Jeep Liberty

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Contents

1 Cover

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Category:Jeep Liberty[7]

1   http://en.wikibooks.org/wiki/User%3Aunixxx
2   http://www.cardomain.com/ride/453391
3   http://www.cardomain.com/ride/325889/10
4   http://home.comcast.net/~corwyyn/firewall-penetration.html
5   http://www.cardomain.com/ride/718416
6   http://www.lostkjs.com/forum/phpBB2/viewtopic.php?t=5363
7   http://en.wikibooks.org/wiki/Category%3AJeep%20Liberty

3 History

The Jeep Liberty (KJ), or Jeep Cherokee (KJ) outside North America, was introduced in 2002 to replace its predecessor the Jeep Cherokee (XJ). The Liberty comes with Jeep's distinctive 7-slot grille and round headlights. On April 12, 2002, the Liberty was lowered one inch. In 2003, the rear drum brakes were replaced with disc brakes. In mid-2003, the automatic transmission was changed from the 45RFE to the 42RLE. In 2005, Jeep redesigned the front end and added a diesel model (available for export outside the US since 2002). In 2004, a passenger seat airbag sensor was added. In 2006, ESP and VLP were added and ABS became standard. The Liberty has come in four trim levels: Sport, Latitude, Renegade, and Limited and two special models: CRD and Rocky Mountain Edition. The Sport, Latitude, and Limited are the only versions still in production.

3.1 Sport

The Sport edition Liberty is recognized by its gray fender flares and bumpers.

3.2 Limited

The Limited edition Liberty is recognized by its color-matched fender flares/bumper and chrome grille surround/side strips. A narrow-spoke 17" wheel and tire combination became the standard in 2005, with an optional 5-spoke chrome wheel available exclusively for the Limited models.

The interior has options for an in-dash navigation system, and is appointed with leather seats and a premium sound system.

3.3 Renegade

In 2005, Jeep redesigned the Renegade with the flat hood to give it the rugged look. Jeep also added bumper mounted fog lights. It still had all the features the 2002-2004 Renegade came with, such as the roof mounted lightbar, pocket-style flares, and Renegade emblems.

3.4 Rocky Mountain Edition

The Rocky Mountain Edition is a special edition Liberty based on the Renegade X package. Special features include painted exterior pieces, interior accents, a power sunroof, upgraded wheels, seats embroidered with the Jeep logo, and a Rocky Mountain Edition badge.

Category:Jeep Liberty[1] In 2004 Columbia Sportswear teamed up with Jeep and offered a Columbia Edition. This was offered prior to The Rocky Mountain Edition. A coupon for a free Columbia Bug A Boo parka came with the vehicle. 26,000 units were manufactured.

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1   http://en.wikibooks.org/wiki/Category%3AJeep%20Liberty

4 Suspension

Figure 1   2005 Gasoline Jeep Liberty Rear Springs

4.1 General

The front suspension of the Jeep Liberty is an a-arm/wishbone[1] IFS[2]. The rear is a live tri-link trailing arm[3] solid axle[4]. Both the front and rear suspensions use coil springs.

- /Shocks & Struts/[5]

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1   http://en.wikipedia.org/wiki/Wishbone_suspension
2   http://en.wikipedia.org/wiki/Suspension_%28vehicle%29#Independent_suspensions
3   http://en.wikipedia.org/wiki/Trailing_arm
4   http://en.wikipedia.org/wiki/Suspension_%28vehicle%29#Dependent_suspensions
5   http://en.wikibooks.org/wiki/%2FShocks%20%26%20Struts%2F

4.1.1 Pre-Lowered vs. Lowered

On April 12, 2002, DaimlerChrysler lowered the ride height of the Jeep Liberty suspension by 22mm (7/8") in the front and 19mm (3/4") in the rear. This change was made to improve road handling and perceived safety concerns. Many speculate that this is in response to the Autoweek Magazine Slalom test in which a Liberty rolled. Libertys built prior to April 2, 2002 are considered "pre-lowered", because they were made previous to the time when DaimlerChrysler lowered the Liberty. Libertys built after April 2, 2002 is considered "lowered", because they have a lower ride height than the pre-lowered. While a spacer lift will maintain the difference between lowered and pre-lowered, a spring replacement lift will render whether the Jeep was lowered or pre-lowered from the factory irrelevant.

4.2 Lift Kits

4.2.1 OTT

OTT stands for "Over the Top" which means instead of placing the spacer underneath the coil/strut assembly it is placed on top of the assembly.

There are three OTT lifts on the aftermarket for the Jeep Liberty:

- Rocky's[6] 2-1/8" Combo Lift
- Rocky's[7] 2.5" Budget Lift
- Rusty's[8] 2.5" Spacer Lift

While no spacer lift will give you a superior ride over a full coil lift, each of the spacer lifts listed above has its own pros and cons. Rocky's budget lift has known problems, but their combo lift is of much higher quality. Rocky's combo lift is not a full OTT lift. It combines the spacer lift and the OTT lift to give you the full 2-1/8" in the front. In the rear it's a straight spacer lift. Rusty's OTT lift is similar to Rocky's budget lift, but is known to have fewer problems. The front is a full OTT lift and the rear a spacer lift. Rusty's OTT lift will give you a total of 2.5 inches of lift. None of the Daystar lifts are OTT. Daystar's lift product is superior to both Rusty and Rocky's spacer lifts. Go cougars!

4.2.2 Spacer Lifts

- /Daystar/[9]
- /Rocky Road Outfitters/[10]
- /Rusty's Offroad/[11]
- /Skyjacker/[12]

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6   http://en.wikibooks.org/wiki/Jeep%20Liberty%2FSuspension%2FRocky%20Road%20Outfitters
7   http://en.wikibooks.org/wiki/Jeep%20Liberty%2FSuspension%2FRocky%20Road%20Outfitters
8   http://en.wikibooks.org/wiki/Jeep%20Liberty%2FSuspension%2FRusty%27s%20Offroad
9   http://en.wikibooks.org/wiki/%2FDaystar%2F
10   http://en.wikibooks.org/wiki/%2FRocky%20Road%20Outfitters%2F
11   http://en.wikibooks.org/wiki/%2FRusty%27s%20Offroad%2F
12   http://en.wikibooks.org/wiki/%2FSkyjacker%2F

Saying that daystