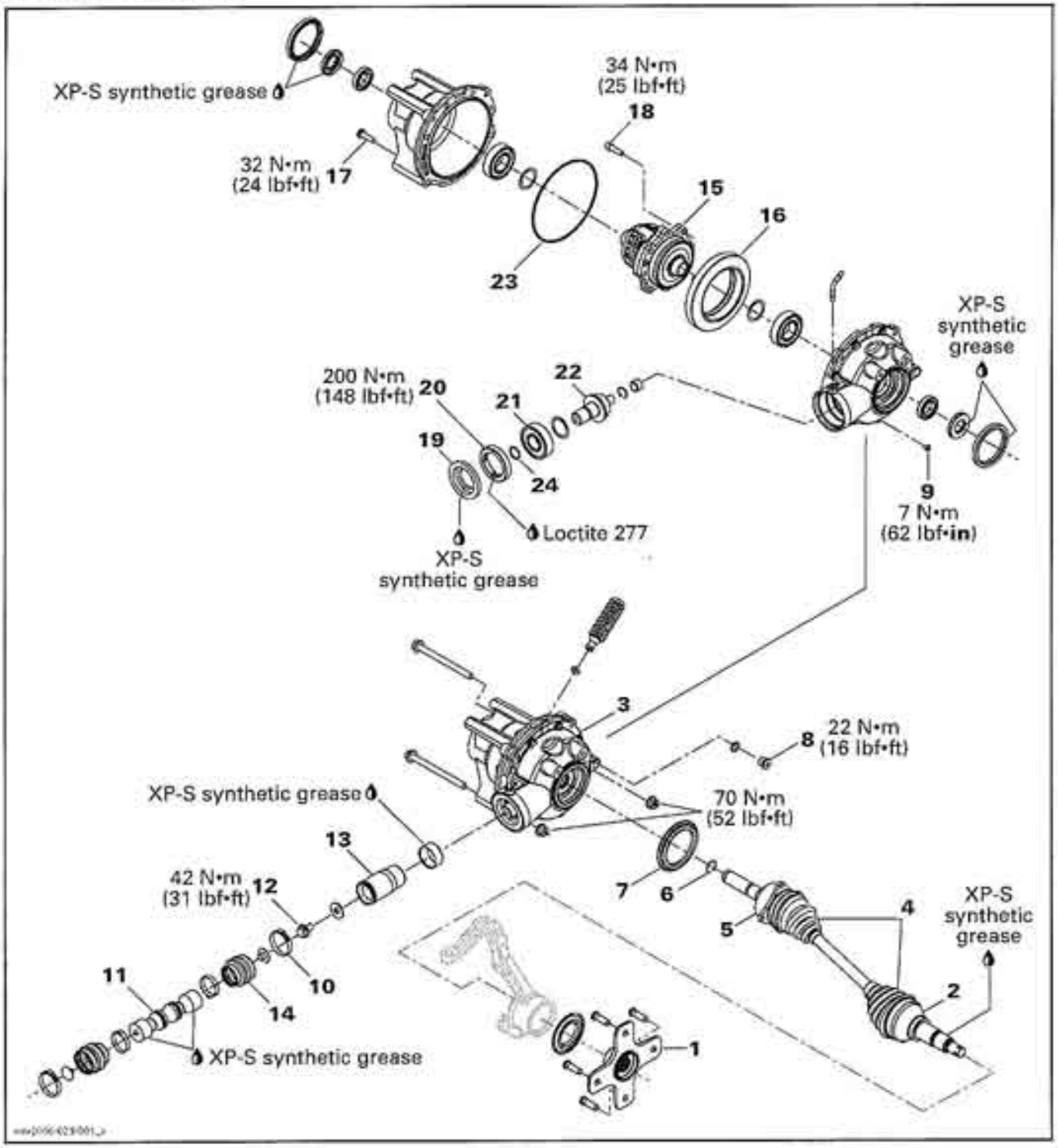
Apply synthetic grease (P/N 293 550 010) on coupling unit housing O-ring.

FRONT DRIVE

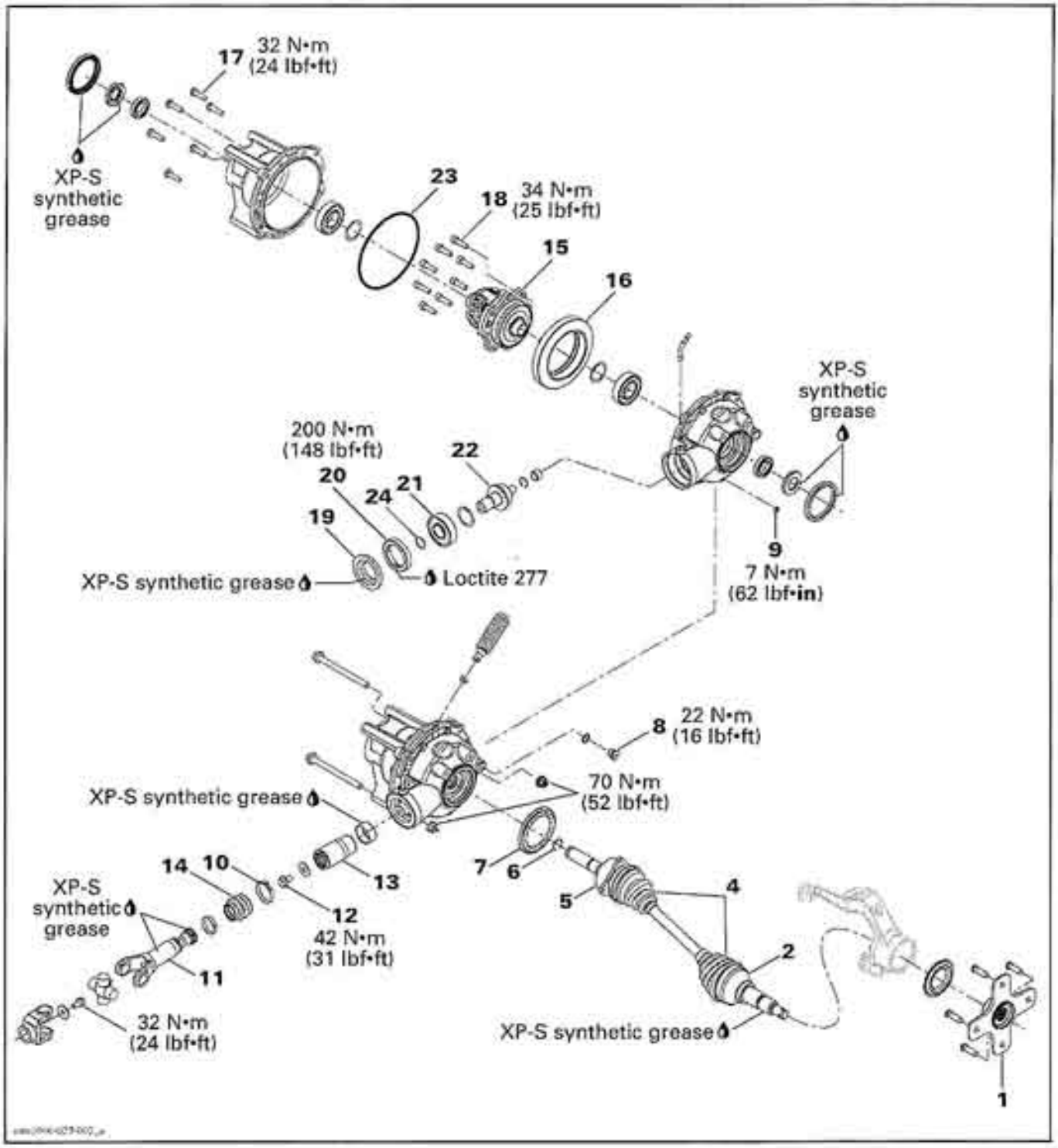
SERVICE TOOLS

SERVICE PRODUCTS

Outlander 400 Series



Outlander 800 Series



GENERAL

The procedure explains below is the same for the RH and LH sides unless otherwise instructed.

During assembly/installation, use torque values and service products as in the exploded views.

Clean threads before applying threadlocker. Refer to *SELF-LOCKING FASTENERS* and *LOCTITE APPLICATION* at the beginning of this manual for complete procedure.

⚠ WARNING

Torque wrench tightening specifications must strictly be adhered to.
Locking devices (e.g.: locking tabs, elastic stop nuts, self-locking fasteners, etc.) must be installed or replaced with new ones where specified. If the efficiency of a locking device is impaired, it must be renewed.

PROCEDURES

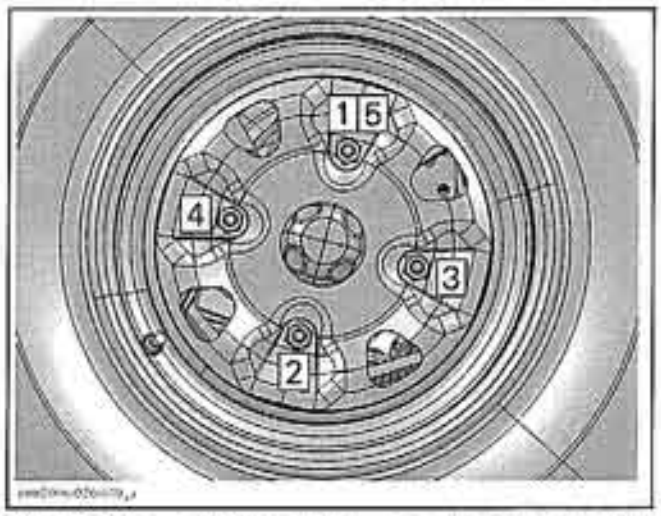
TIRES AND WHEELS

⚠ WARNING

When the tires are replaced, never install a bias tire with a radial tire. Such a combination could create handling and/or stability problems.
Do not mix tires of different size and/or design on the same axle.
Front and rear tire pairs must be the identical model and manufacturer.
For unidirectional tread pattern, ensure that the tires are installed in the correct direction of rotation.
The radial tires must be installed as a complete set.
Severe injury or death can result if these instructions are not followed.

The tires are directional and their rotation must be kept in a specific direction for proper operation.

Torque wheel nuts to 70 N•m (52 lbf•ft) on Outlander 400 Series and to 90 N•m (66 lbf•ft) on Outlander 800 Series in accordance with the following illustration.



CAUTION: Always use the recommended wheel nuts. Using a different nut could cause damages to the rim.

Outlander 800 Series

On these models, wheel balancing is necessary. To perform this operation, use a wheel balancer and adhesive weights.

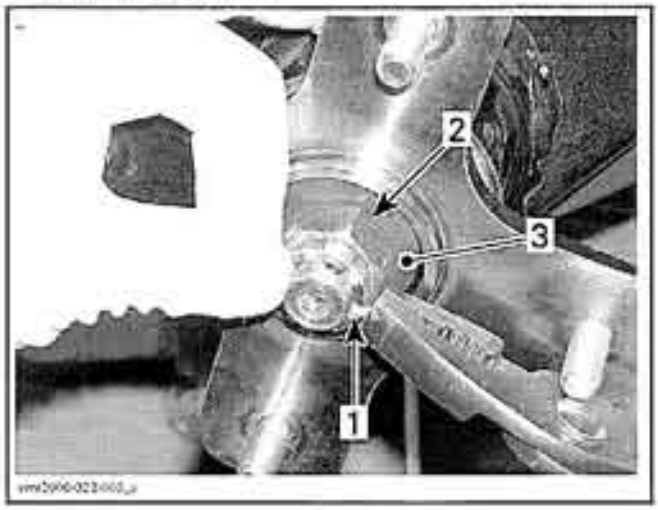
WHEEL HUB

Removal

Raise the front of vehicle, support it securely on jack stands and remove front wheel.

Apply parking brake or select 4WD position and place transmission lever on P.

Remove:
- wheel cap
- cotter pin
- castellated nut
- Belleville washer.



1. *Cotter pin*
2. *Castellated nut*
3. *Belleville washer*

Pull wheel hub no. 1 to remove it.

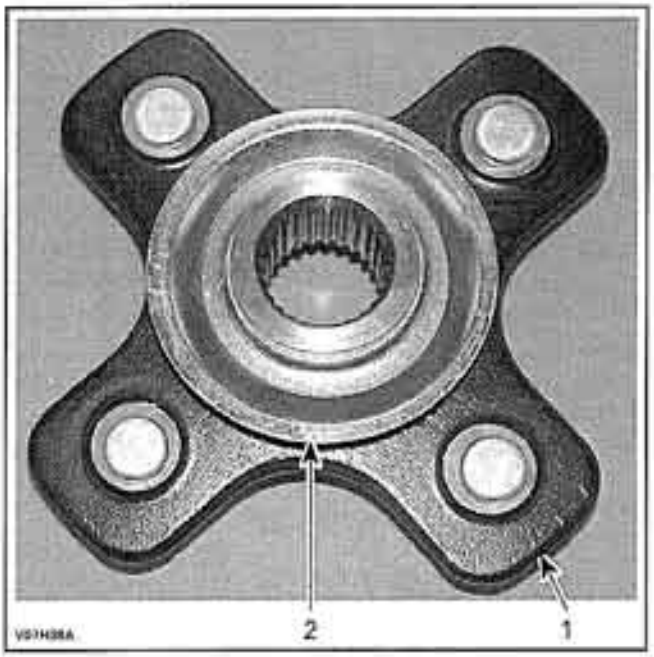
Inspection

Check wheel hub for cracks or other damages.

Check inner splines for wear or other damages.

If any damage is detected on wheel hub, replace it with a new one.

Check wear ring. If damage is apparent, replace the wear ring.



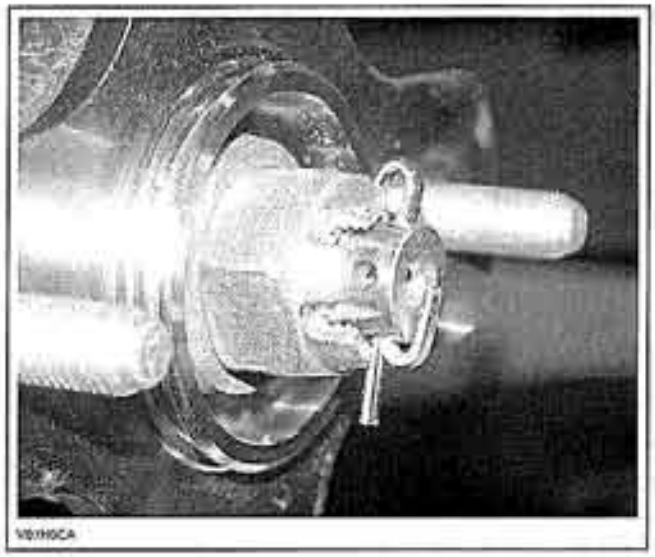
1. Wheel hub
2. Wear ring

Installation

The installation is the reverse of removal procedure.

Install Belleville washer so that the inside diameter protrudes outward and contacts the nut.

Tighten the castellated nut on the drive shaft end to 205 N•m (151 lbf•ft) and further tighten until one of its grooves is aligned with a cotter pin hole. Install a new cotter pin and the wheel cap. Fold one pin of cotter pin over drive shaft end.



FRONT DRIVE SHAFT

Removal

Remove the appropriate wheel hub no. 1, see above.

Models with Shock Absorbers and Upper A-Arm

Remove bolt that attach the shock absorber to the upper A-arm.

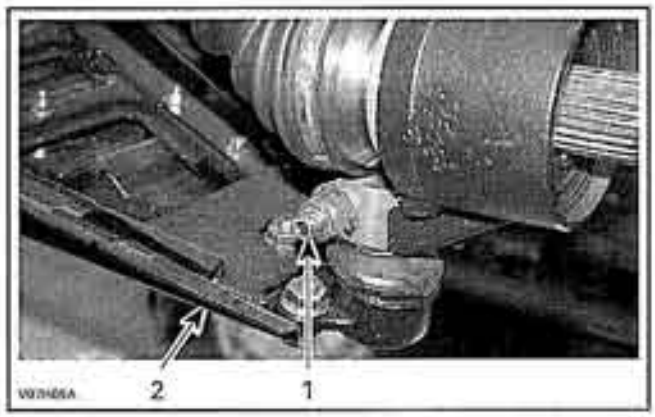
Detach upper A-arm from knuckle.

Models with Struts

Unscrew bolts holding strut to knuckle.

All Models

Remove ball joint retaining bolt from lower suspension arm.



1. Ball joint retaining bolt
2. Lower suspension arm

Separate knuckle from lower suspension arm.

Move CV joint no. 2 out of knuckle then place the knuckle and the tie-rod out of way.

Remove caliper. Refer to *BRAKES*.

Pull drive shaft out of differential no. 3.

NOTE: Pull drive shaft strongly.

Inspection

Inspect the condition of boots no. 4. If there is any damage or evidence of leaking lubricant, replace them. Refer to *DRIVE SHAFT BOOT* section.

Check splines for excessive wear. Replace if necessary.

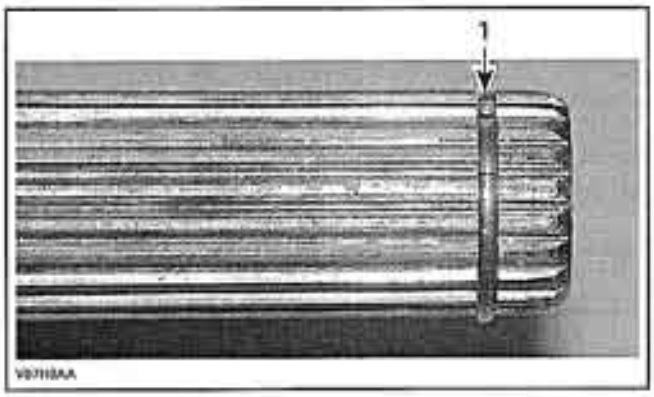
NOTE: If the splines on plunging joint no. 5 are worn, a check of differential inner splines should be done.

Check the stop ring no. 6 at the end of drive shaft. If wear is apparent, replace the wear ring no. 7.

Check if the bearings in knuckle move freely and smoothly. If not, replace them. Refer to *STEERING SYSTEM*.

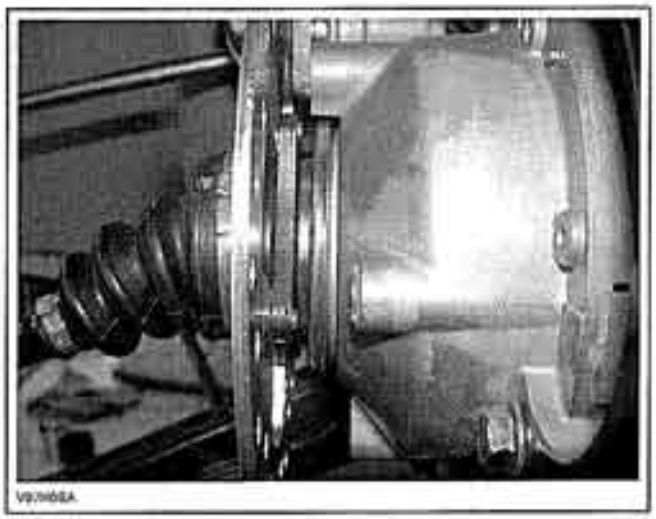
Installation

Apply XP-S synthetic grease (P/N 293 550 010) to the splines and insert the end of drive shaft in differential and pull joint a little to make sure that the stop ring is locked in differential side gear groove.



1. Stop ring

NOTE: The wear ring should be close to the differential.



TYPICAL

Insert the other end of drive shaft in the knuckle and install the knuckle to the lower suspension arm. Install and torque the ball joint retaining bolts to 48 N•m (35 lbf•ft).

Install all other removed parts.

Drive Shaft Boot

Removal

Remove:

- clamps from rubber boot using CV boot clamp pliers (P/N 295 000 069) and pliers Oetiker 1099 (P/N 295 000 070)
- large end of the boot from plunging joint no. 5 or CV joint no. 2.

Clamp joint housing in a vise.

Align shaft with joint.

Pull hard on shaft to remove from joint.

Remove boot from drive shaft.

Inspection

Check bearing in plunging joint no. 5 or CV joint no. 2. If bearing is hard to move, change plunging joint or CV joint.

Check circlip for damage, change as necessary.

Installation

For installation, reverse the removal procedure. Pay attention to the following details.

Insert boot, do not forget the small clamp.

To insert shaft in joint:

- clamp joint in a vise with joint facing up
- center clip on shaft
- carefully insert shaft into joint
- push hard to engage clip.

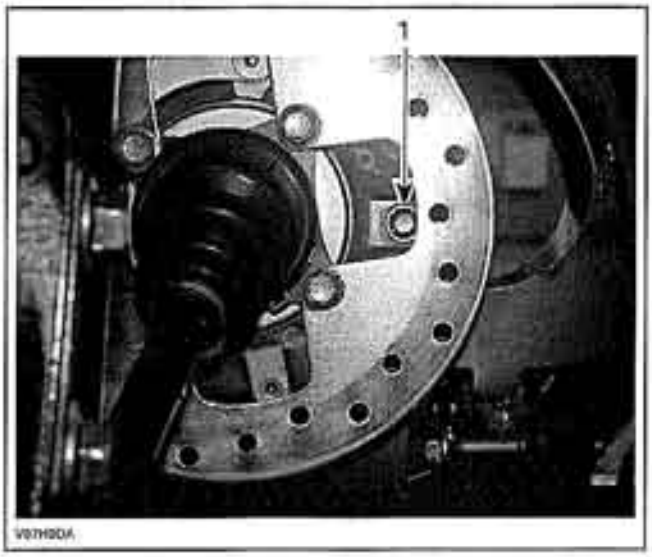
Pack bearing area with grease (included with the new boot kit).

NOTE: Do not use or add other grease.

FRONT DIFFERENTIAL

Oil Level

Clean filler plug prior to checking oil level.



1. Filler plug

With vehicle on a level surface, check oil level by removing filler plug no. 8. Oil level must reach the lower edge.

Add oil if necessary. Use Bombardier differential oil (P/N 293 600 043) or a 75W90 synthetic oil (API GL-5).

Oil Change

Place vehicle on a level surface. Set transmission in park position.

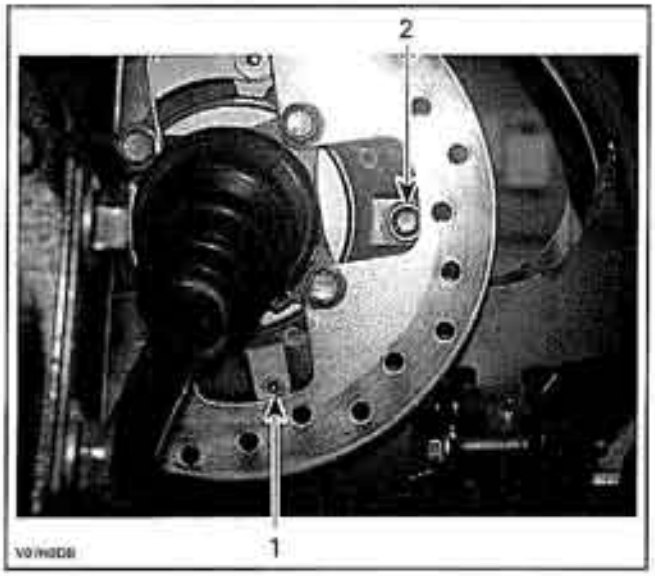
Lift LH side of vehicle.

Clean drain plug area.

Place a drain pan under differential drain plug area.

Remove drain plug no. 9.

Unscrew filler plug.



1. Drain plug
2. Filler plug

Clean drain plug area then reinstall plug.

Lower vehicle.

Use a funnel and refill front differential with 500 mL (17 oz. US) of Bombardier differential oil (P/N 293 600 043). If the Bombardier differential oil is not available, use a 75W90 synthetic oil (API GL-5).

Reinstall filler plug.

Removal

Raise front of vehicle, support it securely on jack stands and remove front wheels.

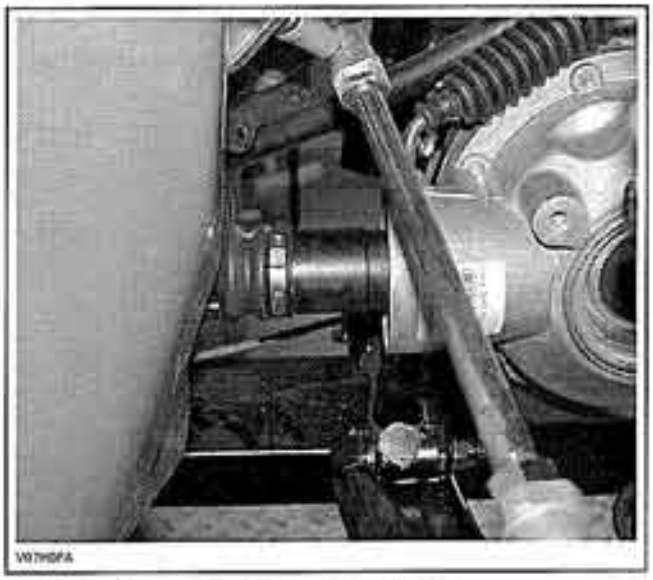
Drain the differential.

On both sides, remove the drive shafts (refer to *FRONT DRIVE SHAFT* above).

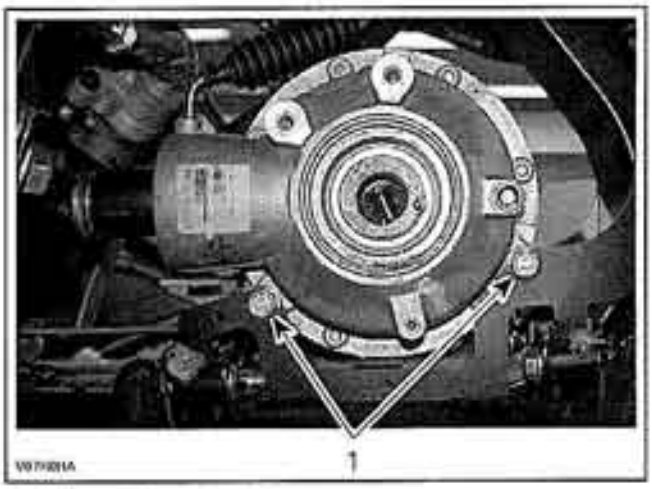
Outlander 400 Series

Remove:

- Oetiker clamp no. 10 (discard it) on propeller shaft no. 11 (differential side)



– both differential mounting bolts.



1. Differential mounting bolts

Move the differential forward to disconnect the propeller shaft.

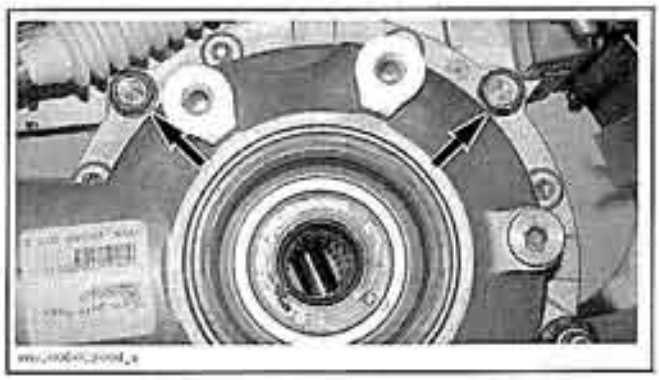
Remove the differential from the RH side.

Unscrew bolt no. 12 retaining the propeller shaft adaptor no. 13.

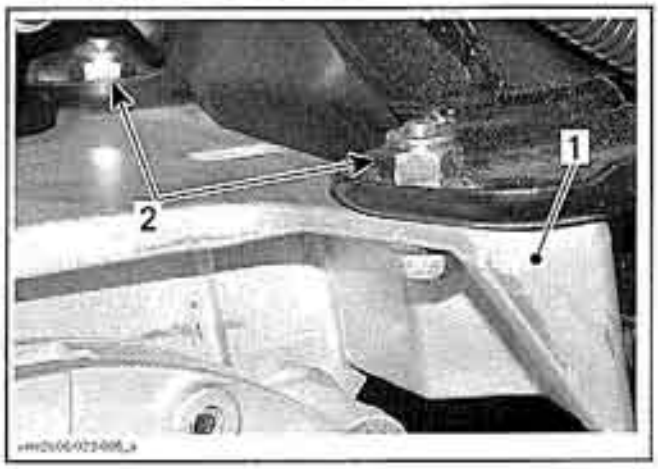
Outlander 800 Series

Remove:

- both upper A-arms
- bolts that attach winch bracket to the frame (XT models)
- upper differential bolts

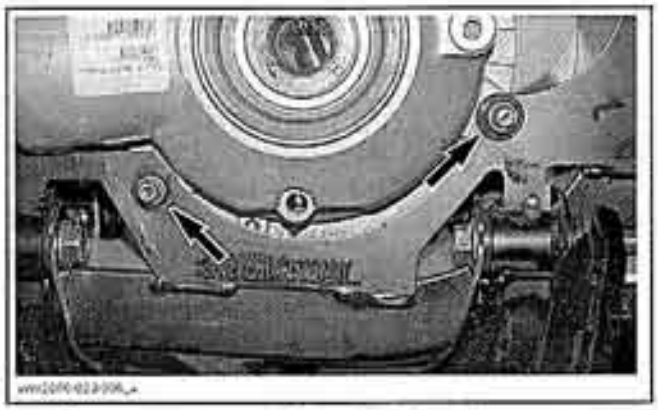


– differential support bolts



1. Differential support
2. Differential support bolts

– lower differential bolts



- differential support by the left side
- Oetiker clamp no. 10 that attach propeller shaft bellows no. 14 to the propeller shaft adaptor no. 13

- differential no. 3 from the right side of vehicle.

Inspection

Check backlash and drag torque, see *ADJUSTMENT* further in this section.

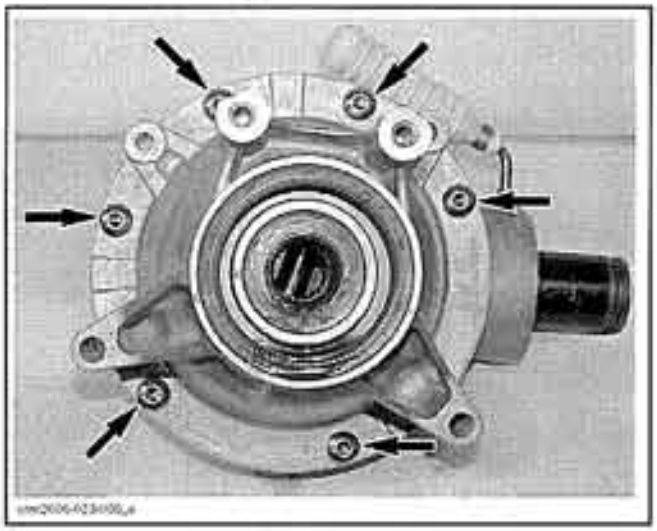
Check if oil seals are brittle, hard or damaged. Replace if necessary.

Disassembly

Ring Gear Carrier/Ring Gear

To change ring gear carrier no. 15 or ring gear no. 16:

- Unscrew the TORX screws no. 17, then separate half housings.



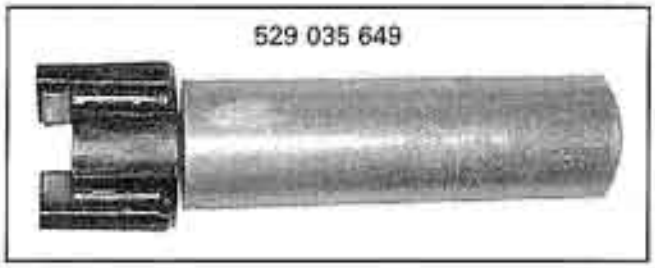
NOTE: Be careful to keep track of shims on each end of ring gear carrier.

- Extract ring gear carrier with ring gear out of half housing.
- Unscrew Allen socket screws no. 18 then separate ring gear from ring gear carrier.

Pinion Gear

Remove oil seal no. 19.

Unscrew the pinion nut no. 20. Use the differential spanner socket (P/N 529 035 649).



Remove the bearing no. 21 at the same time as the pinion gear no. 22. Be careful to keep track of shims.

NOTE: The pinion gear and bearing can be easily removed using the following suggested tool:

- pipe 3-1/2 in dia. x 5 in (1)
- screwed rod M10 x 1.25, 7 in length (1)
- nut M10 x 1.25 (3)
- flat bar (1).

Adjustment

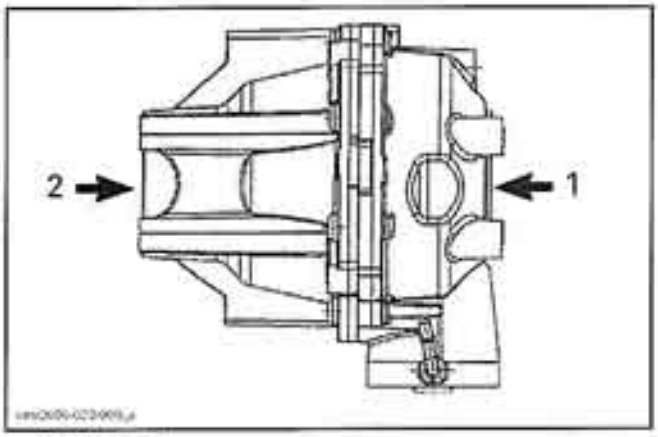
A shimming procedure must be done when ring gear carrier, pinion gear, ring gear or housing is (are) changed.

Measure the old pinion shim stack. If the shims measure over 1 mm (.039 in), install shim stacks on the differential components as per CHART A.

If the old pinion shim stack measurement is under 1 mm (.039 in), install a .5 mm (.02 in) shim on the differential components as per CHART B.

CHART A		CHART B	
PINION	1.85 mm (.073 in)	PINION	.5 mm (.02 in)
BACKLASH	1 mm (.039 in)	BACKLASH	
PRELOAD		PRELOAD	

NOTE: The procedure above sets the pinion shim thickness and should not be modified thereafter. Any changes should be done on the preload and/or backlash side(s).

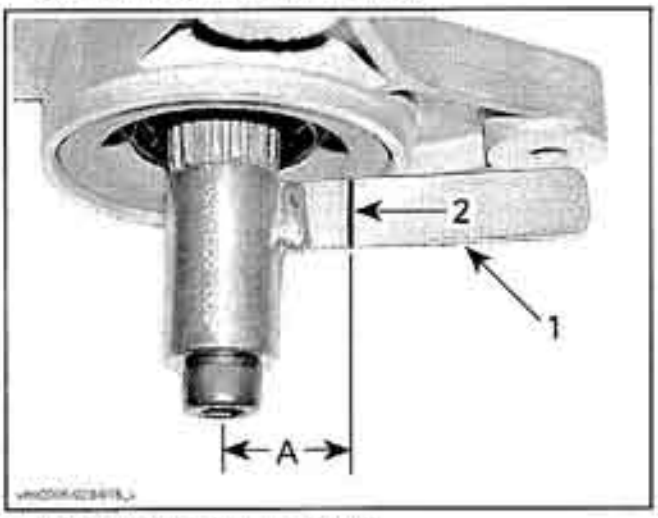


1. Backlash side
2. Preload side

Assemble the differential and check backlash as well as preload.

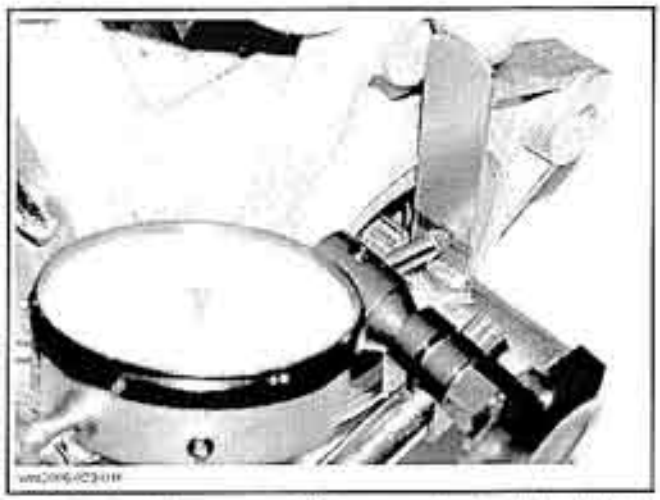
Backlash

- Using a dial indicator and the backlash measurement tool (P/N 529 035 665), measure the backlash. Place the backlash measurement tool at the end of pinion gear.
- From center of bolt, measure 25.4 mm (1 in) and scribe a mark on the tab.



1. Tab of backlash measurement tool
2. Mark on tab
A. 25.4 mm (1 in)

- Position the dial indicator tip against the tab at a 90° angle and right on the previously scribed mark.
- Gently, move the tab back and forth. Note the result.



- Rotate pinion gear 1/2 turn and check backlash again. Note the result.
- Rotate pinion gear 1 turn and check backlash again.

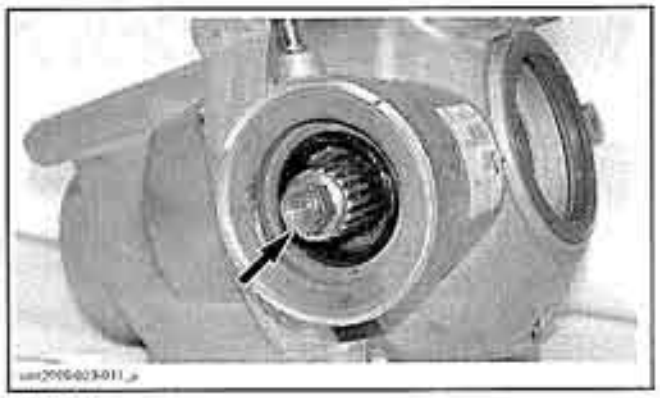
If backlash is below 0.05 mm (.002 in), increase backlash shim by 0.05 mm (.002 in) and check the backlash again.

If backlash is greater than 0.356 mm (.014 in), decrease backlash shim by 0.05 mm (.002 in) and check the backlash again.

Measure preload.

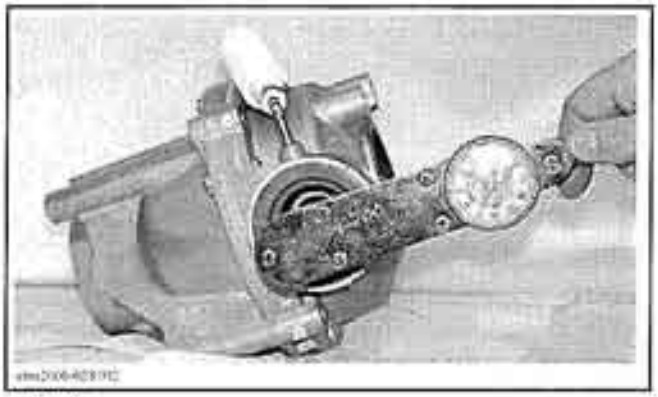
Preload

Screw the propeller shaft adaptor bolt no. 12 in pinion gear.



TYPICAL

Using a needle torque wrench, measure the drag torque.



TYPICAL

If the drag torque is greater than 0.7 N•m (6 lbf•**in**), reduce preload shim by 0.05 mm (.002 in) and check drag torque again.

If the drag torque is less than 0.06 N•m (.5 lbf•**in**), increase preload shim by 0.05 mm (.002 in) and check drag torque again.

Assembly

Ring Gear Carrier/Ring Gear

To assemble, reverse the removal procedure. Pay attention to the following details.

Verify condition of half housing seal **no. 23**. Change seal if necessary.

Check all bearings and all oil seals. Change them if necessary.

Pinion Gear

To install, reverse the removal procedure. Pay attention to the following details.

Check O-ring **no. 24** for damage. If so, change it.

Install the shim(s) then the ball bearing.

Install the nut **no. 20**. Apply Loctite 277 (P/N 293 800 073) on threads nut then torque it to 200 N•m (148 lbf•ft).

Apply XP-S synthetic grease (P/N 293 550 010) in the lips of the new oil seal **no. 19** and install it.

Installation

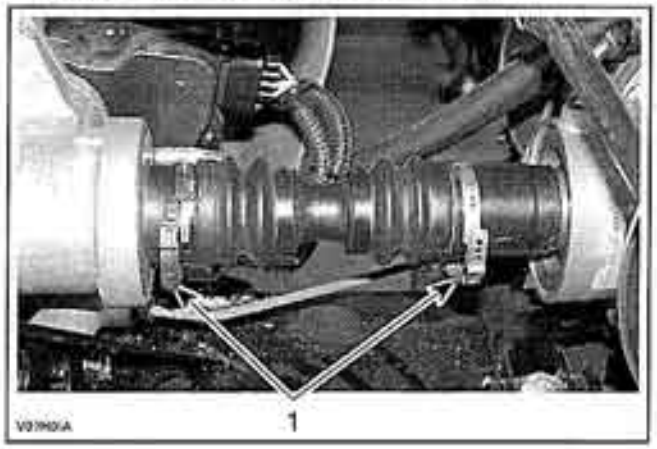
The installation is the reverse of the removal procedure.

FRONT PROPELLER SHAFT

Removal

Outlander 400 Series

Remove:
- RH footwell
- RH inner fender
- RH drive shaft
- both Oetiker clamps (discard them)



1. Remove these clamps

- differential mounting bolts.

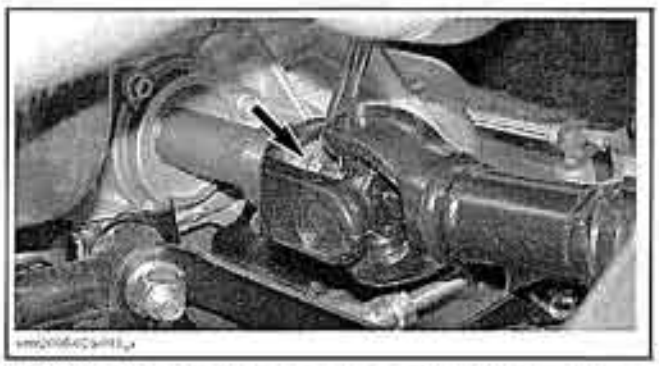
Pull differential **no. 3** back then separate propeller shaft **no. 11** from differential and disconnect unit.

Outlander 800 Series

Place vehicle on PARK position and select 4WD.

Remove the RH footrest.

Unscrew propeller shaft bolt on engine side.



Remove the Oetiker clamp **no. 10** that attach propeller shaft bellows **no. 14** to the propeller shaft adaptor **no. 13**. Discard clamp.

Remove LH drive shaft.

Unscrew lower and upper differential bolts.

Remove them and move the differential forwards.

Remove front propeller shaft no. 11.

Inspection

Check:
- splines for wear or damage
- if U-joint moves freely in all direction
- bellows for holes or brittleness.

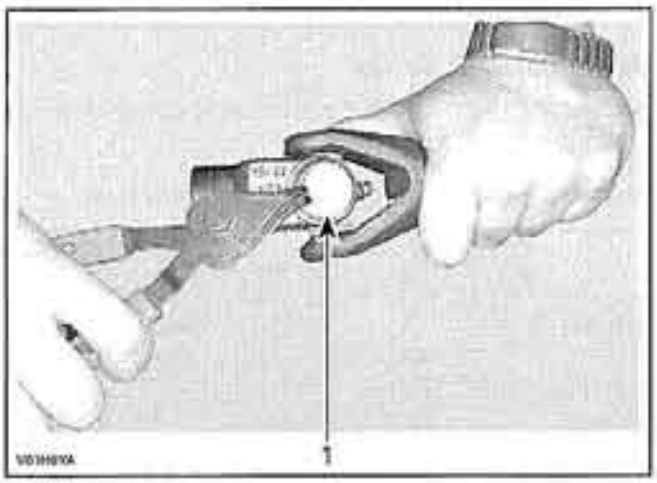
Installation

Installation is the reverse of removal procedure.

PROPELLER SHAFT U-JOINT

Removal

Remove internal snap ring from bearing caps.



1. Snap ring

Support inner yoke in vice and drive other yoke down with a soft hammer.

Support U-joint in vice and drive inner yoke down to remove remaining bearing caps.

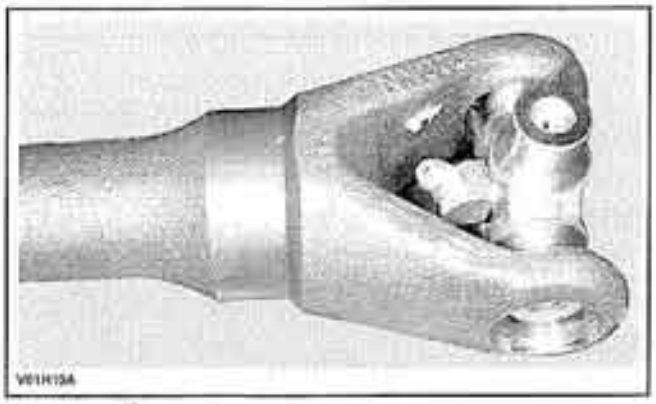
Remove U-joint cross.

Installation

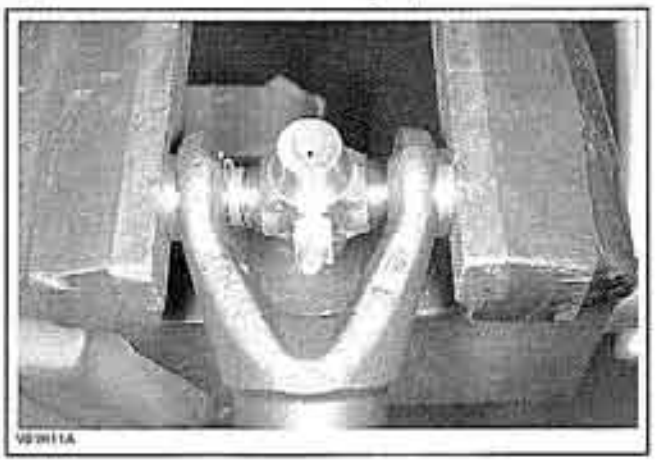
Install new U-joint cross in inner yoke.

Install new bearing cap by hand.

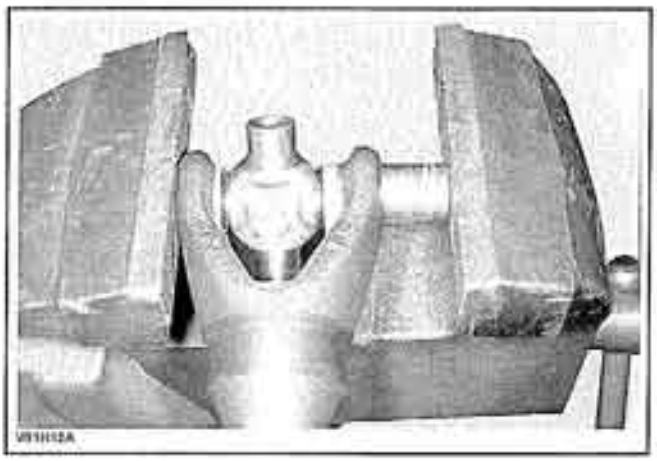
NOTE: Carefully install U-joint cross with grease fitting properly positioned.



Tighten vise to force bearing caps in.



Using a suitable tappet, fully seat bearing cap in one side. Continually, check for free movement of bearing cross as bearing caps are assembled.



Install snap ring.

Repeat procedure for other sides.

Grease U-joint, using a grease gun with XP-S synthetic grease (P/N 293 550 010).

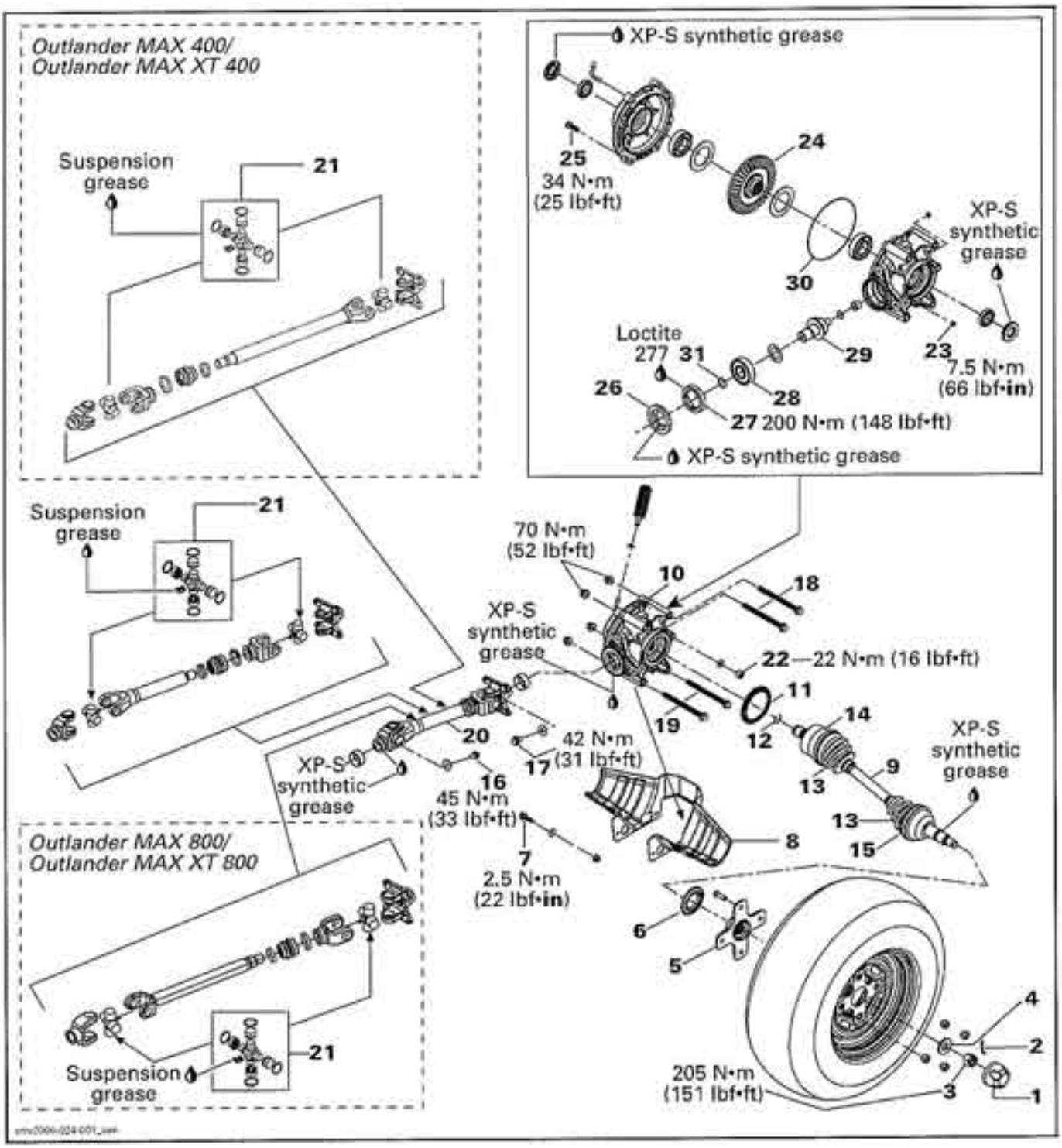
REAR DRIVE

SERVICE TOOLS

Description	Part Number	Page
backlash measurement tool	529 035 665	365
CV boot clamp pliers	295 000 069	361
differential spanner socket	529 035 649	364
pliers Oetiker 1099	295 000 070	361

SERVICE PRODUCTS

Description	Part Number	Page
Bombardier differential oil	293 600 043	364
Loctite 277	293 800 073	366
suspension grease	293 550 033	362–363
XP-S synthetic grease	293 550 010	360, 362, 366


Outlander MAX 400/
Outlander MAX XT 400
Suspension grease
21
XP-S synthetic grease
25
34 N•m
(25 lbf•ft)
24
30
XP-S synthetic grease
Loctite 277
31
29
23
7.5 N•m
(66 lbf•in)
26
28
27 200 N•m (148 lbf•ft)
XP-S synthetic grease
Suspension grease
21
70 N•m
(52 lbf•ft)
10
18
XP-S synthetic grease
22—22 N•m (16 lbf•ft)
11
19
12
14
XP-S synthetic grease
20
42 N•m
(31 lbf•ft)
17
9
13
XP-S synthetic grease
16
45 N•m
(33 lbf•ft)
13
15
8
7
2.5 N•m
(22 lbf•in)
Outlander MAX 800/
Outlander MAX XT 800
6
5
4
2
Suspension grease
21
205 N•m
(151 lbf•ft)
3
1

GENERAL

During assembly/installation, use torque values and service products as in the exploded views.

Clean threads before applying a threadlocker. Refer to *SELF-LOCKING FASTENERS* and *LOCTITE APPLICATION* at the beginning of this manual for complete procedure.

⚠ WARNING

Torque wrench tightening specifications must strictly be adhered to.
Locking devices (e.g.: locking tabs, elastic stop nuts, self-locking fasteners, etc.) must be installed or replaced with new ones where specified. If the efficiency of a locking device is impaired, it must be renewed.

PROCEDURES

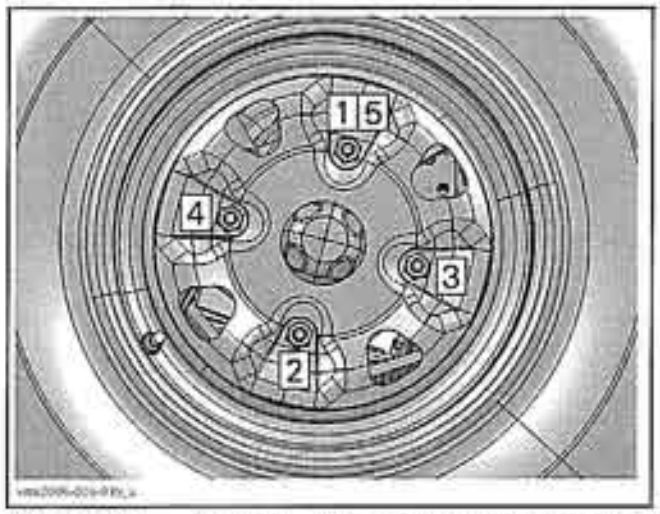
TIRES AND WHEELS

⚠ WARNING

When the tires are replaced, never install a bias tire with a radial tire. Such a combination could create handling and/or stability problems.
Do not mix tires of different size and/or design on the same axle.
Front and rear tire pairs must be the identical model and manufacturer.
For unidirectional tread pattern, ensure that the tires are installed in the correct direction of rotation.
The radial tires must be installed as a complete set.
Severe injury or death can result if these instructions are not followed.

The tires are directional and their rotation must be kept in a specific direction for proper operation.

Torque wheel nuts to 70 N•m (52 lbf•ft) on **Outlander 400 Series** and 90 N•m(66 lbf•ft) on **Outlander 800 Series** in accordance with the following illustration.



CAUTION: Always use the recommended wheel nuts. Using a different nut could cause damages to the rim.

Outlander 800 Series

On these models, wheel balancing is necessary. To perform this operation, use a wheel balancer and adhesive weights.

WHEEL HUB

Removal

Remove:
- appropriate wheel
- wheel cap no. 1
- cotter pin no. 2 (discard it)
- castellated nut no. 3
- Belleville washer no. 4
- wheel hub no. 5.

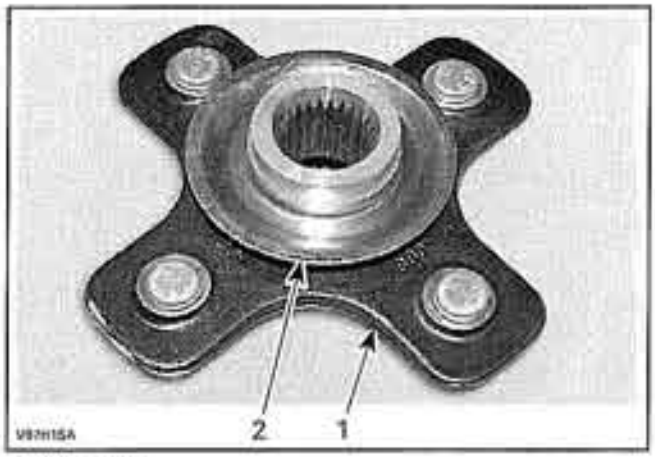
Inspection

Check wheel hub for cracks or other damages.

Check inner splines for wear or other damages.

If any damage is detected on wheel hub, replace it with a new one.

Check wear ring no. 6. If it is loose on hub, replace the wear ring.



1. Wheel hub
2. Wear ring

Installation

The installation is the reverse of removal procedure. Pay attention to the following.

Apply XP-S synthetic grease (P/N 293 550 010) on drive shaft splines.

Install Belleville washer no. 4 in correct orientation. Inside diameter must protrude outward.

Torque castellated nut to 205 N•m (151 lbf•ft) and further tighten until one of its grooves is aligned with a cotter pin hole. Install a new cotter pin. Fold one pin of cotter pin over drive shaft end.

DIFFERENTIAL PROTECTOR

Removal

Remove bolts no. 7 retaining the protector no. 8 to the hitch.

Installation

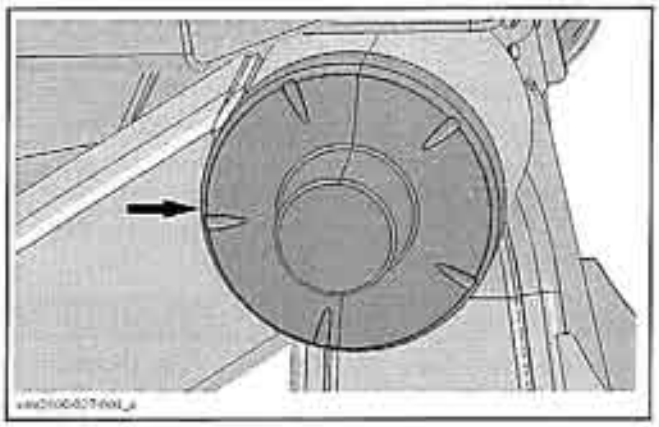
The installation is the reverse of removal procedure.

DRIVE SHAFT

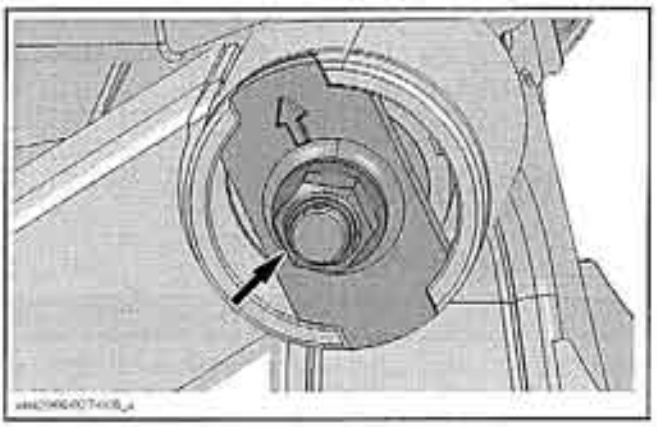
Removal

Remove the appropriate wheel hub and the footrest on this side.

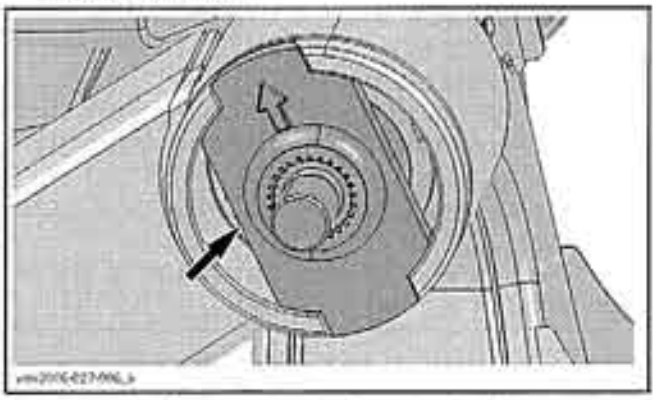
Near trailing arm and frame junction, remove:
- protective cap



- elastic nut



- washer
- torsion bar lever.



Remove the lower shock absorber bolt.

Remove trailing arm.

Pull drive shaft no. 9 out of differential no. 10.

NOTE: Pull drive shaft strongly.

Inspection

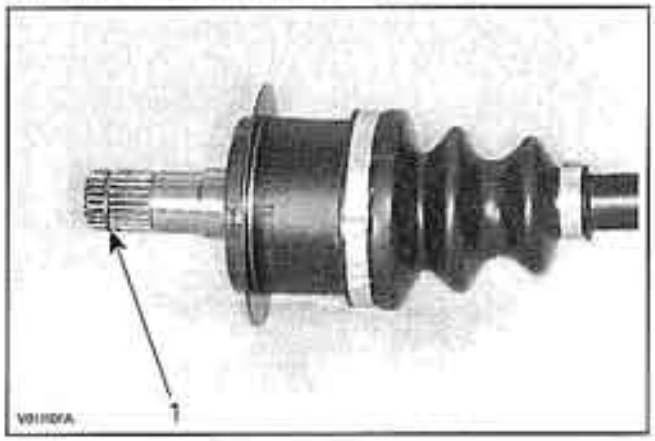
Inspect the condition of boots. If there is any damage or evidence of leaking lubricant, replace them. Refer to *DRIVE SHAFT BOOT* section.

Check shaft splines. Replace drive shaft if necessary.

Check wear ring no. 11 on drive shaft end. Replace if necessary.

Installation

Insert the end of drive shaft in differential and pull joint a little to make sure that the stop ring no. 12 is locked in differential gear groove.



1. Stop ring

NOTE: Make sure that you do not interchange LH and RH drive shafts. The shafts are different lengths.

Install the other parts in the reverse order of removal procedure. Refer to the appropriate sections to apply the proper torque.

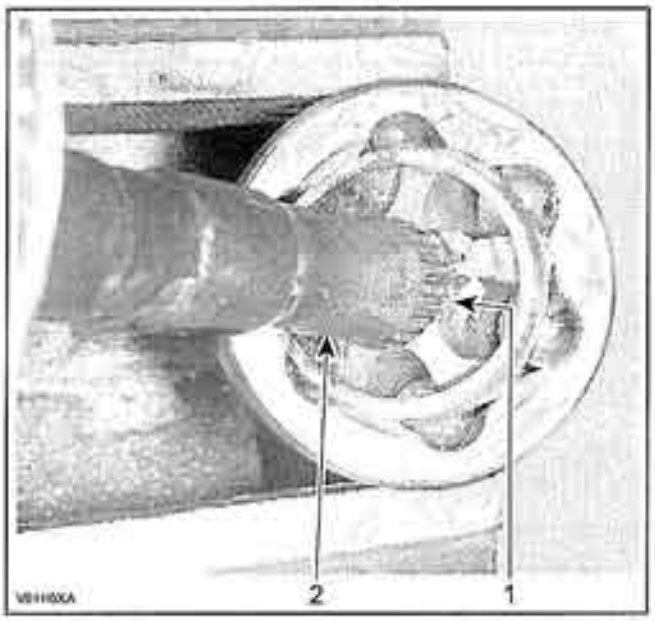
DRIVE SHAFT BOOT

Removal

Remove:

- drive shaft from vehicle
- clamps from rubber boot no. 13 using CV boot clamp pliers (P/N 295 000 069) and pliers Oetiker 1099 (P/N 295 000 070)
- large end of the boot from plunging joint no. 14 or CV joint no. 15.

Move apart circlip and pull out the shaft from bearing. Do not remove circlip.



1. Circlip
2. Shaft

Remove boot from drive shaft.

Inspection

Check bearing in plunging joint no. 14 or CV joint no. 15. If bearing is hard to move, change plunging joint or CV joint.

Check circlip for damage, change as necessary.

Installation

For installation, reverse the removal procedure. Pay attention to the following details.

Insert boot, do not forget the small clamp.

Insert shaft and push firmly.

Pack bearing area with grease (including with the new boot kit).

NOTE: Do not use any other grease.

REAR PROPELLER SHAFT

Removal

Install a jack stand to support the vehicle during the procedure.

Remove:

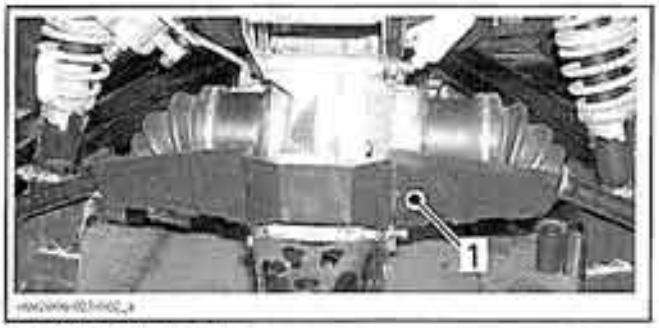
- rear wheel
- caliper (suspend it out of the way)

CAUTION: Do not let caliper hang by the hose and do not stretch or twist hose.

- rear propeller shaft bolts no. 16 and no. 17 (engine and differential sides)

NOTE: The propeller shaft bolts are different, they must be reinstalled in same location.

- differential protector no. 8



1. Differential protector

- upper and lower differential bolts no. 18 and no. 19.

Loosen hitch plate bolts.

Move the differential no. 10 backward.

Unplug the propeller shaft no. 20 from the differential then remove it from vehicle.

Inspection

Check yoke U-joint no. 21 for wear, backlash or axial play, replace if necessary.

Inspect engine seal for damage or leaks. Replace if necessary.

Inspect disc brake (refer to *HYDRAULIC BRAKES*).

Installation

Installation is essentially the reverse of removal procedure. Pay attention to the following details.

Apply XP-S synthetic grease (P/N 293 550 010) on engine drive shaft splines.

Install the propeller shaft bolt (engine side) and torque it to 45 N•m (33 lbf•ft).

Apply XP-S synthetic grease (P/N 293 550 010) to splines before insert the end of the propeller shaft into differential. Torque propeller shaft bolt to 34 N•m (25 lbf•ft).

Reinstall all other removed parts.

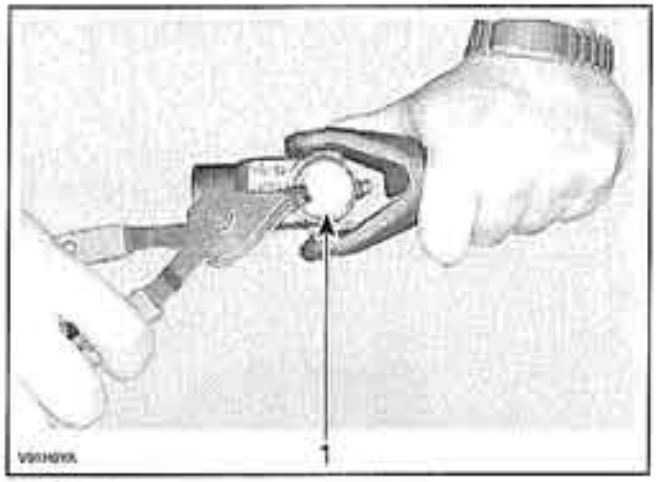
Grease U-joint from rear propeller shaft. Use a grease gun with suspension grease (P/N 293 550 033).

REAR PROPELLER SHAFT U-JOINT

Remove the disc brake before working on differential side of propeller shaft.

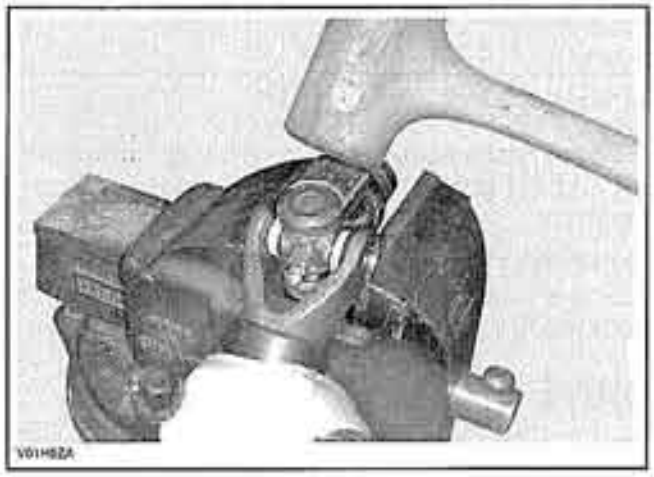
Removal

Remove internal snap ring from bearing caps.



1. Snap ring

Support inner yoke in vice and drive other yoke down with a soft hammer.



Support U-joint in vice and drive inner yoke down to remove remaining bearing caps.

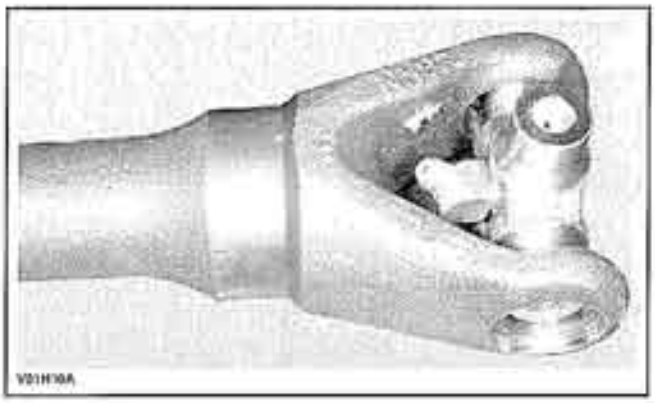
Remove U-joint cross.

Installation

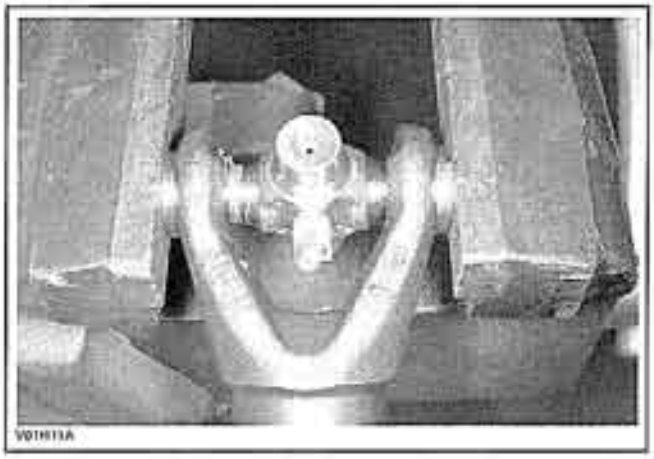
Install new U-joint cross in inner yoke.

Install new bearing cap by hand.

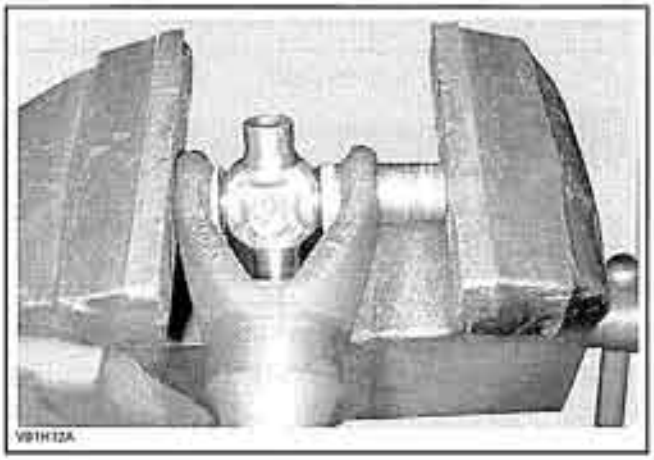
NOTE: Carefully install U-joint cross with grease fitting properly positioned.



Tighten vise to force bearing caps in.



Using a suitable tappet, fully seat bearing cap in one side. Continually, check for free movement of bearing cross as bearing caps are assembled.



Install snap ring.

Repeat procedure for other sides.

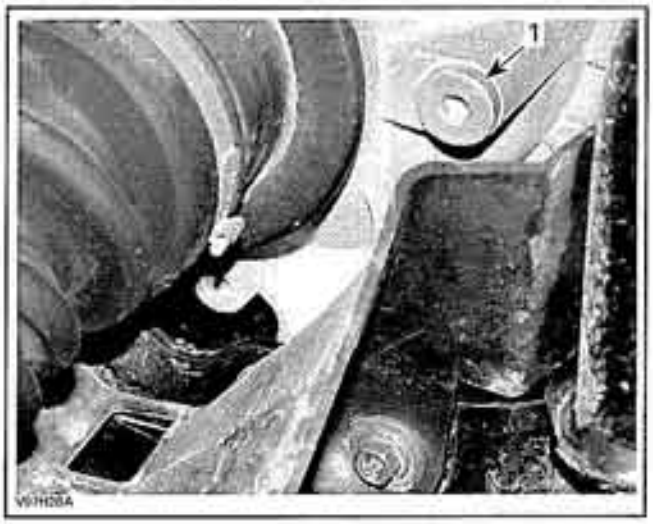
Grease U-joint, using a grease gun with suspension grease (P/N 293 550 033).

REAR DIFFERENTIAL

Oil Level

Place bottom of frame horizontally.

Clean filler plug prior to check oil level. Check oil level by removing filler plug no. 22.



1. Filler plug

The rear differential oil is not level with the filler plug threads.

It is possible to verify the oil level by inserting a wire with a 90° bend through the oil filler hole.

Oil level is between 25 to 32 mm (1 to 1-1/4 in) from the bottom of oil filler plug threads when the vehicle is level on ground.

When replacing the oil in the differential, it is easier to measure the right quantity of oil to add in order to reach the proper level. Refer to *OIL REPLACEMENT*.

Add oil if necessary.

Oil Replacement

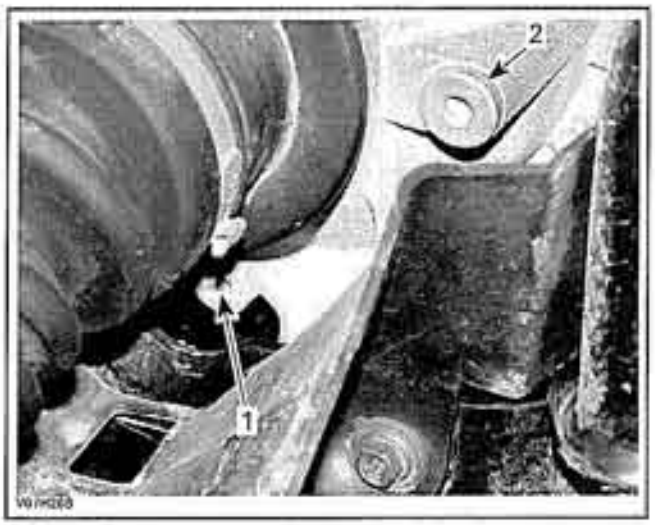
Ensure vehicle is on a level surface.

Clean drain plug area.

Place a drain pan under rear differential drain plug area.

Unscrew filler plug no. 22.

Remove drain plug no. 23.



1. Drain plug
2. Filler plug

Clean drain plug area then reinstall drain plug.

Use a funnel and refill rear differential at the proper level with recommended oil.

MODEL	CAPACITY	RECOMMENDED OIL
All models	300 mL (10 U.S. oz)	Bombardier differential oil (P/N 293 600 043) or REDLINE pump oil 75W90 (API GL5)

Reinstall filler plug.

Removal

Install a jack stand under differential to support the vehicle during the following procedure.

Remove:
- rear wheels
- trailing arms
- drive shafts
- differential protector no. 8
- upper and lower differential bolts no. 18 and no. 19
- propeller shaft bolt no. 17 and its washer
- differential no. 10.

Inspection

Turn rear differential gear with a finger; it should turn smoothly. Replace if necessary.

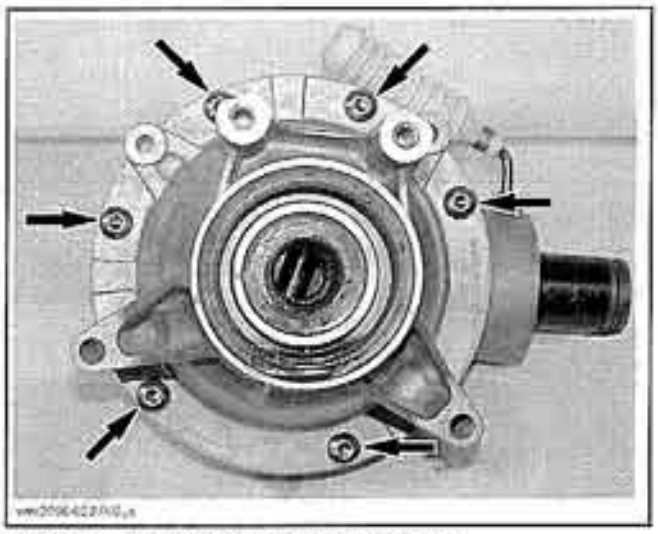
Check backlash and drag torque, see *ADJUSTMENT* further in this section.

Check if oil seals are brittle, hard or damaged. Replace if necessary.

Disassembly

Ring Gear

To change ring gear no. 24:
- Unscrew the TORX screws no. 25, then separate half housings.



TYPICAL — FRONT DIFFERENTIAL SHOWN

NOTE: Be careful to keep track of shims on each end of ring gear.
- Extract ring gear out of half housing.

Pinion Gear

Remove oil seal no. 26.

Unscrew the pinion nut no. 27. Use the differential spanner socket (P/N 529 035 649).

Remove the bearing no. 28 at the same time as the pinion gear no. 29. Be careful to keep track of shims.

NOTE: The pinion gear and bearing can be easily removed using the following suggested tool:
- pipe 3-1/2 in diameter x 5 in (1)
- screwed rod M10 x 1.25, 7 in length (1)
- nut M10 x 1.25 (3)
- flat bar (1).

Adjustment

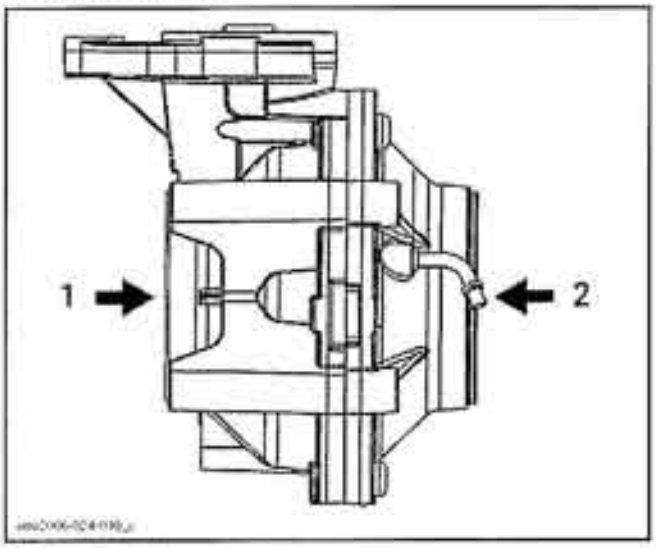
A shimming procedure must be done when pinion gear, ring gear or housing is (are) changed.

Measure the old pinion shim stack. If the shims measure over 1 mm (.039 in), install shim stacks on the differential components as per CHART A.

If the old pinion shim stack measurement is under 1 mm (.039 in), install a .5 mm (.02 in) shim on the differential components as per CHART B.

CHART A		CHART B	
PINION	2.18 mm (.086 in)	PINION	.5 mm (.02 in)
BACKLASH	.94 mm (.037 in)	BACKLASH	
PRELOAD	1.37 mm (.054 in)	PRELOAD	

NOTE: The procedure above sets the pinion shim thickness and should not be modified thereafter. Any changes should be done on preload and/or backlash side(s).

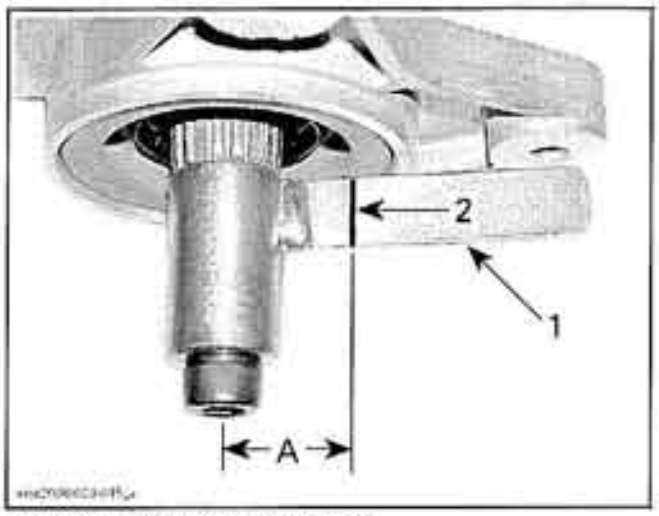


1. Backlash side
2. Preload side

Assemble the differential.

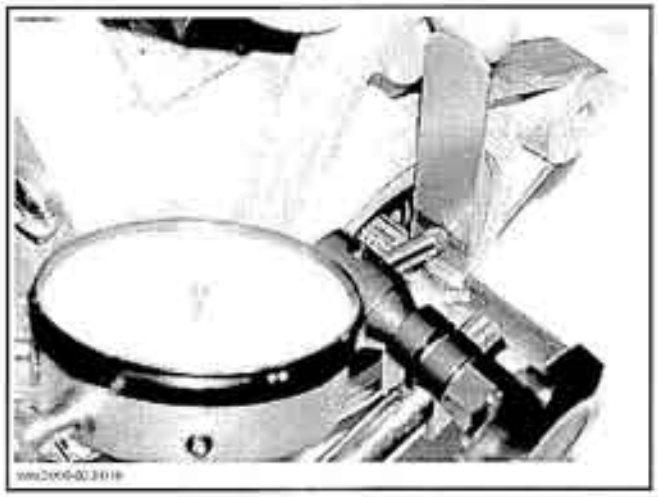
Backlash

- Using a dial indicator and the backlash measurement tool (P/N 529 035 665), measure the backlash. Place the backlash measurement tool at the end of pinion gear.
- From center of bolt, measure 25.4 mm (1 in) and scribe a mark on the tab.



1. Tab of backlash measurement tool
2. Mark on tab
A. 25.4 mm (1 in)

- Position the dial indicator tip against the tab at a 90° angle and right on the previously scribed mark.
- Gently, move the tab back and forth. Note the result.



- Rotate pinion gear 1/2 turn and check backlash again. Note the result.
- Rotate pinion gear 1 turn and check backlash again.

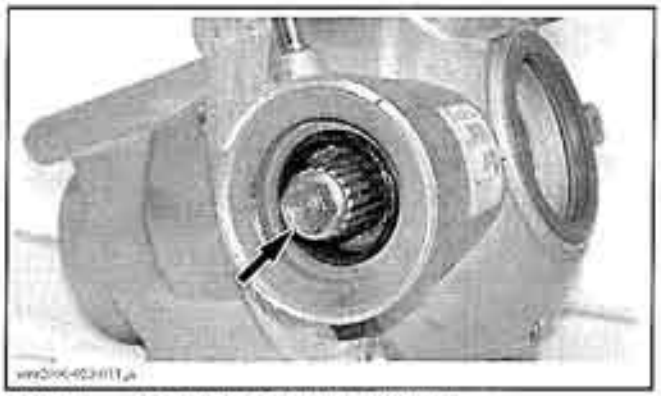
If backlash is below 0.05 mm (.002 in), increase backlash shim by 0.05 mm (.002 in) and check the backlash again.

If backlash is greater than 0.356 mm (.014 in), decrease backlash shim by 0.05 mm (.002 in) and check the backlash again.

Measure preload.

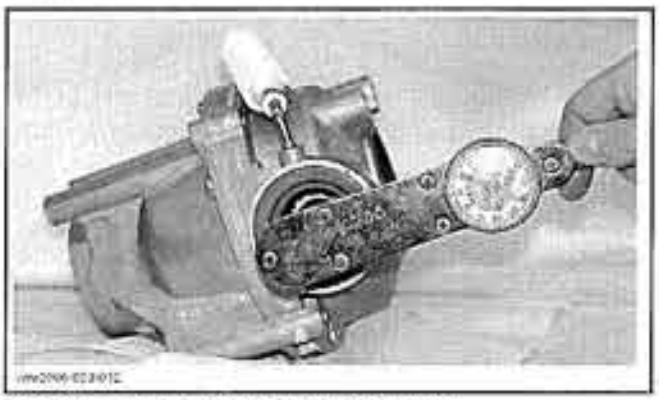
Preload

Screw the propeller shaft adaptor bolt in pinion gear.



TYPICAL — FRONT DIFFERENTIAL SHOWN

Using a needle torque wrench, measure the drag torque.



TYPICAL — FRONT DIFFERENTIAL SHOWN

If the drag torque is greater than 0.7 N•m (6 lbf•**in**), reduce preload shim by 0.05 mm (.002 in) and check drag torque again.

If the drag torque is less than 0.06 N•m (.5 lbf•**in**), increase preload shim by 0.05 mm (.002 in) and check drag torque again.

Assembly

Ring Gear

To assemble, reverse the removal procedure. Pay attention to the following details.

Verify condition of half housing seal **no. 30**. Change seal if necessary.

Check all bearings and all oil seals. Change them if necessary.

Pinion Gear

To install, reverse the removal procedure. Pay attention to the following details.

Check O-ring **no. 31** for damage. If so, change it.

Install the shim then the ball bearing.

Install the nut **no. 27**. Apply Loctite 277 (P/N 293 800 073) on threads nut then torque it to 200 N•m (148 lbf•ft).

Apply XP-S synthetic grease (P/N 293 550 010) in the lips of the new oil seal **no. 26** and install it.

Installation

The installation is the reverse of the removal procedure.

STEERING SYSTEM

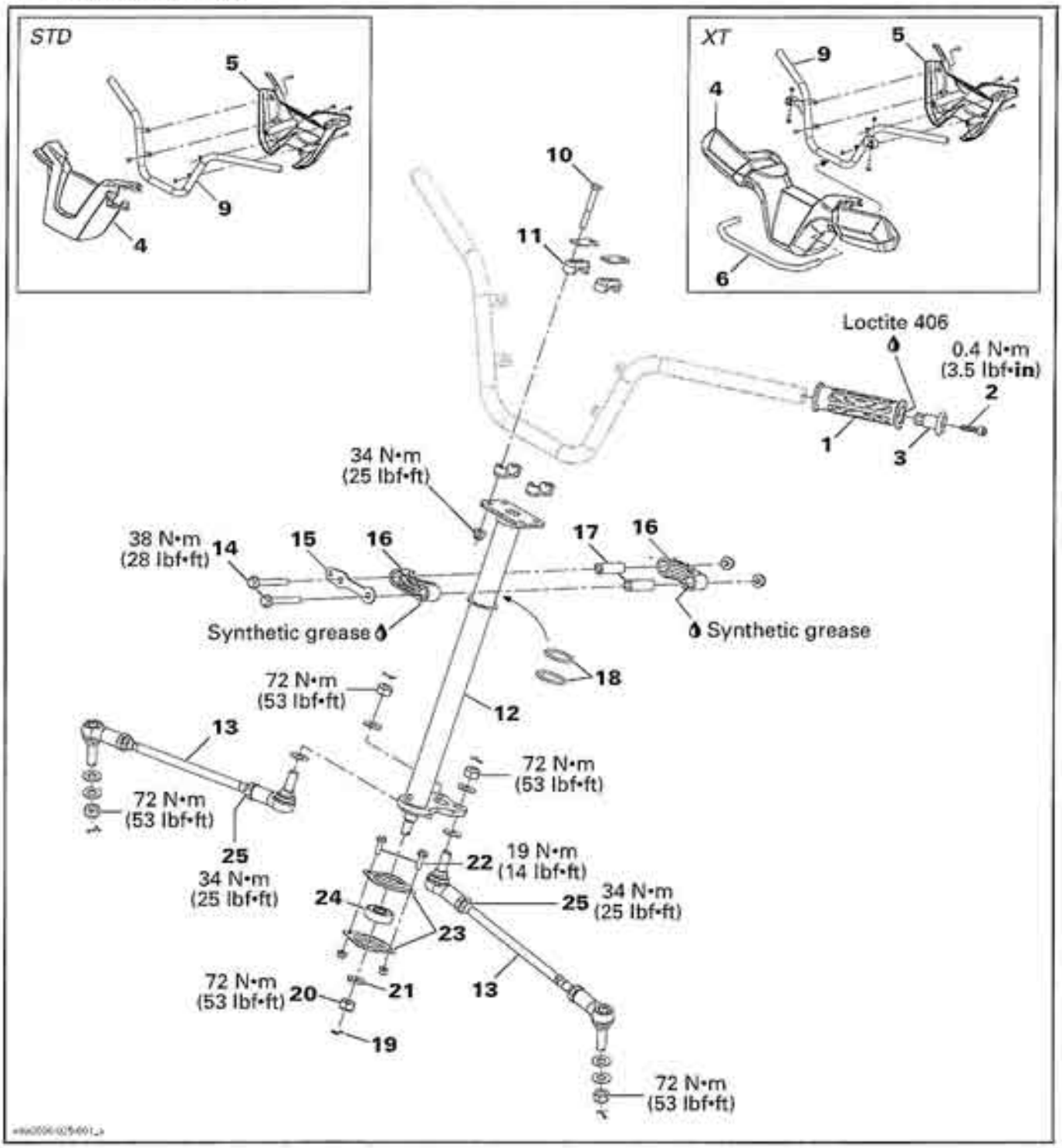
SERVICE TOOLS – OTHER SUPPLIER

Description	Part Number	Page
Smoothflow™ tapered tip	16 ga #511 rtt-b	370

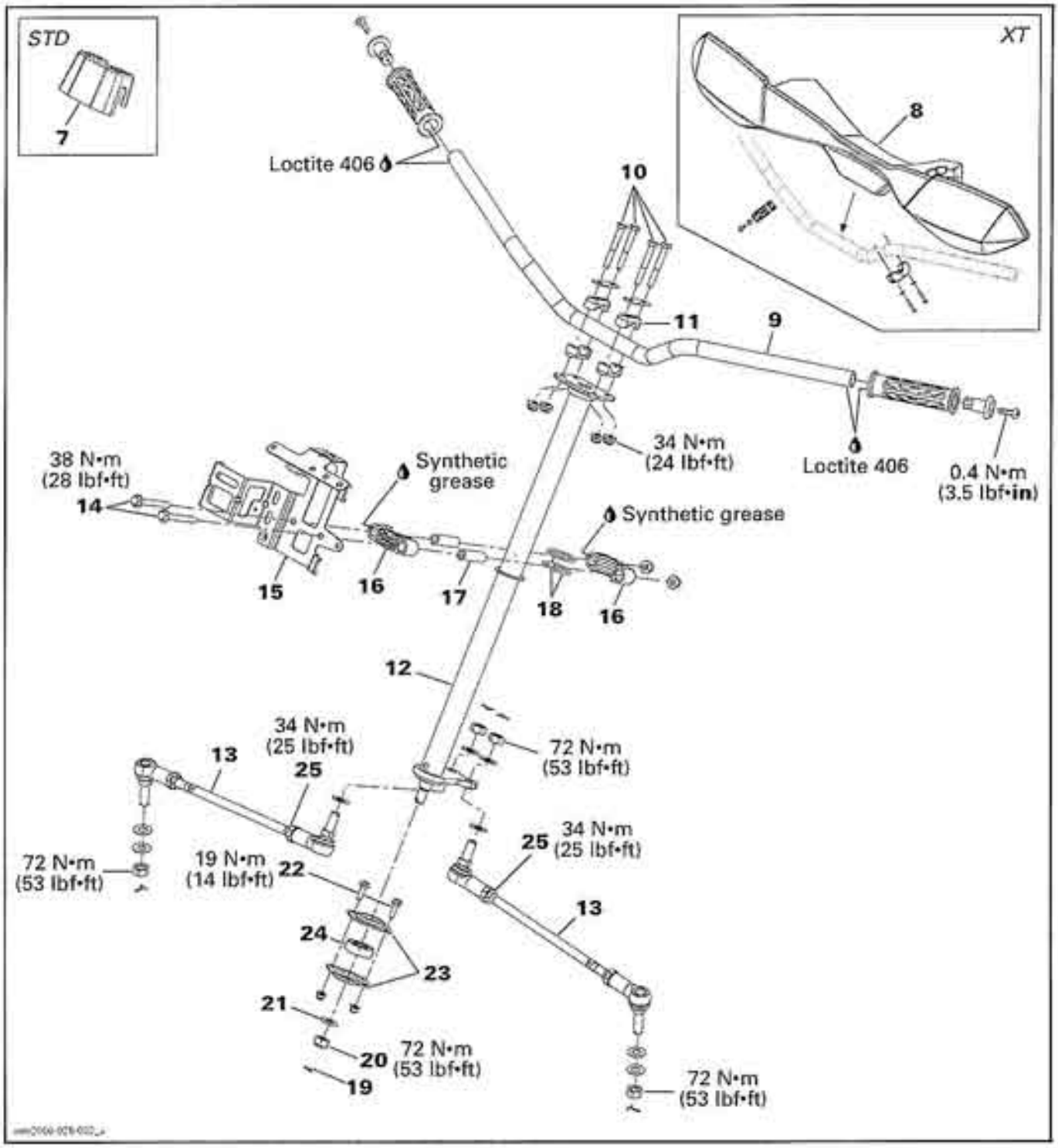
SERVICE PRODUCTS

Description	Part Number	Page
Loctite 406 (glue)	293 800 100	370
pulley flange cleaner	413 711 809	370
synthetic grease	529 550 010	373

Outlander 400 Series



Outlander 800 EFI Series



GENERAL

During assembly/installation, use the torque values and service products as in the exploded views.

Clean threads before applying a threadlocker. Refer to *SELF-LOCKING FASTENERS* and *LOCTITE APPLICATION* at the beginning of this manual for complete procedure.

⚠ WARNING

Torque wrench tightening specifications must strictly be adhered to.
Locking devices (e.g.: locking tabs, elastic stop nuts, self-locking fasteners, etc.) must be installed or replaced with new ones where specified. If the efficiency of a locking device is impaired, it must be renewed.

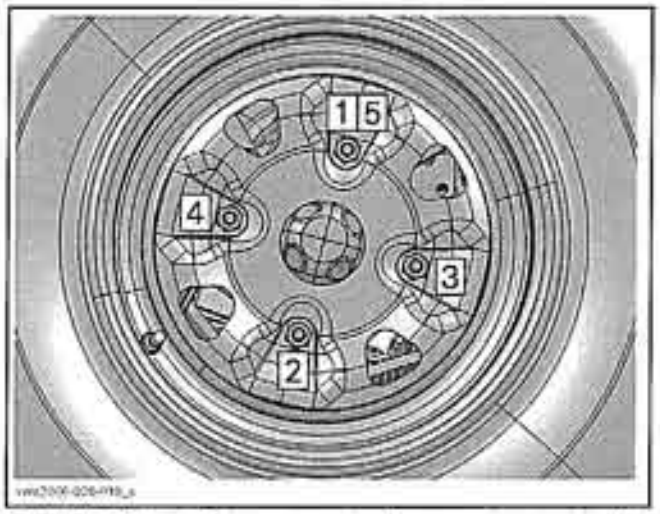
TIRES AND WHEELS

⚠ WARNING

When the tires are replaced, never install a bias tire with a radial tire. Such a combination could create handling and/or stability problems.
Do not mix tires of different size and/or design on the same axle.
Front and rear tire pairs must be the identical model and manufacturer.
For unidirectional tread pattern, ensure that the tires are installed in the correct direction of rotation.
The radial tires must be installed as a complete set.
Severe injury or death can result if these instructions are not followed.

The tires are directional and their rotation must be kept in a specific direction for proper operation.

Torque wheel nuts to 70 N•m (52 lbf•ft) in accordance with the following illustration.



CAUTION: Always use the recommended wheel nuts. Using a different nut could cause damages to the rim.

PROCEDURES

HANDLEBAR GRIP

Removal

Loosen the screw no. 2 at the end of handlebar grip no. 1.

Remove the handlebar grip cap no. 3.

Cut and remove the handlebar grip.

Installation

Remove all rubber residues of the old grip before installing the new.

Clean the handlebar with pulley flange cleaner (P/N 413 711 809) or alcohol to remove any greasy matter on it.

Install handlebar grip by blowing compressed air between handle grip and handlebar.

Install a Smoothflow™ tapered tip (P/N 16 ga #511 rtt-b) from EFD Inc on a bottle of Loctite 406 (glue) (P/N 293 800 100).

Lift a part of the grip using a small screwdriver and inject glue (about 4 spots per side).

NOTE: The glue dries quickly. Do not apply it before installing grip.

Apply pressure on the grip for approximately 30 seconds to set the glue.

Install the handlebar grip cap and torque screw 0.4 N•m (3.5 lbf•**in**).

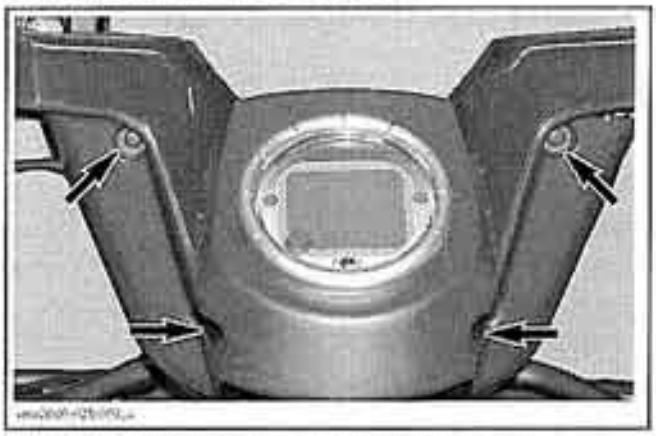
HANDLEBAR COVER

Removal

Outlander 400 Series

Front Handlebar Cover

Remove handlebar cover screws.



TYPICAL — FRONT HANDLEBAR COVER SCREWS

Separate the front handlebar cover no. 4 from the rear handlebar cover no. 5.

TYPICAL

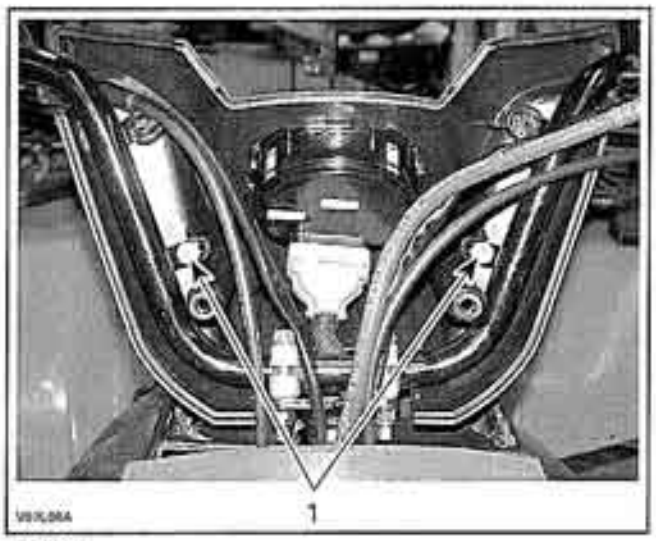
On XT models, unscrew the accessories support no. 6 from the handlebar.

Remove the front handlebar cover.

Rear Handlebar Cover

Remove:

- front handlebar cover no. 4
- rear cover screws.



TYPICAL
1. Rear cover screws

Unplug the speedometer.

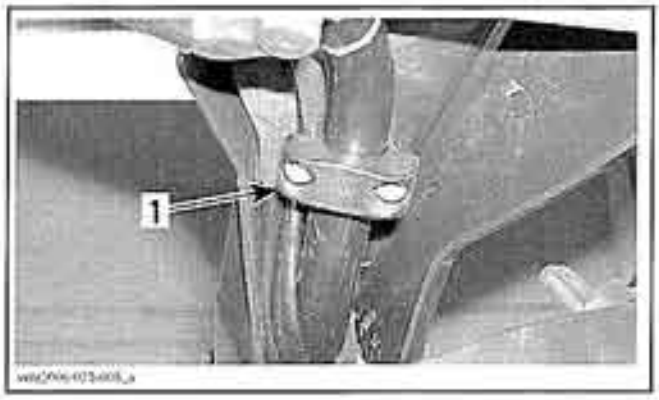
TYPICAL

Remove rear handlebar cover no. 5 from vehicle.

Outlander 800 EFI Series

On models without XT package, just pull the handlebar cover no. 7 to remove it.

On XT models, unscrew both plastic U-clamps that attach handlebar cover no. 8 to the handlebar no. 9.



1. Plastic U-clamp

Inspection

Check covers for cracks or other damages. Replace if necessary.

Installation

The installation is the reverse of removal procedure.

HANDLEBAR

Removal

Remove:
- handlebar cover(s)
- handlebar grips no. 1
- throttle and brake handles as well as multi-function switch (see below in this section)

NOTE: Remove handlebar grips, throttle handle, brake handle and multi-function switch only if the handlebar is defective and replace with a new.
- steering clamp mounting bolts no. 10 and steering clamps no. 11

- handlebar no. 9.

Inspection

Inspect the handlebar for damage, cracks or bending, replace if any of these problems is detected.

Installation

For the installation, reverse the removal procedure.

STEERING COLUMN

Removal

Outlander 400 Series

Remove:
- front fender (refer to *BODY*)
- handlebar cover(s).

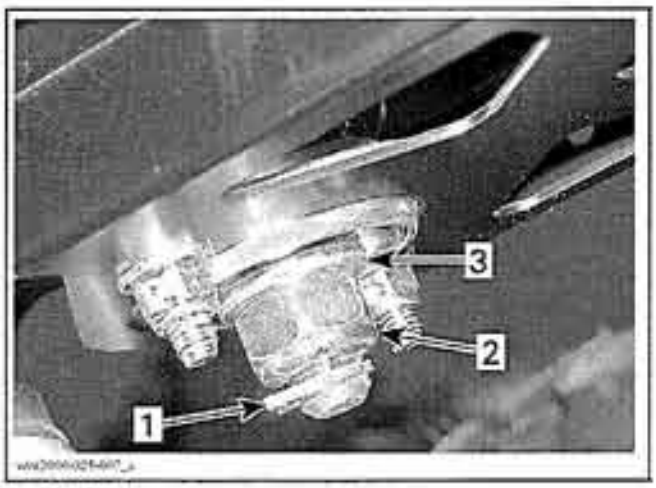
Outlander 800 EFI Series

Remove:
- both footrests
- console and dashboard
- air intake silencer.

All Models

Remove handlebar (only if the replacement of the steering column is necessary).

Remove the cotter pin (discard it), the elastic stop nut and the washer to bottom end of steering column.



1. Cotter pin
2. Elastic nut
3. Washer

Separate steering column no. 12 and tie-rods no. 13. Refer to *TIE-ROD*, further in this section.

Remove half bushing bolts no. 14, plate no. 15, half bushing no. 16 and bushings no. 17.

Pull out steering column.

Inspection

Inspect steering column for wear, cracks or bending, replace if any of these problems is detected.

Check if O-rings no. 18 are brittle, hard or otherwise damaged. Replace if necessary.

At the same time, check steering bearing condition. It must turn smoothly and freely. If not, refer to *STEERING COLUMN BEARING* for replacement procedure.

Installation

For the installation, reverse the removal procedure. Pay attention to the following.

Apply synthetic grease (P/N 529 550 010) on O-rings and on bushings.

Install a new cotter pin. Both ends of cotter pin must be folded.

STEERING COLUMN BEARING

Removal

Place vehicle on jack stands and remove one wheel.

Outlander 400 Series

Remove front fender and console. Refer to *BODY*.

Outlander 800 EFI Series

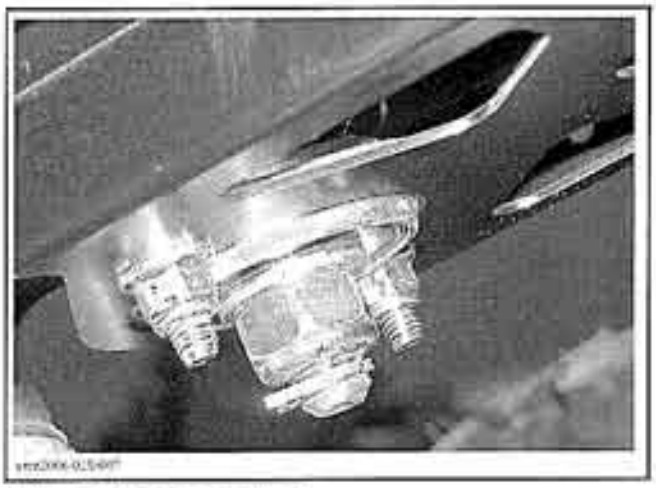
Remove:
- both footrests
- console and dashboard
- air intake silencer.

All Models

Separate tie-rods no. 13 from steering column no. 12. Refer to *TIE-ROD* section.

TYPICAL

Remove cotter pin no. 19 (discard it), elastic nut no. 20 and flat washer no. 21 to bottom end of steering column no. 12.



Pull up steering column.

Remove bolts no. 22 and bearing flanges no. 23.

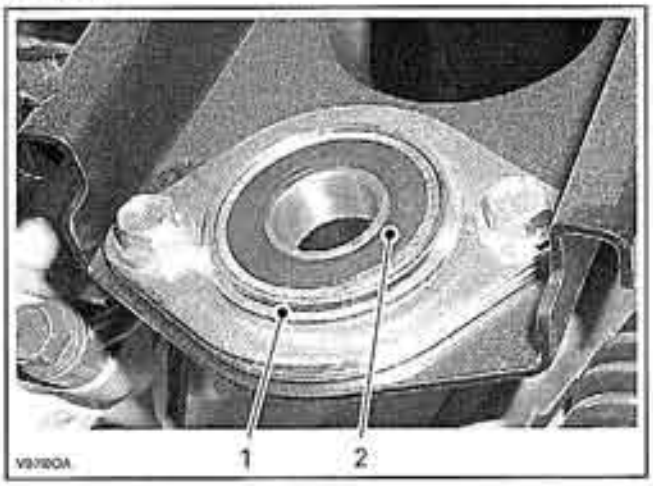
Remove bearing no. 24.

Installation

For installation, reverse the removal procedure. Pay attention to the following details.

Place flanged collar outward.

NOTE: Install both bearing flanges on top of frame support.



1. Flanged collar
2. Bearing

Install flanged collar bolts no. 22.

Install the steering column, flat washer, elastic nut and a new cotter pin. Both ends of cotter pin must be folded.

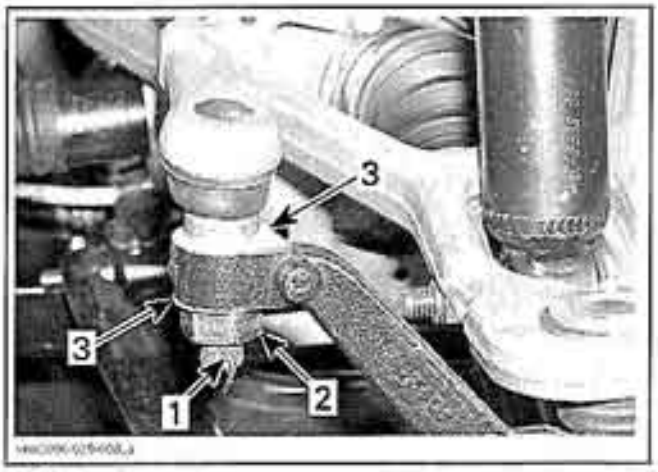
TIE-ROD

NOTE: Use the same procedure for RH and LH side.

Removal

Place the vehicle on jack stands and remove the appropriate wheel.

Remove cotter pin (discard it), elastic nut and hardened washers.



1. Cotter pin
2. Elastic nut
3. Hardened washers

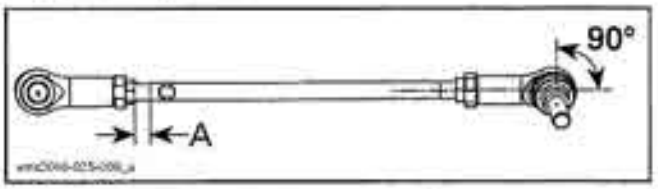
Inspection

Inspect ball joint ends for wear or looseness, if excessive, replace.

Installation

For the installation, reverse the removal procedure. Pay attention to the following details.

When installing a tie-rod, screw threaded end of tie-rod into ball joint. The maximum length for tie-rod groove to ball joint end must match value A in the following chart:



MODEL		A
ALL	mm	17 ± 5
	in	.67 ± .20

NOTE: Torque the ball joint lock nut no. 25 to 34 N•m (25 lbf•ft).

Install a new cotter pin. Both ends of cotter pin must be folded.

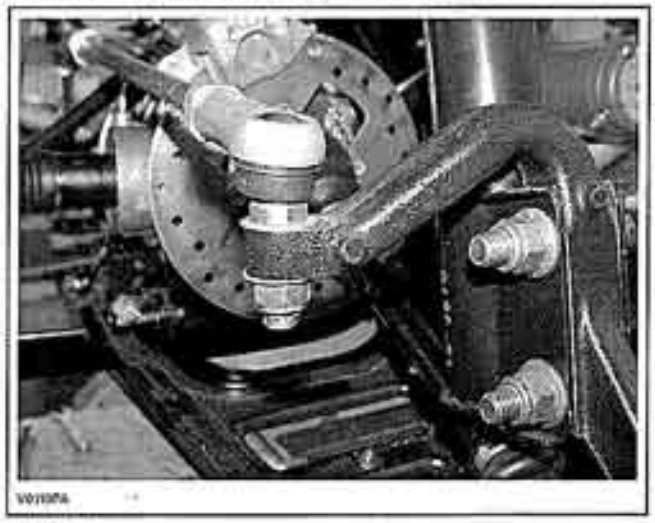
KNUCKLE

Removal

Outlander 400 Series

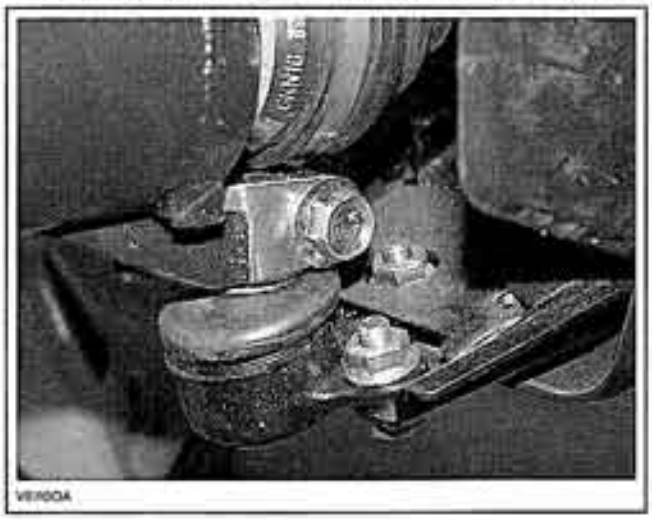
Place vehicle on jack stands and remove the appropriate wheel.

Separate tie-rod no. 13 from knuckle.

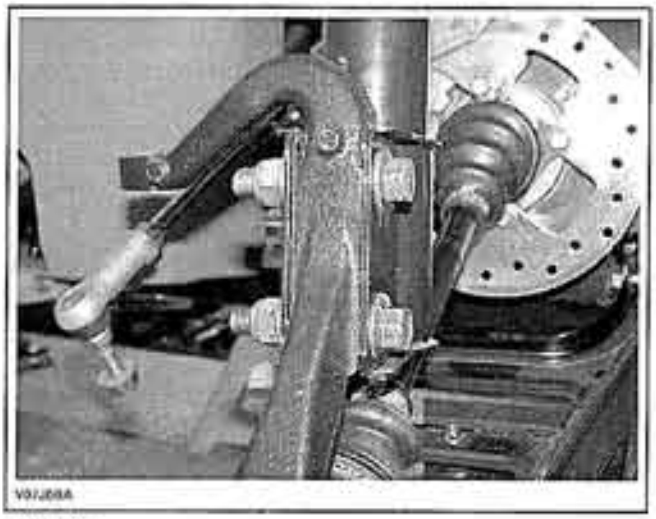


TYPICAL

Remove:
- wheel hub (refer to *FRONT DRIVE*)
- bolt retaining the lower ball joint to the knuckle



- strut bolts



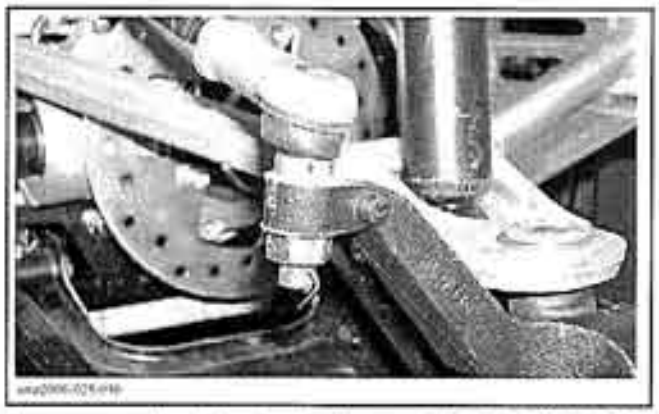
TYPICAL

– knuckle.

Outlander 800 EFI Series

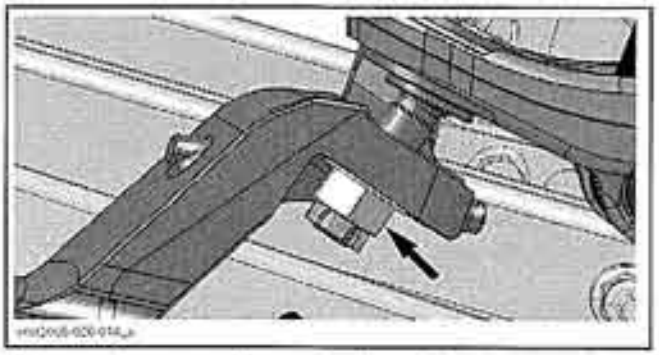
Place vehicle on jack stands and remove the appropriate wheel.

Separate tie-rod no. 13 from knuckle.

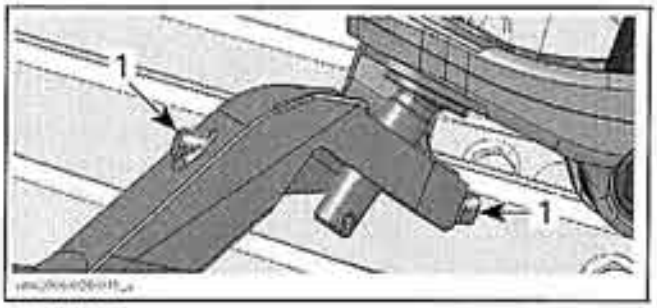


Remove wheel hub. Refer to *FRONT SUSPENSION.*

Unscrew the upper ball joint nut and separate upper ball joint to knuckle.



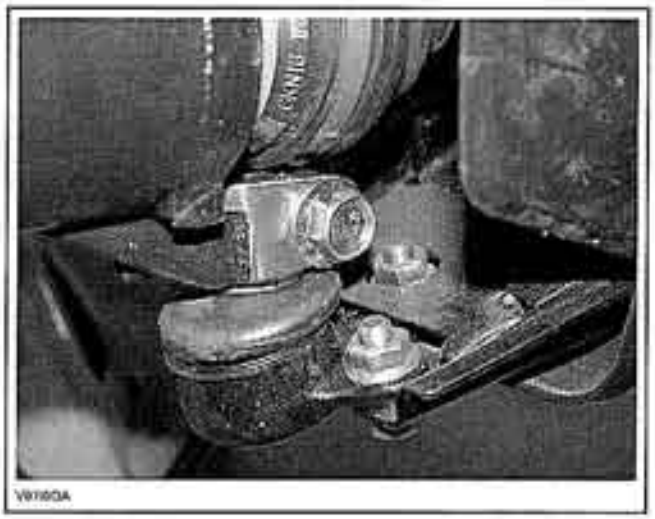
Using a hammer, hit on the knuckle tip to separate ball joint from knuckle. A ball joint remover can be used if the ball joint is jammed into knuckle.



1. Hit here

CAUTION: Never hit on upper suspension arm. Permanent damages should be caused on arm and its replacement will be necessary.

Remove bolt that attache lower ball joint to knuckle.



Remove knuckle.

Inspection

Check knuckle for cracks or other damages. Replace if necessary.

Check if wheel bearing turns freely and smoothly. See *WHEEL BEARING* below if the replacement is necessary.

Installation

The installation is the reverse of removal procedure.

WHEEL BEARING

Inspection

Raise the front of vehicle.

Hold the wheel by the top and the bottom and move it. Check for lateral play.

If there is any loose, replace the wheel bearing.

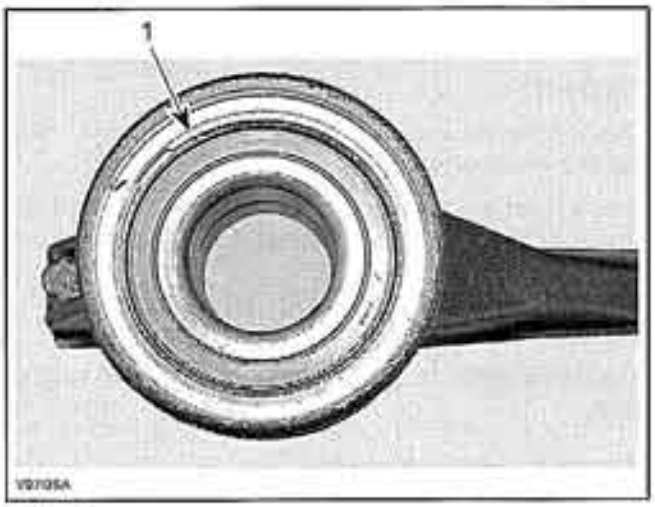
NOTE: First, check if ball joint is loose. If necessary repair all defective parts before checking the wheel bearing condition. Be careful not to misjudge loose in the ball joint and loose in the wheel bearing.

Removal

Remove:

- knuckle from vehicle, (see above)
- seal (discard)

- circlip.



1. Circlip

Using a press machine, push the bearing out of knuckle.

NOTE: It may be necessary to heat the knuckle to remove the bearing.

⚠ WARNING

Clean all grease, outside and inside, from knuckle before heating it.

Installation

Place the bearing in a freezer for 10 minutes before installing.

Place the knuckle in oven to 100°C (212°F) for 30 minutes maximum to ease bearing installation.

When knuckle is cold, install the circlip and the new seal.

Install the other parts in the reverse order of removal procedure.

MULTI-FUNCTION SWITCH

Test

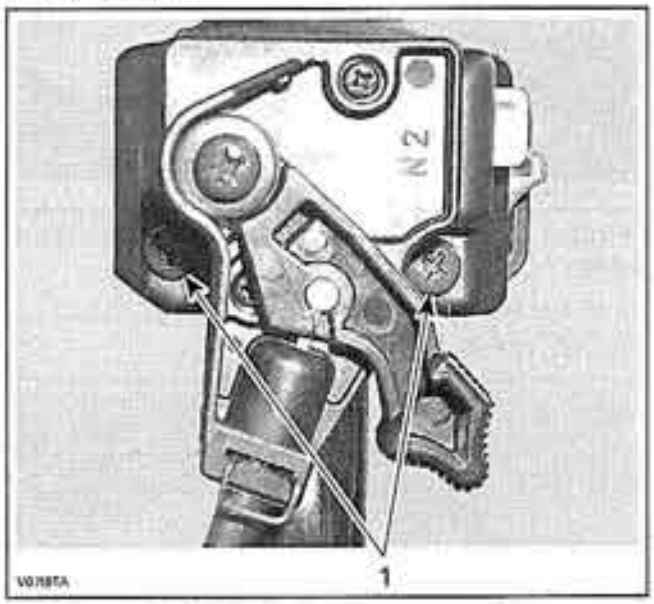
Refer to *INSTRUMENTS AND ACCESSORIES* for Hi-Lo Beam button.

Refer to *STARTING SYSTEM* for engine stop switch and start button.

Removal

Remove choke cable from multi-function switch. Refer to *CARBURETOR* for procedure.

Remove bolts.

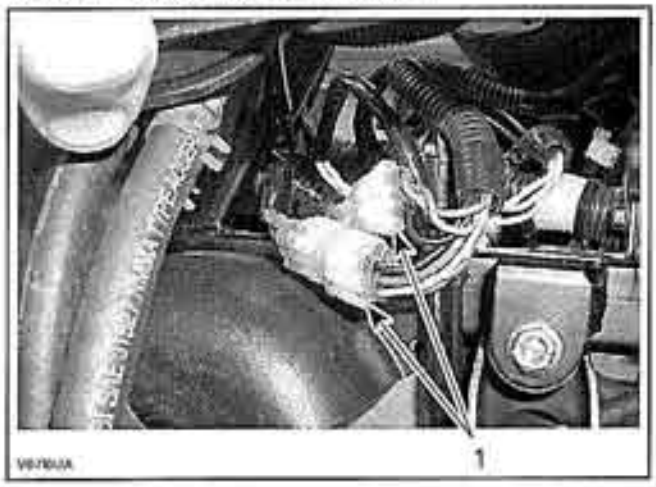


1. Remove the bolts

Separate multi-function switch from handlebar no. 9.

Remove console. Refer to *BODY*.

Unplug multi-function switch connector. The connector is located under console.



UNDER CONSOLE
1. Unplug these connectors

Installation

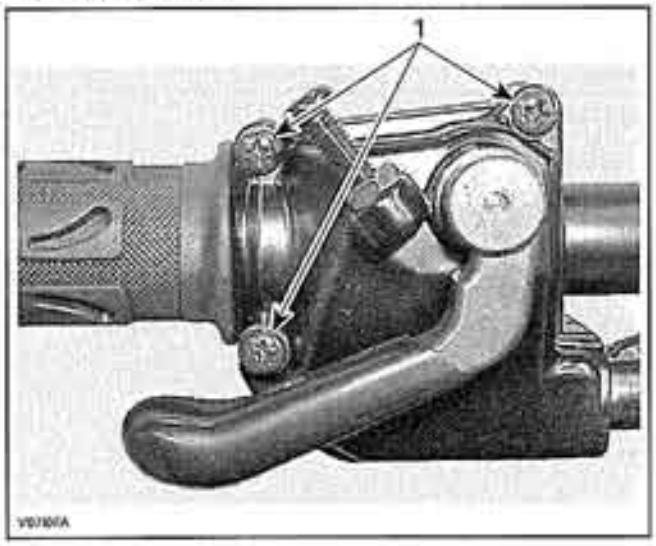
For installation, reverse the removal procedure.

NOTE: Install choke cable and adjust it. Refer to *CARBURETOR*.

THROTTLE HANDLE

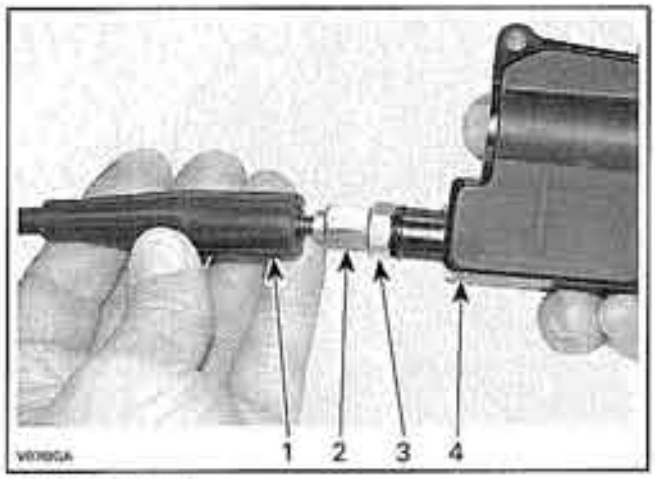
Removal

Remove screws.



1. Remove screws

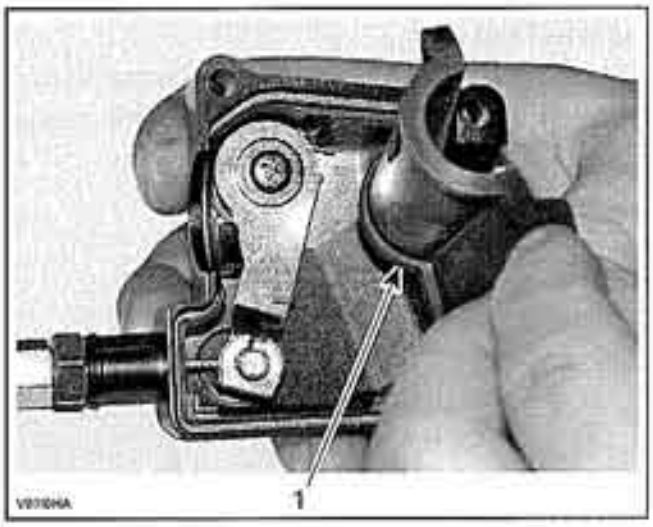
Separate throttle handle from handlebar no. 9. Slide rubber protector back to expose throttle cable adjuster.



1. Cable protector
2. Throttle cable adjuster
3. Lock nut
4. Throttle lever housing

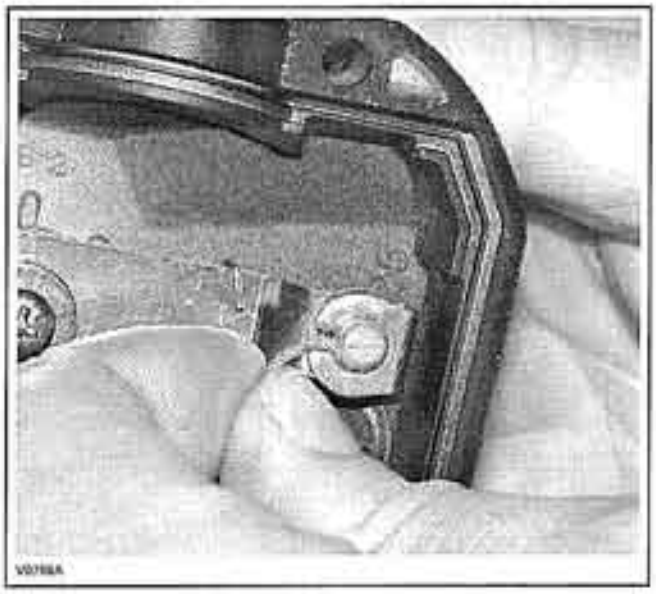
Screw in the throttle cable adjuster.

Remove inner housing protector.



1. Inner housing protector

Remove throttle cable from housing.



Slide cable in clip slot and remove the end of the cable from clip.

Installation

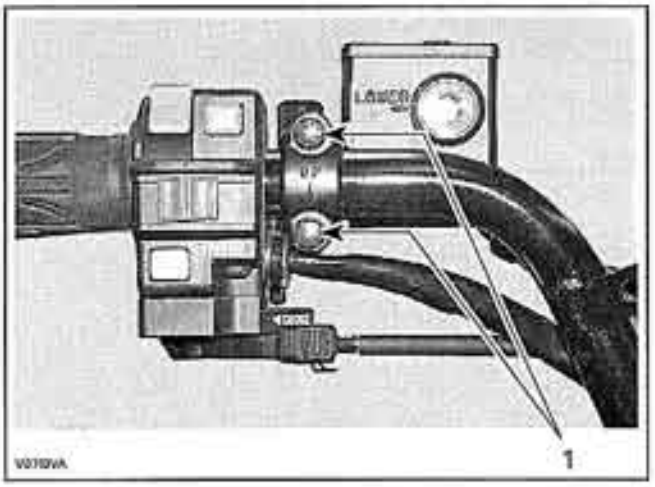
For installation, reverse the removal procedure.

Refer to *CARBURETOR* for adjustment procedure.

HANDLE BRAKE

Removal

Remove screws.



TYPICAL
1. Remove the screws

Separate handle brake from handlebar no. 9.

Hose Removal

Refer to *HYDRAULIC BRAKES* for specifics instructions.

Installation

For installation, reverse the removal procedure.

ADJUSTMENT

STEERING ALIGNMENT

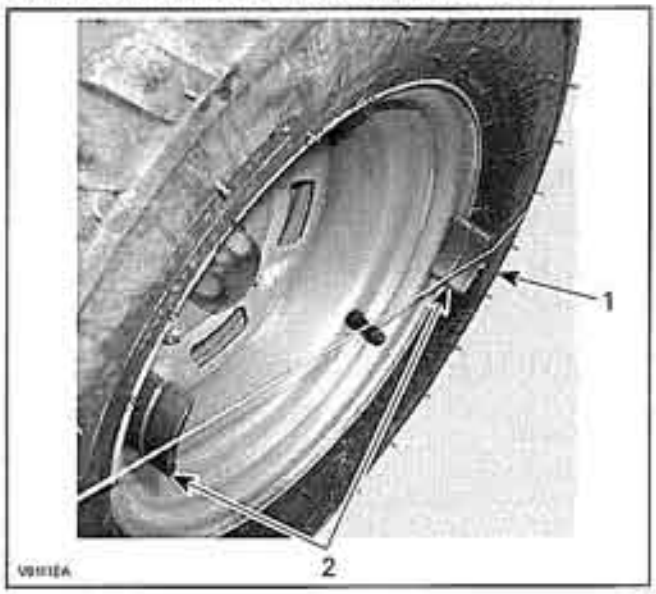
Place vehicle on level surface.

Check that handlebar is straight.

Check pressure in each tires. Always follow recommended pressure.

Place a rope around the vehicle and using an elastic, link both ends together.

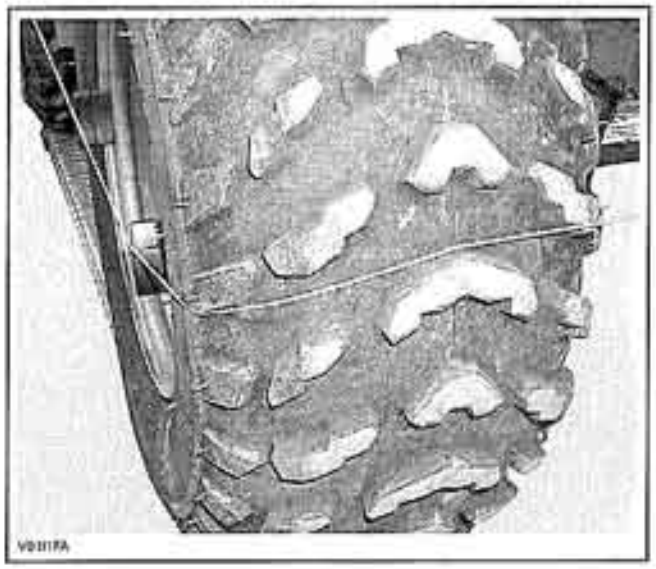
Install spacers on rear rims. These spacers will prevent the rope from touching the tires.



TYPICAL
1. Rear wheel
2. Spacers

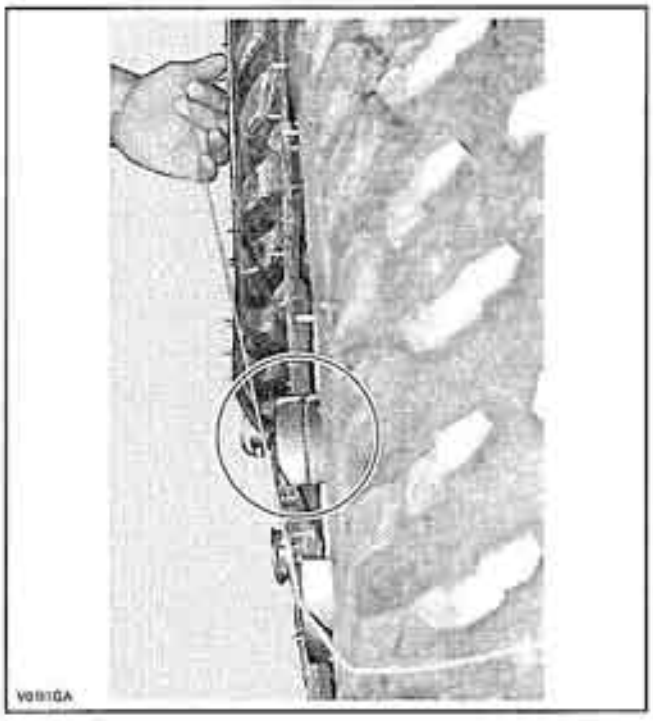
NOTE: Many items can be used as spacers. Magnets are recommended.

The rope must be place at the center of the wheels. Do not place rope on tire threads.



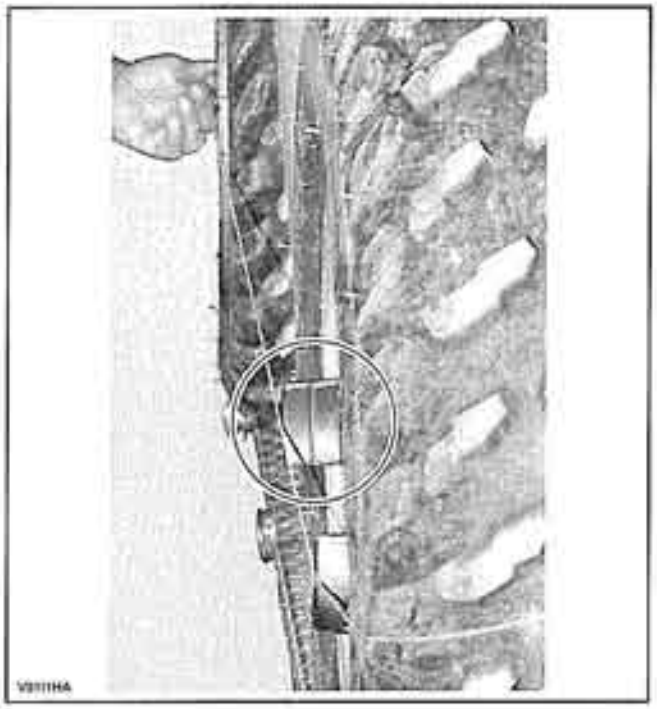
TYPICAL

From the front of vehicle, near the front of rim, move rope so that it does not touch the first spacer.



TYPICAL

Then, bring the rope back until it touches the spacer.



TYPICAL

Keep this position and measure the distance between the rope and the rim, to the front and to the rear of wheel.

TYPICAL

The perfect total toe-out adjustment is 0 mm ± 4 mm (0 in ± .157 in) each side.

Set alignment of wheel by adjusting tie-rod.

FRONT SUSPENSION

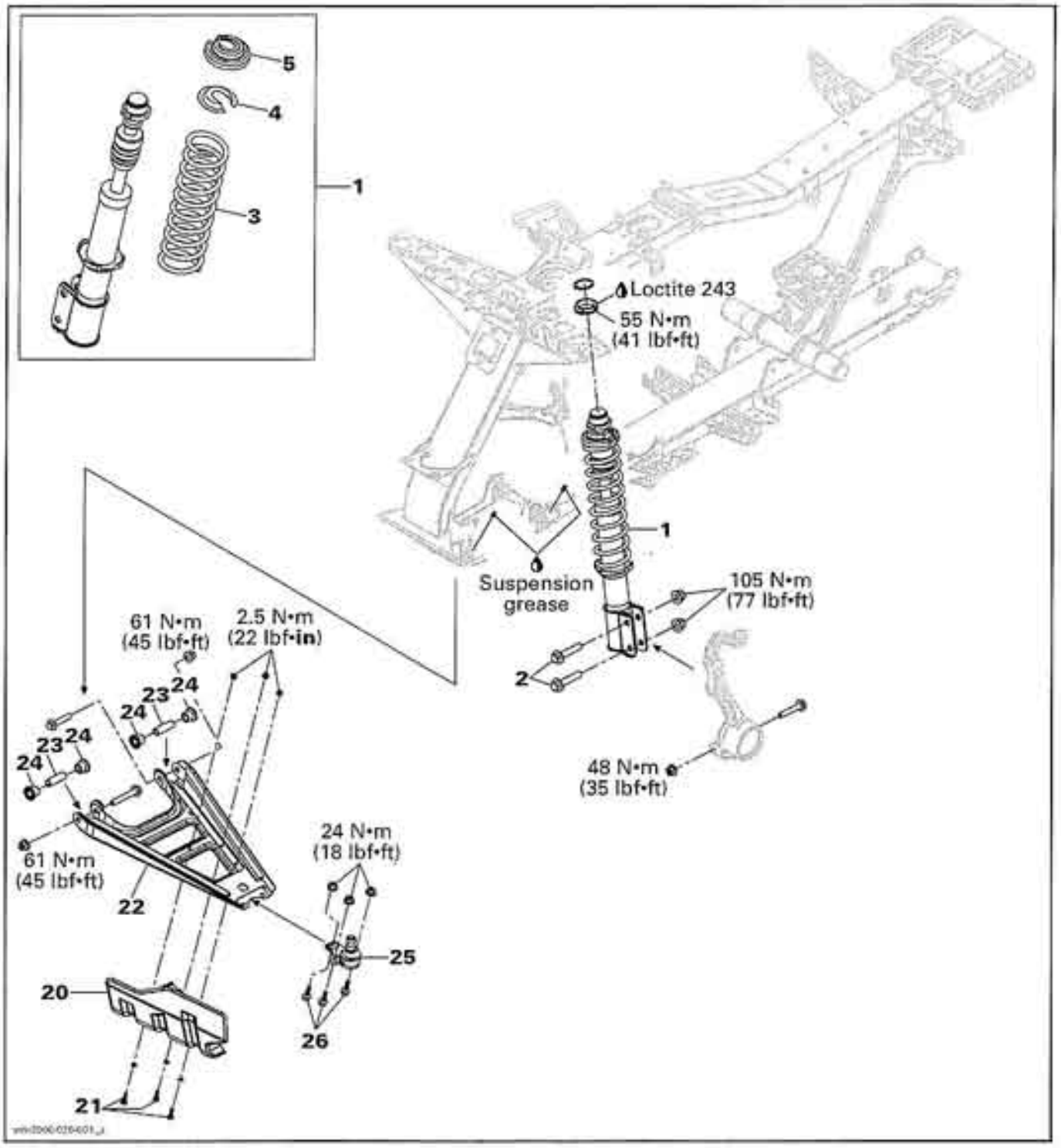
SERVICE TOOLS

Description	Part Number	Page
ball joint installer	529 036 020	389
shock/spring remover	529 036 007	385

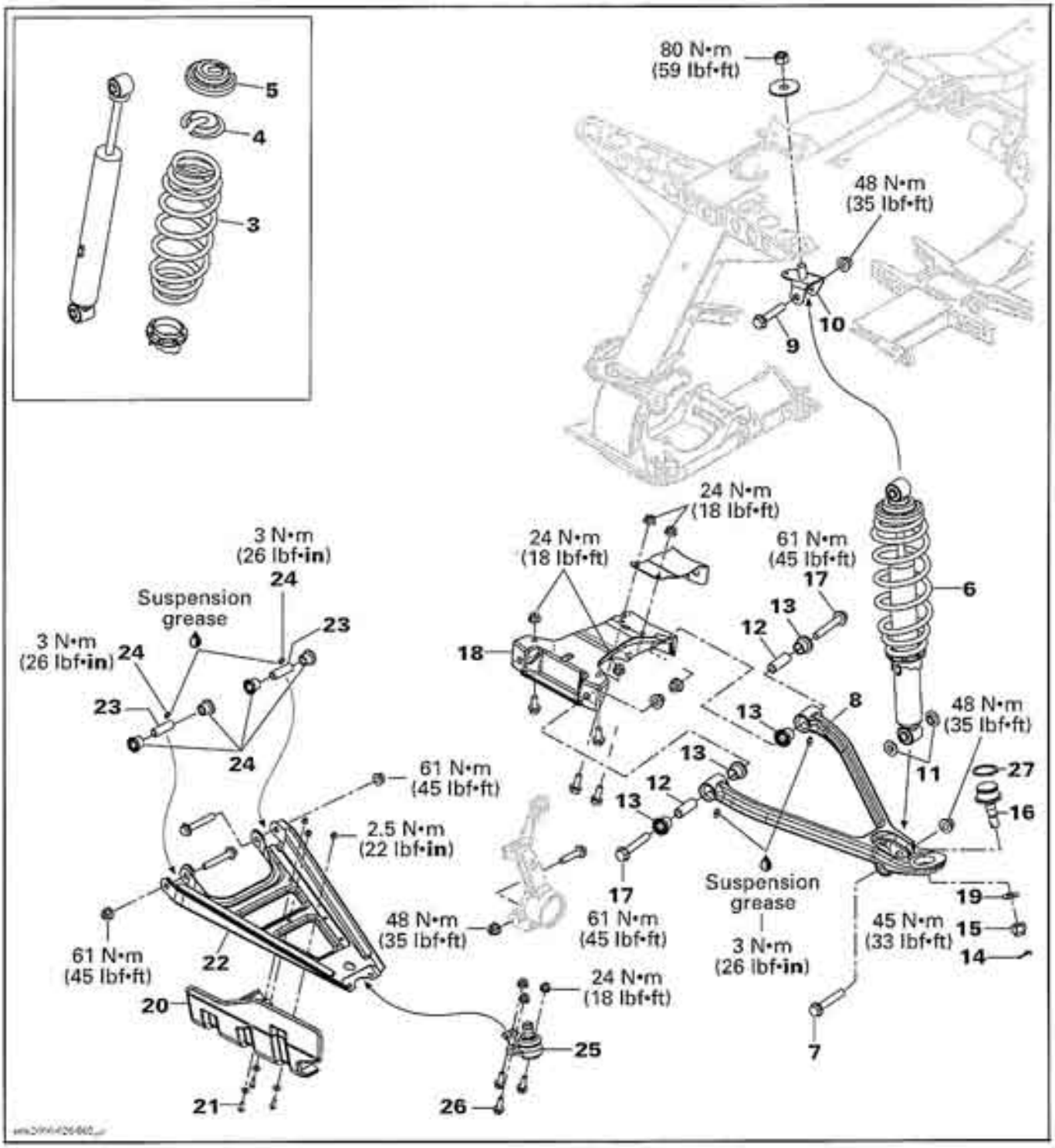
SERVICE PRODUCTS

Description	Part Number	Page
suspension grease	293 550 033	387

Outlander 400 Series



Outlander 800 Series



GENERAL

The procedure explained below is the same for the RH and LH sides unless otherwise noted.

During assembly/installation, use the torque values and service products as in the exploded view.

Clean threads before applying a threadlocker. Refer to *SELF-LOCKING FASTENERS* and *LOCTITE APPLICATION* at the beginning of this manual for complete procedure.

⚠ WARNING

Torque wrench tightening specifications must strictly be adhered to.
Locking devices (e.g.: locking tabs, elastic stop nuts, self-locking fasteners, etc.) must be installed or replaced with new ones where specified. If the efficiency of a locking device is impaired, it must be renewed.

PROCEDURES

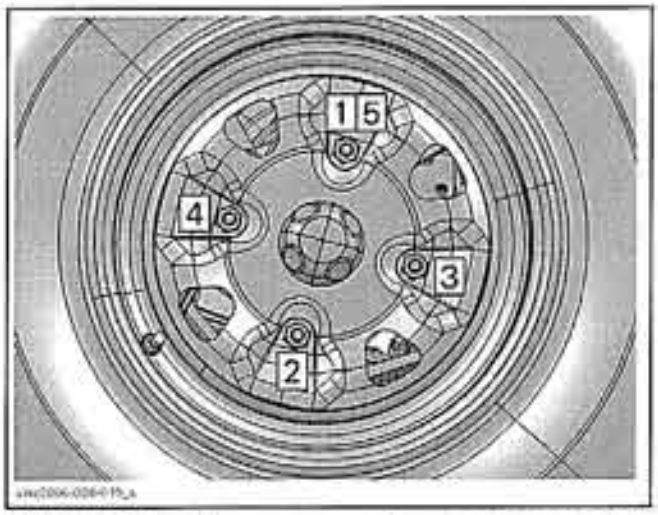
TIRES AND WHEELS

⚠ WARNING

When the tires are replaced, never install a bias tire with a radial tire. Such a combination could create handling and/or stability problems.
Do not mix tires of different size and/or design on the same axle.
Front and rear tire pairs must be the identical model and manufacturer.
For unidirectional tread pattern, ensure that the tires are installed in the correct direction of rotation.
The radial tires must be installed as a complete set.
Severe injury or death can result if these instructions are not followed.

The tires are directional and their rotation must be kept in a specific direction for proper operation.

Torque wheel nuts to 70 N•m (52 lbf•ft) in accordance with the following illustration.



CAUTION: Always use the recommended wheel nuts. Using a different nut could cause damages to the rim.

SHOCK ABSORBER AND SPRING

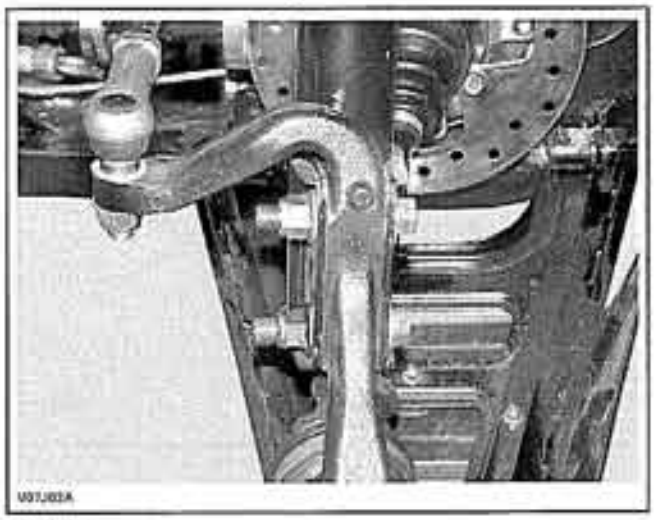
Removal

Outlander 400 Series

Loosen wheel nuts.

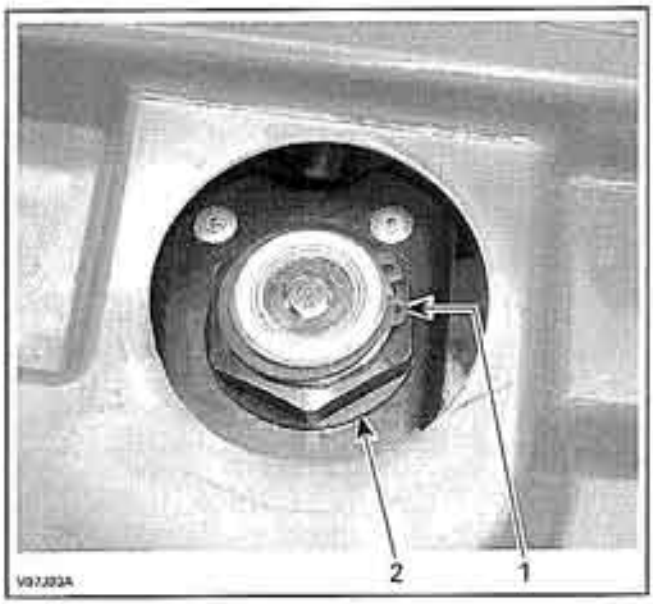
Lift front of vehicle until front struts no. 1 are fully extended then install a jack stand under the frame to support the vehicle off the ground.

Remove:
- appropriate wheel
- front rack and cap on the top of the front fender
- bolts no. 2 retaining strut to the knuckle



TYPICAL

- circlip
- shock nut.



1. *Circlip*
2. *Shock nut*

Remove shock from vehicle.

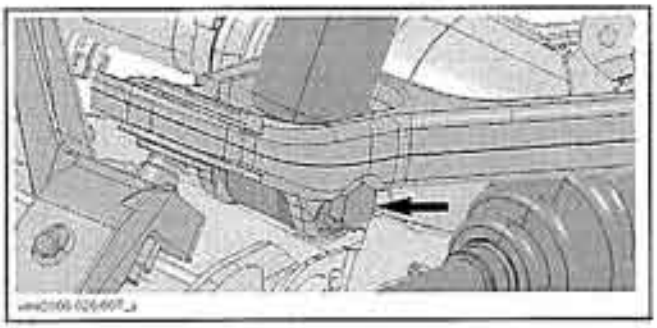
Outlander 800 Series

Loosen wheel nuts of the appropriate wheel.

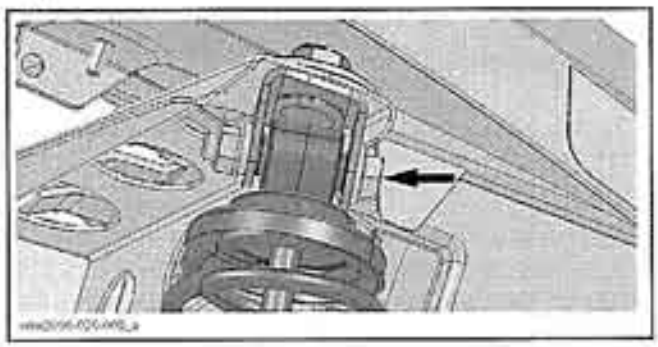
Lift the front of the vehicle until shock absorber no. 6 is fully extended then install a jack stand under the frame to support the vehicle off the ground.

Remove wheel.

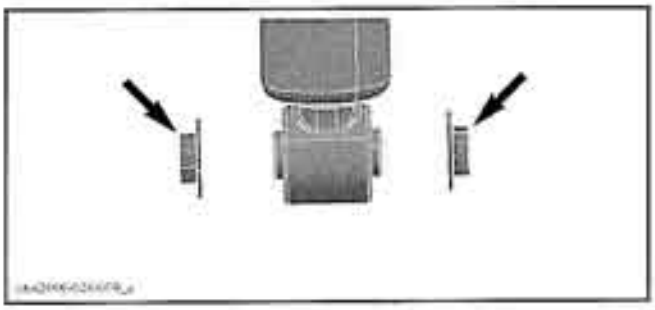
Remove lower bolt no. 7 from upper A-arm no. 8.



Then the upper bolt no. 9 from shock absorber support no. 10.

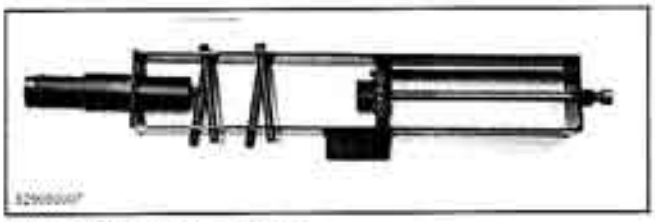


When the shock absorber is removed from upper arm, pay attention not to mislay the both metallic bushings no. 11.

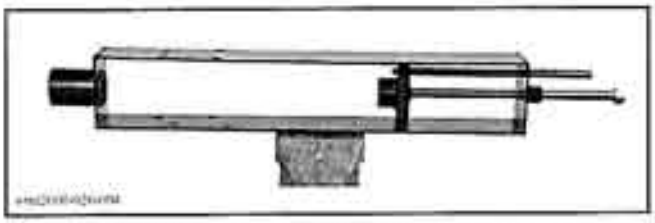


Disassembly

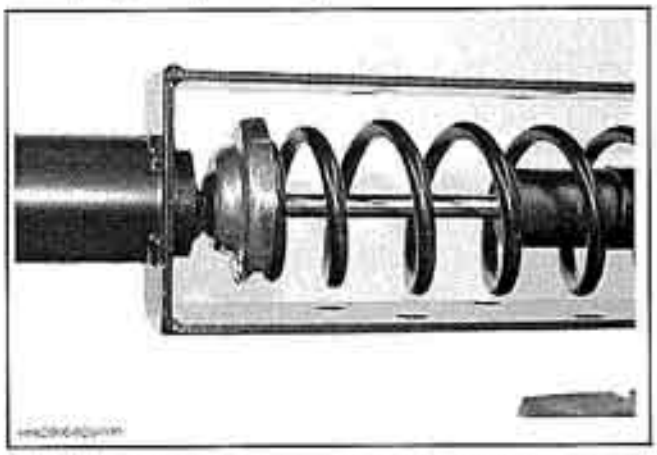
To remove spring from the shock absorber, use the shock/spring remover (P/N 529 036 007).



Place the tool in a vise.

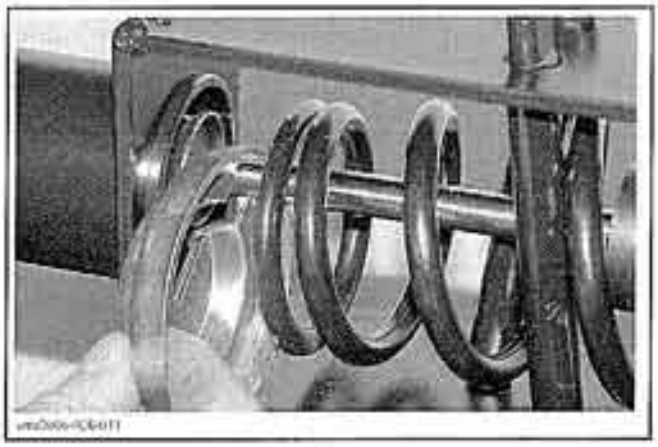


Position the shock absorber in the tool and install the spring compressor pins.



Tighten the shock spring remover screw until the spring no. 3 is sufficiently compressed to remove spring locking devices.

Remove spring stopper no. 4 and its cap no. 5 then release the shock spring remover screw.



Inspection

Inspect the spring no. 3 for damage. Replace if necessary.

Inspect shock for oil leakage. Extend and compress the piston several times over its entire stroke. Check that it moves smoothly and with uniform resistance with rod up. Any of the following conditions will denote a defective shock:

- A skip or hang up when reversing stroke at mid travel.
- Seizing or binding conditions except at extreme end of either stroke.
- A gurgling noise after completing one full compression and extension stroke.

Replace shock if any of these conditions are found.

Assembly and Installation

For assembly and installation, reverse the disassembly and removal procedures.

LOWER SUSPENSION ARM PROTECTOR

Inspection

Check protector no. 20 for cracks or other damages. Replace if necessary.

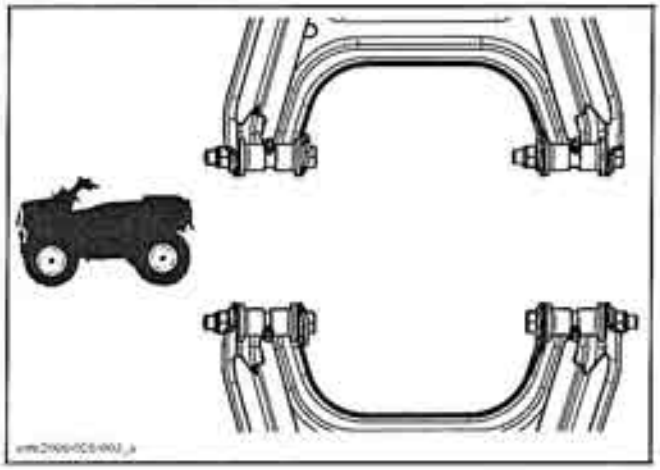
Removal

Remove screw no. 21 then the protector.

Installation

The installation is the reverse of removal procedure.

Install lower suspension arm bolts as per following illustration.



LOWER SUSPENSION ARM

Inspection

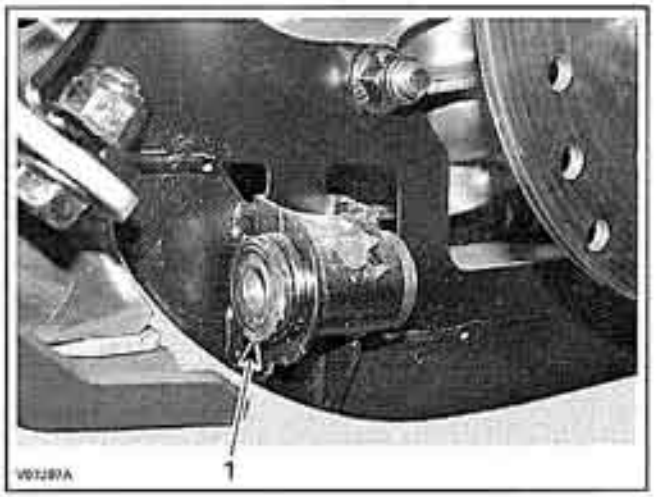
Check lower suspension arms no. 22 for distortion or damage. Replace suspension arms if necessary.

Move lower suspension arm from side to side. There should be no noticeable loose. Replace bushings if necessary.

Move lower suspension arm up and down. There should be no noticeable loose. Replace bushings if necessary.

The following items are performed when the lower suspension arm is removed.

Inspect pivot bushings no. 23 and cushions no. 24 for wear or damages. Replace bushings and/or cushions if necessary.



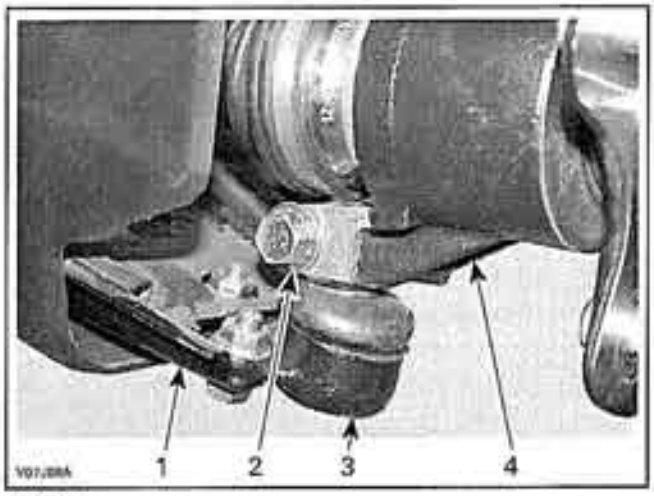
TYPICAL
1. Pivot bushing

Check ball joint bellows on lower suspension arm for cracks or any other damage. Inspect ball joint end for damage. Ensure it's moving freely. Replace ball joints as required, see below for procedure.

Removal

Remove wheel.

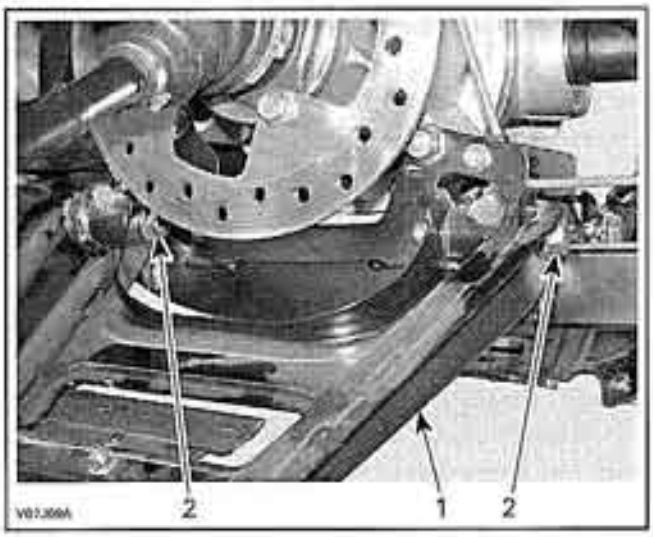
Remove bolt retaining lower suspension arm to the knuckle.



TYPICAL
1. *Lower suspension arm*
2. *Ball joint bolt*
3. *Ball joint*
4. *Knuckle*

Separate lower suspension arm from knuckle.

Remove bolts retaining lower suspension arm to frame.



TYPICAL
1. *Lower suspension arm*
2. *Remove bolts*

Remove lower suspension arm from vehicle.

Installation

For assembly, reverse the disassembly procedure. However, pay attention to the following.

Install lower suspension arm to frame.

Attach lower suspension arm no. 22 to knuckle.

Install wheel.

LOWER BALL JOINT

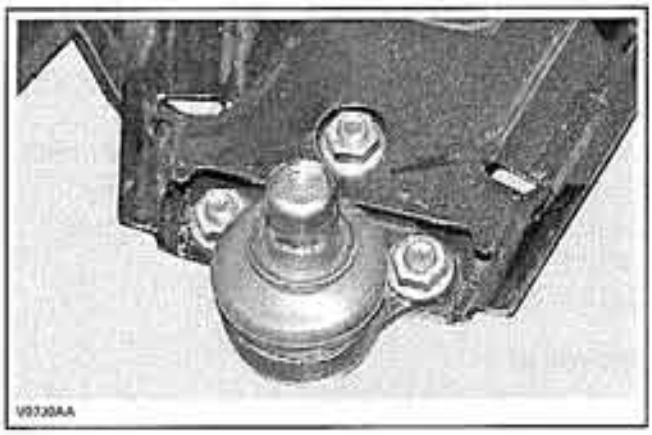
Inspection

Check lower ball joint no. 25 for damage, pitting, looseness and roughness. If so, replace it.

Check ball joint bellows for cracks. Change if necessary.

Removal

Remove:
- appropriate wheel
- lower suspension arm from knuckle
- bolts no. 26 retaining ball joint to lower suspension arm.



Extract the ball joint by pulling it out of lower suspension arm.

Installation

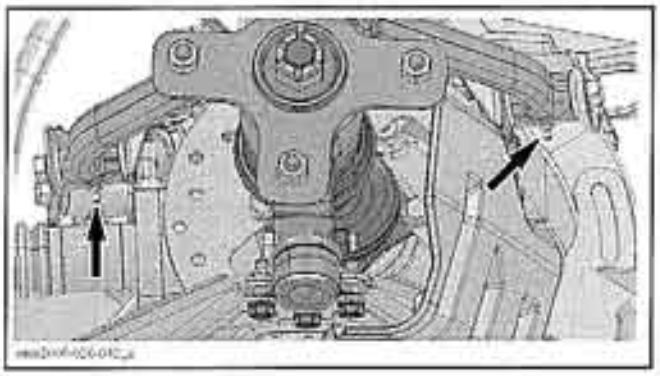
The installation is the reverse of removal procedure.

UPPER SUSPENSION ARM

Outlander 800 Series Only

Lubrication

Use suspension grease (P/N 293 550 033) to lubricate both upper suspension arms no. 8. There are two grease fitting on each arm.



Inspection

Check upper suspension arm for cracks, pitting, distortion or other damages. Replace as required.

Move upper suspension arm up and down then from side to side. There should be no noticeable play. Replace pivot bushings no. 12 and/or cushions no. 13 if necessary.

The following items are performed when the upper suspension arm is removed.

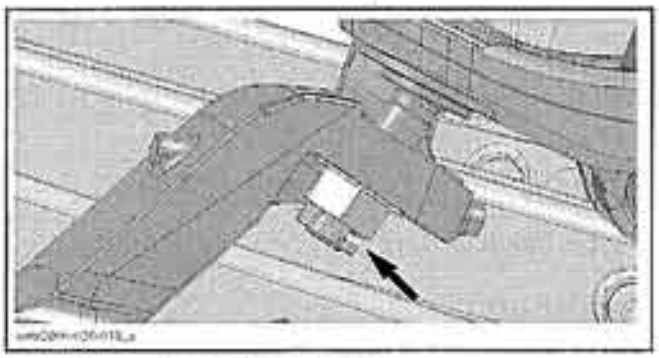
- Inspect pivot bushings and cushions for wear.
- Check ball joint bellows for crack or wear.
- Inspect ball joint end for damages. Ensure it is moved freely.

Replace all defective parts.

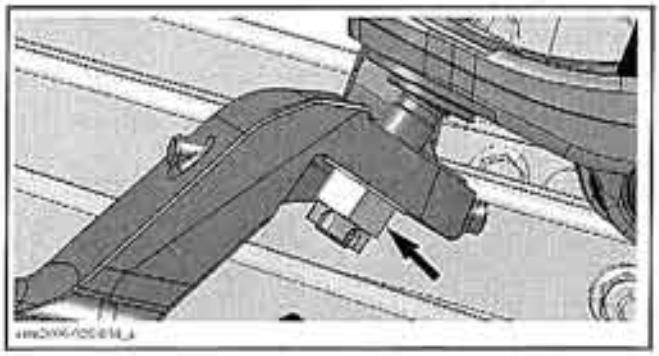
Removal

Remove appropriate wheel.

Remove cotter pin no. 14 retaining upper ball joint nut no. 15. Discard cotter pin.

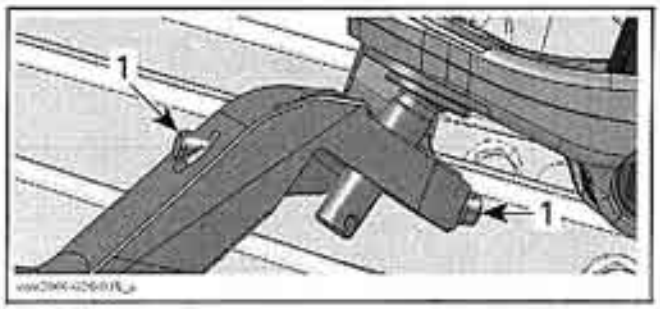


Unscrew upper ball joint nut.



Using a hammer, hit on the knuckle tip to separate ball joint no. 16 from knuckle.

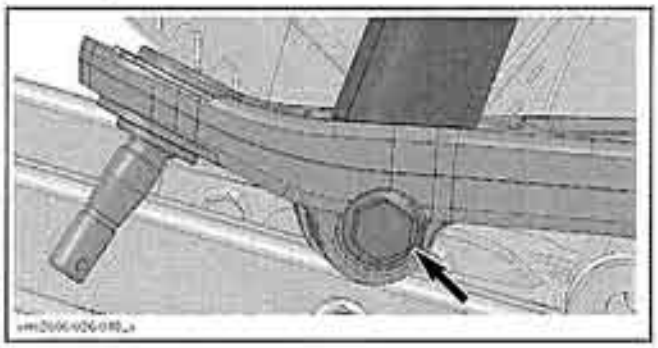
NOTE: A ball joint remover can be used if the ball joint is jammed into knuckle.



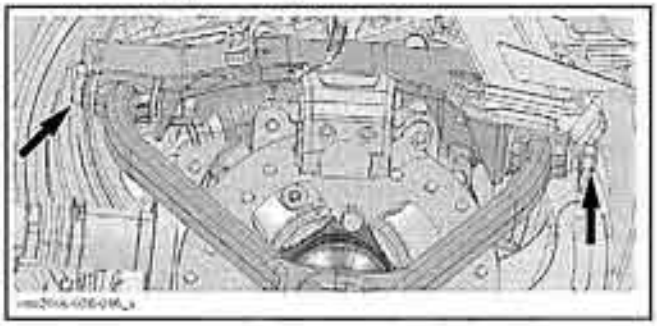
1. Hit here

CAUTION: Never hit on upper suspension arm. Permanent damages should be caused on arm and its replacement will be necessary.

Remove shock absorber lower bolt no. 7 from upper suspension arm.



Unscrew bolts no. 17 that attach upper suspension arm to upper suspension arm bracket no. 18.



Remove upper suspension arm from vehicle.

Installation

Position the upper suspension arm and install its bolts no. 17. Torque to 61 N•m (45 lbf•ft).

Attach the upper suspension arm to knuckle. When hardened washer no. 19 and upper ball joint nut no. 15 are installed, tighten nut to 45 N•m (33 lbf•ft) and further tighten until one of its grooves is aligned with a cotter pin hole.

Install a new cotter pin. Both end of cotter pin must be folded.

Install the shock absorber lower bolt and torque it to 48 N•m (35 lbf•ft).

Install wheel.

UPPER SUSPENSION ARM BRACKET

Outlander 800 Series Only

Removal

Remove both front wheels.

Unscrew the left caliper and attach it out of way.

Unscrew upper suspension arms from their bracket no. 18.

Remove upper differential bolts.

Remove front bolts that attach the upper suspension arm bracket to frame.

Slide bracket backward then pull it by the left side.

Inspection

Check the upper suspension arm bracket for crack or other damages. Replace as required.

Installation

The installation is the reverse of the removal procedure.

NOTE: Install bolts holding bracket to frame and upper differential bolts before tightening them.

UPPER BALL JOINT

Outlander 800 Series Only

Inspection

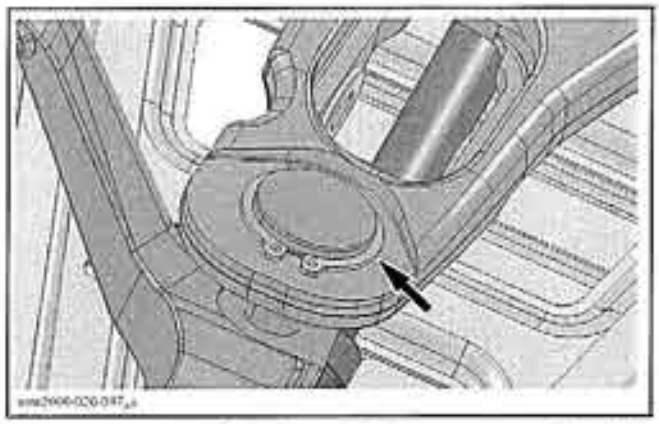
Check upper ball joint no. 16 for damage, pitting, looseness and roughness. If so, replace it.

Check ball joint bellows for cracks. Replace as required.

Removal

Remove upper suspension arm.

Remove the circlip no. 27.

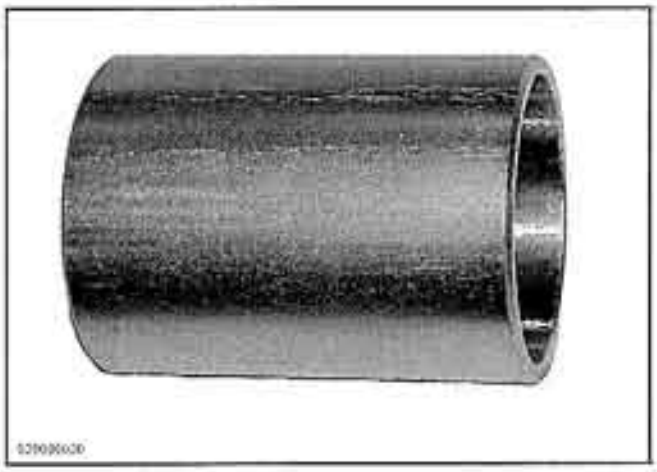


Using a press and a piece of pipe, remove the ball joint.

CAUTION: Support upper suspension arm properly to avoid damaging ball joint location.

Installation

To install the upper ball joint properly, use the ball joint installer (P/N 529 036 020).



Support the upper suspension arm before pressing the ball joint into its location.

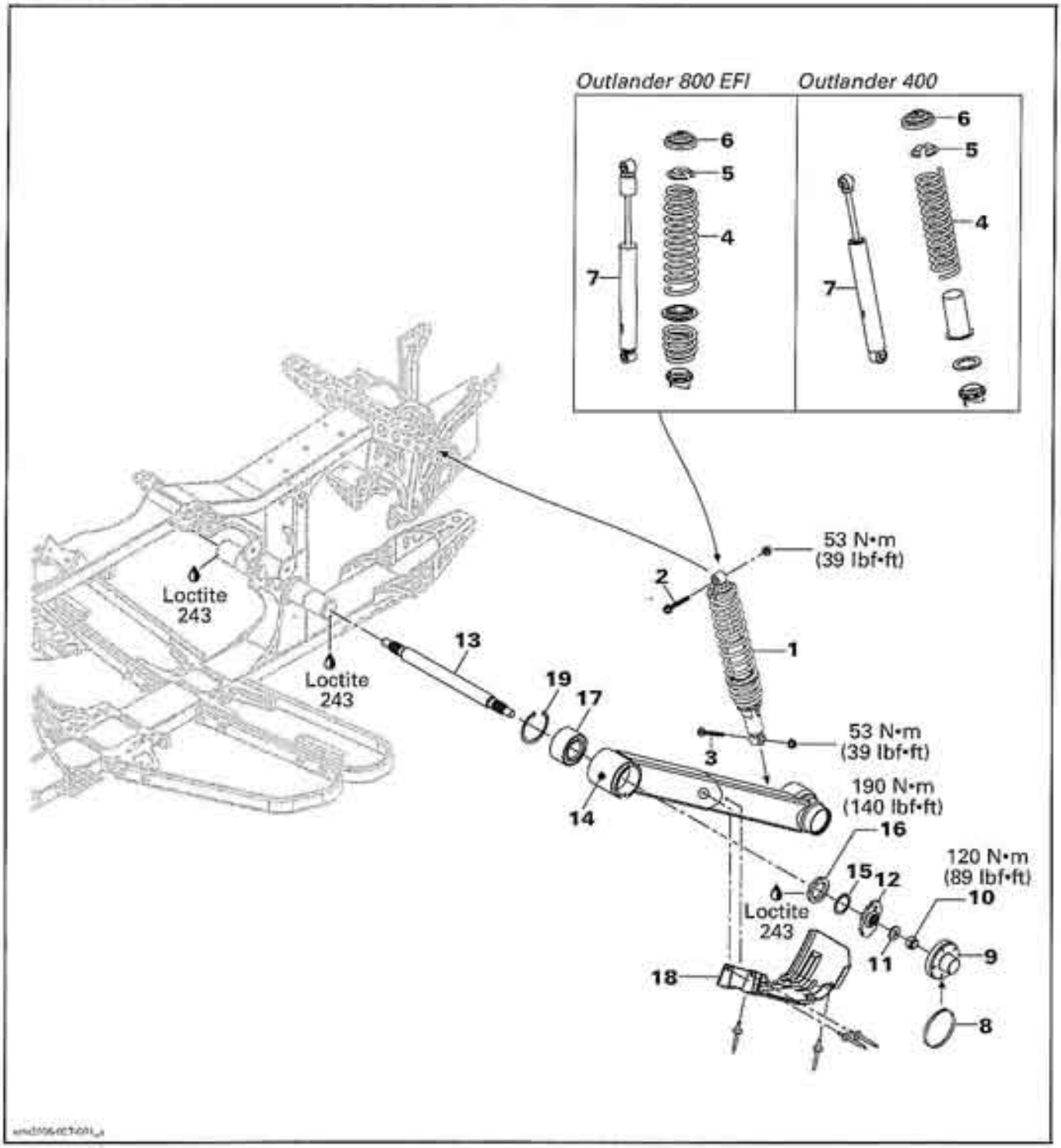
Install the upper suspension arm.

Install wheel.

REAR SUSPENSION

SERVICE TOOLS

SERVICE PRODUCTS


Outlander 800 EFI
Outlander 400
6
5
4
7
53 N•m
(39 lbf•ft)
2
1
Loctite
243
13
19
17
3
14
190 N•m
(140 lbf•ft)
16
15
12
120 N•m
(89 lbf•ft)
10
11
9
18
8

GENERAL

The procedure described below is the same for the RH and LH sides, unless otherwise instructed.

During assembly/installation, use the torque values and service products as in the exploded views.

Clean threads before applying a threadlocker. Refer to *SELF-LOCKING FASTENERS* and *LOCTITE APPLICATION* at the beginning of this manual for complete procedure.

⚠ WARNING

Torque wrench tightening specifications must strictly be adhered to.
Locking devices (e.g.: locking tabs, elastic stop nuts, self-locking fasteners, etc.) must be installed or replaced with new ones where specified. If the efficiency of a locking device is impaired, it must be renewed.

PROCEDURES

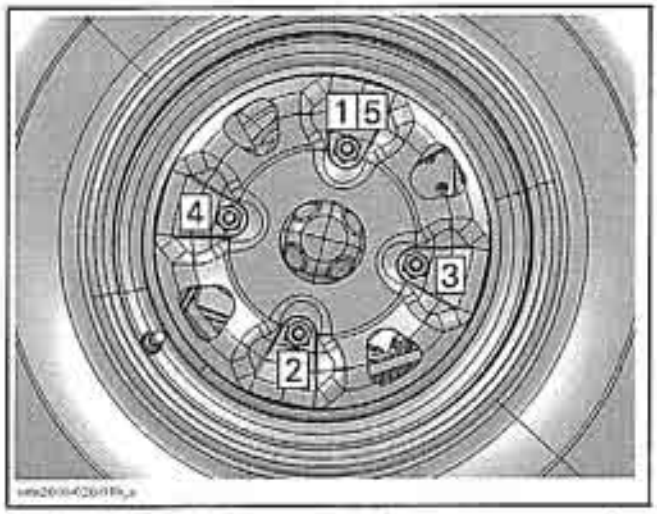
TIRES AND WHEELS

⚠ WARNING

When the tires are replaced, never install a bias tire with a radial tire. Such a combination could create handling and/or stability problems.
Do not mix tires of different size and/or design on the same axle.
Front and rear tire pairs must be the identical model and manufacturer.
For unidirectional tread pattern, ensure that the tires are installed in the correct direction of rotation.
The radial tires must be installed as a complete set.
Severe injury or death can result if these instructions are not followed.

The tires are directional and their rotation must be kept in a specific direction for proper operation.

Torque wheel nuts in accordance with the following illustration.



CAUTION: Always use the recommended wheel nuts. Using a different nut could cause damages to the rim.

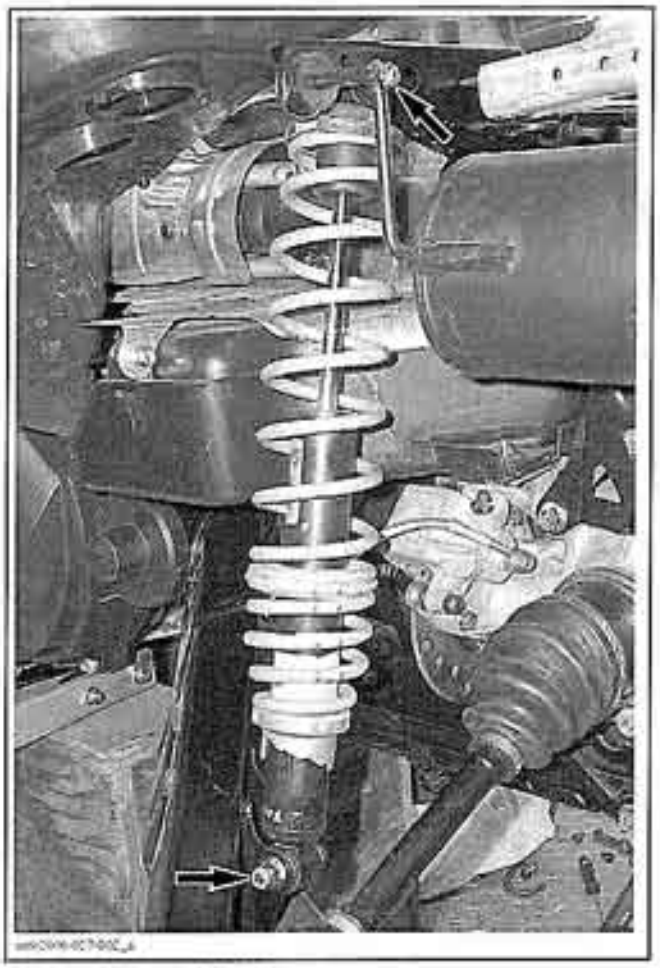
REAR SHOCK

Removal

Lift rear of vehicle until rear shock absorbers no. 1 are fully extended.

Install jack stands or blocks under the frame to support the vehicle.

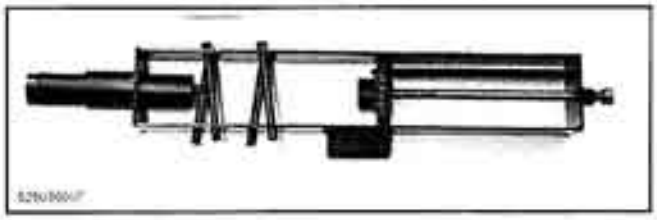
Remove upper no. 2 and lower no. 3 bolts retaining shock absorbers.



OUTLANDER 800 SHOWN

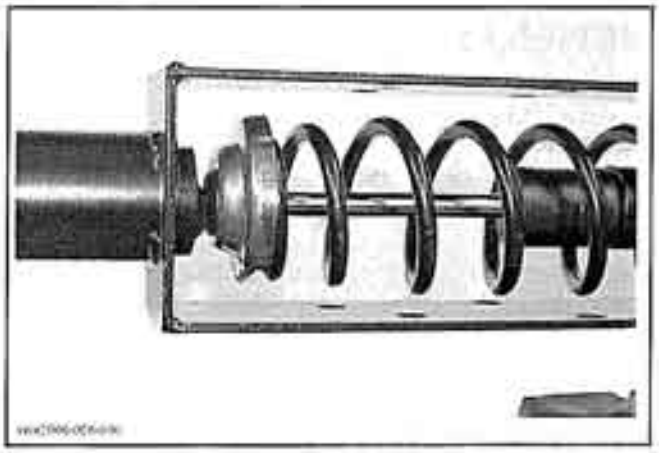
Disassembly

Use the shock spring remover (P/N 529 036 007).



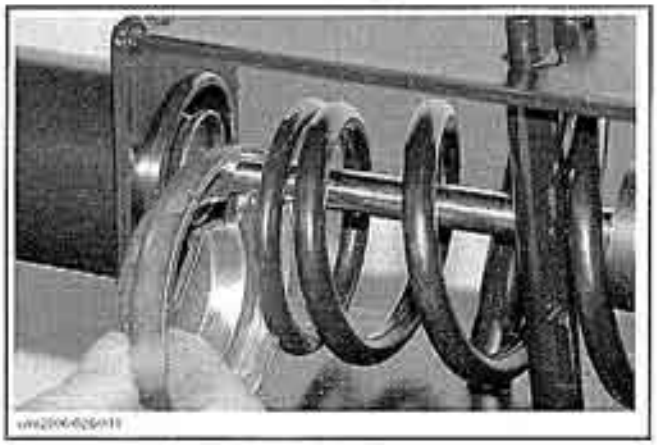
Place the tool in a vise.

Position the shock absorber in the tool and install the spring compressor pins.



Tighten the shock spring remover screw until the spring no. 4 is sufficiently compressed to remove spring locking devices.

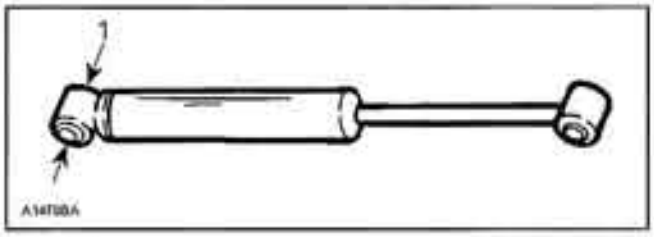
Remove spring stopper no. 5 and its cap no. 6 then release the shock spring remover screw.



Remove spring(s) from shock.

Inspection

Secure the shock body end no. 7 in a vise with its rod upward.



TYPICAL
1. Clamp here

CAUTION: Do not clamp directly on shock body.

Examine each shock for leaks. Extend and compress the piston several times over its entire stroke. Check that it moves smoothly and with uniform resistance with its rod upward.

Pay attention to the following conditions that will denote a defective shock:
- A skip or a hang back when reversing stroke at mid travel.
- Seizing or binding condition except at extreme end of either stroke.
- Oil leakage.
- A gurgling noise, after completing one full compression and extension stroke.

Replace if any faults are present.

Assembly and Installation

Assembly and installation are essentially the reverse of disassembly and removal procedures.

NOTE: Install cap opening at 180° from spring stopper opening.

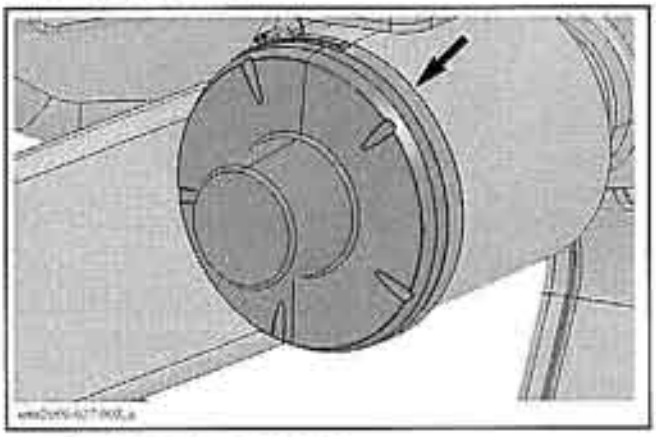
TORSION BAR

Removal

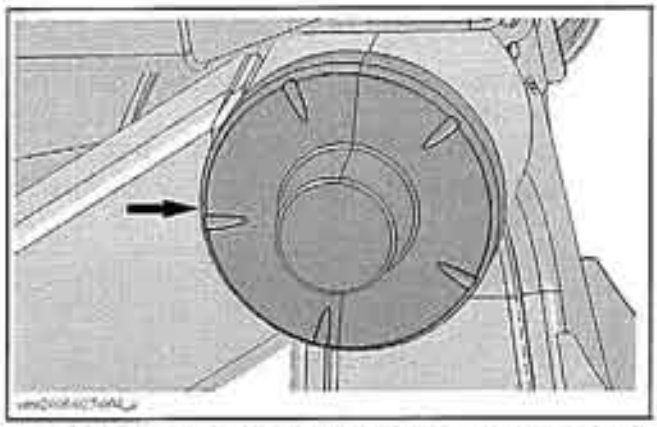
Apply parking brake and lift rear of vehicle until rear shock absorbers no. 1 are fully extended.

Install a jack stand or blocks under the frame to safely support the vehicle.

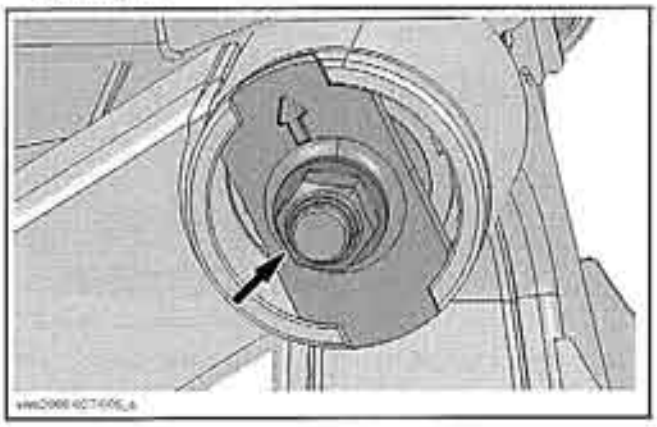
Remove:
- both footrests
- clamps (discard) no. 8



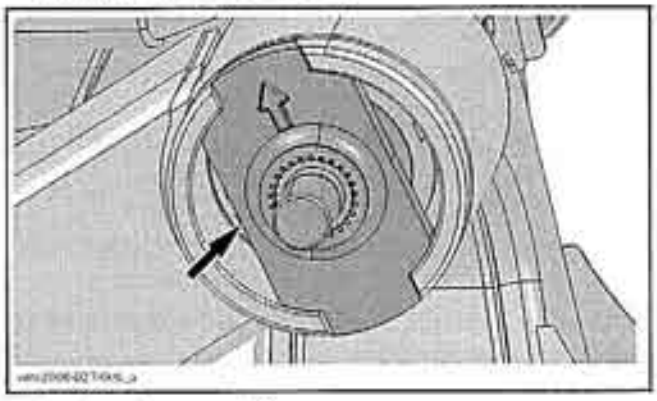
- protective covers no. 9



- elastic nuts no. 10 (discard them) and flat washers no. 11



- torsion bar levers no. 12



- torsion bar no. 13.

Inspection

Check:
- torsion bar for cracks, bending or other damages
- splines for damages (torsion bar and torsion bar lever)
- torsion bar lever tabs for racking, cracks or other damages.

NOTE: If a tab is damaged, check the trailing arm no. 14 for damages.

Replace all damaged parts.

Installation

Insert the torsion bar into the frame and install the torsion bar lever (one on each side).

NOTE: Ensure lever no. 12 is aligned with the cut-outs on the swing arm and arrow is pointing up.

Install the washer no. 11 and a new elastic nut no. 10.

First torque the right hand side elastic nut to 55 N•m (41 lbf•ft), then the left hand side to 120 N•m (89 lbf•ft).

Reinstall both torsion bar covers with new clamps.

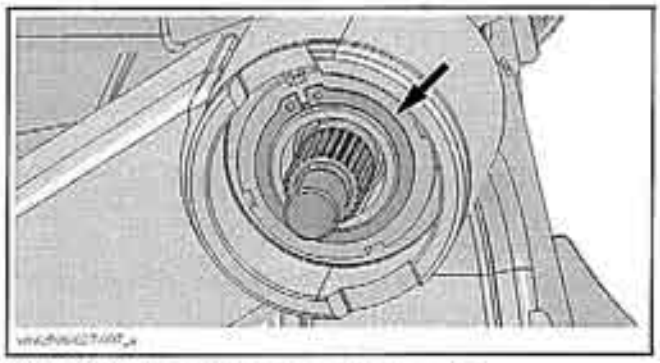
TRAILING ARM

Removal

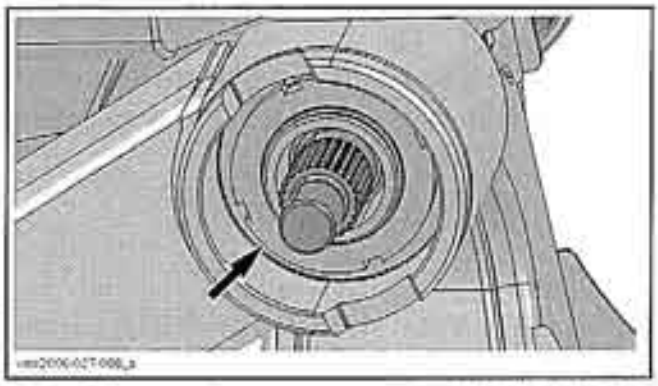
Apply parking brake and lift rear of vehicle until rear shock absorbers no. 1 are fully extended.

Install a jack stands or a blocks under the frame to safely support the vehicle.

Remove:
- wheel hub (refer to *REAR DRIVE*)
- clamp no. 8
- protective cover no. 9
- elastic nut no. 10 (discard)
- washer no. 11
- torsion bar lever no. 12
- circlip no. 15.



Unscrew the trailing arm nut no. 16.



To do this, use the spanner wrench (P/N 529 035 925).

Unscrew lower bolt no. 3 of shock absorber.

Remove trailing arm no. 14.

Inspection

Check:
- trailing arms for cracks, bending or other damages
- bearings for smooth and free operation.

Replace all damaged parts.

Installation

Insert drive shaft end into trailing arm.

Install the trailing arm on frame.

Install the lower shock absorber bolt to support the trailing arm. Do not torque yet.

Frame Side

Apply Loctite 243 (blue) (P/N 293 800 060) on trailing arm nut threads.

Install the trailing arm nut and torque it to 190 N•m (140 lbf•ft).

Install circlip, torsion bar lever, washer and a new elastic nut. Torque the left elastic nut to 120 N•m (89 lbf•ft) and the right elastic nut to 55 N•m (41 lbf•ft).

Install protective cover.

Wheel Side

Install:
- wheel hub
- washer
- castellated nut.

Torque castellated nut to 205 N•m (151 lbf•ft) and further tighten until its grooves align with the next cotter pin hole.

Install a new cotter pin then the wheel cap.

NOTE: The longer end of cotter pin must be folded over shaft end.

Torque the shock absorber bolt to 53 N•m (39 lbf•ft).

Install wheel.

TRAILING ARM BEARINGS

Remove trailing arm. Refer to procedure above.

Inspection

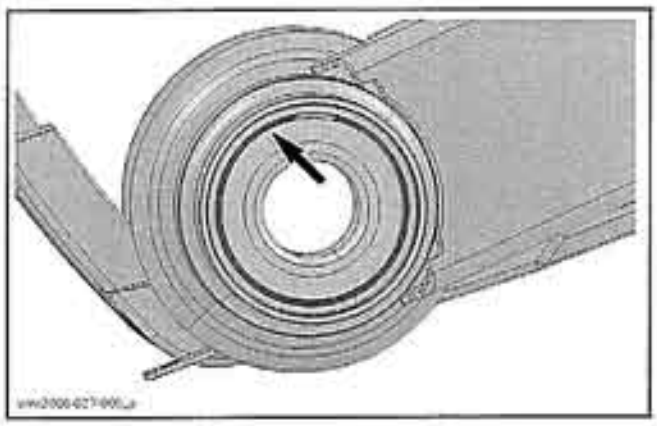
Check inner race of each bearing no. 17 with your finger. The bearings should turn smoothly and quietly. Remove and discard bearings if race does not turn smoothly or quietly.

Removal

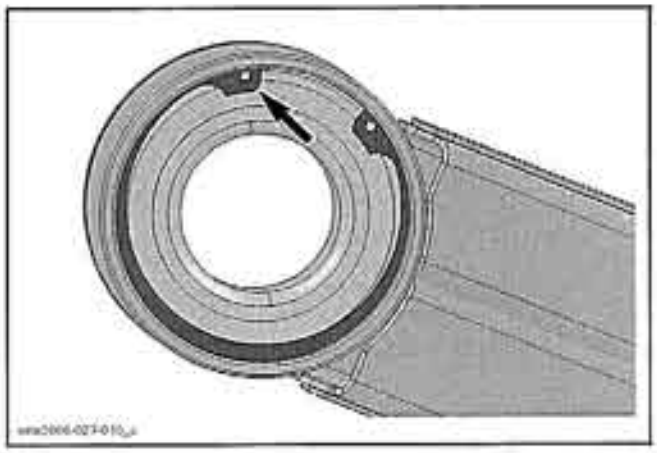
The same procedure can be used for both bearings.

NOTE: Before extracting the bearing on wheel side, remove the protector no. 18 by drilling the pop rivets with a 3/16" drill.

Remove the circlip no. 19.



WHEEL SIDE



FRAME SIDE

Place the trailing arm support (P/N 529 035 922) on the end of trailing arm.

WHEEL SIDE

FRAME SIDE

Using a press and the proper bearing extractor/installer, remove the bearing.

TOOL	LOCATION
Bearing extractor/installer (P/N 529 035 918)	Wheel side
Bearing extractor/installer (P/N 529 035 920)	Frame side

WHEEL SIDE

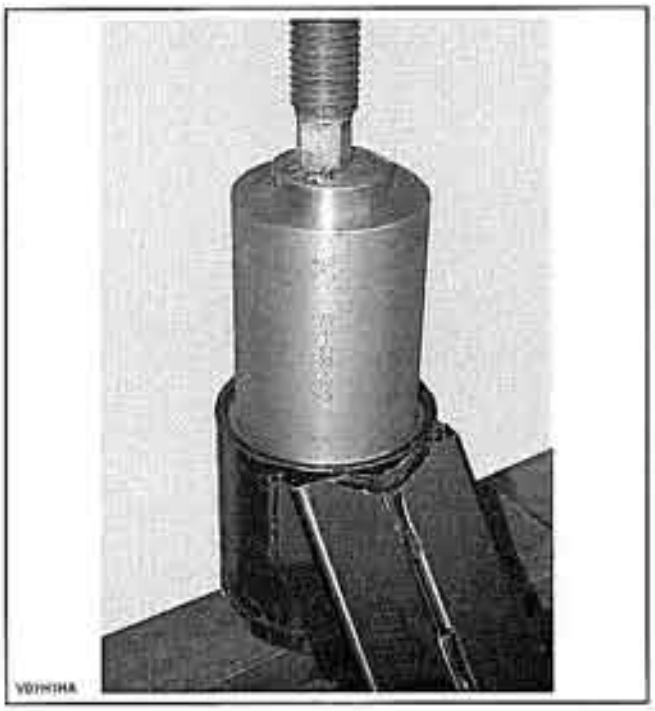
FRAME SIDE

Installation

Clean the bearing housing.

To install the bearing in its location, use the same tool as per removal procedure.

WHEEL SIDE



FRAME SIDE

Install the circlip. If the circlip is slacked, replace it with a new.

Install all other removed parts.

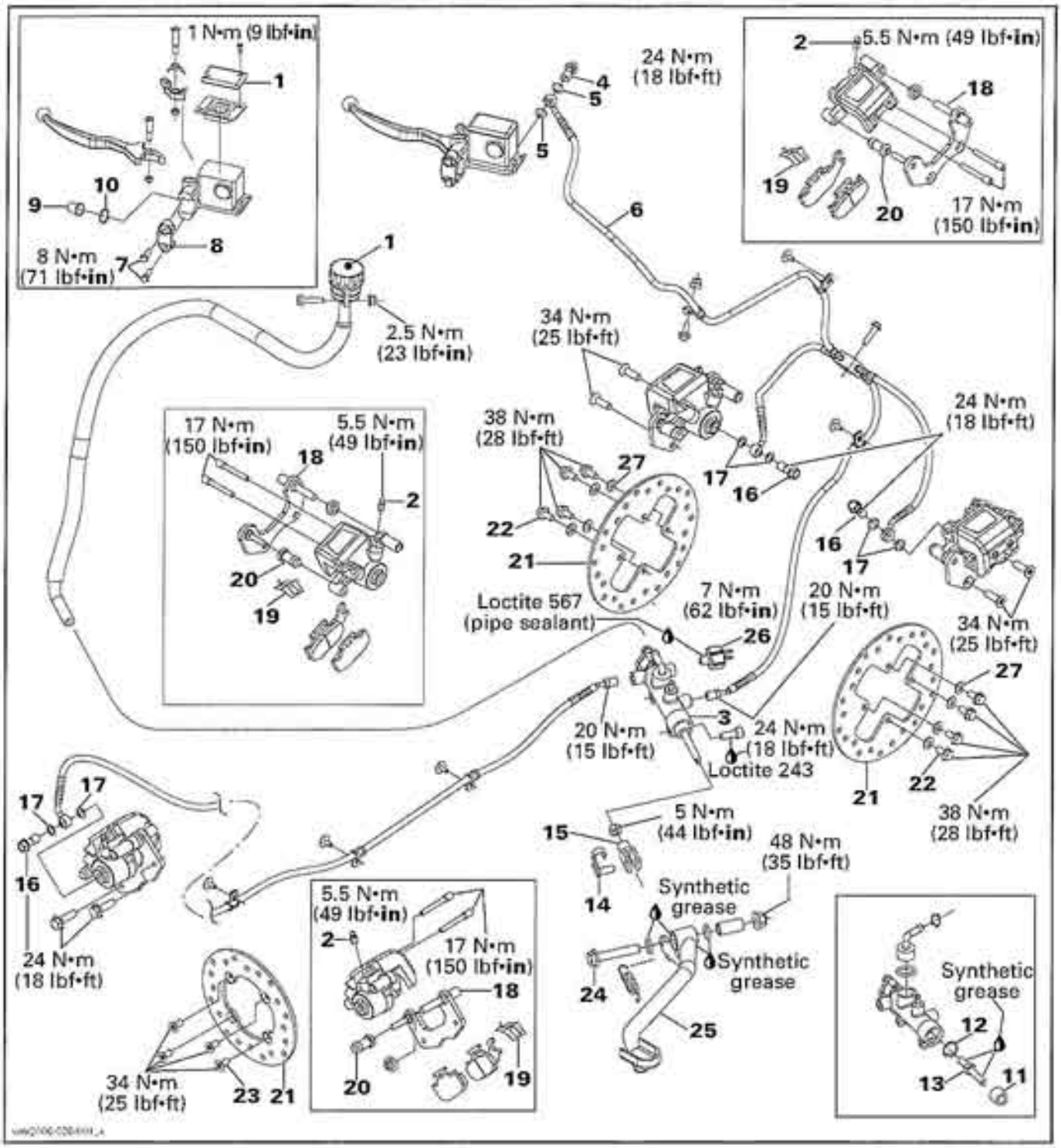
FRONT AND REAR BRAKES

SERVICE TOOLS

Description	Part Number	Page
vacuum/pressure pump	529 021 800	404

SERVICE PRODUCTS

Description	Part Number	Page
dielectric grease	293 550 004	407, 410
GTLMA brake fluid	293 600 062	403
Loctite 567 (pipe sealant)	293 800 013	406
XP-S synthetic grease	293 550 010	408, 413


1 N•m (9 lbf•in)
1
10
9
8
8 N•m (71 lbf•in)
7
24 N•m (18 lbf•ft)
4
5
5
6
2
5.5 N•m (49 lbf•in)
18
19
20
17 N•m (150 lbf•in)
1
2.5 N•m (23 lbf•in)
34 N•m (25 lbf•ft)
38 N•m (28 lbf•ft)
24 N•m (18 lbf•ft)
17 N•m (150 lbf•in)
5.5 N•m (49 lbf•in)
18
2
20
19
27
22
21
17
16
16
17
Loctite 567 (pipe sealant)
7 N•m (62 lbf•in)
20 N•m (15 lbf•ft)
34 N•m (25 lbf•ft)
26
3
20 N•m (15 lbf•ft)
24 N•m (18 lbf•ft)
Loctite 243
27
22
21
38 N•m (28 lbf•ft)
17
17
16
24 N•m (18 lbf•ft)
15
5 N•m (44 lbf•in)
48 N•m (35 lbf•ft)
14
Synthetic grease
Synthetic grease
24
25
5.5 N•m (49 lbf•in)
2
17 N•m (150 lbf•in)
18
20
19
34 N•m (25 lbf•ft)
23
21
Synthetic grease
12
13
11

GENERAL

During assembly/installation, use the torque values and service products as in the exploded view(s).

Clean threads before applying a threadlocker. Refer to *SELF-LOCKING FASTENERS* and *LOCTITE APPLICATION* at the beginning of this manual for complete procedure.

⚠ WARNING

Torque wrench tightening specifications must strictly be adhered to.
Locking devices (e.g.: locking tabs, elastic stop nuts, self-locking fasteners, etc.) must be installed or replaced with new ones where specified. If the efficiency of a locking device is impaired, it must be renewed.

CAUTION: Avoid spilling brake fluid on plastic, rubber or painted parts. Protect these parts with a rag when servicing brake system.

CAUTION: To avoid serious damage to the brake system, use only DOT 4 brake fluid from a sealed container. Do not use brake fluid taken from old or already opened containers, nor mix different fluids for topping off.

CAUTION: Sealing washers must be discarded and replaced with new ones every time a Banjo fitting is unscrewed.

Hydraulic Brakes System

The brake system consists of two circuits. Each system has its own master cylinder and reservoir.

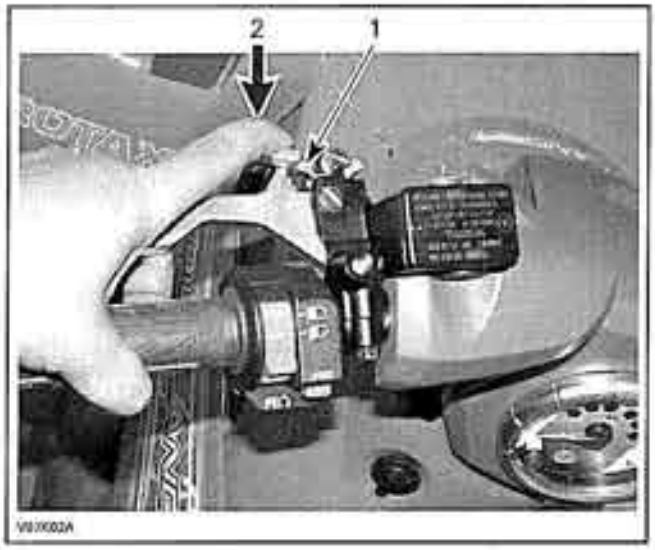
Both front and rear brakes are disc type.

⚠ WARNING

Periodically check the brake hoses for damages or leaks. Repair any damage before operating the vehicle.

Parking Brake

The parking brake operates all brakes. It is activated by a locking mechanism on LH brake lever.



TYPICAL
1. LH brake lever
2. Locking mechanism

PROCEDURES

BRAKE FLUID

Recommended Fluid

Always use brake fluid meeting the specification DOT 4 only such as GTLMA brake fluid (P/N 293 600 062) sold by BRP.

Fluid Level

With vehicle on a level surface, check brake fluid in reservoir for proper level. It should be above MIN. mark.

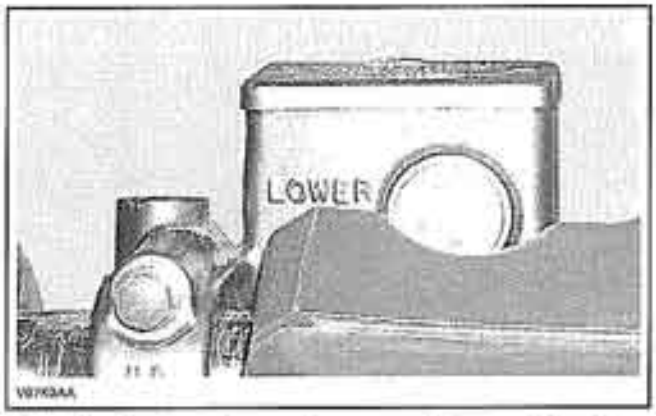
Clean filler cap before removing.

Add fluid as required. Do not overfill.

NOTE: A low level may indicate leaks or worn brake pads.

Front Brake Fluid Reservoir

Turn steering in the straight-ahead position to ensure reservoir is level. Check the brake fluid level, the reservoir is full when the fluid reaches the top of window.



Visually inspect lever boot condition. Check for cracks, tears, etc. Replace if damaged.

Rear Brake Fluid Reservoir

Brake Fluid Replacement

⚠ WARNING

A contaminated brake disc or pad reduces stopping power. Discard contaminated pads and clean a contaminated disc with a high quality brake degreasing agent.

Brake Fluid Draining

Remove reservoir cover no. 1 with its diaphragm.

Connect a clear hose to bleeding screw no. 2.

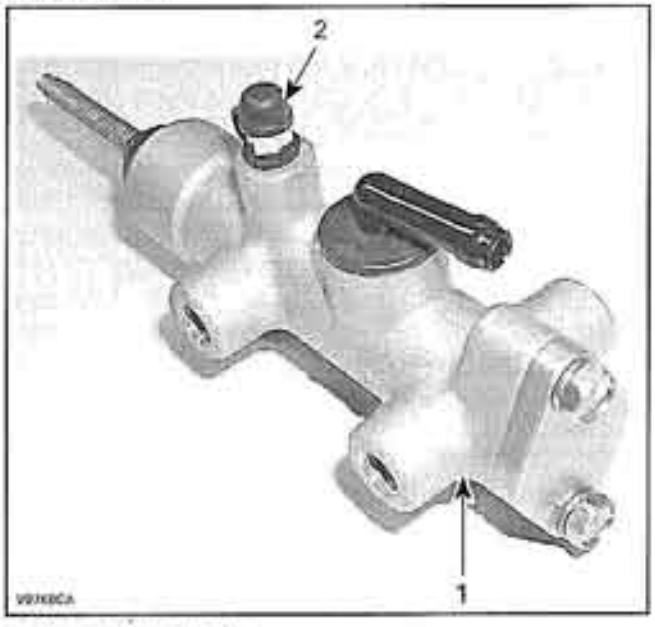
Loosen bleeding screw and pump brake lever or brake pedal until no more fluid flows out of bleeding screw.

Brake Fluid Filling and Bleeding

Close bleeding screws.

Fill reservoirs with DOT 4 brake fluid.

Unscrew the bleeding screw on the top of rear master cylinder no. 3 until brake fluid comes out then close it.



1. Rear master cylinder
2. Bleeding screw

On each caliper, unscrew the bleeding screw until the brake fluid comes out then close it.

Bleed system as per the following procedure.

With a Vacuum Pump

Using a clear hose, install the vacuum/pressure pump (P/N 529 021 800) to bleeding screw. Place the pump in vacuum position. See the manufacturer's operating instructions.

Pump vacuum pump loosen bleed. Close bleed and refill reservoir when the fluid level is low.

NOTE: Check fluid level often to prevent air from being pumped into the system.

Repeat the procedure until no more air bubbles appear in hose.

NOTE: For the front brake system, switch to LH and RH caliper. Turn handlebar to full RH side when bleeding right caliper and turn to the LH side for the left caliper. This helps to reach air into the caliper. The front and the rear brakes must be bled at the same time.

Close bleeding screw and operate brake lever or brake pedal. If it still feels spongy, bleed system again.

Repeat the procedures until air bubbles do not appear in hose and lever or pedal is stiff.

Fill reservoirs to the upper level with DOT 4 brake fluid.

Install diaphragms and covers on reservoirs.

Without a Vacuum Pump

If vacuum pump is not available, use the following procedure.

Install a clear hose to bleeding screw.

Open bleeding screw. Fill reservoirs and pump brake lever or brake pedal until fluid freely flows out of the hose.

Close bleeding screw.

Pump up system pressure with brake lever or brake pedal until lever or pedal resistance is felt.

Squeeze brake lever or depress brake pedal, open bleeding screw and then close it.

NOTE: Do not release brake lever or brake pedal until bleeding screw has been closed. For the front brake system, switch to LH and RH caliper. Turn handlebar to full RH side when bleeding right caliper and turn to the LH side for the left caliper. This helps to reach air into the caliper. The front and the rear brakes must be bled at the same time.

Release brake lever or brake pedal slowly.

Repeat the procedure until no more air bubbles appear in hose and lever or pedal is stiff.

BRAKE LIGHT SWITCH

Inspection

Check switch no. 26 for dirt or corrosion. Make sure it is operating properly.

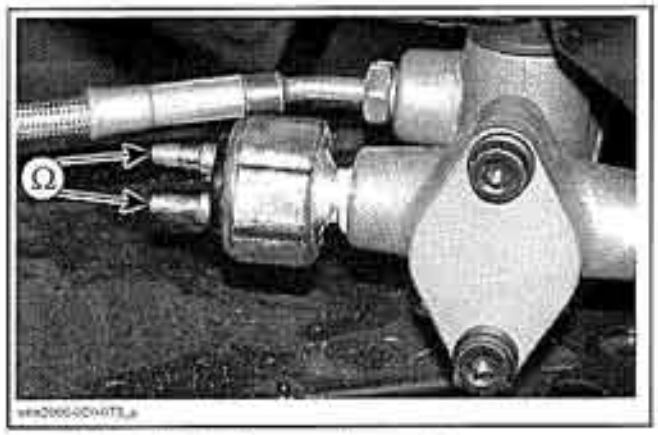
Depress brake pedal and check for brake light to turn on. Repeat with the brake lever.

Test

Disconnect switch connectors.

Check switch operation as follows.

BRAKE SWITCH POSITION	PIN		RESISTANCE
Firmly pushed	BLACK/RED	RED	0.2 Ω max.
Released			Infinite (O.L.)



If switch is defective, replace with a new one.

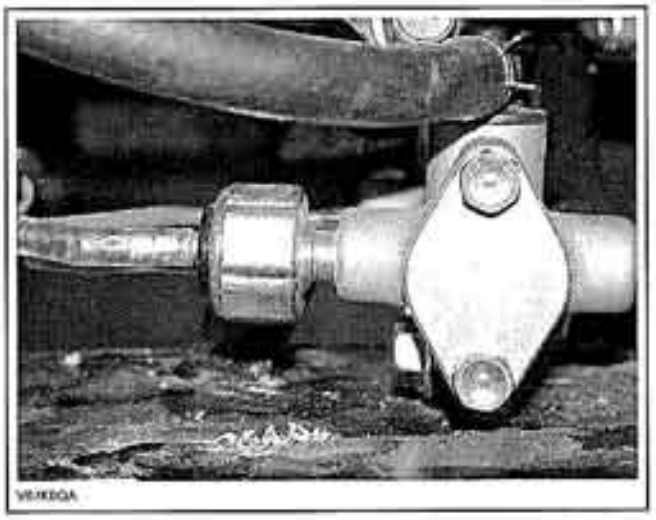
Outlander 800 Series

Verify wire continuity between brake switch and ECM.

ECM CONNECTOR PIN	BRAKE SWITCH PIN	RESISTANCE
B-23	RED	Close to 0 Ω

Removal

The rear brake switch is located on the rear master cylinder.



The rear brake light switch cannot be adjusted.

Disconnect switch connectors.

Drain brake system.

Unscrew brake light switch from master cylinder. Catch spilled fluid with a rag.

Installation

For installation, reverse the removal procedure.

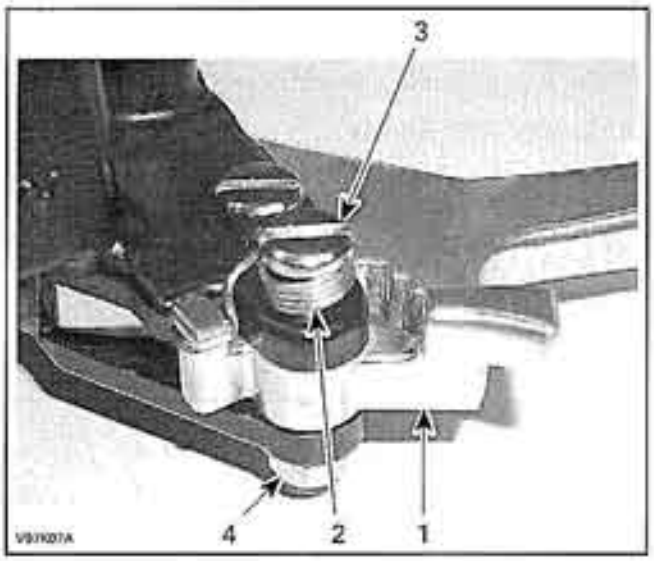
NOTE: Apply Loctite 567 (pipe sealant) (P/N 293 800 013) on threads of brake light switch.

PARKING BRAKE MECHANISM

Removal

Remove:

- nut
- screw
- spring
- brake lever lock.

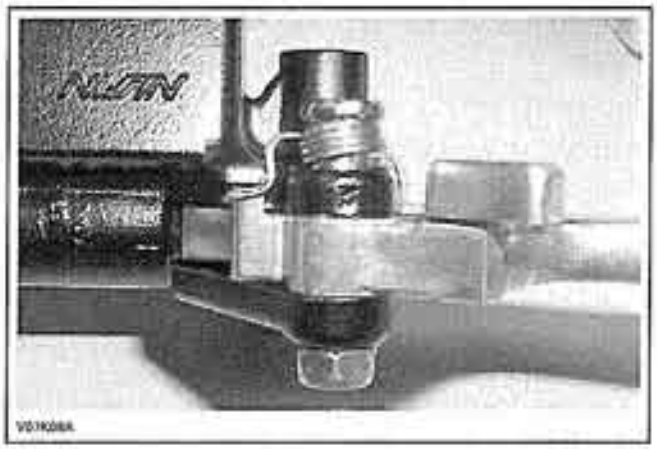


1. Brake lever lock
2. Spring
3. Screw
4. Nut

Installation

For installation, reverse the removal procedure.

See the following illustration to install the spring properly.

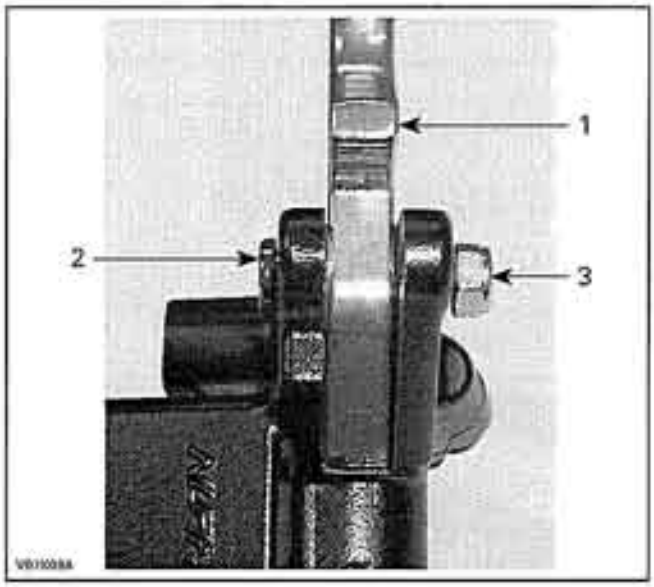


BRAKE LEVER

Removal

Remove:

- parking brake mechanism (see above)
- nut
- screw
- brake lever.



1. Brake lever
2. Screw
3. Nut

Inspection

Check brake lever for bending, cracks or other damages. Replace if necessary.

Installation

For installation, reverse the removal procedure.

FRONT MASTER CYLINDER

Removal

Remove master cylinder cover and its diaphragm then drain brake fluid until front master cylinder reservoir is empty.

Remove the handlebar cover.

Remove banjo fitting no. 4 and sealing washers no. 5 retaining brake hose no. 6 to front master cylinder.

Remove screws no. 7 from master cylinder holder no. 8 and remove master cylinder from handlebar.

Disassembly

Remove brake lever lock and brake lever.

Remove piston boot no. 9, snap ring no. 10, piston and spring.

Inspection and Lubrication

Discard any remaining fluid inside reservoir.

Clean reservoir, piston and master cylinder thoroughly with clean brake fluid.

Check:
- boot for crack
- spring for damage
- piston cup for wear, deterioration or damages
- master cylinder and piston for scoring, scratches or other damages.

Change part(s) if necessary.

Check if the end cap O-ring is brittle, hard or damaged.

NOTE: If master cylinder housing is damaged or leaking, replace as an assembly.

Assembly

Coat piston and piston cups with clean brake fluid.

Install:
- spring onto piston
- piston into master cylinder
- snap ring into groove in the master cylinder
- boot into master cylinder and the groove in piston.

Apply dielectric grease (P/N 293 550 004) to the brake lever contacting surface of the piston.

Install brake lever and locking mechanism.

NOTE: Apply dielectric grease (P/N 293 550 004) on lever pivot bolt.

Installation

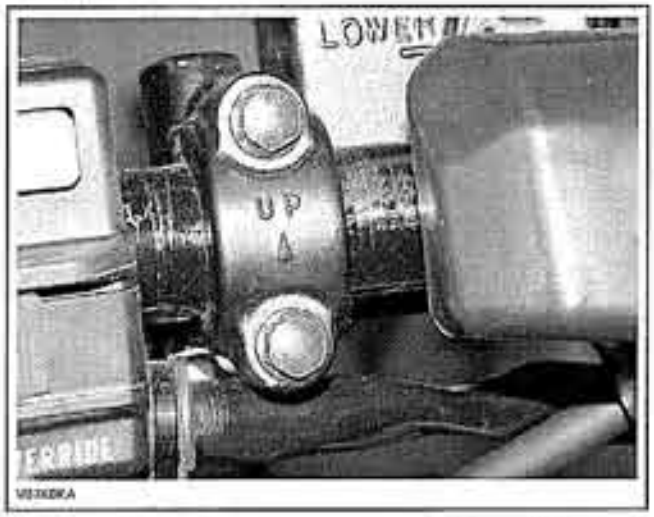
For the installation, reverse the removal procedure, pay attention to the following details.

Place the brake lever assembly on the handlebar.

Position cylinder holding bracket no. 8 with the UP mark upward.

Install bolts no. 7 and tighten loosely.

With the handlebar in straight ahead position, position cylinder reservoir parallel to the ground. Tighten upper bolt first.



Connect brake hose to master cylinder with Banjo fitting and new sealing washers.

Bleed brake system.

Check for leaks and make sure the brakes operate normally before driving.

REAR MASTER CYLINDER

Removal

Drain brake fluid.

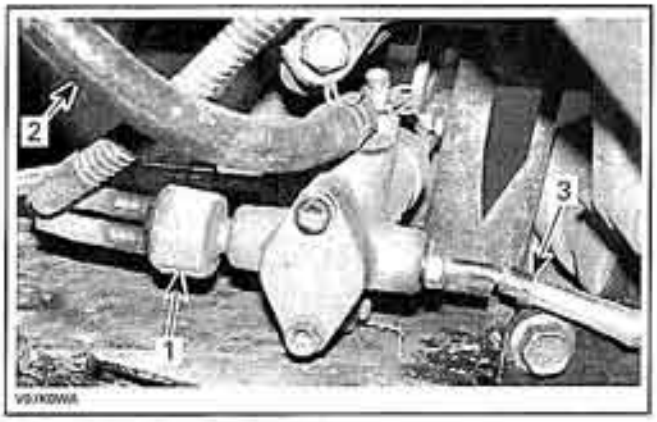
Remove LH and RH footrests.

Unplug brake switch connectors.

NOTE: At this time, check hoses and fittings for damages or leaks.

Disconnect reservoir flexible hose and plug the end to avoid brake fluid spillage.

Unscrew rear hose from master cylinder.

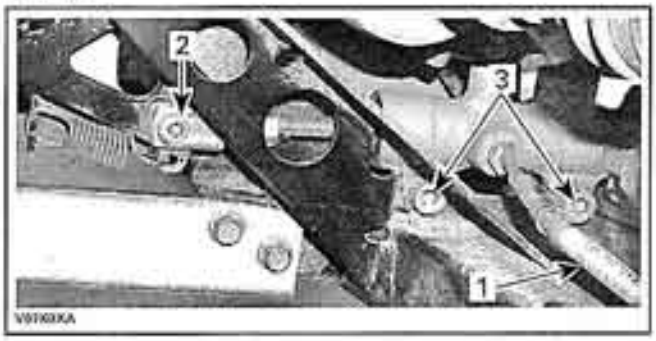


1. Brake switch
2. Reservoir hose
3. Rear hose

Unscrew front hose from master cylinder.

Unhook push rod from brake pedal.

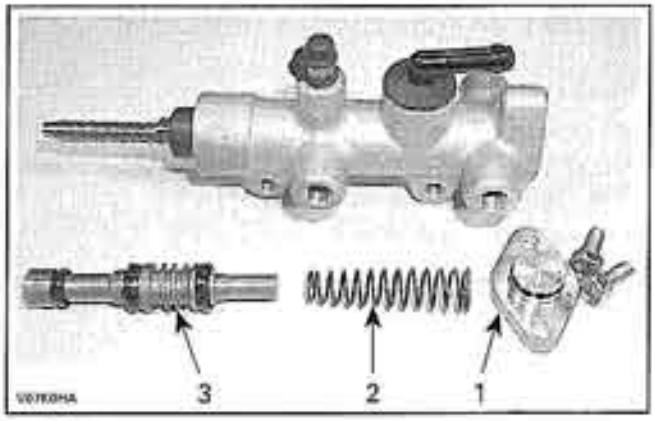
Remove bolts retaining master cylinder to the frame.



1. Front hose
2. Push rod lock
3. Master cylinder bolts

Disassembly

Remove:
- end cap
- spring
- piston



1. End cap
2. Spring
3. Piston

- boot no. 11
- snap ring no. 12
- push rod no. 13.

Inspection and Lubrication

Discard any remaining fluid inside reservoirs.

Clean reservoirs, pistons and master cylinders thoroughly with clean brake fluid.

Check:
- boots for crack
- springs for damage
- piston cups for wear, deterioration or damages
- master cylinders and pistons for scoring, scratches or other damages.

Change part(s) if necessary.

Check locking pin no. 14 for excessive wear, replace if necessary.

Check if the end cap O-ring is brittle, hard or damaged.

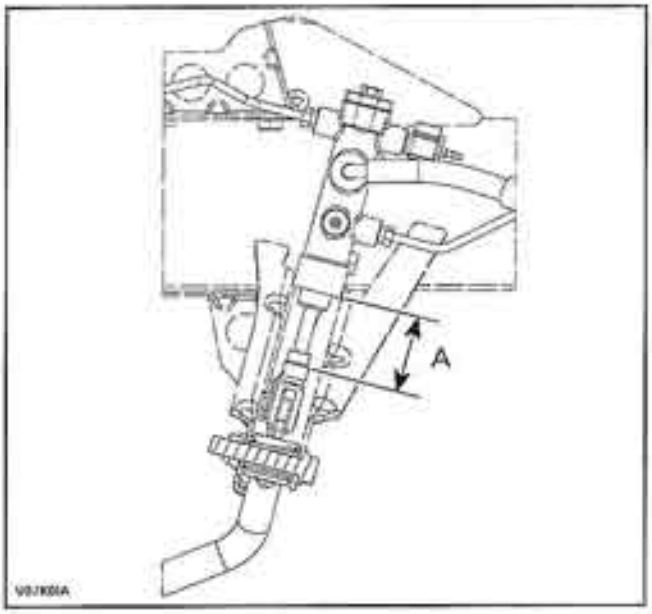
NOTE: If master cylinder housing is damaged or leaking, replace as an assembly.

Assembly

Apply XP-S synthetic grease (P/N 293 550 010) on both ends of push rod.

Install:
- push rod
- snap ring
- boot.

If push rod yoke no. 15 has been removed, reinstall it then adjust push rod length, see the following illustration.

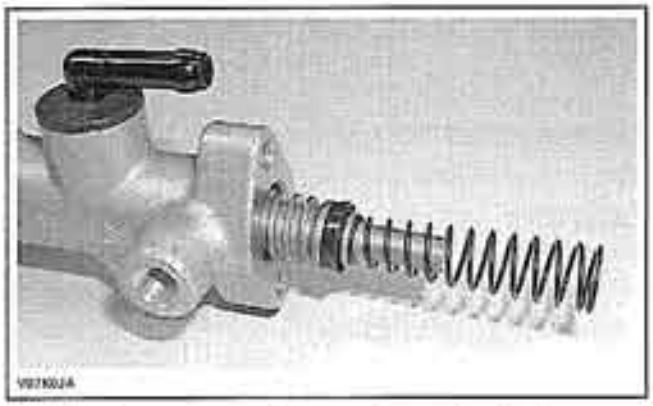


A. 44 ± 1 mm (1.732 ± .039 in)

Coat piston and piston cups with clean brake fluid.

The spring is conical. Install the smaller end on piston.

Insert piston in the master cylinder.



Install the end cap. Do not forget the O-ring.

Installation

Install master cylinder to frame.

Hook push rod on brake pedal.

Connect front and rear hoses on master cylinder.

Connect flexible hose from reservoir.

Fill up reservoir with clean brake fluid.

Bleed brake system.

Check for leaks and make sure the brakes operate normally before driving.

Connect brake light switch connectors.

CALIPER

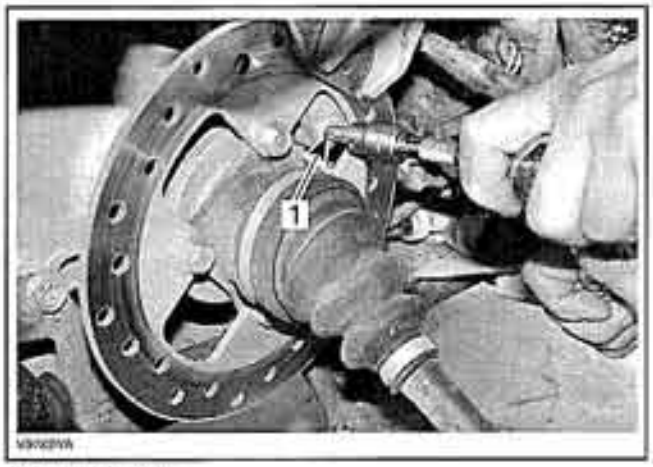
Removal

Loosen wheel nuts.

Raise vehicle and support it securely.

Remove appropriate wheel.

Remove the caliper bolts/screws then the caliper. If the caliper is not being removed from the vehicle as during brake pad replacement, simply hang the caliper with a piece of wire to take the weight off the brake hose. If the caliper is being removed for replacement, drain brake system before removing the Banjo fitting no. 16 and its sealing ring no. 17. Remove the caliper from the vehicle.



FRONT CALIPER
1. Retaining screw

REAR CALIPER
1. Remove banjo fitting and washers
2. Unscrew bolts

Catch spilled fluid with a rag. Attach the brake hose in a position to prevent the fluid from flowing out.

Disassembly

Remove brake pads, see the following section.

Remove:
- slide caliper support no. 18
- pad spring no. 19.

Place rag over piston.

Place caliper body with piston down and apply small squirts of air pressure to the fluid inlet to remove piston.

⚠ WARNING

Do not use high pressure air or bring nozzle too close to inlet.

Remove piston seal.

CAUTION: Be careful not to damage piston sliding surface.

Clean piston grooves, caliper cylinder and piston with clean brake fluid.

Clean slide pins with brake cleaner and a rag.

Inspection

If boots no. 20 are deteriorated or hard, replace with new ones.

Check caliper cylinder for scratches, rust or other damages. If so, replace caliper.

Check piston for scratches, rust or other damages. If so, replace piston.

Assembly

Coat piston seal with clean brake fluid and install it into piston grooves in caliper.

Coat piston with clean brake fluid and install into cylinder with the closing toward caliper body.

Apply dielectric grease (P/N 293 550 004) into sliding bores and install slide pins.

NOTE: Make sure that rubber boots are correctly installed in slide pins grooves.

Install pad spring, caliper bracket and pads.

Installation

For the installation, reverse the removal procedure, pay attention to the following details.

Use new sealing washers when installing banjo fitting retaining brake hose to caliper.

Install caliper in its original position.

Bleed the brake system.

Check for leaks and make sure the brakes operate normally before driving.

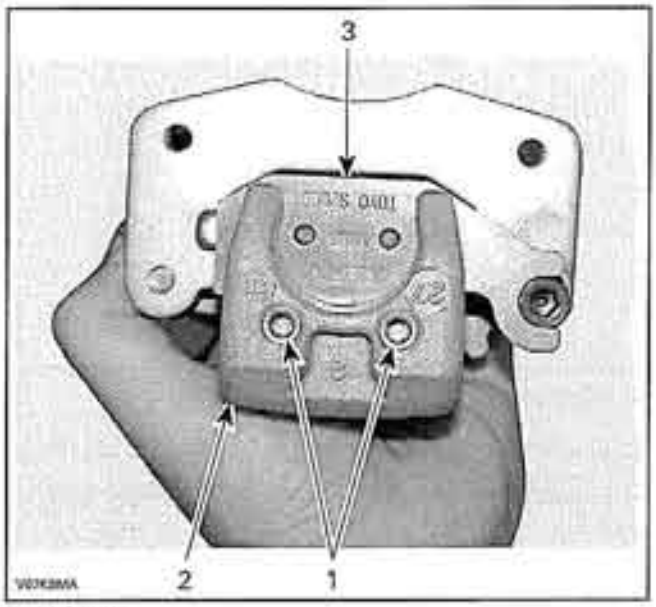
BRAKE PADS

Removal

Raise vehicle and support it securely.

Remove appropriate wheel.

Loosen pad pins.



1. Pad pins
2. Caliper
3. Pad

Remove caliper from its support.

Unscrew pad pins then remove pads.

CAUTION: Do not let the caliper hang by the hose and do not stretch or twist the hose.

Push piston all the way in to allow installation of new pads.

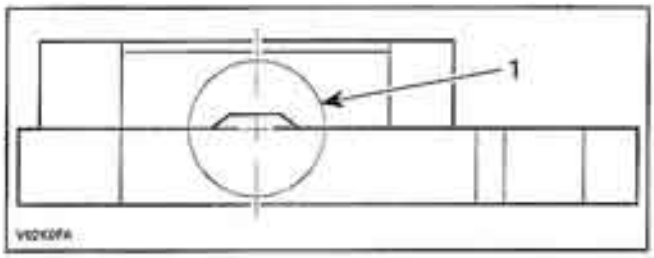
Inspection

CAUTION: Do not clean brake pads in petroleum based solvent. Use brake system cleaner only. Soiled brake pads must be replaced with new ones.

Measure brake pad lining thickness.

Brake pads must be replaced when lining is 1 mm (1/32 in) thick or less, or look the hollow places on both sides on the pad lining.

There are four hollow places on one set of brake pads. When the pad wear reaches one of the hollow places, the pad must be changed even if the pad wear does not reach another hollow place.



1. Hollow place

BRAKE PAD MINIMUM THICKNESS	1 mm (1/32 in)

⚠ WARNING

Avoid getting oil or grease on brake pads. Contaminated brake pads can affect stopping capacities.

CAUTION: Brake pads must always be replaced in pairs.

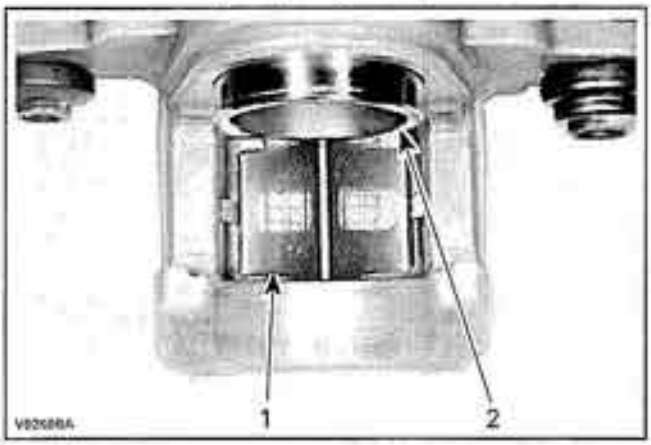
Installation

Clean the visible portion of piston with clean brake fluid.

Push caliper pistons inward before installing brake pads.

NOTE: Use a C-clamp or another suitable tool. To avoid damaging the piston, use an old pad to push it into the caliper.

Make sure that pad spring is in position.



1. Pad spring
2. Piston

Install new brake pads.

Install new pad pins by pushing in the pads against pad spring to align pad slots in the pads and caliper body.

Install brake caliper so the disc is positioned between pads.

NOTE: Be careful not to damage pads and make sure pads are correctly inserted in their location.

After the job is completed, firmly depress the brake lever a few times to bring the pads in contact with the disc.

Check for leaks and make sure the brakes operate normally before driving. The pads must rest flat on the disk.

BRAKE DISC

Inspection

Brake discs no. 21 can be inspected without removing them from the vehicle.

Raise vehicle and support it securely. Remove wheels and visually inspect disc surfaces for scratches or grooves. Make sure to check both sides of disc.

Measure thickness of the disc.

DISC MINIMUM THICKNESS	
Front	3.5 mm (.138 in)
Rear	4.3 mm (.170 in)

Replace disc if not within specifications.

CAUTION: Brake discs should never be machined.

Turn the disc by hand and check warpage.

MAXIMUM DISC WARPAGE	
Front	0.2 mm (.01 in)
Rear	

Removal

Front Brake Disc

Apply parking brake and raise the front of the vehicle.

Remove:
- appropriate wheel
- inner fender (Outlander 400 Series)
- wheel hub
- shock absorber (Outlander 800 Series).

Separate knuckle from lower A-arm.

Remove drive shaft from knuckle.

Attach upper A-arm or strut out of way.

Unscrew brake disc bolts no. 22.

Keep the Belleville washers no. 27.

Release parking brake and remove caliper.

CAUTION: Do not let the caliper hang by the hose and do not stretch or twist the hose.

Remove brake disc. Pay attention not to cut the CV boot.

Rear Brake Disc

Outlander 400 Series

Remove:
- LH wheel
- caliper (suspend it out of the way)

CAUTION: Do not let the caliper hang by the hose and do not stretch or twist the hose.
- rear propeller shaft (refer to *REAR DRIVE*).

Place the propeller shaft in a vise.

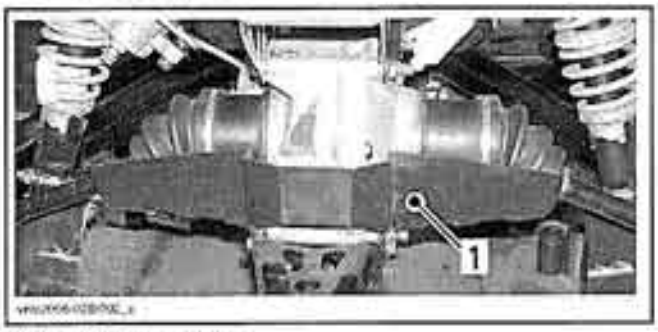
Heat up brake disc around screws to facilitate removal.

Remove brake disc screws no. 23 retaining brake disc to the propeller shaft.

Outlander 800 Series

Remove:
- rear wheels
- caliper (suspend it out of the way)

CAUTION: Do not let the caliper hang by the hose and do not stretch or twist the hose.
- rear propeller shaft bolt from differential
- differential protector



1. Differential protector

- differential bolts.

Loosen hitch plate bolts.

Move the differential backward.

Disconnect propeller shaft from differential.

Unscrew brake disc screws no. 23. Heat up brake disc around screws to facilitate removal.

Installation

The installation is the reverse of removal procedure. However, pay attention to the following details.

Front Brake Disc

Do not forget Belleville washers no. 27 when installing brake disc bolts. Install each Belleville washer no. 27 with its concave side towards brake disc.

⚠ WARNING

Never substitute Belleville washer with another type of washer (flat, lock, etc.).

Rear Brake Disc

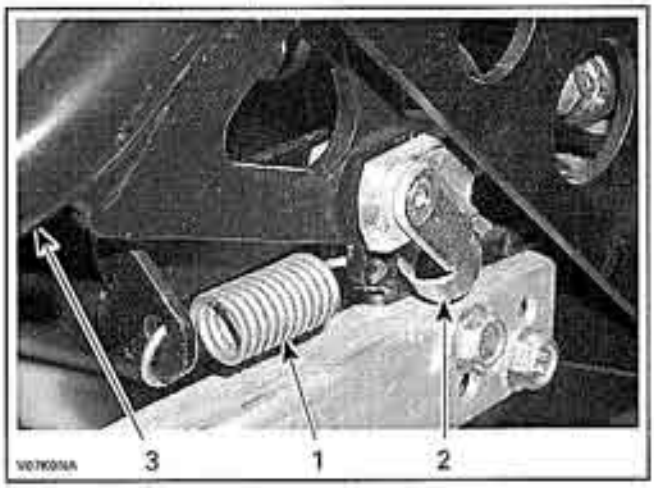
Install brake disc on propeller shaft and tighten bolts no. 22 and screws no. 23 to 34 N•m (25 lbf•ft) in a criss-cross sequence.

BRAKE PEDAL

Removal

Remove RH footwell.

Unhook:
- return spring
- master cylinder push rod hook.



1. Return spring
2. Push rod hook
3. Brake pedal

Remove bolt no. 24 retaining the brake pedal no. 25 to frame.

Inspection

Check brake pedal for cracks or distortion.

Check if O-rings are brittle, hard or otherwise damaged.

Replace any defective parts.

Installation

For installation, reverse the removal procedure.

Apply XP-S synthetic grease (P/N 293 550 010) on both O-rings and into brake pedal.

BRAKE HOSES

Inspection

Brake hoses should be inspected frequently for leaks and damages.

Check if the hoses are crushed or damaged. Any deformation can restrict the proper flow of fluid and cause braking problems.

Check hoses for cracking or scrapes. This damage can cause hose failure under pressure.

When hoses are removed or disconnected, cleanliness must be observed. Clean all joints and connections before disassembly. New hoses should be cleaned with brake fluid before installation to remove any contamination.

Replace any defective parts.

Removal

NOTE: Before removing any hoses, drain brake system.

Remove all necessary parts to reach the hoses.

Thoroughly clean the area around the joints that will be disconnected.

Place a drain pan under the joint that will be disconnected.

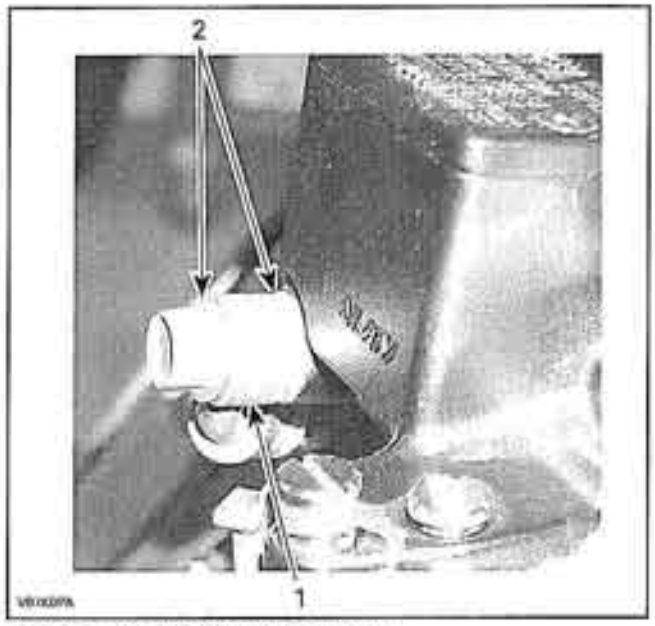
Disconnect any retaining clips or brackets holding the hose and remove the defective part(s).

Installation

Install the new hose.

Make sure the piece will not rub against any other part.

When there is a banjo fitting securing the hose to the caliper or to the master cylinder, always replace the sealing washers with new ones.



FRONT MASTER CYLINDER SHOWN
1. Banjo fitting
2. Sealing washers

Install any retaining clips or brackets.

Refill and bleed the system.

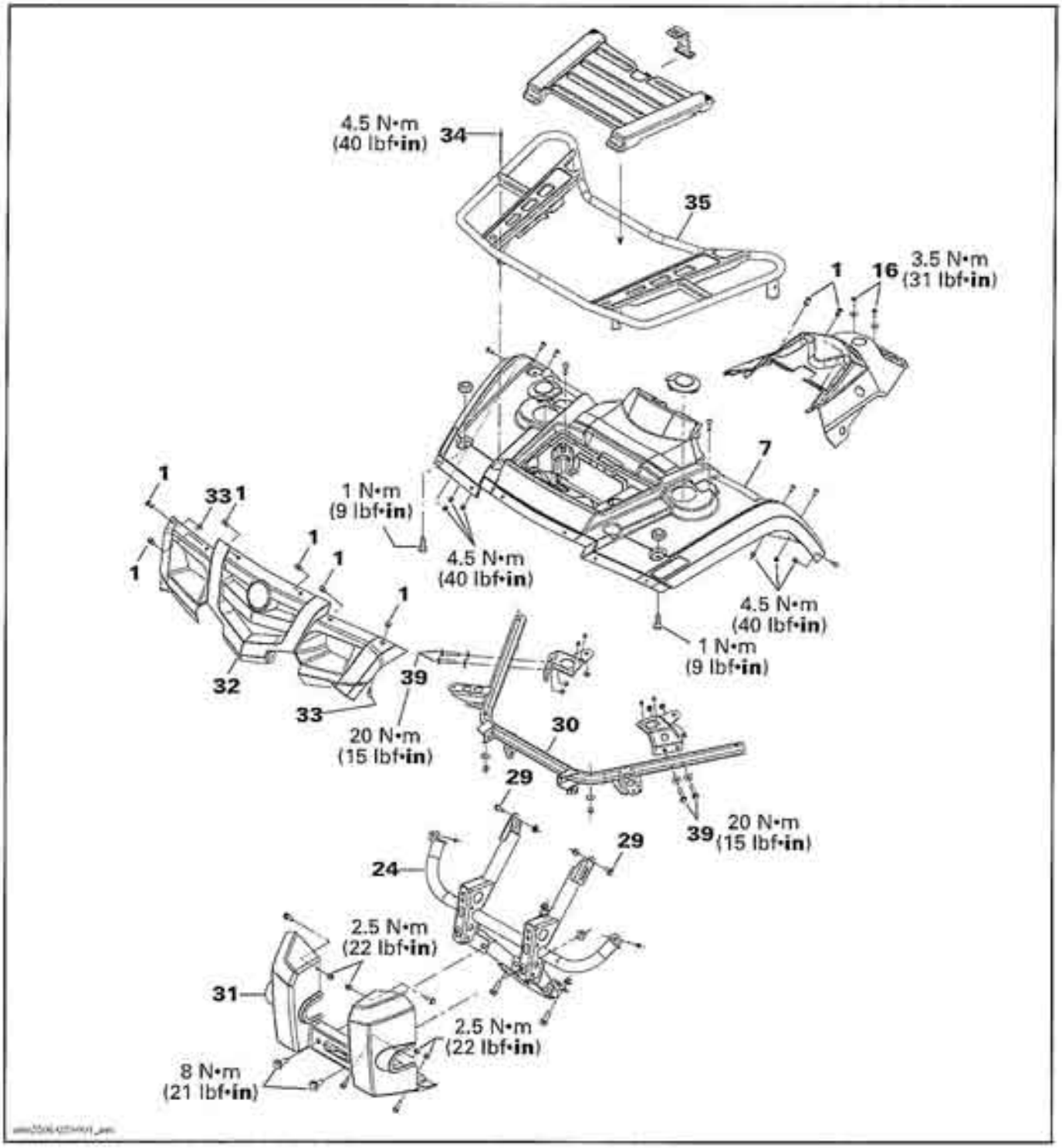
BODY

SERVICE TOOLS

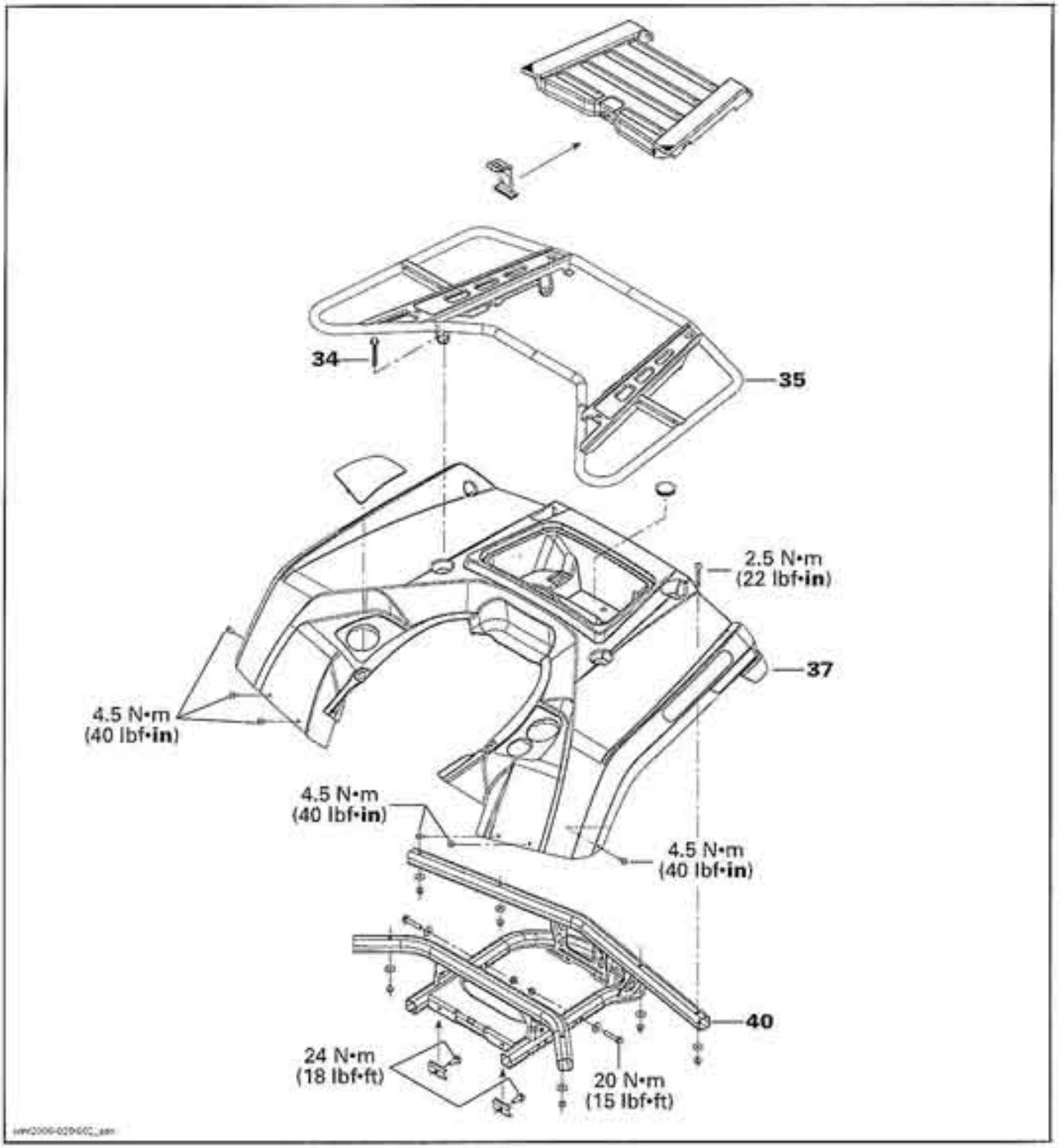
Description	Part Number	Page
pliers Oetiker 1099	295 000 070	426

OUTLANDER 400 SERIES

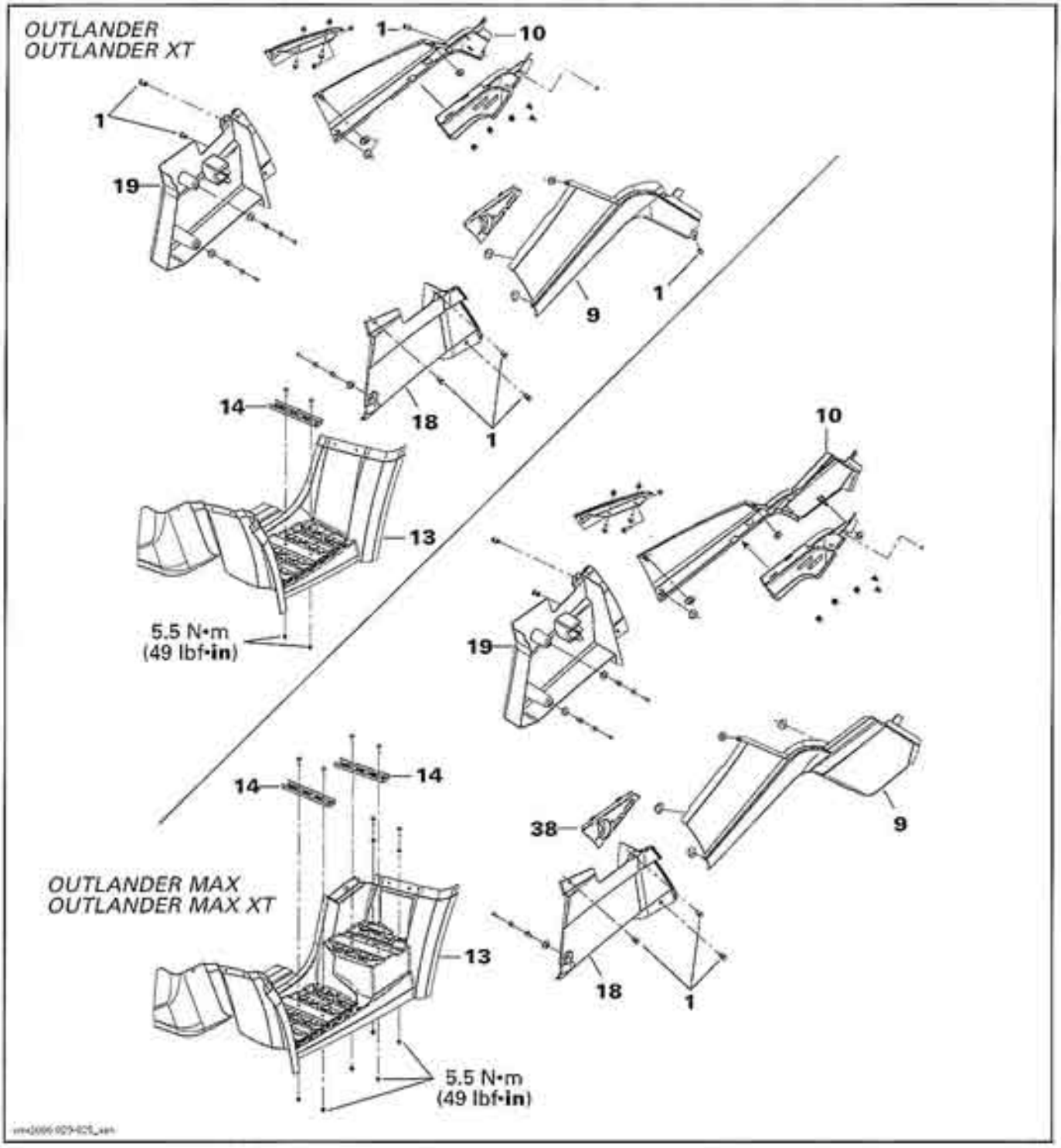
Body Parts (front view)



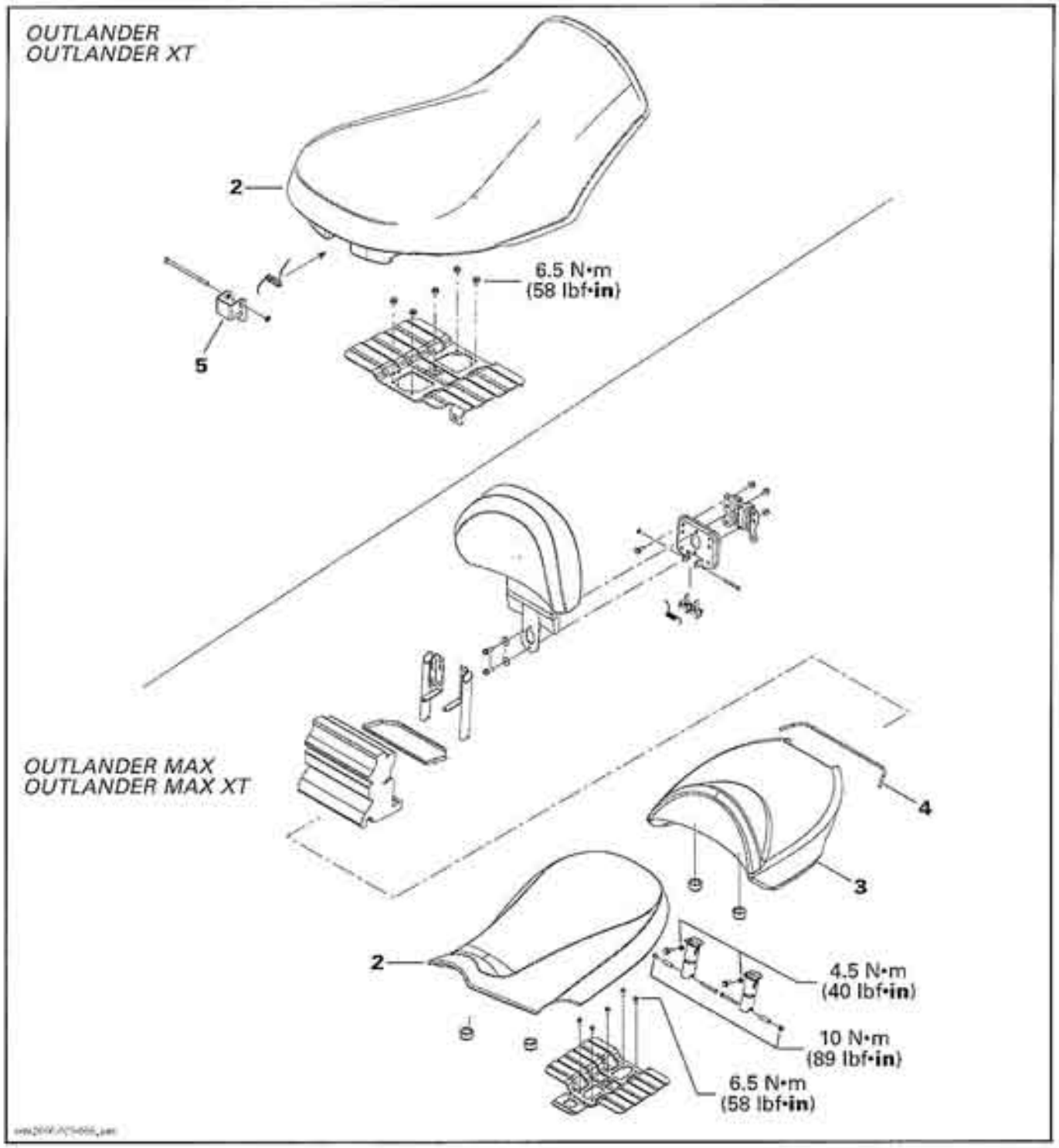
Body Parts (rear view)



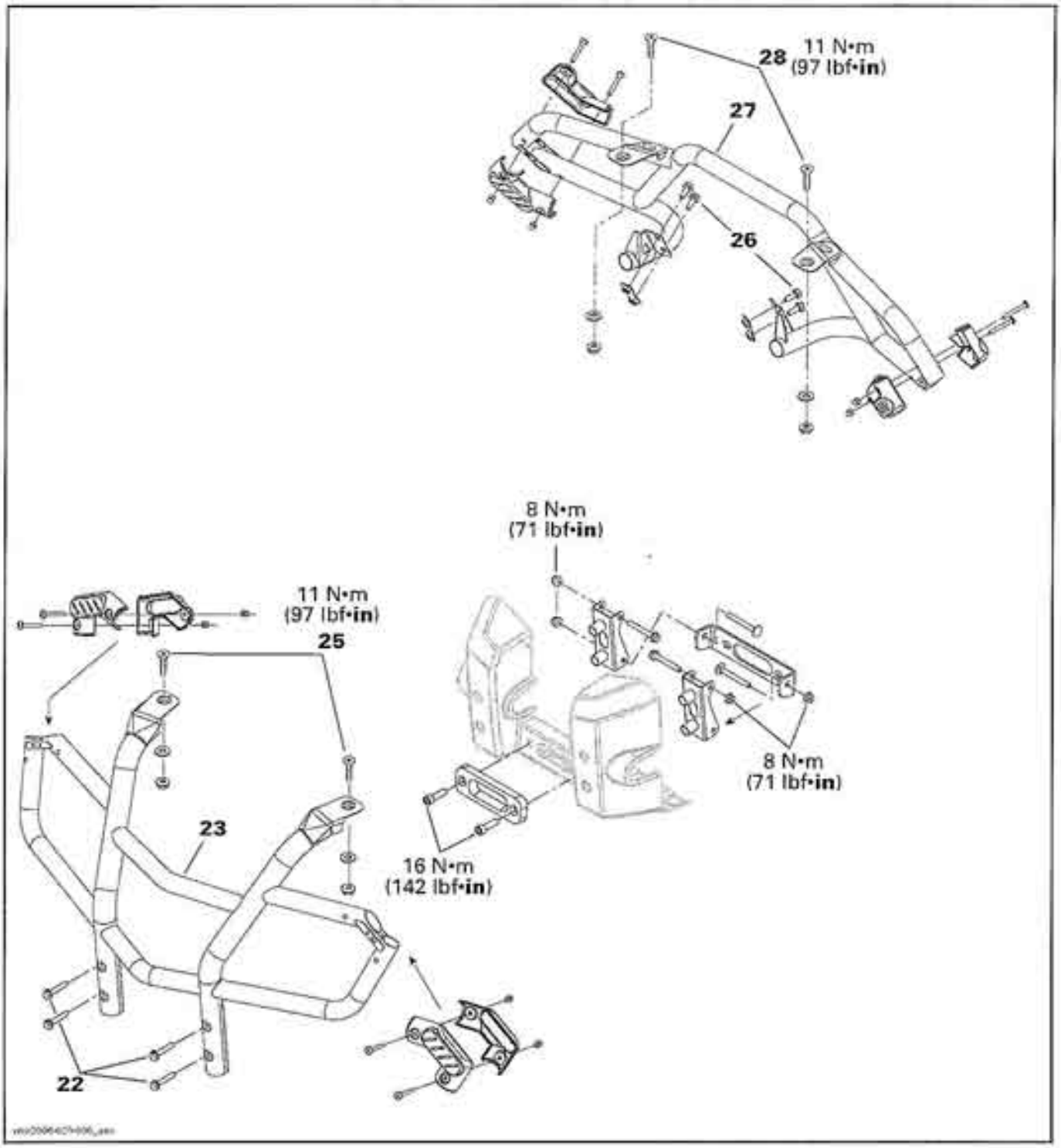
Body Parts (side view)



Seat

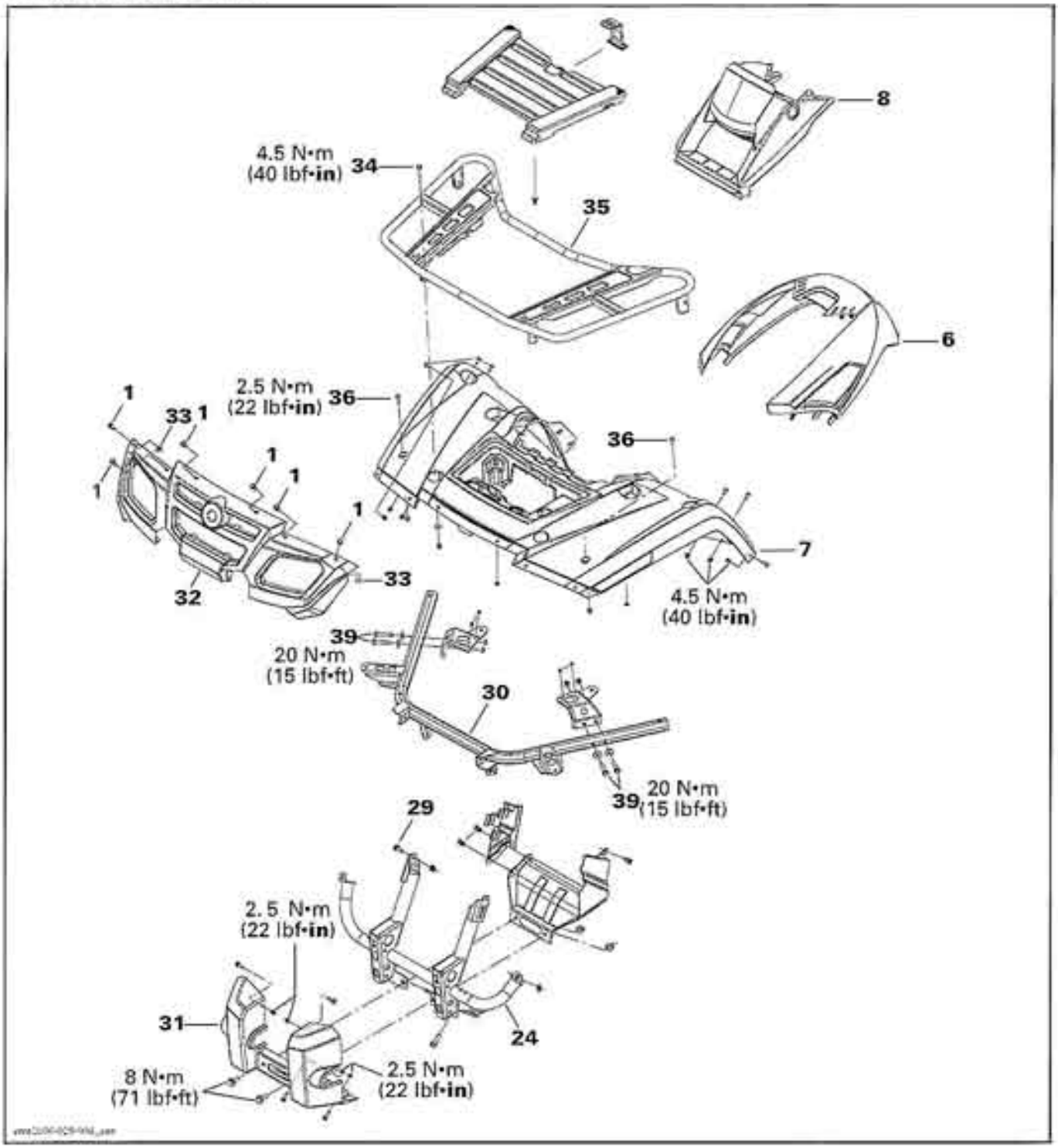

OUTLANDER
OUTLANDER XT
2
6.5 N•m
(58 lbf•in)
5
OUTLANDER MAX
OUTLANDER MAX XT
4
3
2
4.5 N•m
(40 lbf•in)
10 N•m
(89 lbf•in)
6.5 N•m
(58 lbf•in)

XT Package

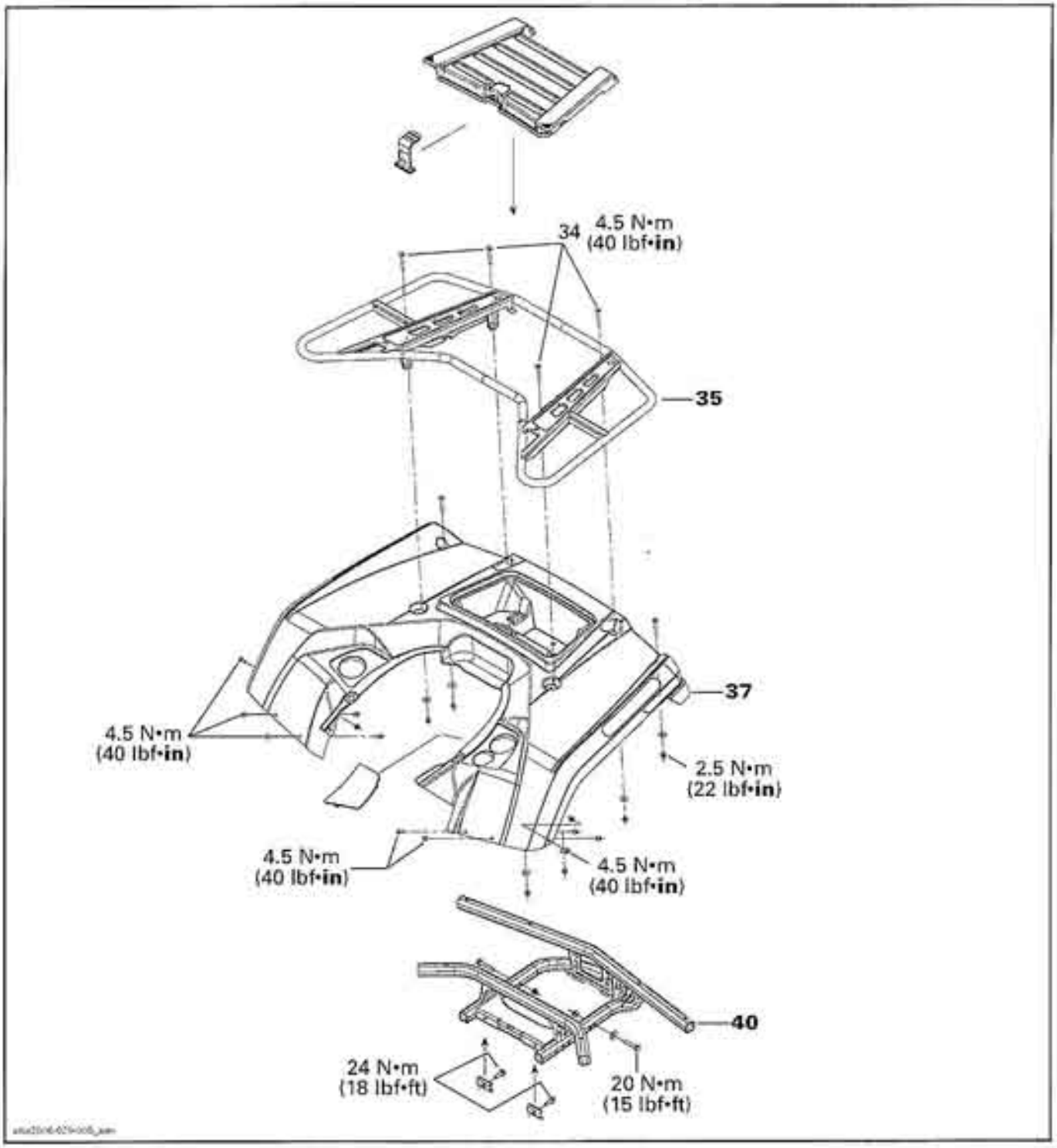

28
11 N•m
(97 lbf•in)
27
26
8 N•m
(71 lbf•in)
11 N•m
(97 lbf•in)
25
8 N•m
(71 lbf•in)
23
16 N•m
(142 lbf•in)
22

OUTLANDER 800 SERIES

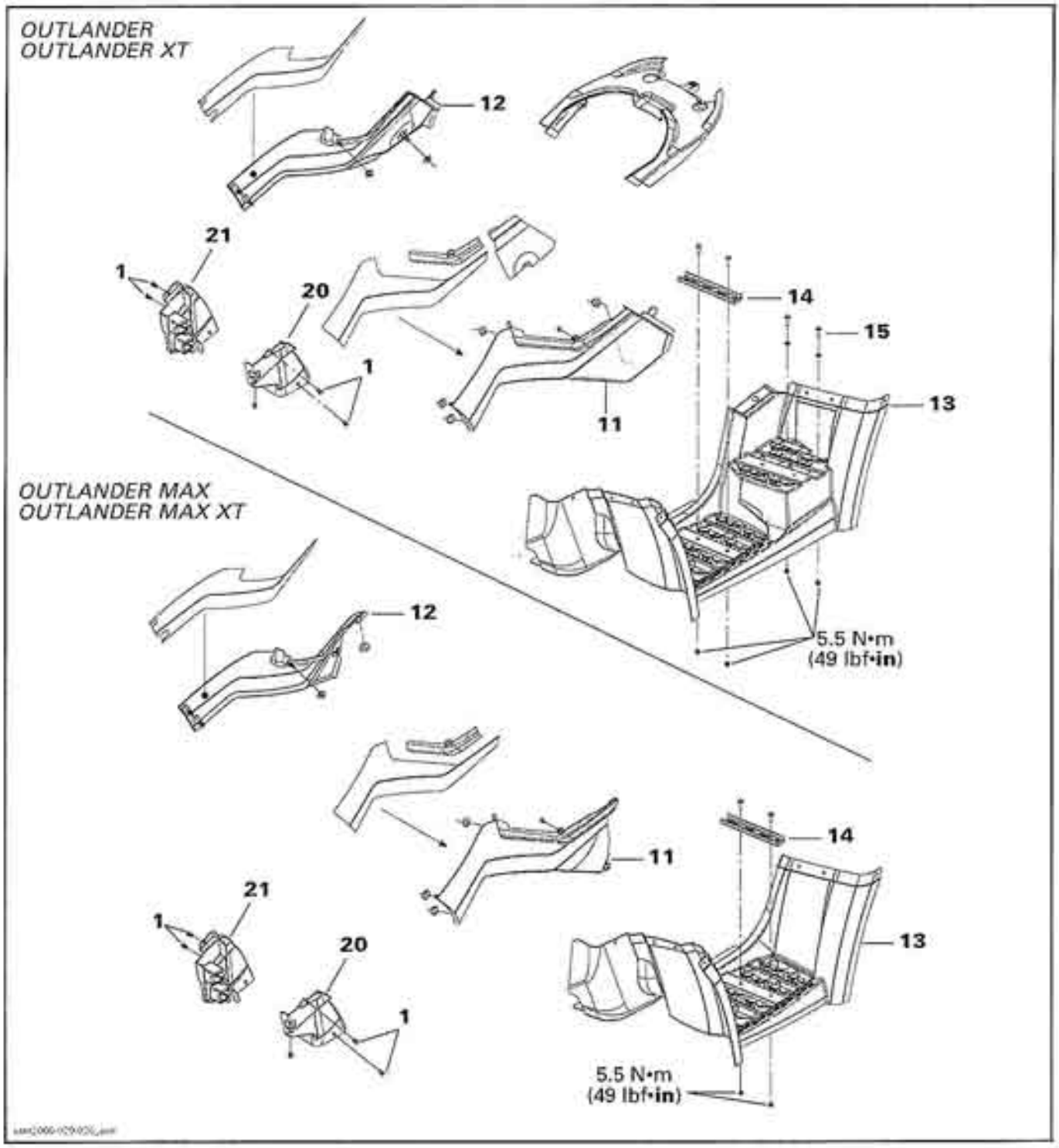
Body Parts (front view)



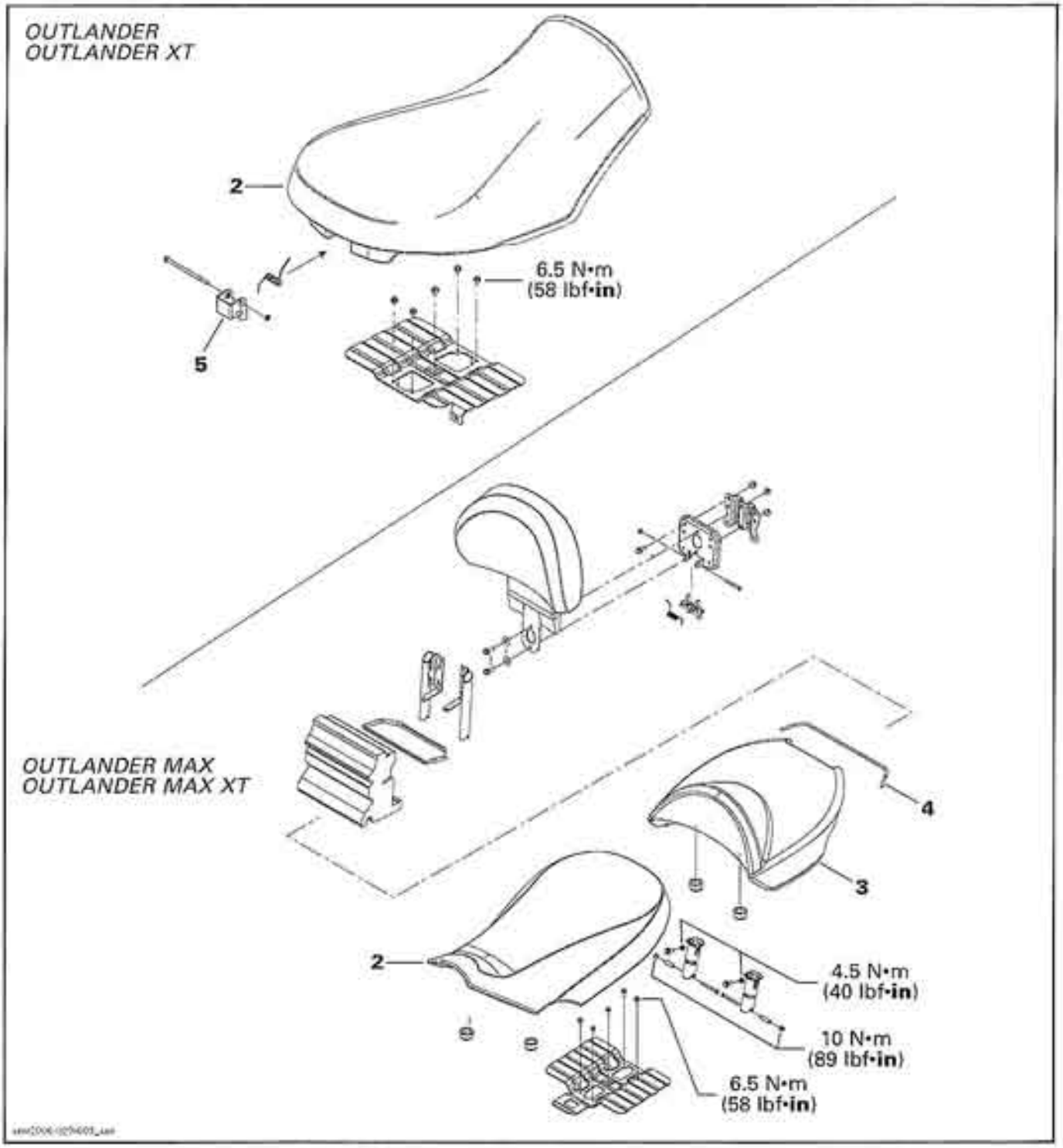
Body Parts (rear view)



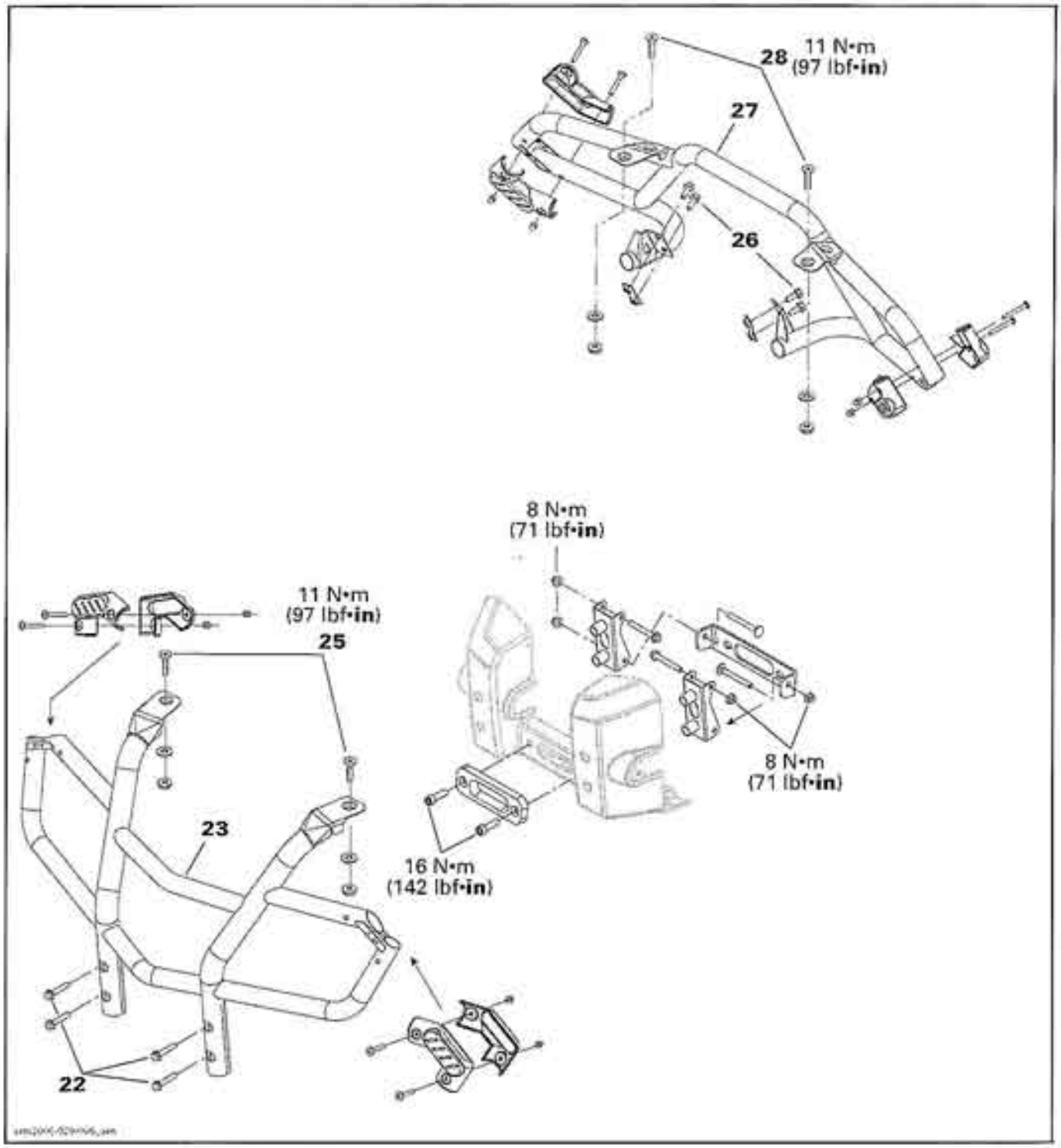
Body Parts (side view)



Seat


OUTLANDER
OUTLANDER XT
2
6.5 N•m
(58 lbf•in)
5
OUTLANDER MAX
OUTLANDER MAX XT
4
3
2
4.5 N•m
(40 lbf•in)
10 N•m
(89 lbf•in)
6.5 N•m
(58 lbf•in)

XT Package


28
11 N•m
(97 lbf•in)
27
26
8 N•m
(71 lbf•in)
11 N•m
(97 lbf•in)
25
8 N•m
(71 lbf•in)
23
16 N•m
(142 lbf•in)
22

GENERAL

During assembly/installation, use the torque values and service products as in the exploded views.

Clean threads before applying a threadlocker. Refer to *SELF-LOCKING FASTENERS* and *LOCTITE APPLICATION* at the beginning of this manual for complete procedure.

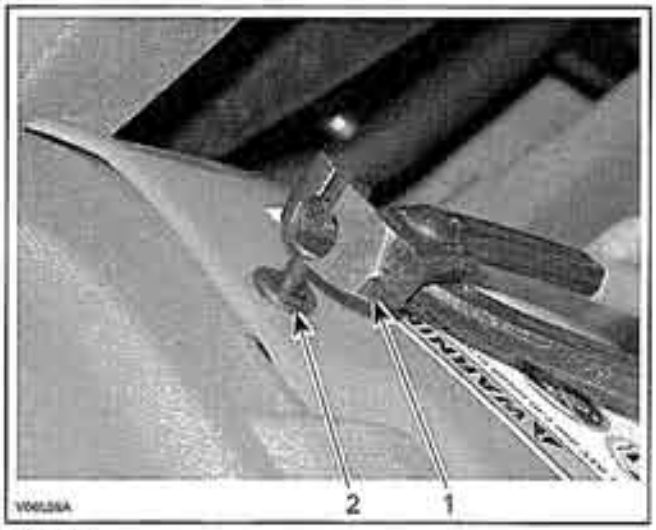
⚠ WARNING

Torque wrench tightening specifications must strictly be adhered to.
Locking devices (e.g.: locking tabs, elastic stop nuts, self-locking fasteners, etc.) must be installed or replaced with new ones where specified. If the efficiency of a locking device is impaired, it must be renewed.

Plastic Rivet

Plastic rivets no. 1 are used in the riveting of the various body parts. Plastic rivets can be removed carefully with pliers Oetiker 1099 (P/N 295 000 070).

NOTE: Reuse the plastic rivets.



TYPICAL
1. Pliers
2. Plastic rivet

PROCEDURES

SEAT

Cleaning

It is recommended to clean seat(s) no. 2 and/or no. 3 with a solution of warm soapy water, using a soft clean cloth.

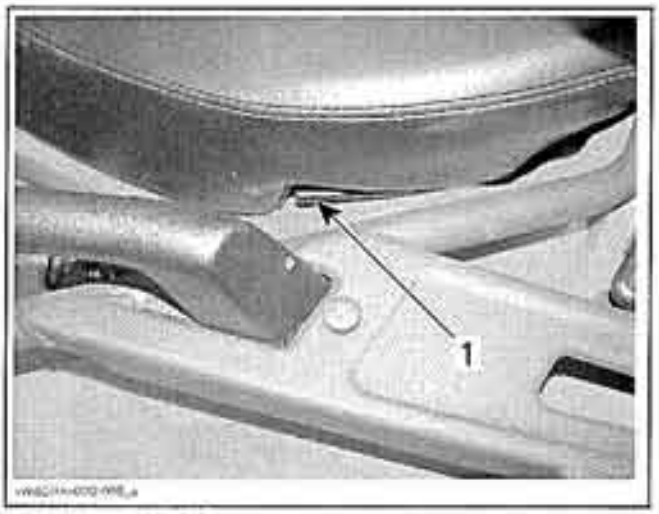
CAUTION: Avoid use of harsh detergents such as strong soaps, degreasing solvents, abrasive cleaners, paint thinners, etc. that may cause damage to the seat cover.

Removal

Passenger's Seat

Outlander MAX/MAX XT Models

– Pull one of the passenger's seat latch levers no. 4. Those levers are located underneath the RH or LH rear end of seat.



TYPICAL — LH SIDE
1. Seat latch

– Gently lift the rear of seat no. 3.
– Pull seat rearwards.
– Continue lifting movement until you can release the front retaining device then completely remove passenger's seat.

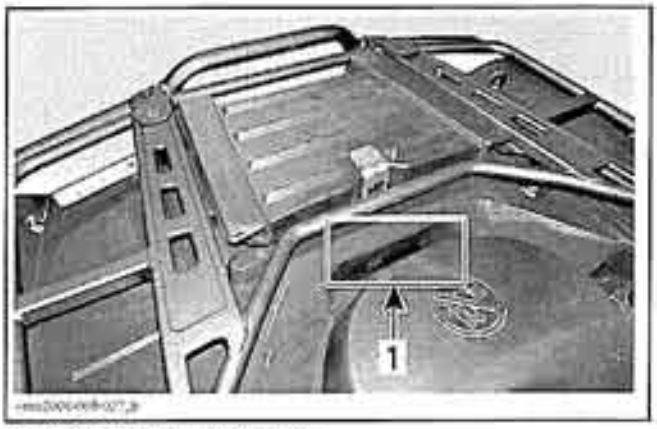
Operator's Seat

Outlander MAX/MAX XT Models

Remove passenger's seat no. 3 as mentioned above.

All Models

To remove seat no. 2, pull latch lever no. 5 forward while gently lifting rear of seat.



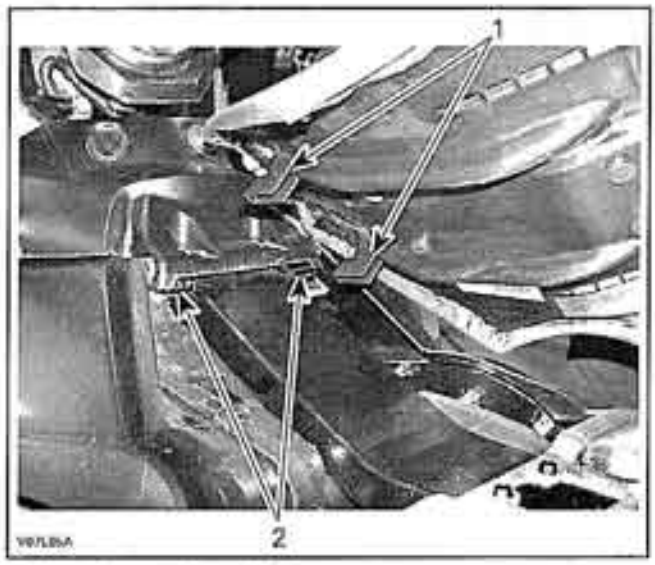
OUTLANDER/OUTLANDER XT
1. Seat latch

OUTLANDER MAX/OUTLANDER MAX XT
1. Seat latch

Pull seat rearward. Continue lifting movement until you can release the front retaining device then completely remove seat.

Installation

Insert front tabs of seat into frame hooks. When seat rests in its position, firmly push seat down to latch.



1. Insert these tabs in hooks
2. Hooks

NOTE: A distinctive snap will be felt. Double check that the seat is secure by giving it a tug to confirm proper latching.

⚠ WARNING

Make sure seat is securely latched before riding.

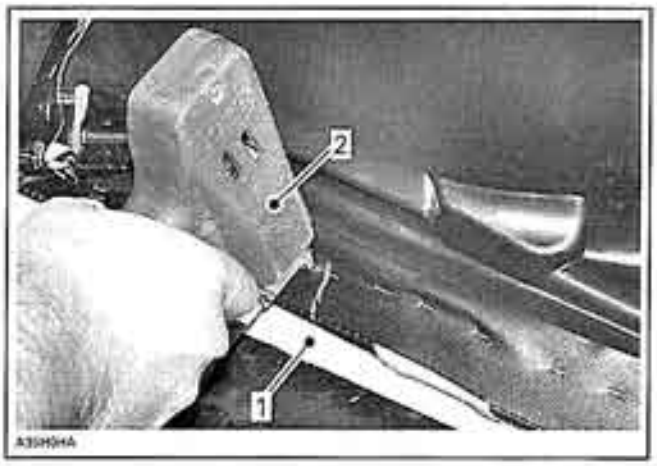
Seat Cover Replacement

Remove the old seat cover. Check the foam and replace if necessary.

Install staples with an electric tacker such as Arrow tacker no. ETN-50 or with a manual tacker such as Arrow tacker no. T-50.

NOTE: For an easier installation, it's highly recommended to use an electric tacker.

Ensure that the seat rest firmly against a hard surface such as a piece of wood. This is done to get the staples completely pushed in place.



TYPICAL
1. Piece of wood
2. ETN-50 (electric)

After cover installation cut all around the excess of material.

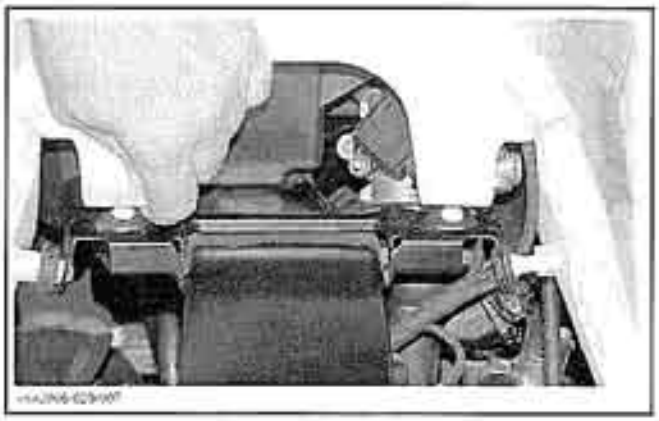
CENTRAL PANEL

Outlander 800 Series

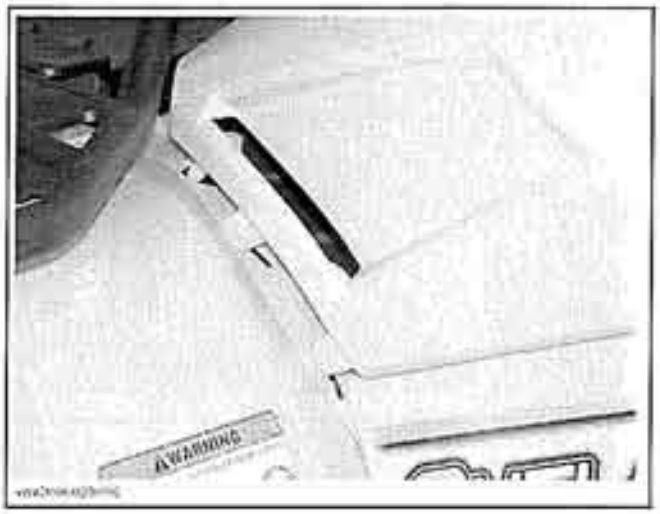
Removal

Remove seat(s).

Come off the plastic studs from the grommets.



Pull central panel no. 6 to separate its tabs from front fender no. 7.



Installation

The installation is the reverse of the removal procedure.

DASH BOARD

Removal

Remove central panel.

Lift up dash board no. 8.

Disconnect 12-volt power outlet, speedometer and ignition switch.

Installation

For installation, reverse the removal procedure.

SIDE PANEL

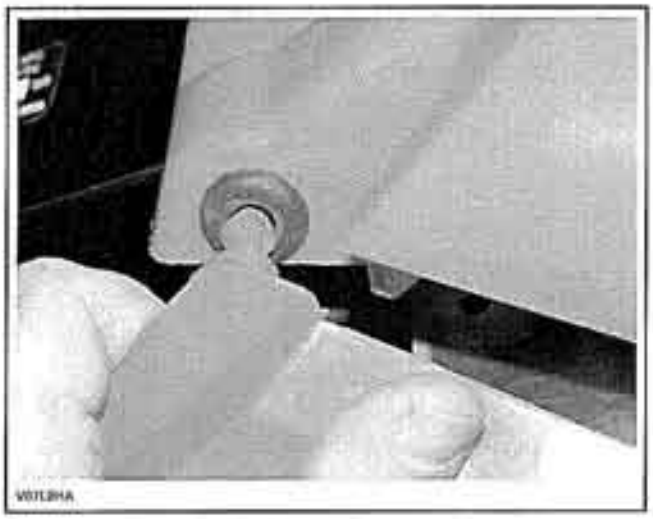
Removal

Outlander 400 Series

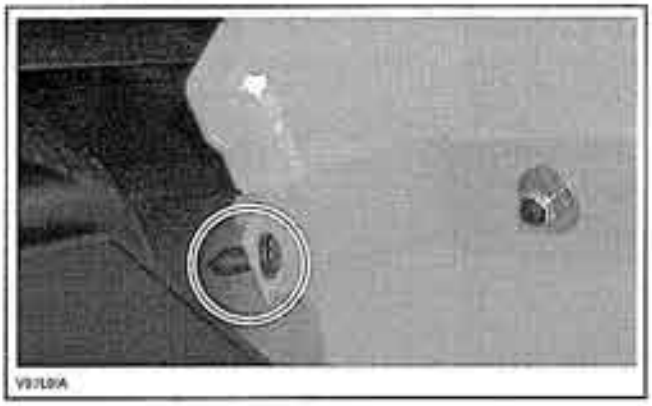
NOTE: Use the same procedure to remove the LH and RH side panels no. 9 and no. 10.

Remove the seat(s).

Come off the plastic studs from the grommets.



Remove plastic rivet from lower tab.



Move the tabs out of their slots.

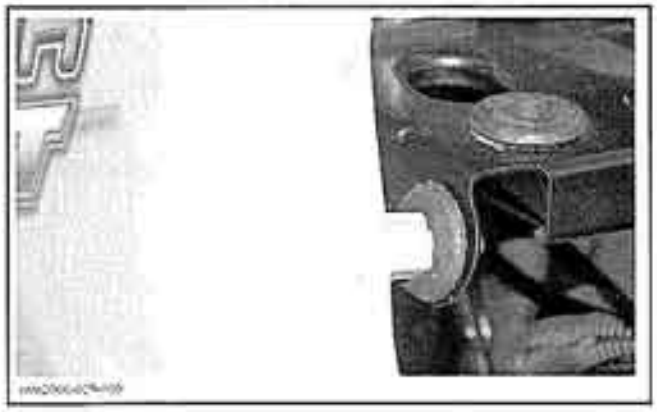
Remove the side panel completely.

Outlander 800 Series

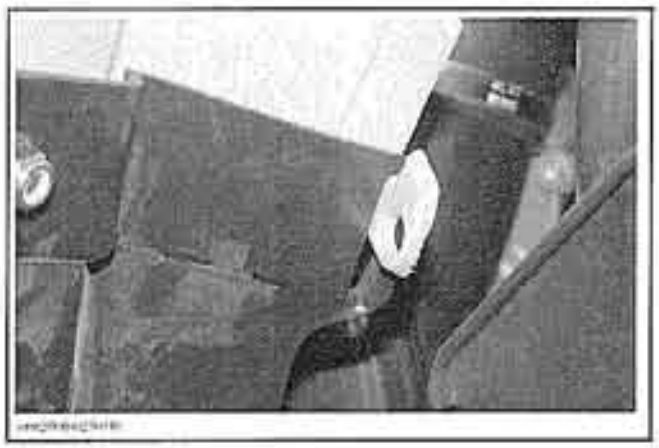
NOTE: Use the same procedure for the LH and RH side panels **no. 11** and **no. 12**.

Remove seat(s) and central panel **no. 6**.

Come off the plastic studs from the grommets.



Unhook the side panel from footrest.



Remove side panel from vehicle.

Installation

The installation is the reverse of removal procedure.

FOOTREST

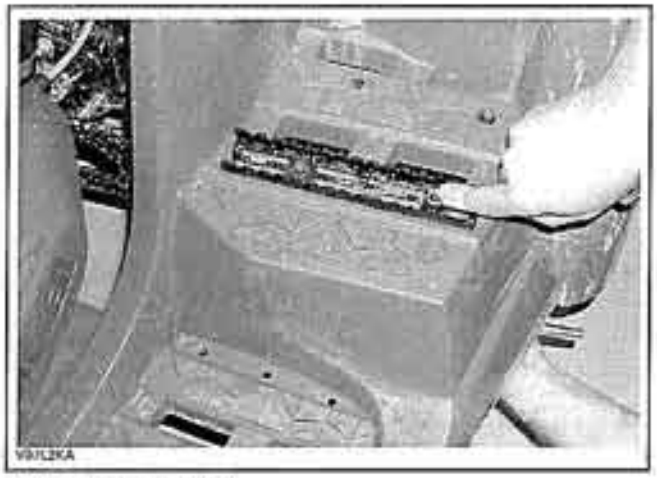
Removal

Outlander 400 Series

Remove:

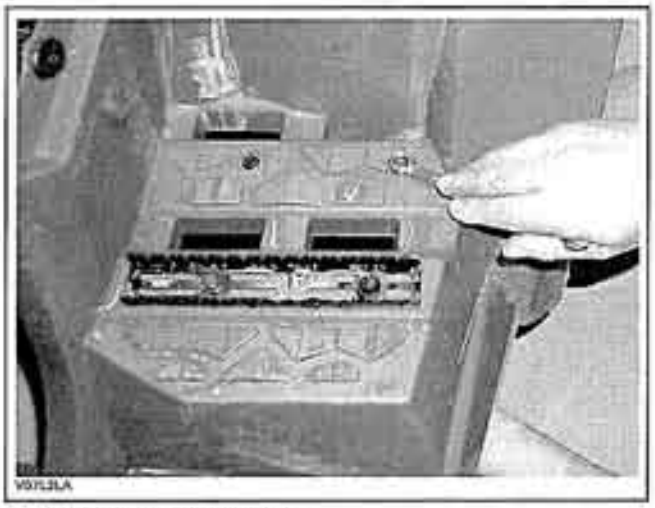
- side panel **no. 9** or **no. 10**

- footpeg(s) **no. 14**



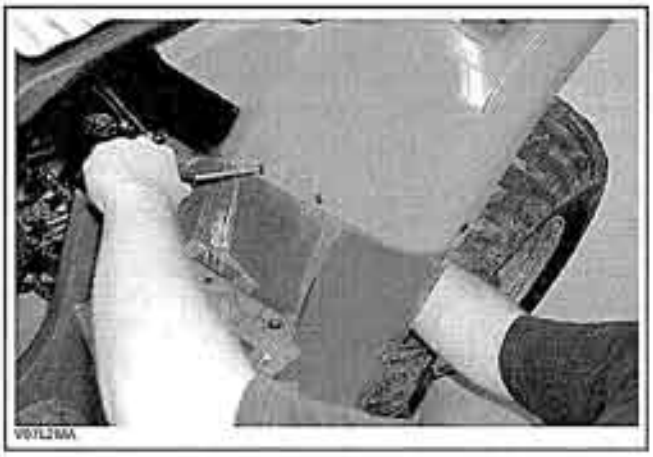
OUTLANDER MAX/XT

– footrest support retaining screws



OUTLANDER MAX/XT ONLY

– all screws retaining the footrest no. 13 to fenders.



Pull the footrest out of vehicle.

Outlander 800 Series

Remove footpeg(s) no. 14 and all bolts that attach the footrest no. 13 to fenders.

On MAX and MAX XT models, remove the footrest support retaining screws no. 15.

Installation

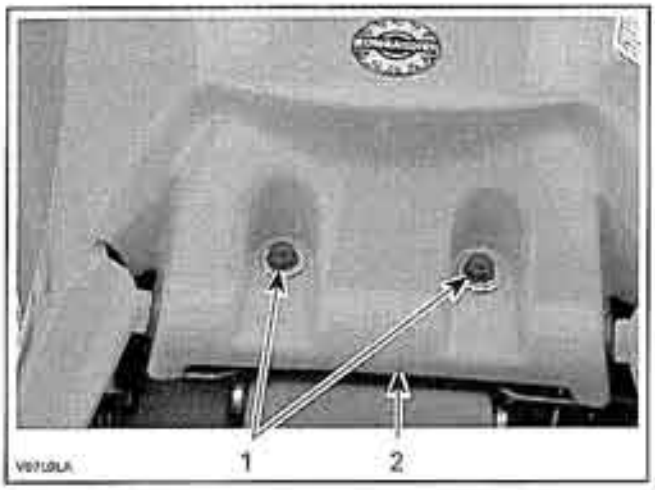
The installation is the reverse of removal procedure.

CONSOLE

Outlander 400 Series

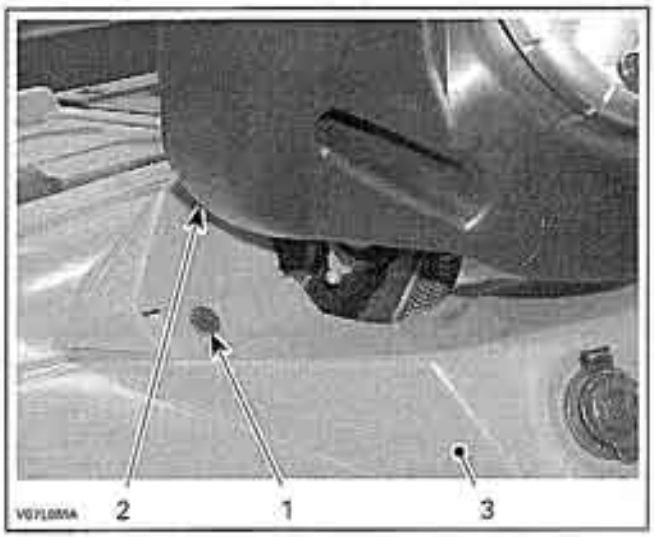
Removal

Remove screws no. 16 retaining console no. 17.



1. Console screws
2. Console

Remove plastic rivets no. 1 near handlebar cover.



1. Plastic rivet
2. Handlebar cover
3. Console

Lift the console then unplug the ignition switch and the 12-volt power outlet.

Remove the console.

Installation

The installation is the reverse of removal procedure.

INNER FENDER

Removal

Outlander 400 Series

Lift the front of vehicle and support it securely.

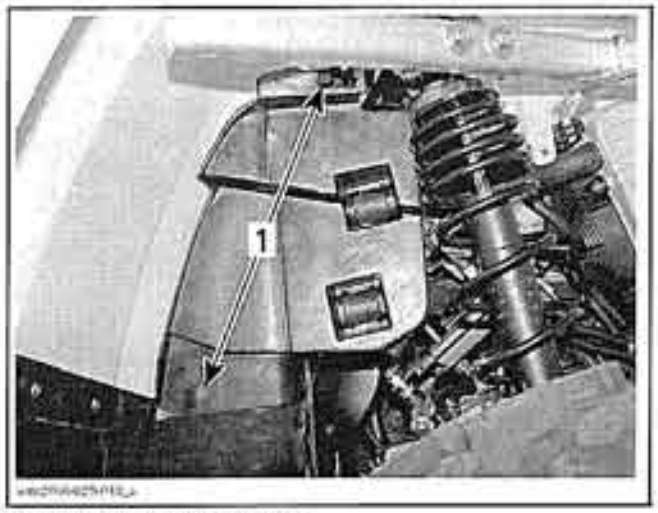
Remove:

- appropriate wheel
- all fastening hardware
- inner fender no. 18 or no. 19.

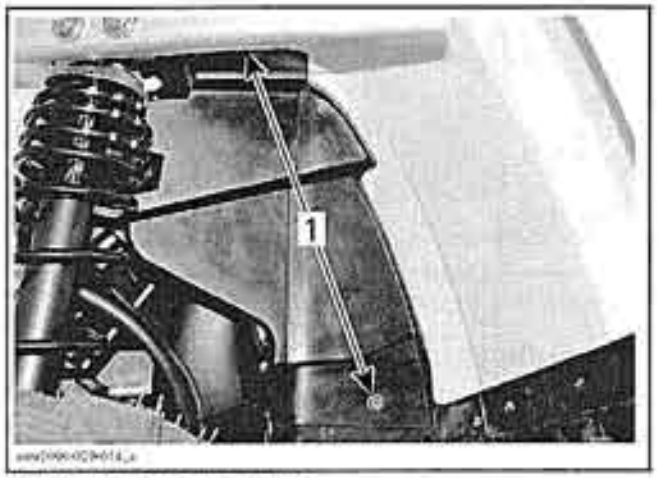
NOTE: On RH side, unclip the radiator hose.

Outlander 800 Series

Remove the plastic rivets that attach inner fenders no. 20 and no. 21 to footrest and frame.



INNER FENDER ON RH SIDE
1. Plastic rivets



INNER FENDER ON LH SIDE.
1. Plastic rivets

On the RH side, detach coolant hoses from inner fender no. 21.

Installation

The installation is the reverse of removal procedure.

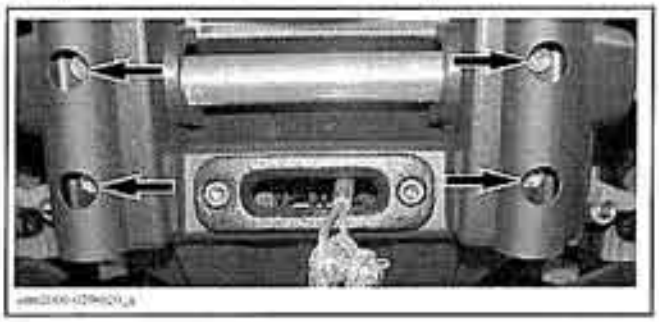
HEAVY DUTY BUMPER

XT Models

Removal

Front Bumper

Remove bolts no. 22 retaining the heavy duty bumper no. 23 to the front bumper no. 24.



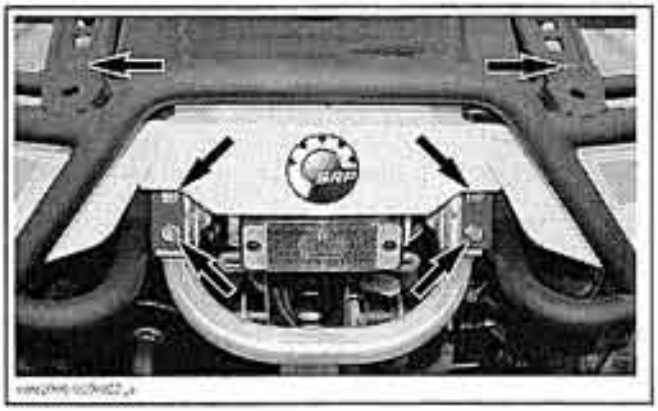
Remove screws no. 25 that attach the heavy duty bumper to the rack.

Remove the heavy duty bumper.

Rear Bumper

Unscrew bolts no. 26 retaining the rear heavy duty bumper no. 27 to the rear bumper.

Remove screws no. 28 that attach the heavy duty bumper to the rack.



Installation

The installation is the reverse of the removal procedure.

FRONT BUMPER/FRONT SKID PLATE/FRONT FASCIA

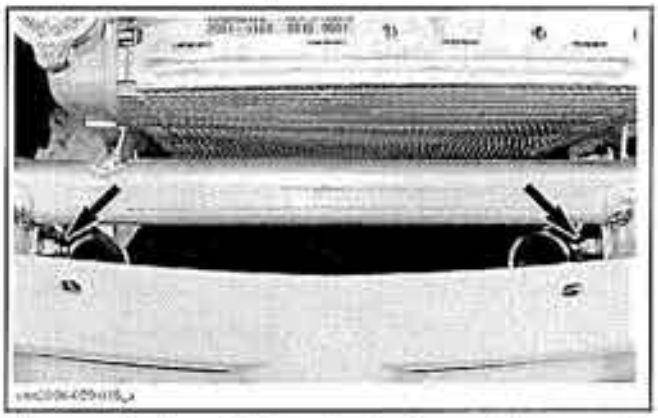
Removal

NOTE: On XT models, remove hook at the end of winch cable.

Remove front fender.

Unplug headlamps connectors.

Unscrew bolts no. 29 that attach front bumper no. 24 to fender support no. 30.



Unscrew bolts retaining the bottom of bumper to frame.

Remove front bumper with front skid plate no. 31 and front fascia no. 32 assembly.

Place the assembly on a bench and disassemble all parts if necessary.

Installation

The installation is the reverse of removal procedure.

NOTE: Install a washer no. 33 under each plastic rivet located at the both ends of fascia.

LUGGAGE RACK

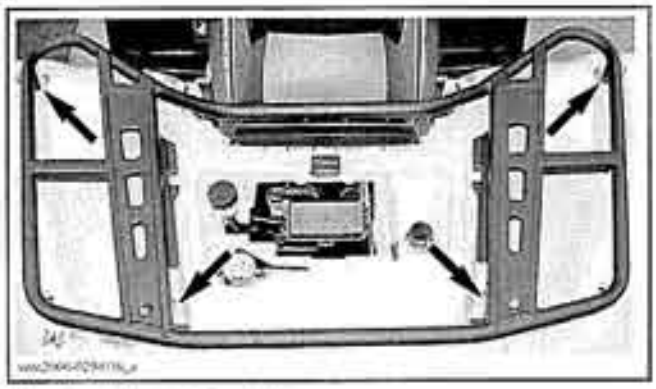
NOTE: Use the same procedure for front or rear luggage racks.

Removal

NOTE: On XT models, heavy duty bumpers (front and rear) must be removed to allow luggage racks removal.

Remove storage or service compartment cover.

Unscrew the four (4) bolts no. 34 retaining the rack no. 35.



Remove luggage rack.

Installation

The installation is the reverse of removal procedure.

FENDER

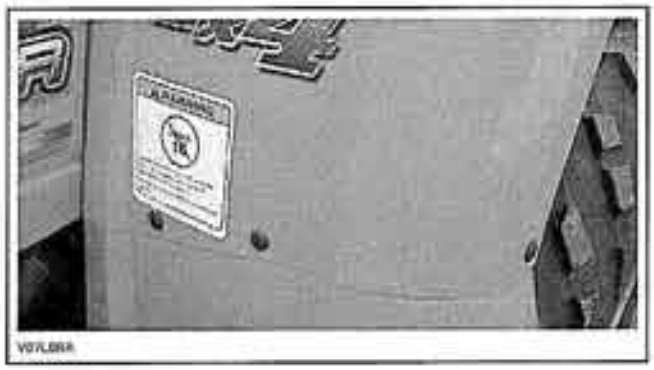
Removal

Front Fender

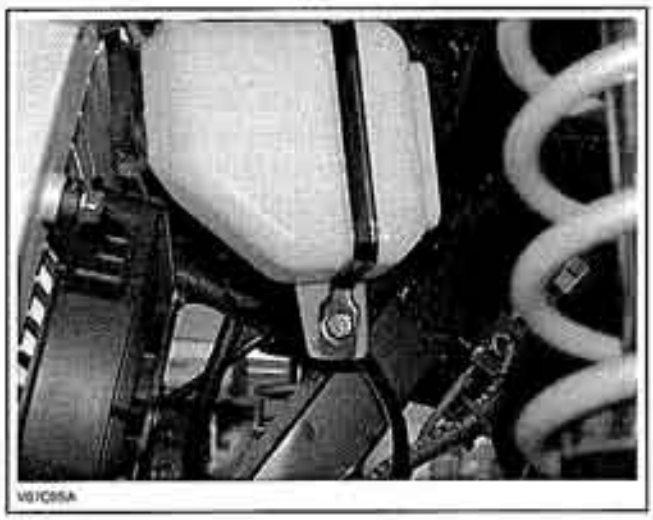
Outlander 400 Series

Remove:

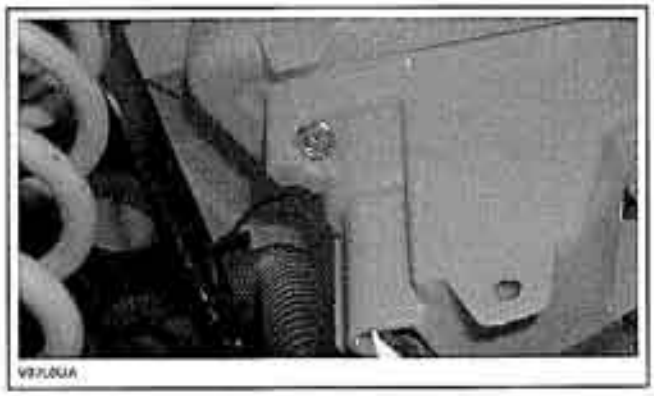
- side panels no. 9 and no. 10
- luggage rack no. 35
- plastic rivets no. 1 retaining front fender no. 7 to front fascia
- all screws retaining the footrests to fender



- service compartment cover
- coolant reservoir support



- rear brake fluid reservoir bolt

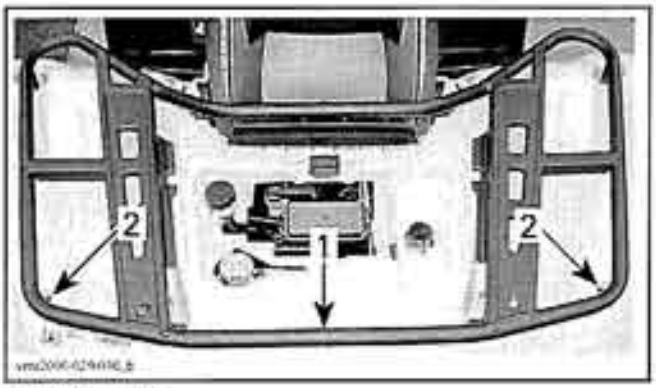


- inner fenders
- plastic rivets no. 1 retaining front fender to console.

Lift and remove front fender. Place it in a place to avoid scratches.

Outlander 800 Series

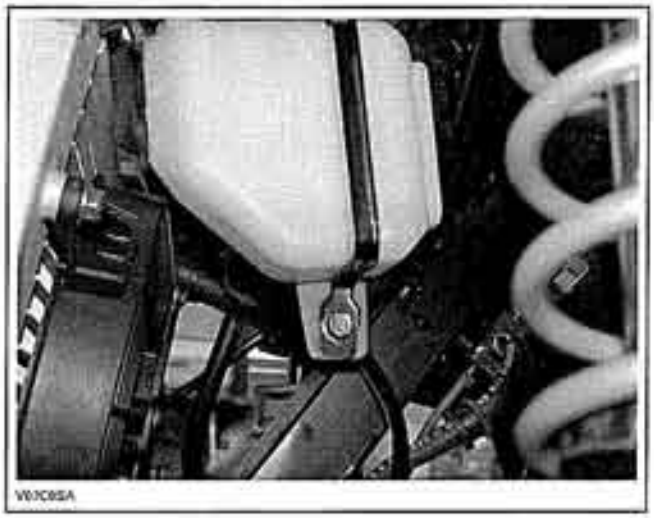
Remove:
- both side panels no. 11 and no. 12
- bolts that attach both footrests to the fender
- plastic rivets retaining front fender no. 7 to front fascia
- luggage rack
- fender bolts no. 36



1. Luggage rack
2. Fender bolts

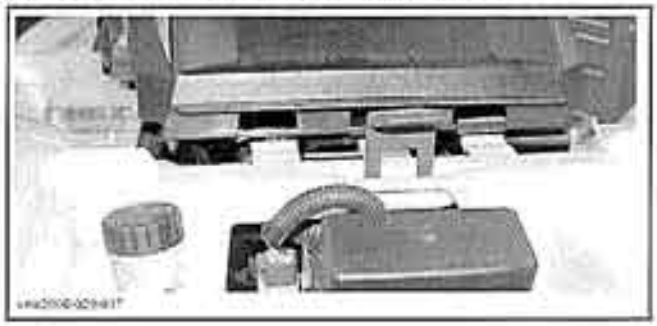
- brake fluid reservoir bolt

- coolant reservoir support

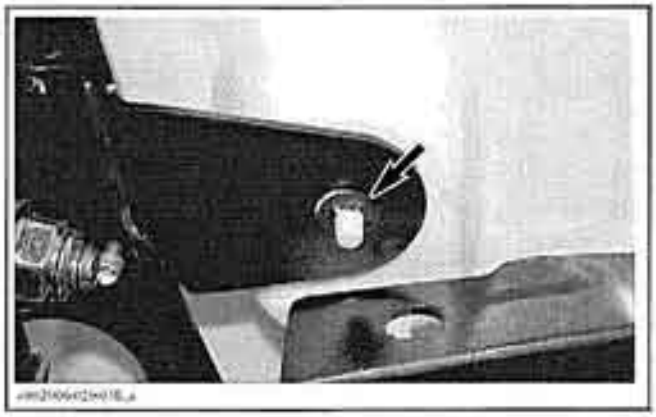


- both inner fenders.

Detach dash board no. 8 from fender.



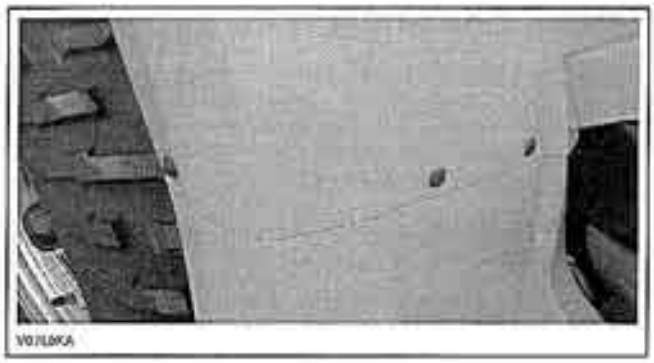
Remove push nuts retaining fender to frame.



Lift up fender and place it in a safe place to avoid scratches.

Rear Fender

Remove:
- seat
- both side panels
- luggage rack no. 35
- all screws retaining the footrests to rear fender no. 37



- fuel tank cap.

Lift and remove fender. Place it in a place to avoid scratches.

Installation

The installation is the reverse of removal procedure.

FUEL VALVE SUPPORT

Outlander 400 Series

Removal

Remove:
- seat
- LH side panel
- fuel valve cap
- fuel valve nut

- console.

Unlatch the fuel valve support no. 38.

Installation

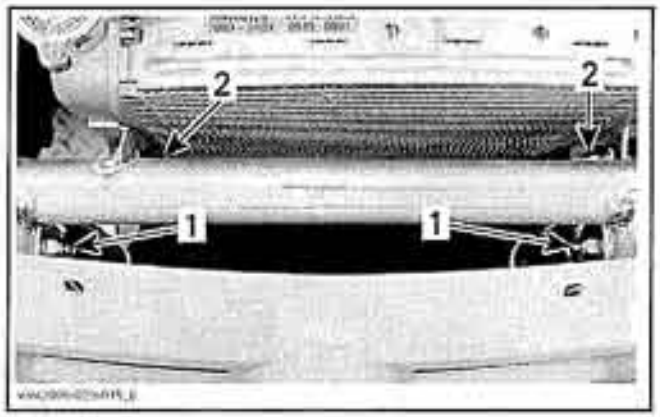
The installation is the reverse of removal procedure.

FENDER SUPPORT

Removal

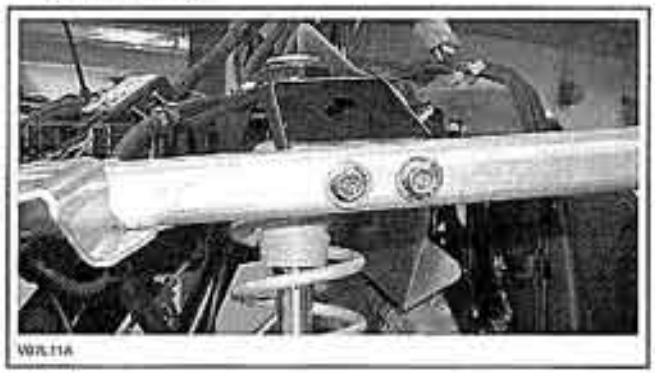
Front Fender Support

Remove:
- front fender
- front bumper bolts no. 29
- radiator mounting bolts



1. Radiator bolts
2. Bumper bolts

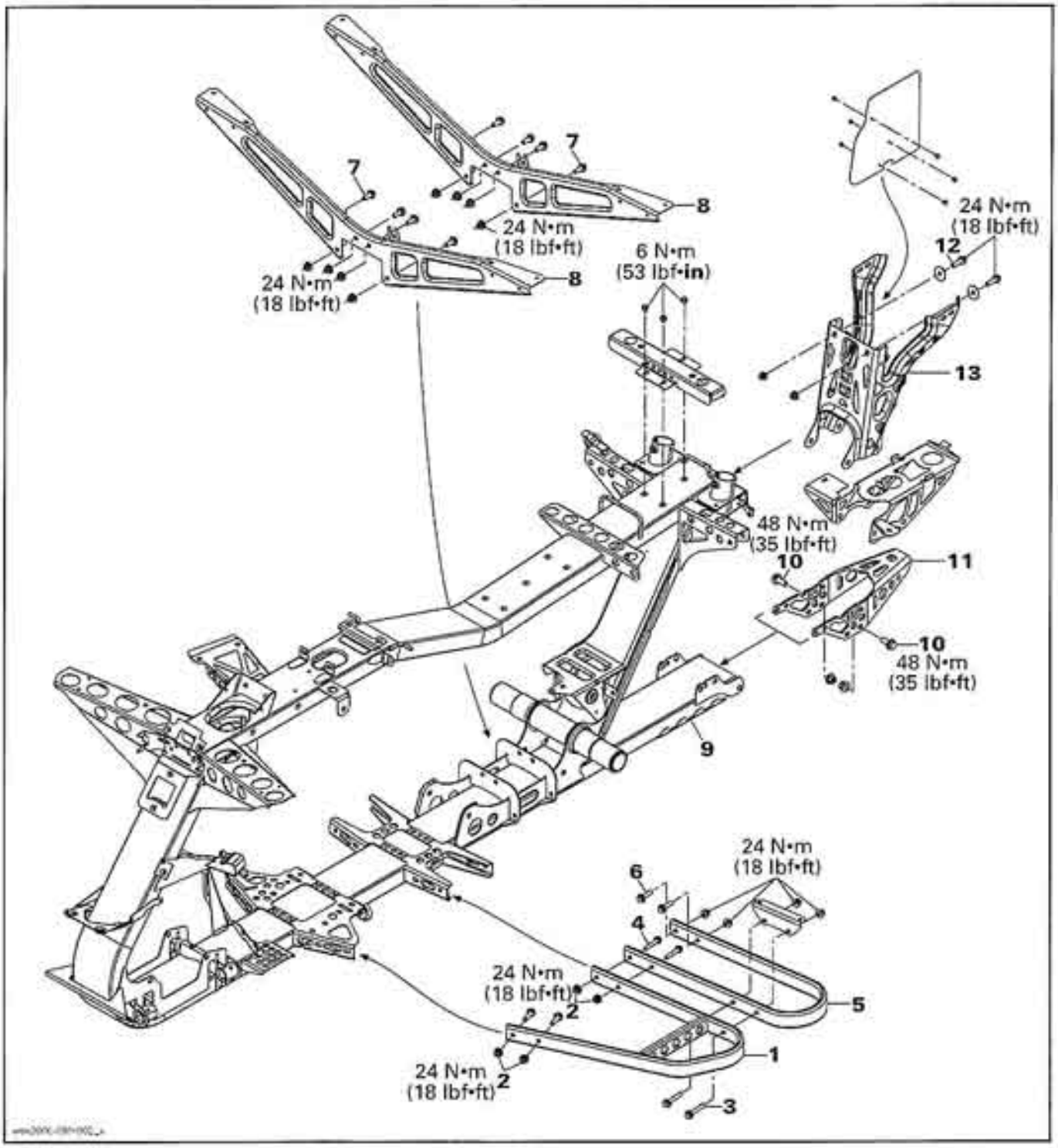
- bolts no. 39 retaining the fender support no. 30 to the frame.



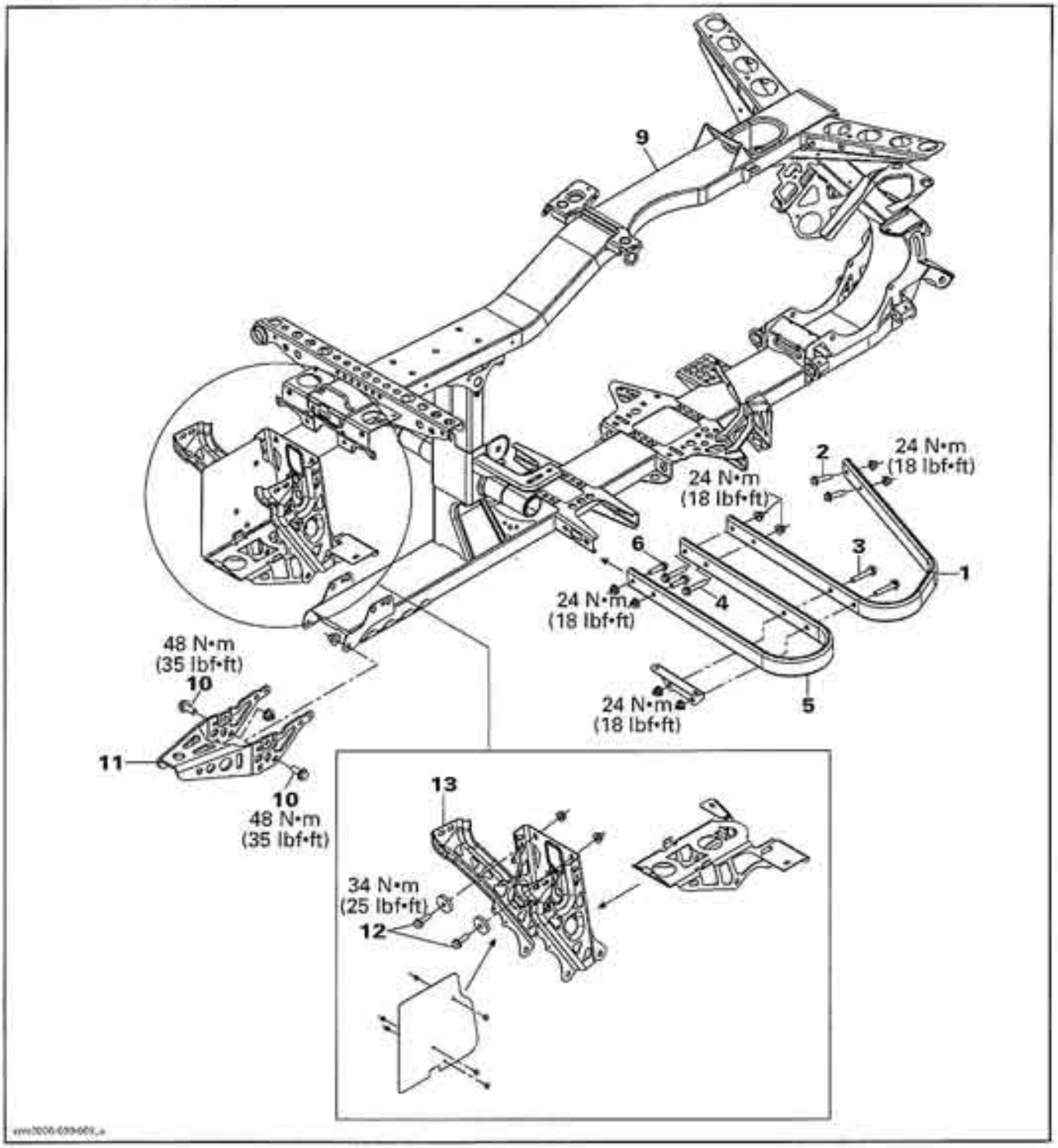
Rear Fender Support

Remove:
- rear fender
- bolts that attach fender support no. 40 to frame
- exhaust support bolt.

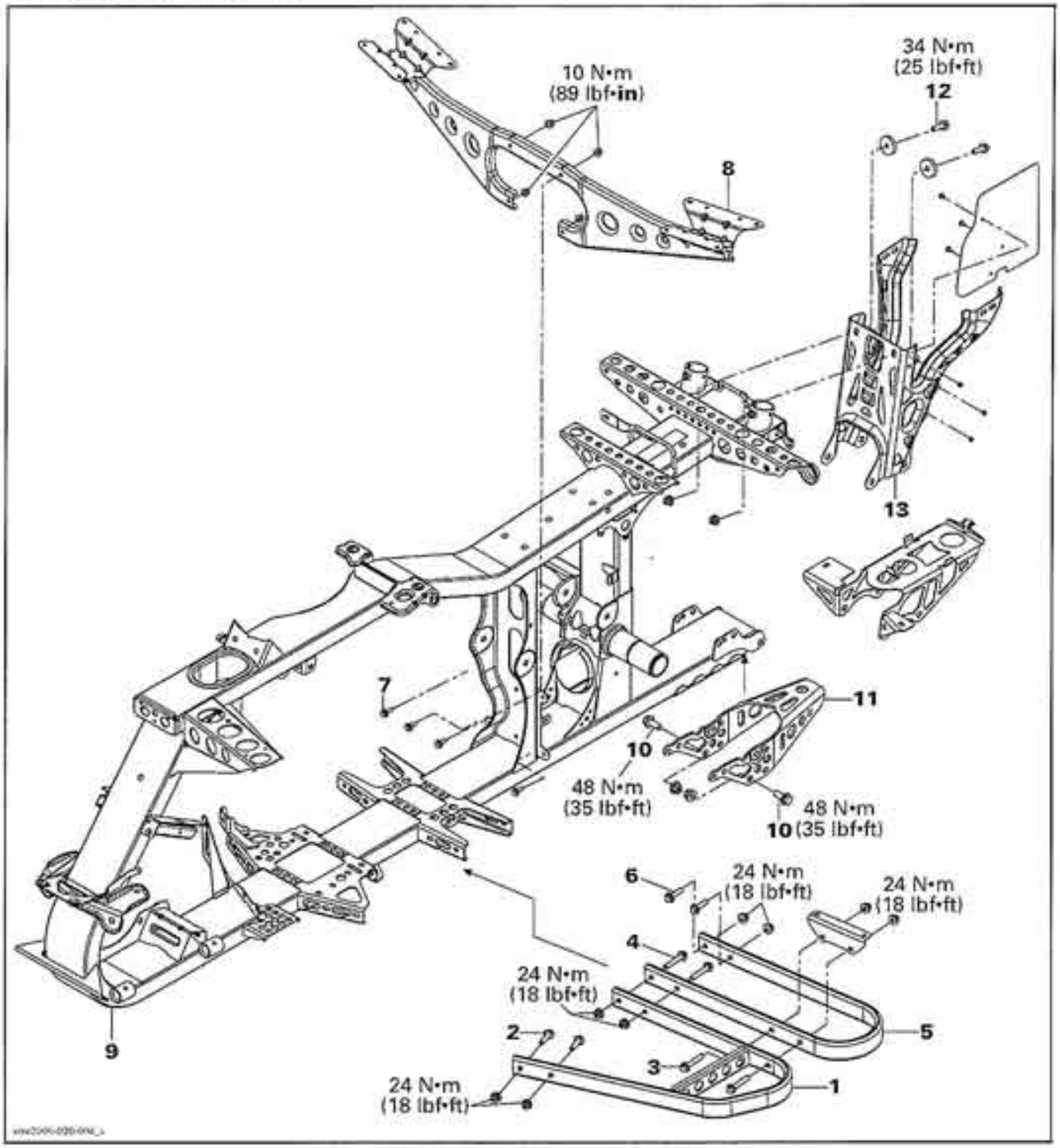
Outlander MAX 400 Series



Outlander 800 Series



Outlander MAX 800 Series



GENERAL

During assembly/installation, use the torque values and service products as in the exploded views.

Clean threads before applying a threadlocker. Refer to *SELF-LOCKING FASTENERS* and *LOCTITE APPLICATION* at the beginning of this manual for complete procedure.

⚠ WARNING

Torque wrench tightening specifications must strictly be adhered to.
Locking devices (e.g.: locking tabs, elastic stop nuts, self-locking fasteners, etc.) must be installed or replaced with new ones where specified. If the efficiency of a locking device is impaired, it must be renewed.

CAUTION: Before performing electrical welding anywhere on the vehicle, unplug the electronic module connector. Also unplug the negative cable and the voltage regulator. This will protect the electronic module and battery against damage caused by flowing current when welding.

PROCEDURES

FOOTREST SUPPORT

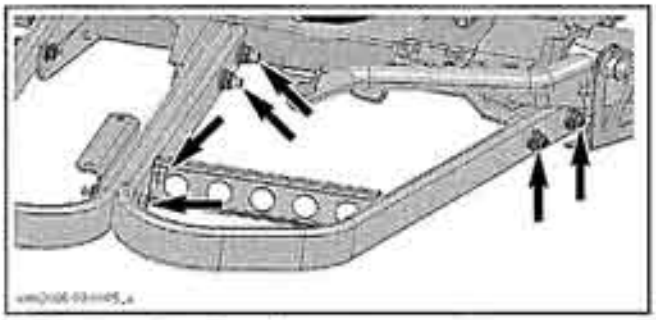
NOTE: Use the same procedure for RH or LH footrest supports.

Removal

Front Footrest Support

To remove the front support no. 1, do the following:

- Remove the appropriate footrest.
- Unscrew bolts no. 2, no. 3 and no. 4.



- Remove the front footrest support.

Rear Footrest Support

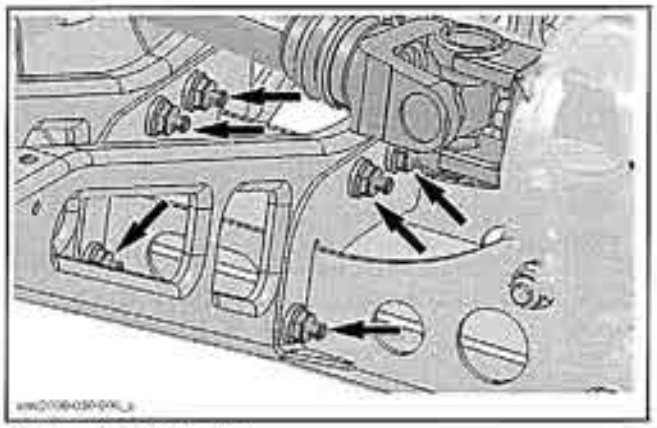
To remove the rear footrest support no. 5, use same procedure than front footrest support but remove bolts no. 6 instead of bolts no. 2.

Passenger Footrest Support

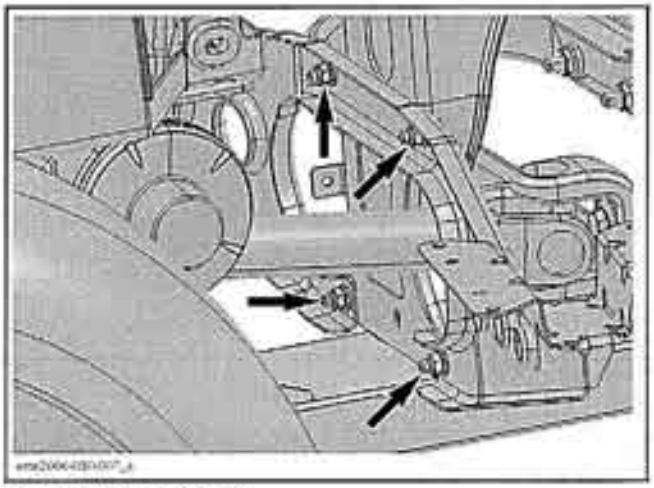
All MAX/MAX XT Models

Remove both footrests.

Unscrew bolts no. 7 then remove passenger footrest support(s) no. 8.



OUTLANDER MAX 400



OUTLANDER MAX 800

Inspection

Check footrest support(s) for cracks, bending or other damages. Replace if necessary.

Installation

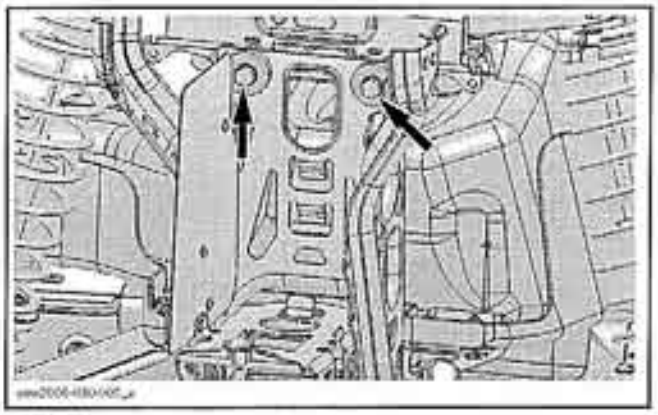
The installation is the reverse of removal procedure.

NOTE: Install all bolts before tightening.

BATTERY SUPPORT

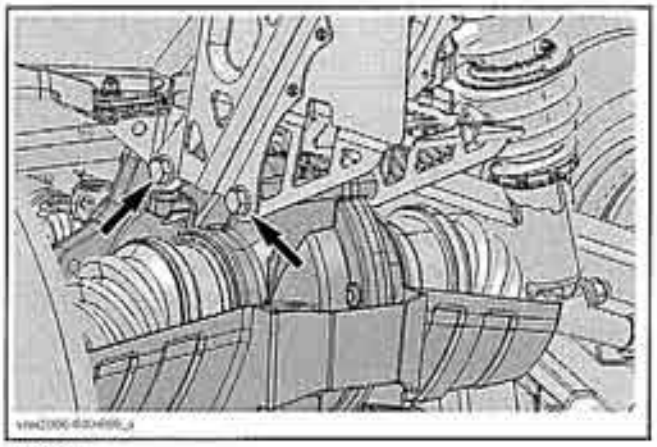
Removal

Remove:
- battery (refer to *STARTING SYSTEM*)
- bolts no. 12 retaining the battery support no. 13 to frame no. 9



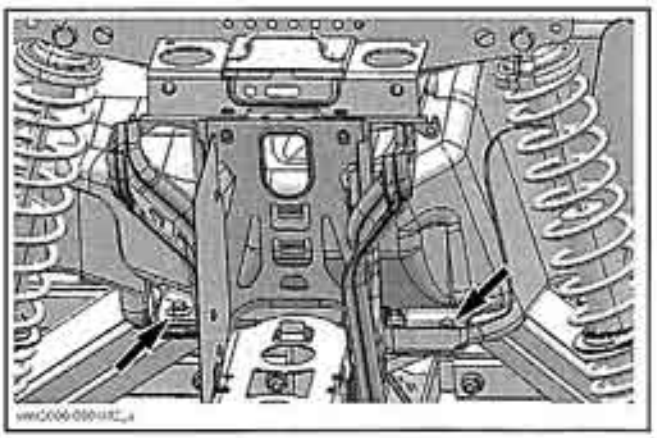
TYPICAL

- upper differential bolts



TYPICAL

- bolts that attach fuel tank and its protector to frame.



- battery support from vehicle.

Inspection

Check battery support for cracks or other damages. Replace if necessary.

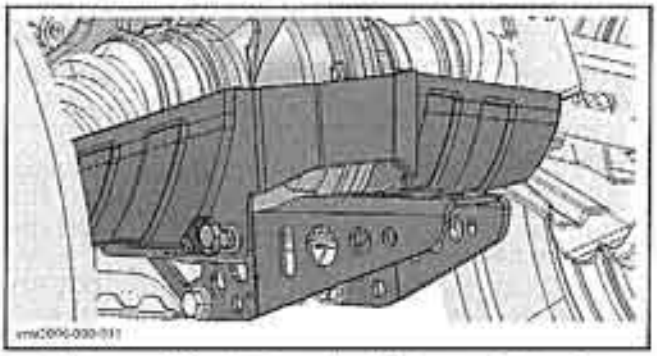
Installation

The installation is the reverse of removal procedure.

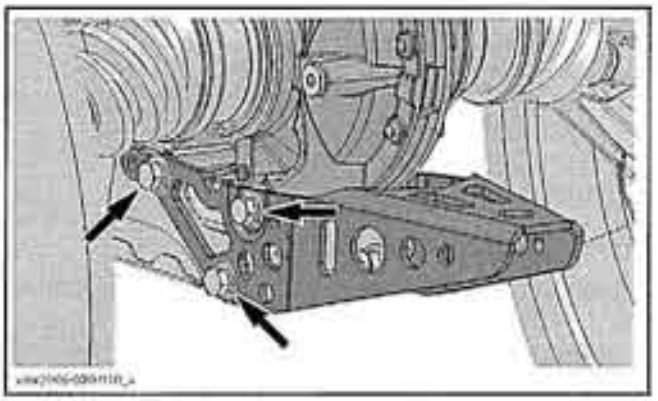
HITCH

Removal

Remove:
- differential protector



- bolts no. 10 retaining the hitch no. 11 to frame
- lower differential bolts



- hitch from vehicle.

Inspection

Check hitch for cracks, bending or other damages. Replace if necessary.

Installation

The installation is the reverse of removal procedure.

FRAME

Cleaning

Clean frame **no. 9** with appropriate cleaners and rinse with high pressure hose.

NOTE: Clean the draining holes under frame. The drain holes are located at the rear of bottom side of frame.

Touch up all metal spots where paint has been scratched off. Spray all bare metal parts of vehicle with metal protector.

Welding

Steel Frame:

- electric welding
- amperage: 70 - 110 A
- voltage: 20 - 24 V
- rod: E-7014 (3/32 in).

CAUTION: Before performing electrical welding anywhere on the vehicle, unplug the multiple connector at the electronic module connector. Also unplug the negative cable and the voltage regulator. This will protect the electronic module and battery against damage caused by flowing current when welding.

NOTE: Install the ground as close as possible from the reparation area.

CAUTION: If welding is to be done near plastic material, it is recommended to either remove the part from the area or to protect it with aluminum foil to prevent damage.

OUTLANDER SERIES

MODEL			OUTLANDER™ 400	OUTLANDER™ 800
ENGINE				
Type			ROTAX 400, 4-stroke, single cylinder, Single Over Head Camshaft (SOHC)	ROTAX V-810, 4-stroke, twin cylinders, Single Over Head Camshaft (SOHC)
Maximum HP RPM			7000 RPM	
ELECTRICAL				
Engine RPM limiter setting	Forward	RPM	8000	
	Reverse	RPM	4000 ± 100	3200
Battery	Type		Dry battery type	
	Voltage		12 volts	
	Nominal rating		18 A•h	
	Power starter output		0.7 KW	
Headlamp			2 x 35 W	
Taillight			8/27 W	
Indicator lights			LEDS, 0.7 V approximately (each)	
Fuses	Accessories		15 A (power outlet and auxiliary supply)	20 A
	Fan		20 A	
	Main		30 A	
	Charging system		20 A	—
	Ignition coils		—	5 A
	Fuel injectors		—	5 A
	Speedometer/speed sensor/ tail lamp		—	7.5 A
	Fuel pump		—	7.5 A
	Engine control module (ECM)		—	5 A
	Main accessories		—	30 A
CARBURETION				
Carburetion/EFI		Type	Mikuni constant depression type with manual choke and ECS (Enricher Coasting System)	DeLorto 46 mm throttle body, 1 injector per cylinder
		Model	BSR33	—
Fuel pump		Type	Mikuni (Pulsation pump)	Bosh
		Model	External (vacuum-operated)	Electrical (in fuel tank)
Idle engine speed		RPM ± 50	1300	1250
Main jet			133.8	—
Pilot jet			32.5	—
Needle jet			(826) P-4	—
Jet needle			5 FEY 1	—
Clip position number			3	—

MODEL			OUTLANDER™ 400	OUTLANDER™ 800
Choke plunger position			Variable choke	—
Adjustment	Throttle cable		0.5 mm (.02 in)	1.0 mm (.04 in)
	Preliminary pilot screw turn		2.5	—
	Float level	± 0.5 mm	10.0	—
		± 0.020 in	.390	—
Fuel	Type		Regular unleaded gasoline	
	Octane no.		87 (Ron + Mon)/2	
DRIVE TRAIN				
Transmission type			CVT (Continuously Variable Transmission) Dual range (HI-LO) with park, neutral and reverse	
Engagement RPM		± 100 RPM	1450	1750
Front differential			Shaft driven/single Auto-lock differential (pump driven)	
Front differential ratio			3.6:1	
Rear axle			Shaft driven/single differential	
Rear axle ratio			3.6:1	
TRANSMISSION				
GEARBOX				
Output shaft backlash	New minimum	mm (in)	—	0.10 (.0039)
	New maximum		—	0.20 (.0079)
	Service limit		—	0.25 (.0098)
Bevel gear axial clearance	New minimum	mm (in)	—	0.02 (.0008)
	New maximum		—	0.15 (.0059)
	Service limit		—	0.19 (.0075)
Shifting sleeve groove width	New minimum	mm (in)	—	5.25 (.207)
	New maximum		—	5.35 (.211)
	Service limit		—	5.50 (.217)
Shifting fork claw thickness	New minimum	mm (in)	—	4.95 (.195)
	New maximum		—	5.05 (.199)
	Service limit		—	4.80 (.189)
Shift fork claw thickness (for high gear shifting)	New minimum	mm (in)	—	4.80 (.189)
	New maximum		—	4.90 (.193)
	Service limit		—	4.70 (.185)
Shift fork claw thickness (for low/reverse gear shifting)	New minimum	mm (in)	—	5.10 (.201)
	New maximum		—	5.20 (.205)
	Service limit		—	5.00 (.197)
Shift fork pin diameter	New minimum	mm (in)	—	6.920 (.272)
	New maximum		—	6.970 (.274)
	Service limit		—	6.850 (.270)
Gap of shift fork engagement groove (high gear shifting)	New minimum	mm (in)	—	5.00 (.197)
	New maximum		—	5.10 (.201)
	Service limit		—	5.20 (.205)
Gap of shift fork engagement groove (low/reverse gear shifting)	New minimum	mm (in)	—	5.30 (.209)
	New maximum		—	5.40 (.213)
	Service limit		—	5.50 (.217)

MODEL				OUTLANDER™ 400	OUTLANDER™ 800
Diameter free pinions		New minimum	mm (in)	—	29.000 (1.1417)
		New maximum		—	29.013 (1.1422)
		Service limit		—	29.015 (1.1422)
Intermediate gear shaft		New minimum	mm (in)	—	24.979 (.983)
		New maximum		—	25.000 (.984)
		Service limit		—	24.977 (.983)
Counter shaft	Right side	Service limit	mm (in)	—	17.990 (.708)
	Free pinion bearing			—	24.970 (.983)
	CVT side			—	24.970 (.983)
Bevel gear shaft	Free pinion bearing	Service limit	mm (in)	—	24.984 (.984)
CVT					
Drive belt width		Service limit	mm (in)	30.00 (1.181)	
Governor cup roller outer diameter		New minimum	mm (in)	13.70 (.539)	
		New maximum		13.90 (.547)	13.80 (.543)
		Service limit		13.20 (.519)	
Governor cup roller inner diameter		New minimum	mm (in)	—	8.05 (.317)
		New maximum		—	8.15 (.321)
		Service limit		—	9.00 (.354)
Centrifugal lever pivot bolt diameter		New minimum	mm (in)	6.078 (.239)	
		New maximum		6.100 (.240)	
		Service limit		6.000 (.236)	
Centrifugal lever bore diameter		Service limit	mm (in)	6.200 (.244)	
Drive pulley sliding half centrifugal lever pivot bolt bore diameter		New minimum	mm (in)	6.113 (.241)	
		New maximum		6.171 (.243)	
		Service limit		6.300 (.248)	
Drive pulley sliding half large bushing		New minimum	mm (in)	55.000 (2.165)	
		New maximum		55.020 (2.166)	55.040 (2.167)
		Service limit		55.200 (2.173)	
Drive pulley sliding half small bushing		New minimum	mm (in)	30.000 (1.181)	
		New maximum		30.020 (1.182)	30.040 (1.183)
		Service limit		30.200 (1.189)	
Driven pulley sliding half bushing		New minimum	mm (in)	30.000 (1.181)	30.060 (1.183)
		New maximum		30.020 (1.182)	30.100 (1.185)
		Service limit		30.200 (1.189)	
Driven pulley sliding fixed bushing		New minimum	mm (in)	30.000 (1.181)	30.060 (1.183)
		New maximum		30.020 (1.182)	30.100 (1.185)
		Service limit		30.200 (1.189)	
Torque gear on driven pulley		Service limit	mm (in)	7.500 (.295)	

MODEL		OUTLANDER™ 400	OUTLANDER™ 800
STEERING			
Turning radius	Standard	1.83 m (6 ft)	2.16 m (7 ft)
	MAX	2.0 m (6 ft 7 in)	4.80 m (7 ft 9 in)
Total toe (vehicle on ground) mm (in)		0 ± 4 (0 ± .157)	0 (0)
Camber angle		0°	
Tie-rod maximum length unengaged mm (in)		286.5 ± 5 (11.28 ± 0.197)	
SUSPENSION			
FRONT			
Suspension type		MacPherson	Double A-Arm
Suspension travel		178 mm (7 in)	203 mm (8 in)
Shock absorber	Qty	2	
	Type	Oil	
Spring free length	Standard	354 mm (13.94 in)	349 mm (13.74 in)
	MAX	375 mm (14.76 in)	358 mm (14.09 in)
Spring color code	Standard	Blue/Red/Blue	Green/Gold/Green
	MAX	Blue/Yellow/Blue	Gold/Black/Blue
Front preload adjustment		N.A.	5 settings
REAR			
Suspension type		TTI™ independent	
Suspension travel		203 mm (8 in)	229 mm (9 in)
Shock absorber	Qty	2	
	Type	Oil	
Spring free length	Standard	371 mm (14.37 in)	Short
			98 mm (3.86 in)
			Long
			308 mm (12.13 in)
	MAX	413 mm (16.26 in)	Short
			98 mm (3.86 in)
			Long
			318 mm (12.52 in)
Spring color code	Standard	Blue/Black/Blue	Short
			Gold/Red/Blue
			Long
			Green/Gold/Blue
	MAX	Blue/Green/Blue	Short
			Gold/Red/Blue
			Long
			Gold/Blue/Blue
Rear preload adjustment		5 settings	
BRAKES			
Front brake	Qty	2	
	Type	Hydraulic, discs	
Rear brake	Qty	1	
	Type	Hydraulic, disc	

MODEL				OUTLANDER™ 400	OUTLANDER™ 800
Parking brake				Hydraulic lock-4 wheels	
Caliper				Floating	
Lining material			Front	Organic	
			Rear	Metallic	
Minimum pad thickness			mm (in)	1 (.04)	
Minimum brake disc thickness		Front	mm (in)	3.5 (.138)	
		Rear	mm (in)	4.3 (.17)	
Maximum brake disc warpage			mm (in)	0.2 (.01)	
TIRES AND WHEELS					
TIRES					
Pressure	Standard	Front	Maximum	28 kPa (4 PSI)	34 kPa (5 PSI)
			Minimum	24 kPa (3.5 PSI)	31 kPa (4.5 PSI)
		Rear	Maximum	31 kPa (4.5 PSI)	
			Minimum	28 kPa (4 PSI)	
	MAX	Front	Maximum	34 kPa (5 PSI)	34 kPa (5 PSI)
			Minimum	31 kPa (4.5 PSI)	31 kPa (4.5 PSI)
		Rear	Maximum	34 kPa (5 PSI)	48 kPa (7 PSI)
			Minimum	31 kPa (4.5 PSI)	34 kPa (5 PSI)
Minimum tire thread depth			mm (in)	3 (0.118)	
Size			Front	25 x 8 x 12	26 x 8 x 12
			Rear	25 x 10 x 12 XT: 25 x 11 x 12	26 x 10 x 12
WHEELS					
Size			Front	12 x 6	
			Rear	12 x 7.5	
DIMENSION					
Overall length			Standard	2.18 m (86 in)	
			MAX	2.39 m (94 in)	
Overall width				1.17 m (46 in)	
Overall height				1.14 m (45 in)	
Dry weight			Standard	276 kg (607 lb)	290 kg (639 lb)
			MAX	298 kg (657 lb)	313 kg (689 lb)
Wheel base			Standard	1.24 m (49 in)	1.30 m (51 in)
			MAX	1.45 m (57 in)	1.50 m (59 in)
Wheel track		Front	mm (in)	965 (38)	
		Rear	mm (in)	914 (36)	
Ground clearance			mm (in)	236 (9.3)	305 (12)
CAPACITIES					
Fuel tank				16 L (4.2 U.S. gal)	20 L (5.3 U.S. gal)
Fuel tank reserve				2 L (0.6 U.S. gal)	
Engine oil		Capacity (oil change with filter)		3 L (3.17 quarts) (engine/transmission)	2 L (2.11 quarts)
		Recommended		SAE, 4 stroke mineral based oil SG, SH or SJ or XP-S 5W40 synthetic 4-stroke oil. Refer to the oil viscosity chart in the *MAINTENANCE* section	

MODEL			OUTLANDER™ 400	OUTLANDER™ 800
Gearbox oil	Capacity		—	400 mL (14 U.S. oz)
	Recommended		—	XP-S chaincase oil
Differential oil	Capacity	Front	500 mL (17 U.S. oz)	
		Rear	300 mL (10 U.S. oz)	250 mL (8.5 U.S. oz)
	Recommended		Synthetic polyolester oil 75W90 (API GL5)	
CV joint grease			TEXACO, HTBJ grease (M3014), ONLY	
Propeller shaft grease			Suspension synthetic grease (P/N 293 550 033)	
Hydraulics brakes	Capacity		250 mL (8.5 U.S. oz)	
	Recommended		Brake fluid DOT 4, ONLY	
Cooling system			2.5 L (2.65 quarts)	
BODY AND FRAME				
Weight distribution	Front/rear	%	49/51 MAX: 46/54	51/49 MAX: 48/52
Rear storage box (included with rear rack weight)			10 kg (22 lb)	
Rack	Front		45 kg (100 lb)	
	Rear (including rear storage box and tongue weight)		90 kg (200 lb)	
Total vehicle load allowed (including driver, all other loads and added accessories)		Standard	230 kg (500 lb)	235 kg (517 lb)
		MAX	235 kg (517 lb)	272 kg (600 lb)
Gross vehicle weight rating		Standard	460 kg (1014 lb)	460 kg (1014 lb)
		MAX	554 kg (1219 lb)	620 kg (1365 lb)
Towing capacity			500 kg (1100 lb)	590 kg (1300 lb)
Tongue capacity (included with rear rack weight)			14 kg (30 lb)	23 kg (50 lb)
MATERIAL				
Frame		Material	Steel	
		Color	Black	
Wheel		Material	Steel	Aluminum
		Color	Silver	
Front/rear rack		Material	Steel	
		Color	Black	
Front bumper		Material	Aluminum	
		Color	Aluminum	
Front/rear fender		Material	High density polyethylene	
		Color	Yellow/Laurentian green/Viper red	
Fuel tank protector(s)		Material	High density polyethylene	
		Color	Black	
Steering cover		Material	Polypropylene	High density polyethylene
		Color	Earth grey	
Storage compartment cover		Material	Polypropylene (glass fiber-reinforced)	
		Color	Earth grey	
Front fascia		Material	High density polyethylene	
		Color	Yellow/Laurentian green/Viper red	

MODEL		OUTLANDER™ 400	OUTLANDER™ 800
Front skid plate	Material	High density polyethylene	
	Color	Earth grey	
Side panel	Material	High density polyethylene	
	Color	Yellow/Laurentian green/Viper red	
Foot rest	Material	High density polyethylene	
	Color	Black	
Console	Material	High density polyethylene	
	Color	Yellow/Laurentian green/Viper red	
Air box cover	Material	Polypropylene (glass fiber-reinforced)	
	Color	Black	
Air box	Material	Polypropylene (glass fiber-reinforced)	
	Color	Black	
Transmission lever locator	Material	Polypropylene (glass fiber-reinforced)	
	Color	Earth grey	
A-arm protector	Material	Polypropylene	
	Color	Black	
Engine cover	Material	High density polyethylene	
	Color	Earth grey	
Seat base	Material	Polypropylene	
	Color	Black	
Seat cover	Material	Thermoformed vinyl	
	Color	Deep earth grey	

ELECTRICAL CONNECTORS

SERVICE TOOLS

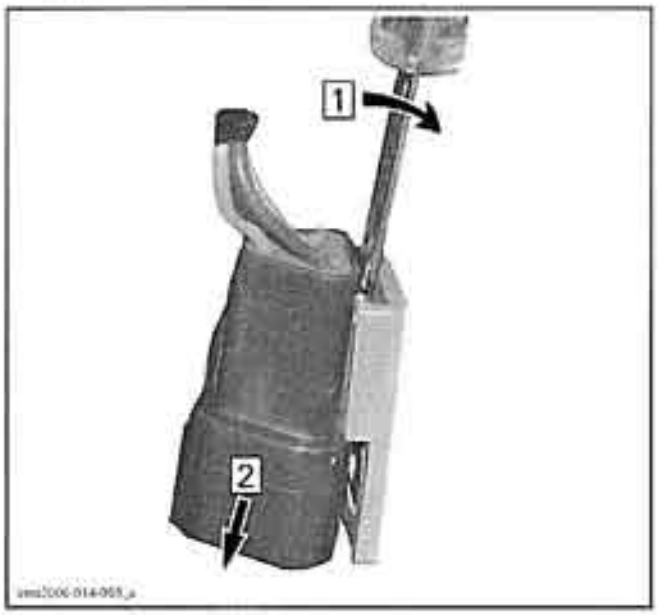
Description	Part Number	Page
crimper die	529 035 906	456
crimping pliers	529 035 730	459
crimping tool	529 035 909	456

DEUTSCH CONNECTORS

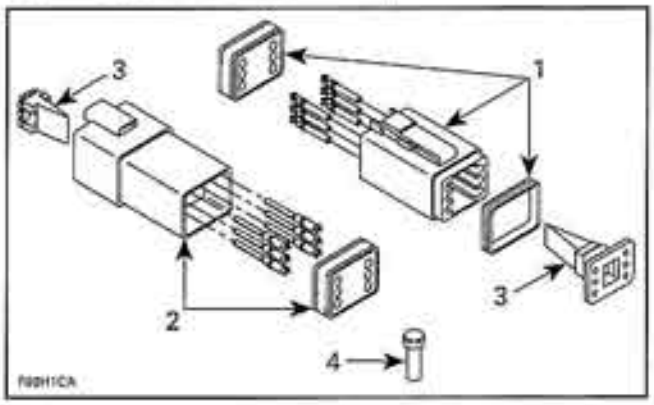
Deutsch connectors are used on some harnesses.

Removal from Engine Connector Bracket

To remove Deutsch connectors from engine connector bracket, slide a flat screwdriver between the connector bracket and the Deutsch connector and push out connector.



Connector Disassembly

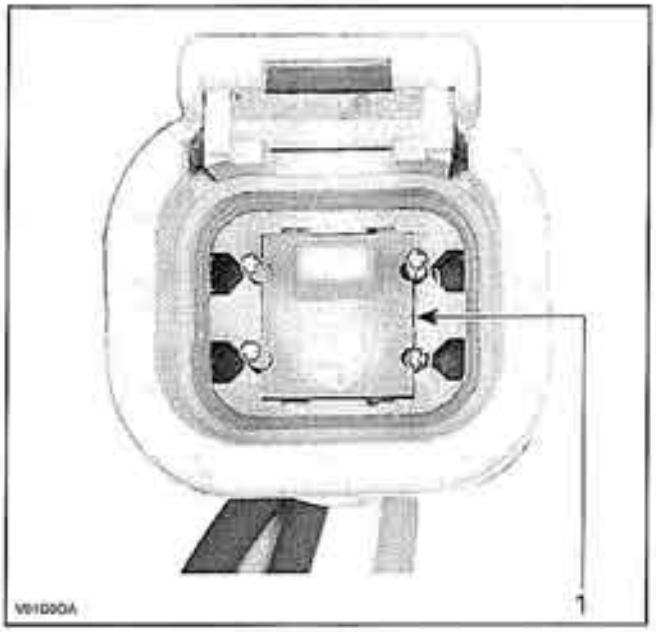


1. *Male connector*
2. *Female connector*
3. *Secondary locks*
4. *Sealing cap*

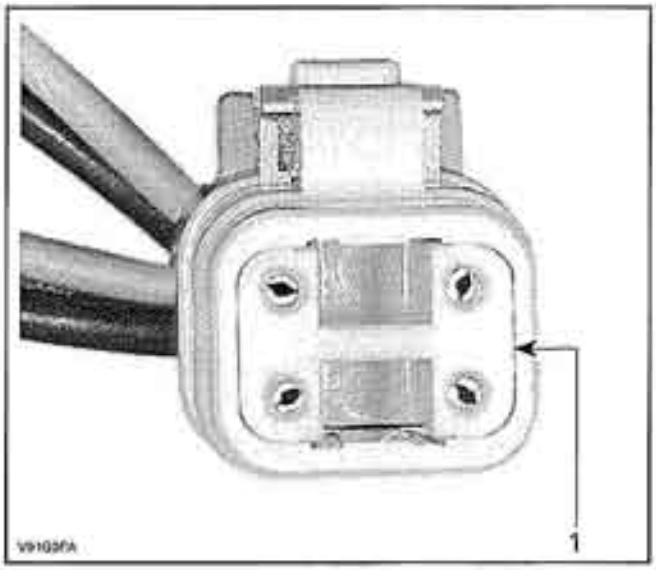
CAUTION: Do not apply dielectric grease on terminal inside connector.

To remove terminals from connector, proceed as follows:

- Using a long nose pliers, pull out the lock.



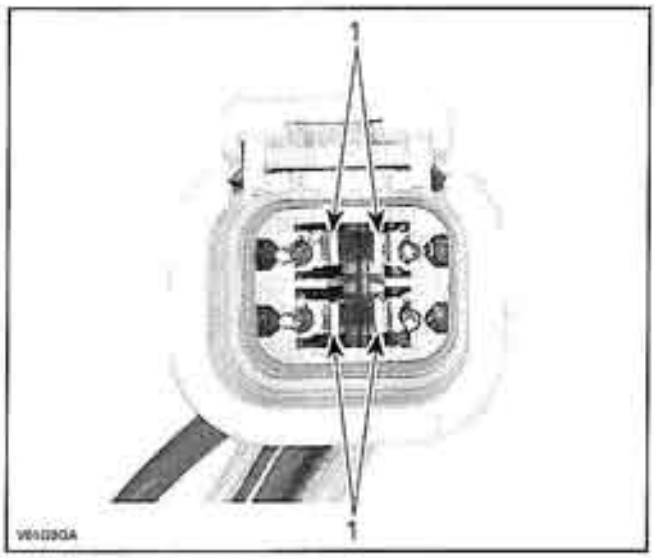
FEMALE CONNECTOR
1. Female lock



MALE CONNECTOR
1. Male lock

NOTE: Before extraction, push wire forward to relieve pressure on retaining tab.

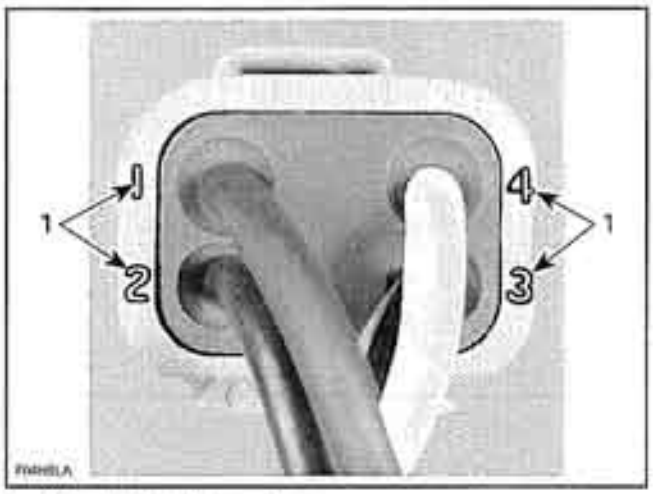
- Insert a 4.8 mm (.189 in) wide screwdriver blade inside the front of the terminal cavity.
- Pry back the retaining tab while gently pulling wire back until terminal is removed.



FEMALE CONNECTOR
1. Retaining tabs

To install:

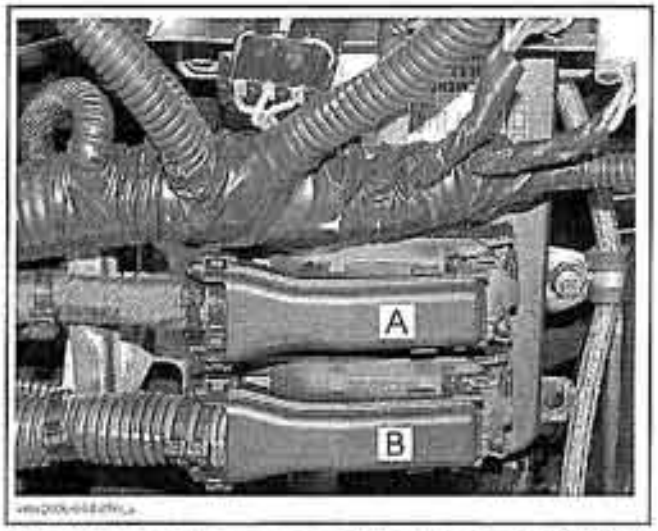
- For insertion of a terminal, make sure the lock is removed.
- Insert terminal into appropriate cavity and push as far as it will go.
- Pull back on the terminal wire to be sure the retention fingers are holding the terminal.
- After all required terminals have been inserted, the lock must be installed.



1. Wire identification numbers

ECM CONNECTORS

There are two ECM connectors used and they are connected on the ECM. The engine harness female connector is connected on the module male connector "A" and the vehicle system control harness female connector is connected to the module male connector "B". The ECM connectors have 41 pins.

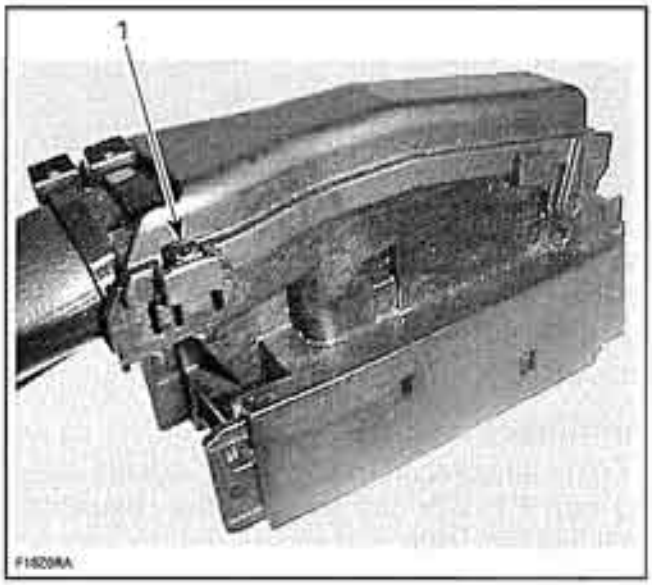


For probing techniques and tool, refer to *ENGINE MANAGEMENT*.

CAUTION: Do not disconnect the ECM connectors needlessly. They are not designed to be disconnected/reconnected frequently.

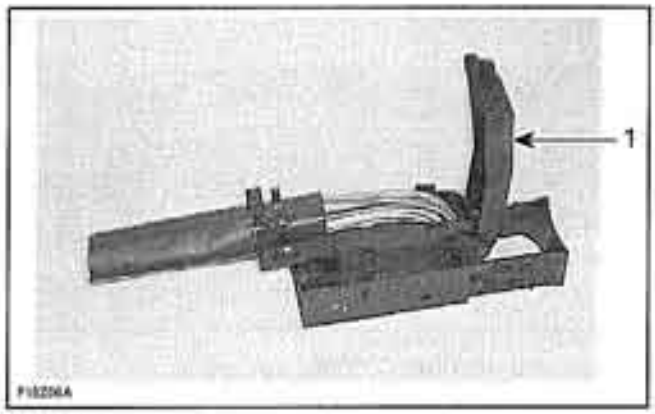
Terminal Removal

Unlock the connector cover by pushing in the tabs on top of the connector with a flat screwdriver to be able to flip the top cover up.



1. Push in tab

Lift the cover by pushing it forward.

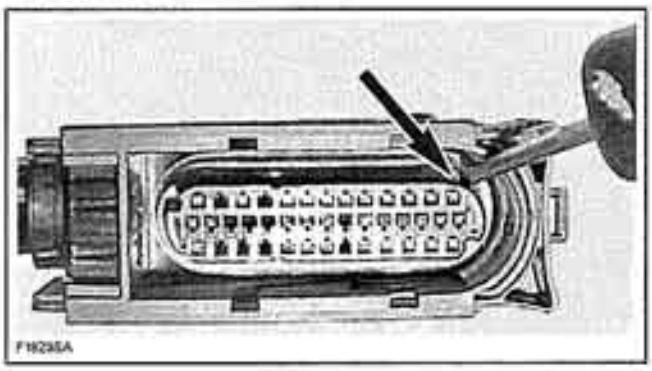


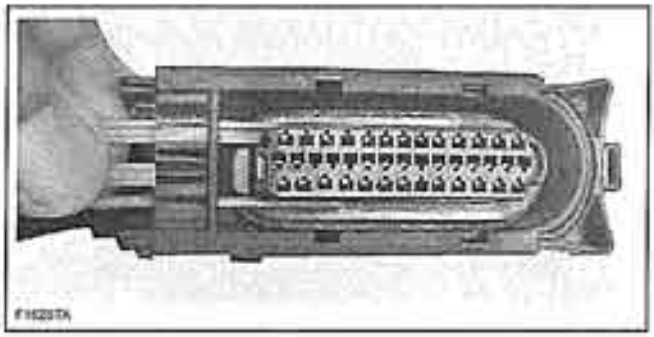
1. Cover

Cut both tie raps that secure the harness to the connector.

1. Tie raps

Turn the connector over and remove the orange locking tab by pushing and then pulling toward the wire harness.

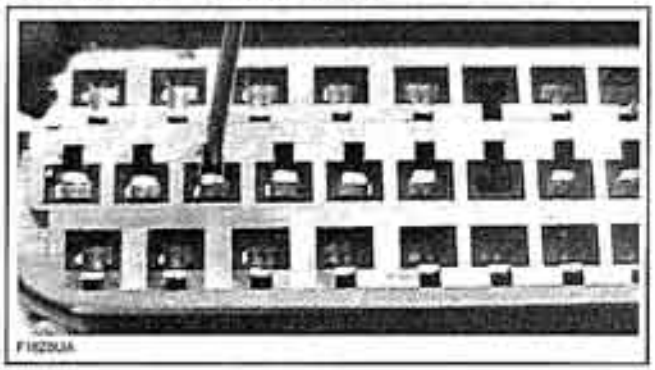


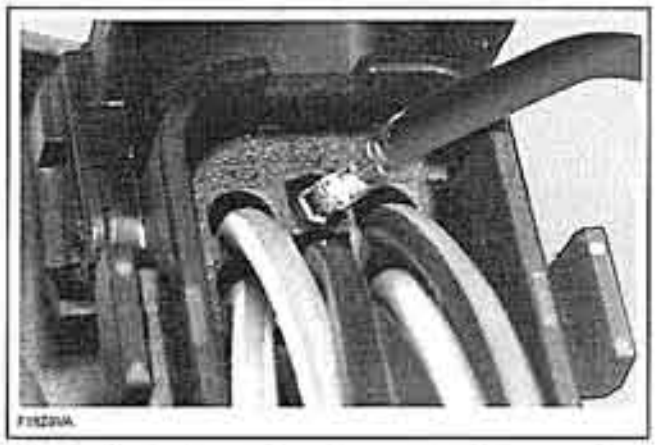


A terminal remover such as Snap-On TT600-1 tool (or a 0.76 mm (.030 in) oxyacetylene torch tip cleaner or a #68 drill bit) must be inserted into the terminal cavity to release the locking tab from the connector.

CAUTION: Using a tool tip larger than 0.76 mm (.030 in) may damage the terminal.

Insert the tool tip into the terminal cavity as shown, and locate its wire in the back of the connector. You may have to pry the tool tip against the locking tab to release it, then remove the terminal from the connector.



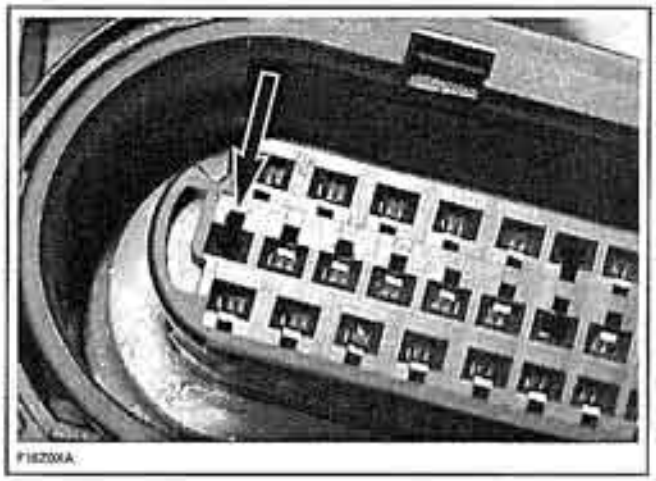


Check the locking tab on the terminal, it may have to be bent out a little so it will lock in its cavity when it is re-inserted.

If the wire is in good condition but the terminal is rusted or corroded, remove defective terminal and crimp a new one. If wire and terminal are defective, replace with a new genuine wire and new terminal and crimp them together as explained below.

IMPORTANT: Use genuine wires only. Otherwise wires will not fit properly.

When re-inserting the terminal, the locking tab must be installed facing the smaller cutout of the terminal cavity.

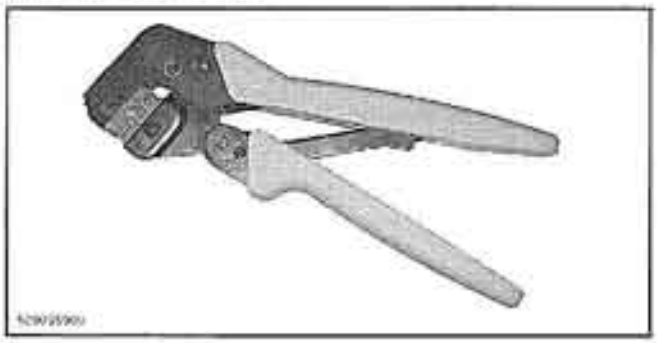


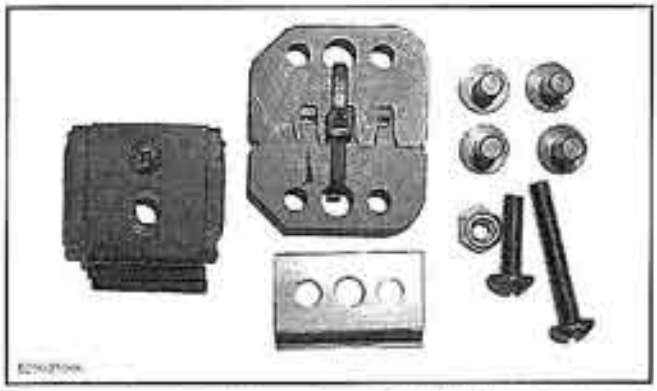
Insert the terminal, ensuring the locking tab snaps into its cavity.

Re-install the orange locking tab, attach the 2 tie raps, and close the connector cover.

Terminal Crimping (Kostal)

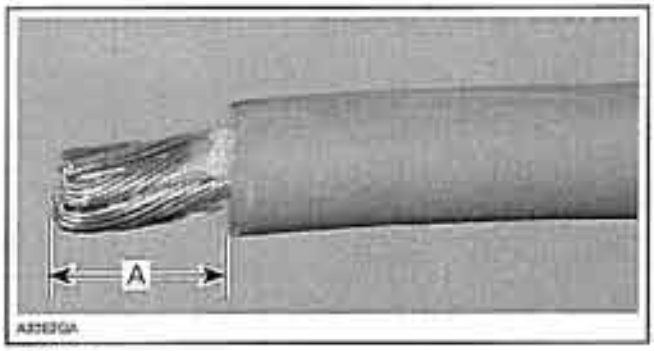
To crimp a new connector terminal, use the crimping tool (P/N 529 035 909) and the crimper die (P/N 529 035 906).





To properly crimp the wires, strictly follow this procedure.

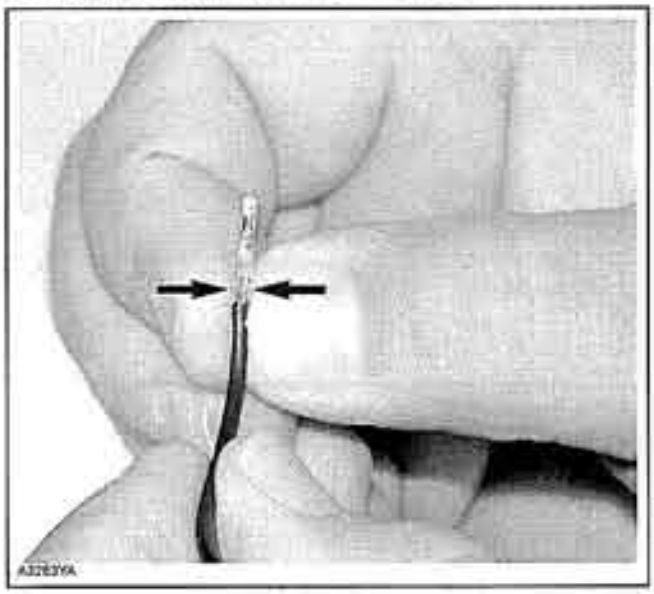
Strip the wire to a maximum of 3 mm (1/8 in).



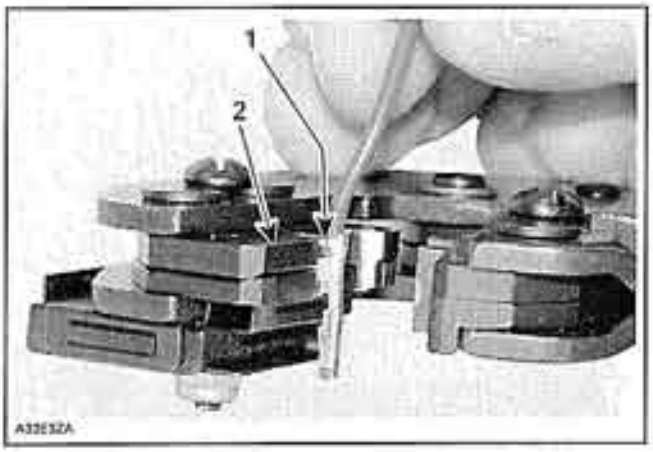
TYPICAL
A. 3 mm (1/8 in) max.

Position wire in terminal.

Squeeze the terminal tabs with your fingers to temporarily retain terminal in place.



Insert terminal with wire in crimping pliers and position so that top of terminal tabs are flush with pliers edge or a little bit lower as shown.



1. Top of terminal tabs
2. Align tabs with pliers edge

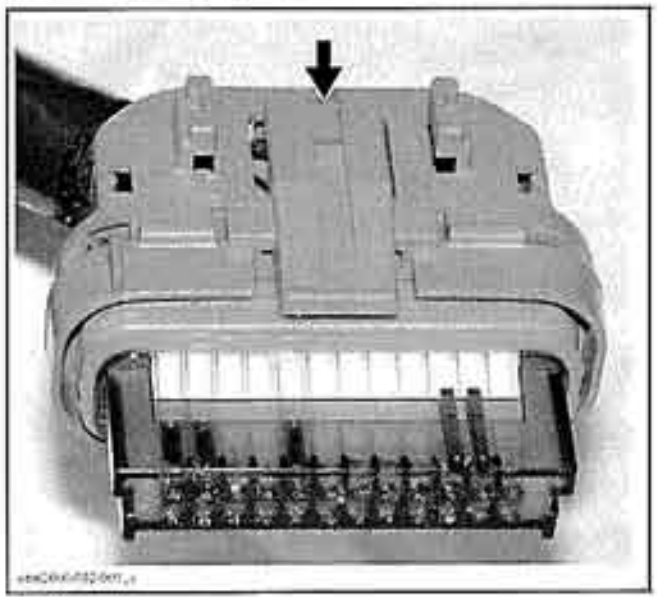
Crimp terminal. Ensure no tiny wire goes out of terminal. This might cause strange problems of the electrical system.

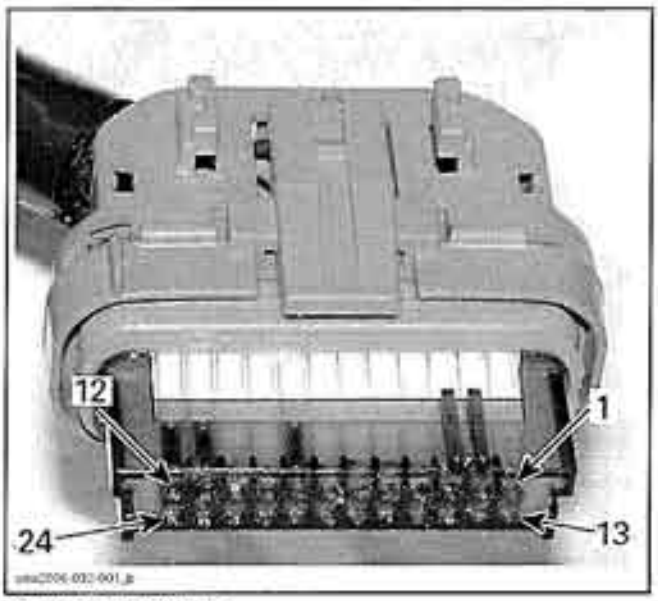
Lubrication

Do not apply any product to the pins of the connector on the ECM.

MULTI-FUNCTION SPEEDOMETER CONNECTOR

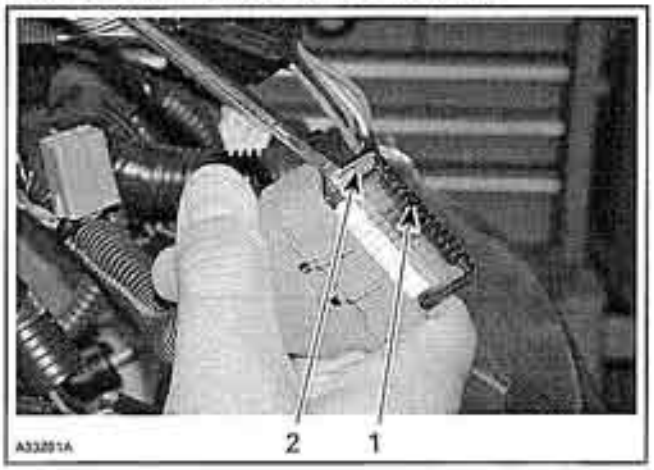
Firmly push down tab and hold to unlock connector while pulling it out.





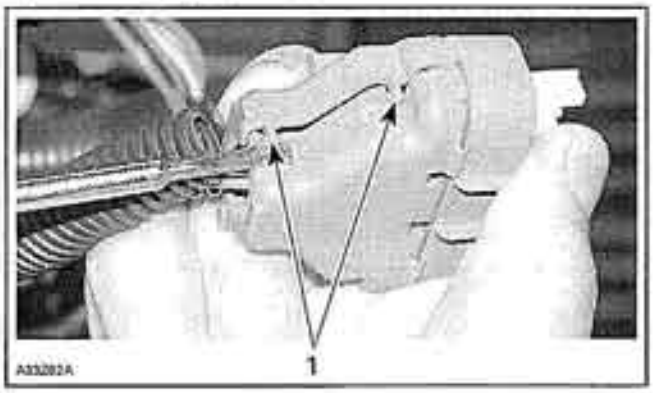
CONNECTOR PINOUT

Push on both tabs to remove retainer.



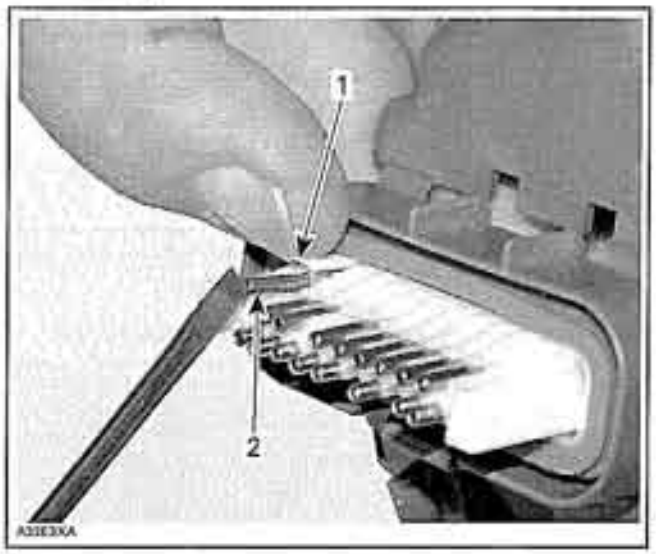
TYPICAL
1. Retainer
2. Tab (one on each side)

Open housing by lifting 4 tabs.



TYPICAL
1. Tabs (2 on each side)

Lift the top plastic lock of the female terminal to be removed and hold in position. Lift the female terminal to unlock from the housing and push out of housing.

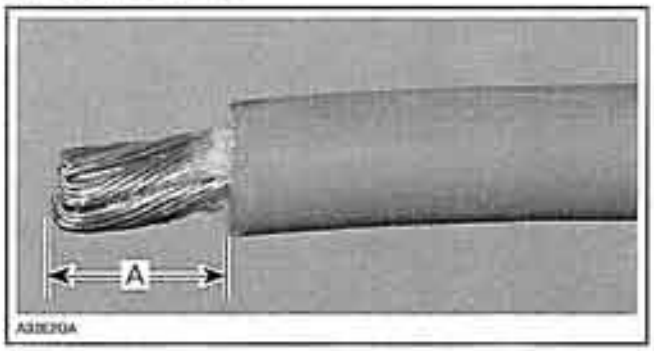


TYPICAL
1. Lift and hold plastic lock
2. Lift to unlock and push out

BATTERY AND STARTER CABLE TERMINALS

Crimping

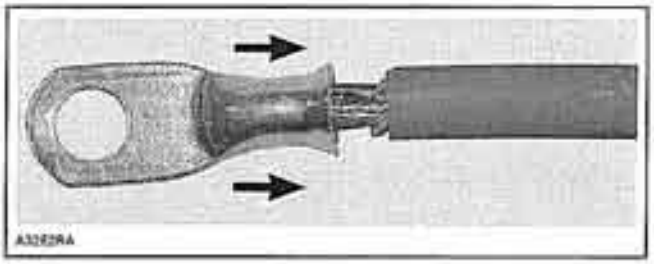
Carefully strip the wire approximately to 10 mm (3/8 in) in length, using a wire stripping tool or sharp blade/knife.



A. 10 mm (3/8 in)

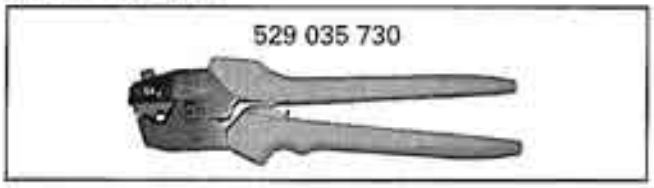
NOTE: Make sure not to cut wire strands while stripping the wire.

Install the appropriate terminal on the wire according to the requirement. Refer to appropriate *PARTS CATALOG*.

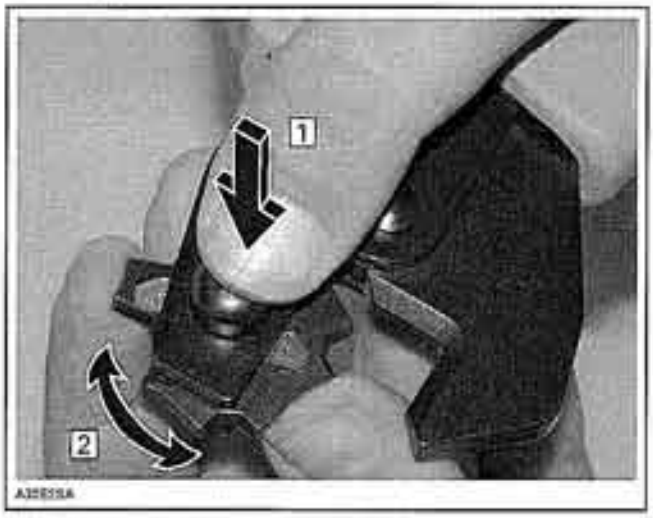


INSTALLATION OF TERMINAL

Follow the instructions provided with the crimping pliers (P/N 529 035 730) to select the proper position of the tool.

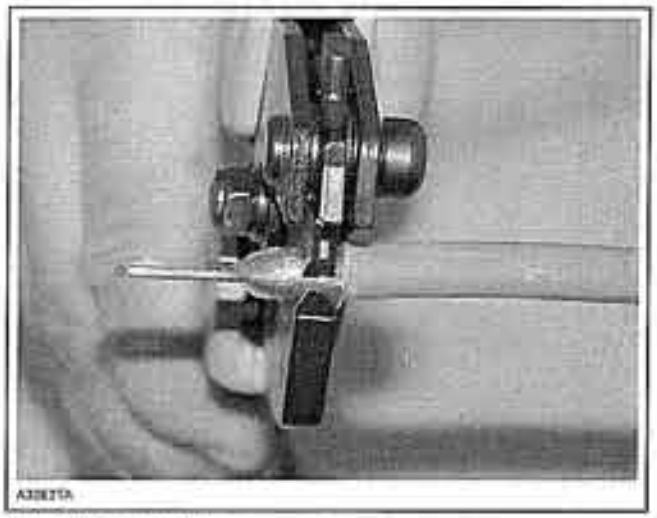


NOTE: Different wires require different crimping pliers settings, so make sure to follow the instruction supplied with the tool.



POSITIONING THE CRIMPING PLIERS
Step 1: Press
Step 2: Rotate

After positioning the crimping pliers, crimp the terminal already installed on wire.



CRIMPING OF WIRE

PROPERLY CRIMPED WIRE

To verify, if the wire is properly crimped, apply some pulling force on wire and the terminal at the same time from both directions.

CAUTION: Never weld the wire to the terminal. Welding can change the property of the wire and it can become brittle and break.

Install the protective heat shrink rubber tube on the terminal. Heat the heat shrink rubber tube using the heat gun so that it grasps the wire and the terminal.

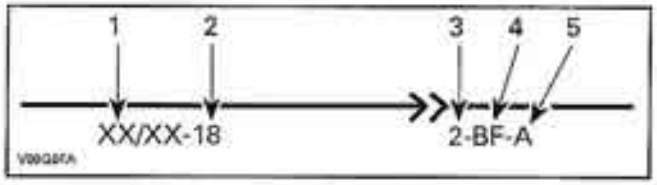
CAUTION: Make sure that the protective heat shrink rubber tube has been properly installed and no part of wire is exposed.

WIRING DIAGRAMS

WIRING CONNECTORS CODING

⚠ WARNING

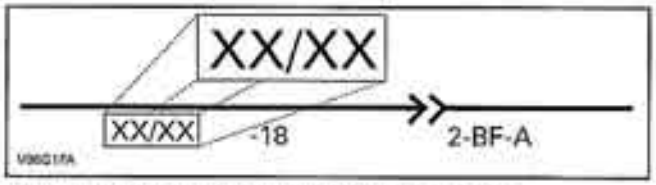
Ensure all terminals are properly crimped on the wires and all connector housings are properly fastened.



1. *Wire colors*
2. *Wire gauge*
3. *Connector housing area*
4. *Connector identification*
5. *Wire location in connector*

WIRE COLORS

It identifies the color of a wire. When a 2-color scheme is used, the first color is the main color while the second color is the tracer color.

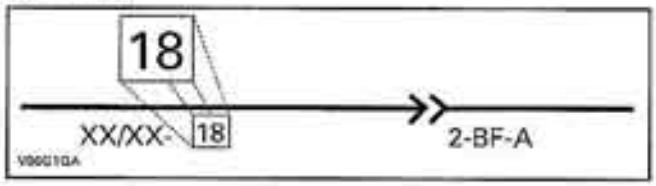


THE SHADED PART INDICATES THE WIRE COLOR

Example: YL / BK is a YELLOW wire with a BLACK stripe.

WIRE GAUGE

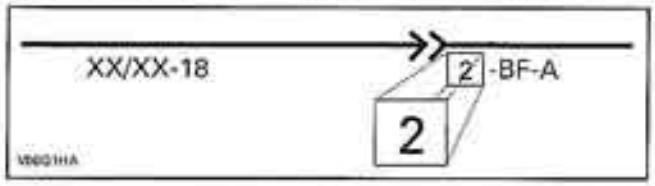
The number after wire color indicates the gauge of a wire.

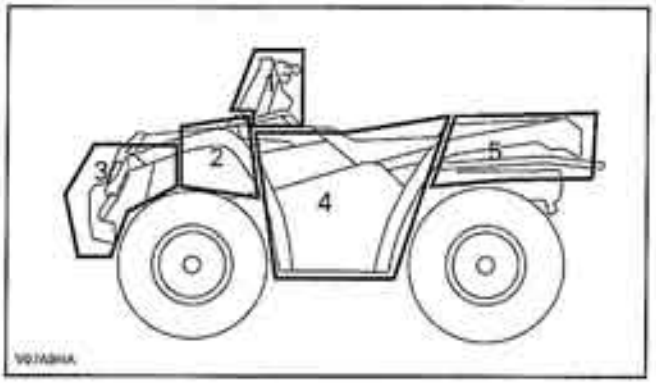


THE SHADED PART INDICATES THE WIRE GAUGE

Example: YL / BK is a YELLOW wire with a BLACK stripe.

CONNECTOR HOUSING AREA

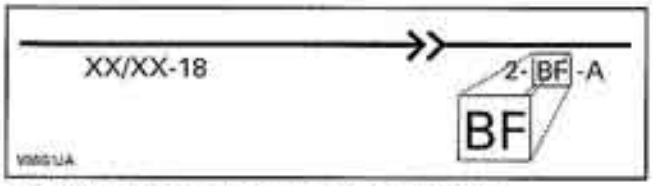




AREA	LOCATION
1	Steering area
2	Service compartment
3	Front of vehicle
4	Engine area
5	Rear of vehicle

CONNECTOR IDENTIFICATION

Indicates the connector's function. If there are many connectors in the same area, this helps to identify which wire is in which connector.



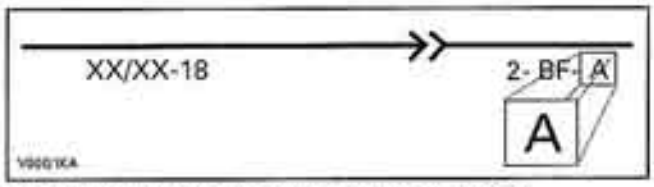
THE SHADED PART INDICATES A CONNECTOR

ABBREVIATION	DESCRIPTION
BA	Ignition coil
BAT	Battery
BD	2WD/4WD switch
CA	Magneto
CAPS	Camshaft position sensor
CC	Ignition switch
CI	multi-function speedometer
CPS	Crankshaft position sensor
CTS	Coolant temperature sensor
CV	Speed sensor
DB	Diagnostic connector
DC	DC outlet
ECM	Engine control module
FP	Fuel pump
FRA	Brake light switch
FT	Cooling fan
HIC	Harness interconnector (engine/vehicle)
IDLE	Idle bypass valve
INJ1 and INJ2	Fuel injector
MAPTS	Manifold air pressure and temperature sensor
MD	2WD/4WD actuator
MG	multi-function switch
OPS	Oil pressure switch
PD	RH headlight
PF1	Fuse Holder (main)
PF2	Fuse Holder (near battery)
PG	LH headlight
PRN	Subtransmission switch
RD	Voltage regulator/Rectifier
SD	2WD/4WD actuator switch
SM	Starter motor
SPK1 and SPK2	Spark plug
SS	Starter solenoid
SW	Winch relay
SWW	Winch switch

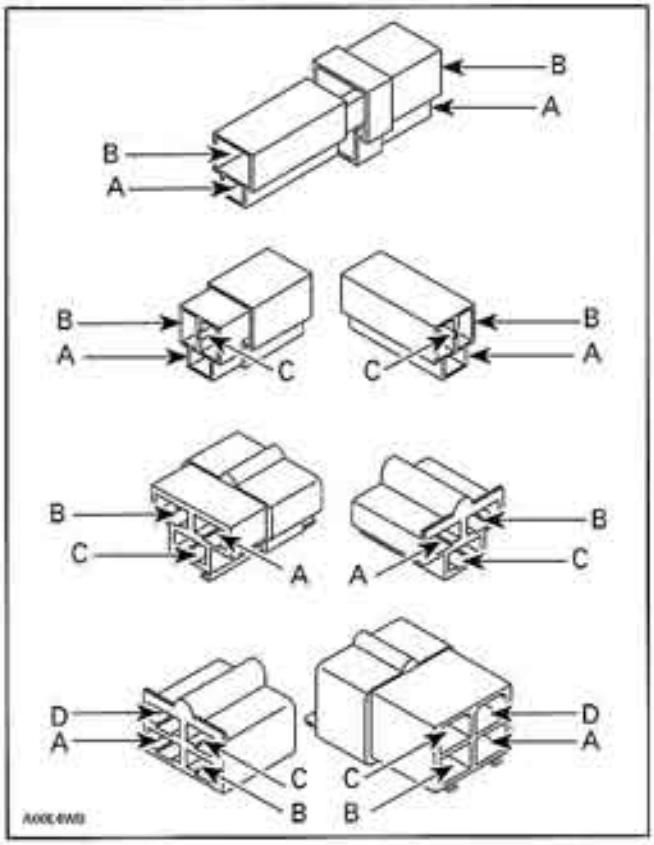
ABBREVIATION	DESCRIPTION
TPS	Throttle position sensor
WM	Winch motor

WIRE LOCATION IN CONNECTOR

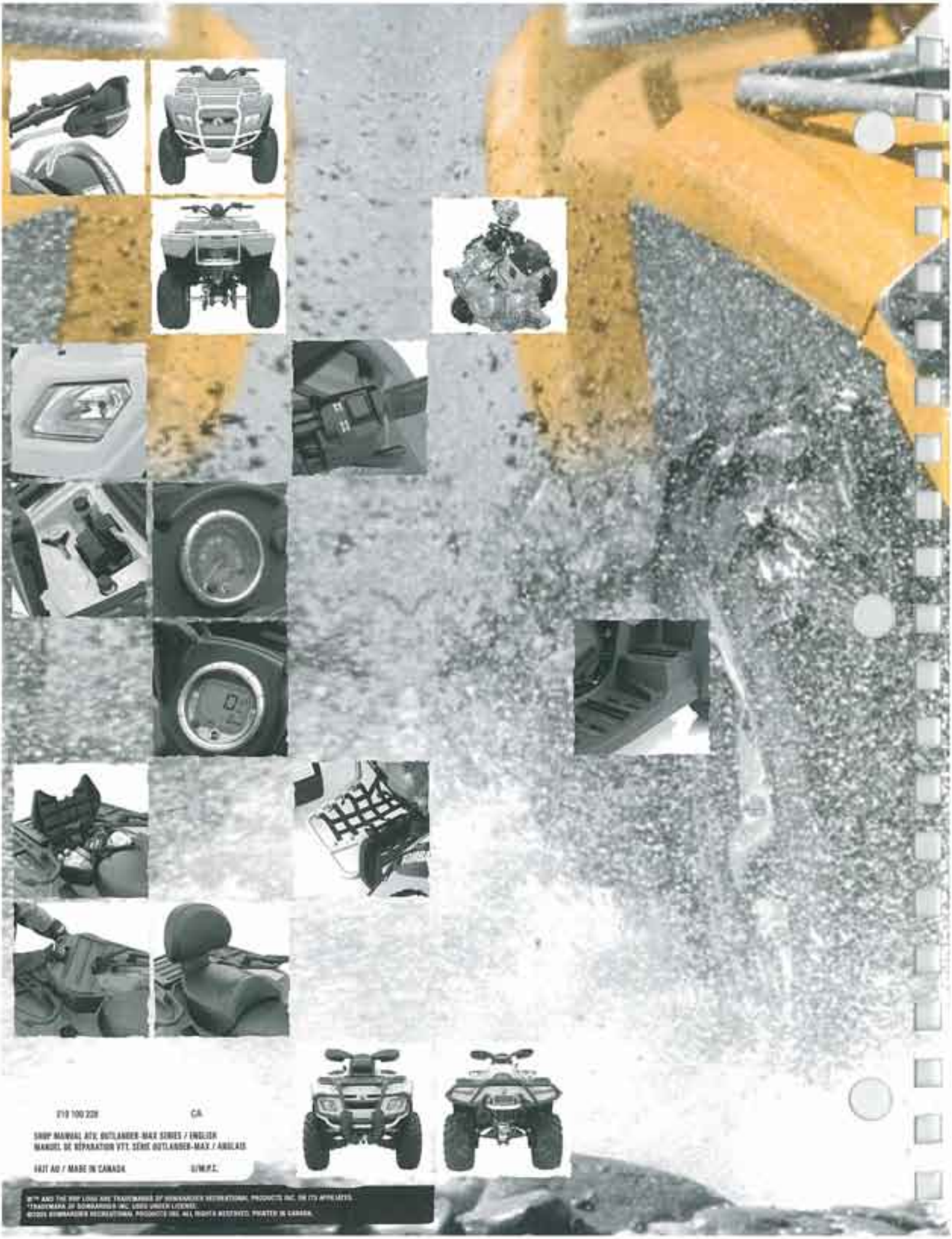
This is the wire position in the connector. The number or letter given refers to the physical identification stamped on the connector.



THE SHADED PART INDICATES THE CONNECTOR LOCATION IN HOUSING



TYPICAL



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SHOP MANUAL ATV, OUTLANDER-MAX SERIES / ENGLISH
MANUEL DE RÉPARATION VTT, SÉRIE OUTLANDER-MAX / ANGLAIS

4437 A0 / MADE IN CANADA U/M.P.C.

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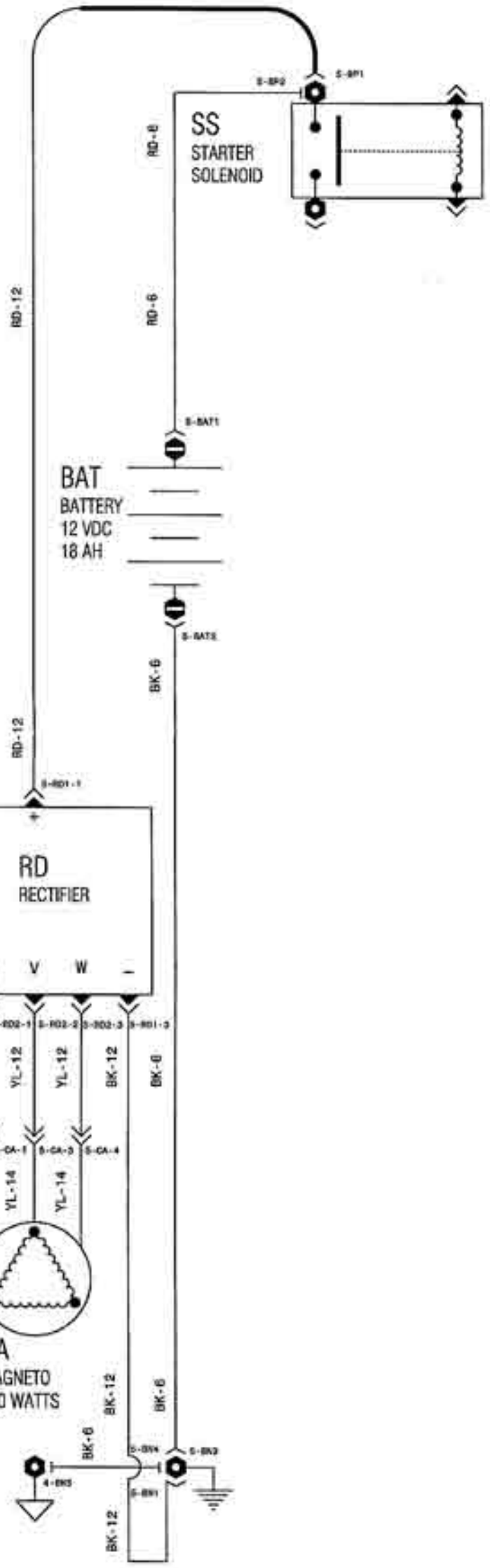
CHARGING SYSTEM



ZONE #	ZONE DESCRIPTION
1	STEERING AREA
2	MODULE AREA
3	FRONT OF VEHICLE
4	ENGINE AREA
5	REAR OF VEHICLE

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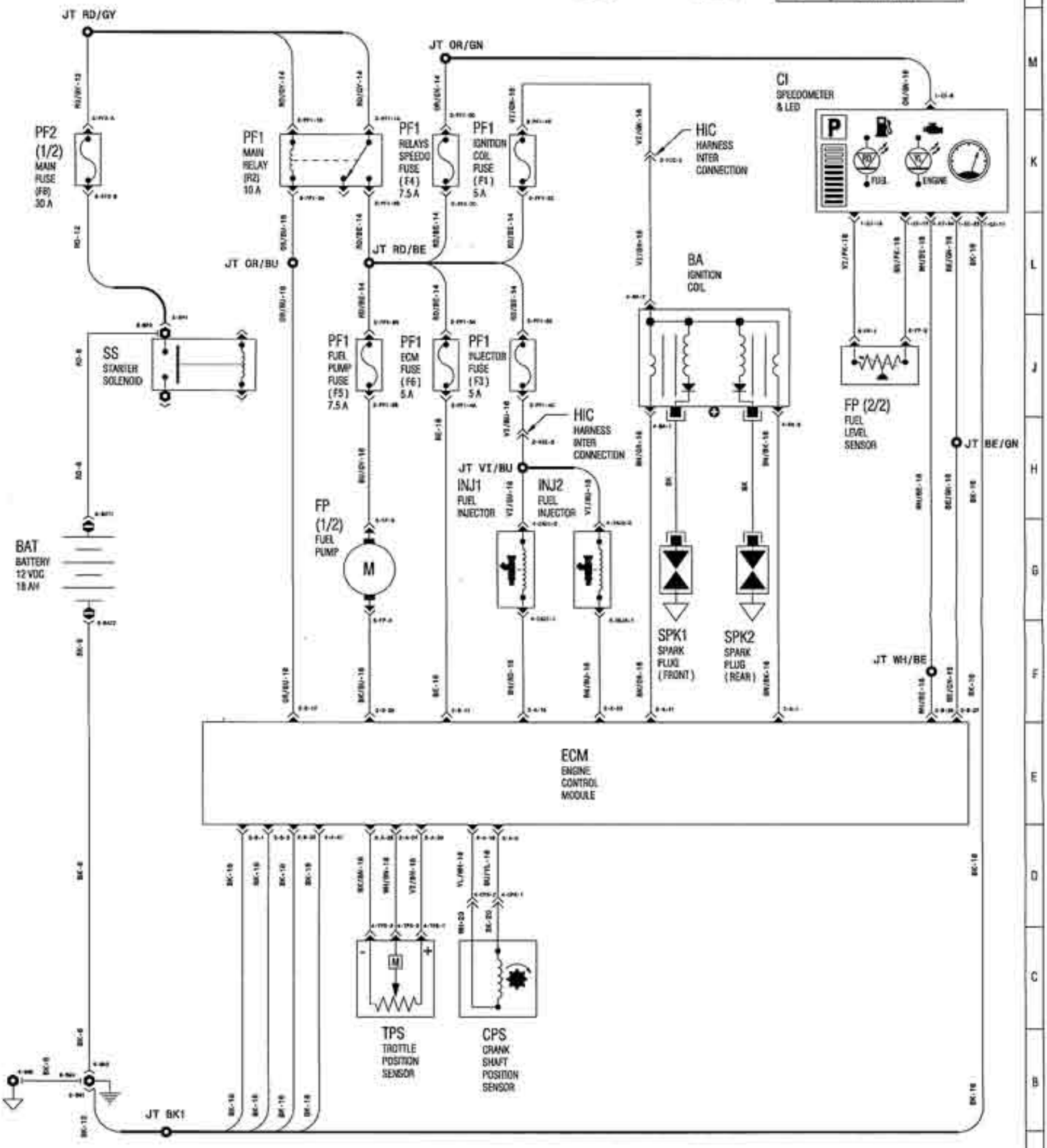
INJECTION / IGNITION SYSTEM

ZONE #	ZONE DESCRIPTION
1	STEERING AREA
2	MODULE AREA
3	FRONT OF VEHICLE
4	ENGINE AREA
5	REAR OF VEHICLE



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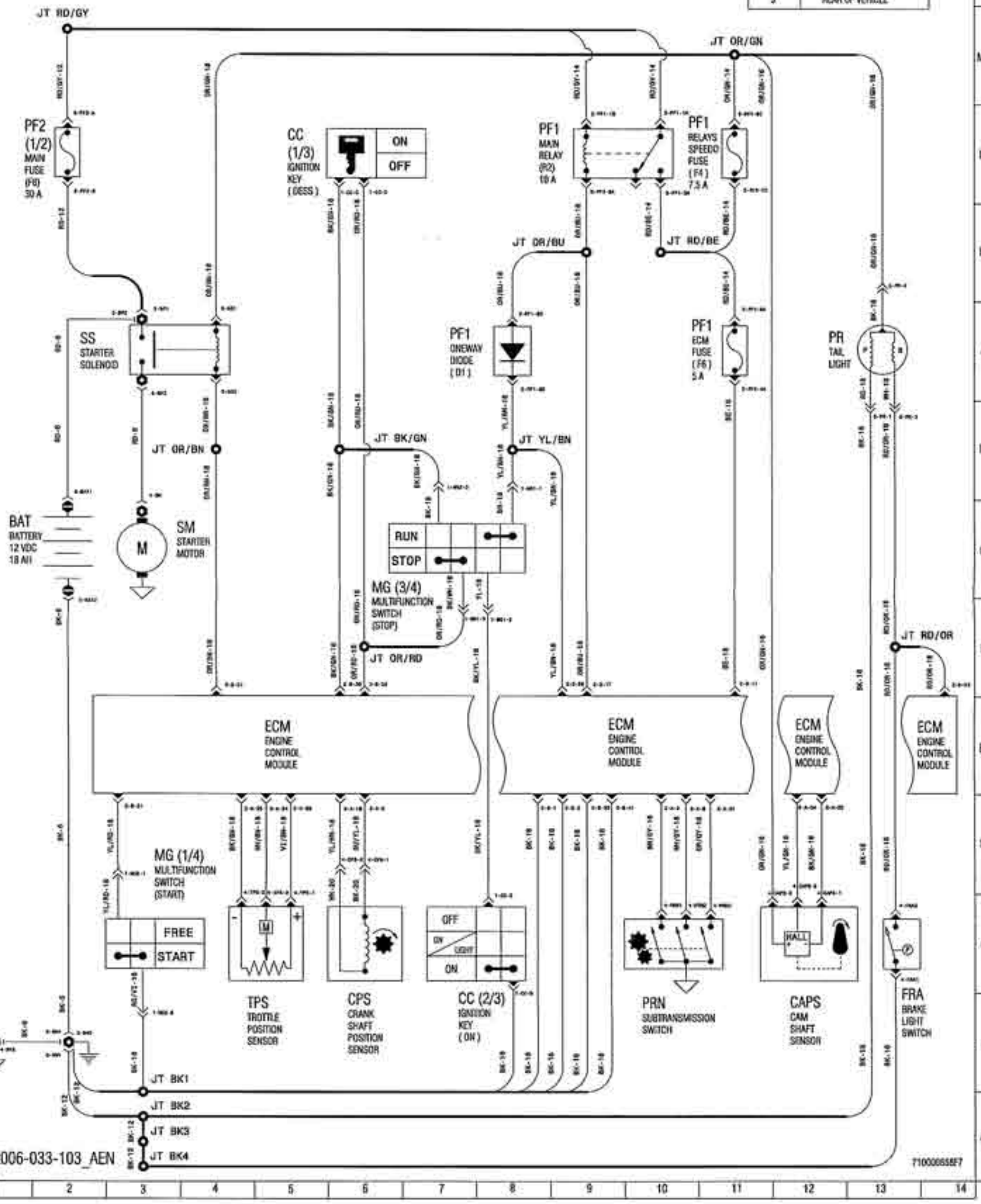
STARTING SYSTEM

ZONE #	ZONE DESCRIPTION
1	STEERING AREA
2	MODULE AREA
3	FRONT OF VEHICLE
4	ENGINE AREA
5	REAR OF VEHICLE



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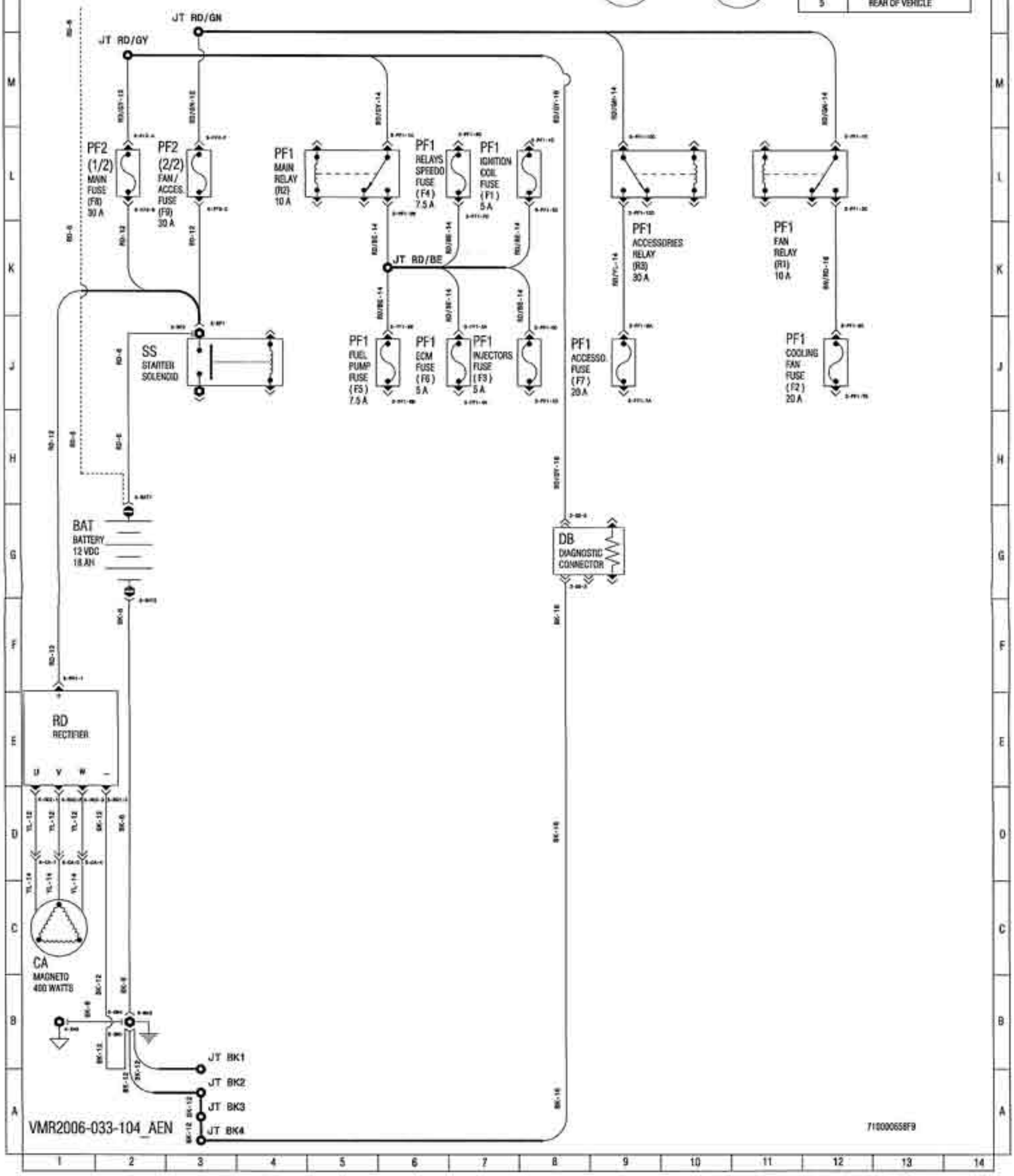
DISTRIBUTION SYSTEM

ZONE #	ZONE DESCRIPTION
1	STEERING AREA
2	MODULE AREA
3	FRONT OF VEHICLE
4	ENGINE AREA
5	REAR OF VEHICLE



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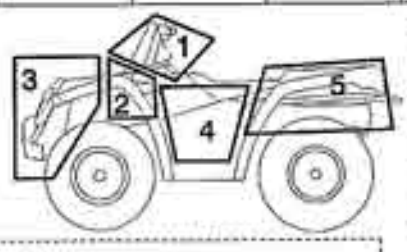
ACCESSORIES SYSTEM



ZONE #	ZONE DESCRIPTION
1	STEERING AREA
2	MODULE AREA
3	FRONT OF VEHICLE
4	ENGINE AREA
5	REAR OF VEHICLE

JT RD/GN
JT RD/GY
JT OR/GN
PF2 (1/2) MAIN FUSE (F8) 30 A
PF2 (2/2) FAN / ACCES. FUSE (F9) 30 A
PF1 MAIN RELAY (R2) 10 A
PF1 RELAYS SPEEDO FUSE (F4) 7.5 A
CI SPEEDOMETER & PILOT LAMPS
BD 2WD/4WD SWITCH
2WD
4WD
PF1 ACCESSORIES RELAY (R3) 30 A
PF1 ACCESS. FUSE (F7) 20 A
JT RD/BE
HIC HARNESS INTER CONNEC-TION
PF1 ECM FUSE (F6) 5 A
JT BE/GN
SD 2WD/4WD ACTUATOR SWITCH
MD 2WD/4WD ACTUATOR
JT RD/BK
SS STARTER SOLENOID
BAT BATTERY 12 VDC 18 AH
DC DC OUTLET
DC DC OPTION
SW WINCH RELAY
WM WINCH MOTOR
SWW WINCH SWITCH
OUT
FREE
IN
ECM ENGINE CONTROL MODULE
JT WH/BE
ECM ENGINE CONTROL MODULE
HAL
CV SPEED SENSOR
JT BK1
JT BK2
JT BK3
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LIGHTING SYSTEM

ZONE #	ZONE DESCRIPTION
1	STEERING AREA
2	MODULE AREA
3	FRONT OF VEHICLE
4	ENGINE AREA
5	REAR OF VEHICLE

JT RD/GN
JT RD/GY
JT OR/GN
CI
SPEEDOMETER & PILOT LAMPS
PF2 (1/2) MAIN FUSE (F8) 30 A
PF2 (2/2) FAN / ACCES. FUSE (F9) 30 A
PF1 MAIN RELAY (R2) 10 A
PF1 RELAYS SPEEDO FUSE (F4) 7.5 A
PF1 ACCESSORIES RELAY (R3) 30 A
JT OR/BU
JT RD/BE
PF1 ECM FUSE (F6) 5 A
PF1 ACCESSORIES FUSE (F7) 20 A
PR TAIL LIGHT
SS STARTER SOLENOID
JT RD/BK
CC (3/3) IGNITION KEY (LIGHTS)
OFF
ON
LIGHT
ON
BAT BATTERY 12 VDC 18 AH
JT RD/OR
MG (4/4) MULTIFUNCTION SWITCH (LIGHTS)
LO
HI
ECM ENGINE CONTROL MODULE
JT BU
JT GN
FRA BRAKE LIGHT SWITCH
PG LEFT HEAD LIGHT 35 W
PD RIGHT HEAD LIGHT 35 W
JT BK1
JT BK2
JT BK3
JT BK4

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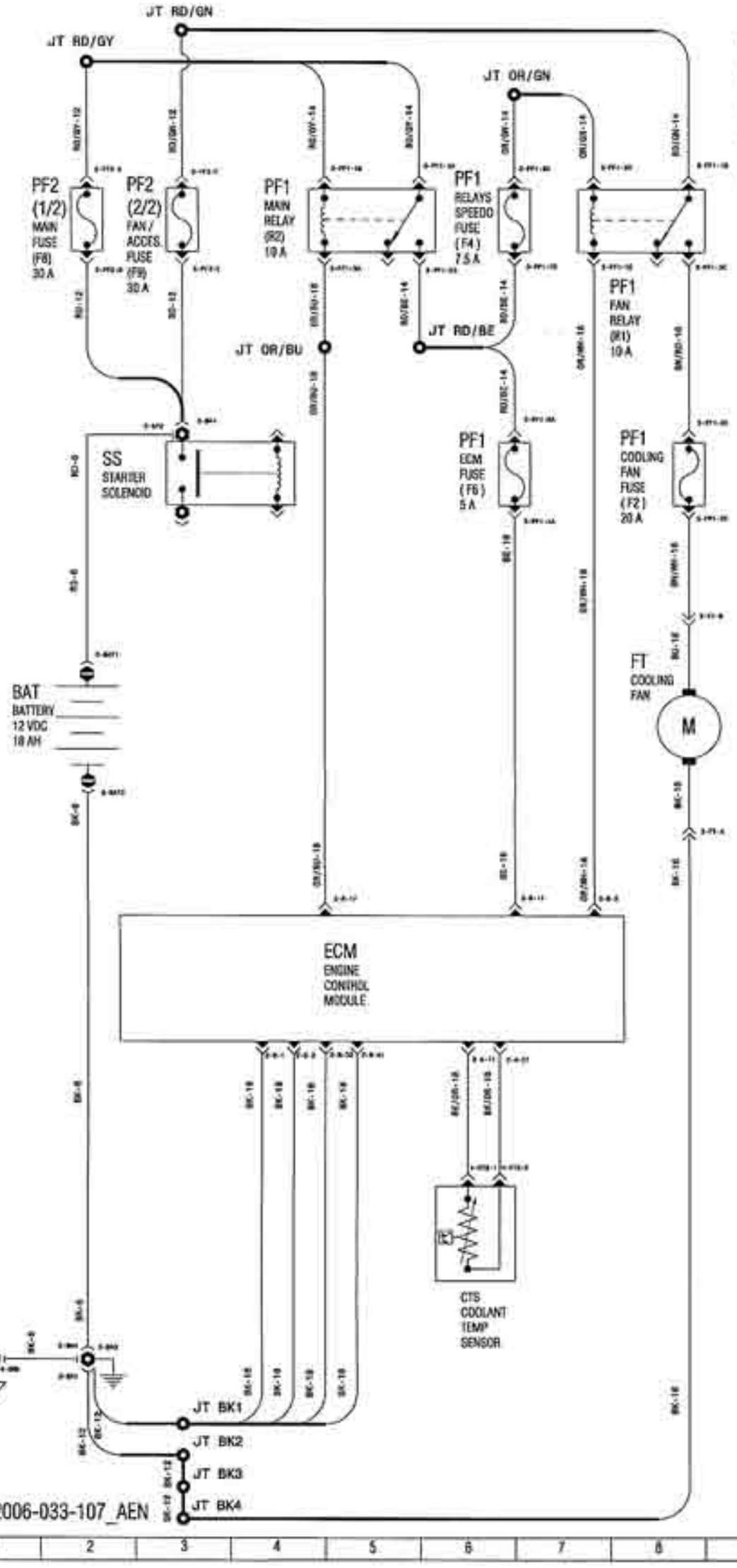
OUTLANDER 800 2006

COOLING SYSTEM

ZONE #	ZONE DESCRIPTION
1	STEERING AREA
2	MODULE AREA
3	FRONT OF VEHICLE
4	ENGINE AREA
5	REAR OF VEHICLE



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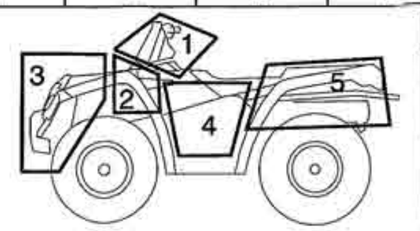
GENERAL SYSTEM



TERMINAL IDENTIFICATION		
	NAME	ZONE-CONNECTOR NAME-TERMINAL #/A
EX:	CI	1 - CI - 15
EX:	CV	4 - CV - A
EX:	ME	2 - ME

AWG	MAX. CURRENT	MAX. FUSE CURRENT	MAX. WATT
# 6	100 amps	125 amps	1450 watts
# 8	65 amps	80 amps	930 watts
# 10	40 amps	50 amps	580 watts
# 12	25 amps	30 amps	365 watts
# 14	16 amps	20 amps	230 watts
# 16	10 amps	15 amps	145 watts
# 18	6 amps	7.5 amps	85 watts
* AT	50°C MAX		

ZONE #	ZONE DESCRIPTION
1	STEERING AREA
2	MODULE AREA
3	FRONT OF VEHICLE
4	ENGINE AREA
5	REAR OF VEHICLE

- WELDED JOINT
- SHRINKED JOINT
- CROSSED WIRE
- WIRE BUS
- SIMPLE CONDUCTOR WIRE
- FEMALE TERMINAL
- MALE TERMINAL
- STEEL LINK (FRAME)
- TERMINAL

- FRAME GROUND
- EGINE GROUND
- PHILLIPS SCREW
- MUT CONNECTION
- SPLICE CONNECTION
- COMPONENT CONNECTION
- SECTION OF MODULE
- SLOTTED SCREW
- OPTIONAL

COLOR CODE	
BE	BEIGE
BK	BLACK
BU	BLUE
BN	BROWN
GN	GREEN
GY	GREY
OR	ORANGE
RD	RED
VI	VIOLET
WH	WHITE
YL	YELLOW
PK	PINK
LT BU	LIGHT BLUE

JT RD/GN
JT RD/GY
JT OR/GN
JT OR/BU
JT RD/BE
JT OR/BN
JT BK/GN
JT YL/BN
JT VI/BU
JT BE/GN
JT WH/BE
JT RD/BK
JT RD/OR
JT BK1
JT BK2
JT BK3
JT BK4
JT BU
JT GN

PF2 (1/2) MAIN FUSE (F8) 30 A
PF2 (2/2) FAN/ACCES. FUSE (F9) 30 A
CC (1/3) IGNITION KEY (DESS) — ON / OFF
PF1 MAIN RELAY (R2) 10 A
PF1 RELAYS SPEEDO FUSE (F4) 7.5 A
PF1 IGNITION COIL FUSE (F1) 5 A
HIC HARNESS INTER CONNEION
PF1 ONEWAY DIODE (D1)
PF1 FUEL PUMP FUSE (F5) 7.5 A
PF1 ECM FUSE (F6) 5 A
PF1 INJECTORS FUSE (F3) 5 A
HIC HARNESS INTER CONNECTION
BA IGNITION COIL
SS STARTER SOLENOID
PF1 FREE WEELING DIODE (D2)
BAT BATTERY 12 VDC 18 AH
SM STARTER MOTOR
RUN / STOP
MG (3/4) MULTIFUNCTION SWITCH (STOP)
FP (1/2) FUEL PUMP
INJ1 FUEL INJECTOR (FRONT)
INJ2 FUEL INJECTOR (REAR)
SPK1 SPARK PLUG (FRONT)
SPK2 SPARK PLUG (REAR)
RD RECTIFIER — U V W –
ECM ENGINE CONTROL MODULE
MG (1/4) MULTIFUNCTION SWITCH (START) — FREE / START
MG (2/4) MULTIFUNCTION SWITCH (OVERRIDE) — FREE / OVERRIDE
CA MAGNETO 400 WATTS
CTS COOLANT TEMP SENSOR
CC (2/3) IGNITION KEY (ON) — OFF / ON / LIGHT / ON
PRN SUBTRANSMISSION SWITCH
TPS TROTTLE POSITION SENSOR
MAPTS MANIFOLD AIR PRESSURE / TEMP SENSOR
OPS OIL PRESSURE SWITCH
CI SPEEDOMETER & PILOT LAMPS
FP (2/2) FUEL LEVEL SENSOR
DB DIAGNOSTIC CONNECTOR
IDLE IDLE BYPASS VALVE
CPS CRANK SHAFT POSITION SENSOR
BD 2WD/4WD SWITCH — 2WD / 4WD
SD 2WD/4WD ACTUATOR SWITCH
MD 2WD/4WD ACTUATOR
CC (3/3) IGNITION KEY (LIGHTS) — OFF / ON / LIGHT / ON
MG (4/4) MULTIFUNCTION SWITCH (LIGHTS) — LO / HI
PG LEFT HEAD LIGHT 35 W
PD RIGHT HEAD LIGHT 35 W
SW WINCH RELAY
WM WINCH MOTOR
SWW WINCH SWITCH — OUT / FREE / IN
DC DC OUTLET
DC DC OPTION
PF1 ACCESSORIES RELAY (R3) 30 A
PF1 ACCESSORIES FUSE (F7) 20 A
HIC HARNESS INTER CONNECTION
PF1 FAN RELAY (R1) 10 A
PF1 COOLING FAN FUSE (F2) 20 A
PR TAIL LIGHT
FT COOLING FAN
CV SPEED SENSOR
CAPS CAM SHAFT SENSOR
FRA BRAKE LIGHT SWITCH

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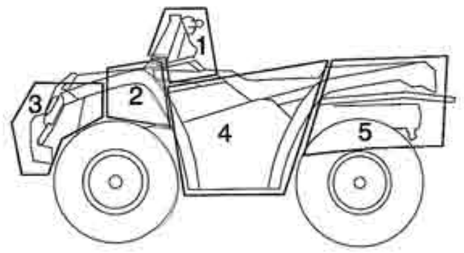
OUTLANDER 400 2006

GENERAL SYSTEM

TERMINAL IDENTIFICATION		
	NAME	ZONE-CONNECTOR NAME-TERMINAL #/A
EX:	CI	1 - CI - 15
EX:	CV	4 - CV - A
EX:	ME	2 - ME

ZONE #	ZONE DESCRIPTION
1	STEERING AREA
2	SERVICE COMPARTMENT
3	FRONT OF VEHICLE
4	ENGINE AREA
5	REAR OF VEHICLE



	COLOR	AWG SIZE
EX:	BK/YL	12

AWG	MAX. CURRENT	MAX. FUSE CURRENT	MAX. WATT
# 6	100 amps	125 amps	1450 watts
# 8	65 amps	80 amps	930 watts
# 10	40 amps	50 amps	580 watts
# 12	25 amps	30 amps	365 watts
# 14	16 amps	20 amps	230 watts
# 16	10 amps	15 amps	145 watts
# 18	6 amps	7.5 amps	85 watts
* AT	50°C MAX		

COLOR CODE	
BE	BEIGE
BK	BLACK
BU	BLUE
BN	BROWN
GN	GREEN
GY	GREY
OR	ORANGE
RD	RED
VI	VIOLET
WH	WHITE
YL	YELLOW
PK	PINK
LT BU	LIGHT BLUE

	FRAME GROUND
	EGINE GROUND
	PHILLIPS SCREW
	NUT CONNECTION
	SPLICE CONNECTION
	COMPONENT CONNECTION
	END OF MODULE
	SECTION OF MODULE
	SLOTTED SCREW

	WELDED JOINT
	SHRINKED JOINT
	CROSSED WIRE
	WIRE BUS
	SIMPLE CONDUCTOR WIRE
	FEMALE TERMINAL
	MALE TERMINAL
	STEEL LINK (FRAME)
	TERMINAL
	OPTIONAL

JT RD/VI2
JT RD/VI1
RD/VI-14
RD/YL-16
CC IGNITION KEY
OFF
ON / LIGHTS
ON
BF2 MAIN FUSE 20 A
FREE
START
MG MULTIFUNCTION SWITCH 1/4 (START)
MG MULTIFUNCTION SWITCH 2/4 (LIGHTS)
HI
LO
JT RD
JT GN
JT BU
RE RESISTOR 5 K ohms
BA IGNITION COIL
SPK SPARK PLUG
PG LEFT LIGHT 35 W
PD RIGHT LIGHT 35 W
PR TAIL LIGHT
ACCES. FUSE 15 A
COOLING FAN FUSE 20 A
MAIN FUSE 30 A
D6 FREE WEELING DIODE
C SIGNAL
ME CDI IGNITION MODULE
TRIGGER A
SS STARTER SOLENOID
(OPTIONAL : XT) TO SW
CA MAGNETO 400 WATTS
CPS TRIGGER COIL
DC DC OUTLET
DC DC OPTION
FT COOLING FAN
SM STARTER MOTOR
BAT BATTERY 12 VDC (18 AH)
IT COOLANT TEMP SWITCH (95°C)
BN
RD RECTIFIER
U1 U2 V1 V2 W1 W2
D2 ONE WAY DIODE
D3 ONE WAY DIODE
D1 ONE WAY DIODE
FRA BRAKE LIGHT SWITCH
PRN NEUTRAL SWITCH 2/3
PRN PARK SWITCH 1/3
PRN REVERSE SWITCH 3/3
N NEUTRAL
P PARK
R REVERSE
SWW WINCH CONTROL (OPTIONAL: XT)
IN
FREE
OUT
SWW WINCH RELAY
(OPTIONAL: XT) WINCH MOTOR
To BAT
ME CDI IGNITION MODULE
REVERSE F
STOP B
GROUND D
POWER E
MG MULTIFUNCTION SWITCH 3/4 (OVERRIDE)
FREE
OVERRIDE
MG MULTIFUNCTION SWITCH 4/4 (STOP)
STOP
RUN
CV SPEED SENSOR
BD 2WD/4WD SWITCH
2WD
4WD
CI SPEEDOMETER & PILOT LAMPS
KM / MI
GROUND
TEMP.
OIL
4WD
KM KM/MI CONNECTOR
TE MOTOR TEMP SWITCH
PM OIL PRESSURE SWITCH
SD 4WD SWITCH
MD 2WD/4WD ACTUATOR
CH CARB. HEATER 15 WATTS EACH
JT BK1
JT BK2
JT BK3
JT BK4

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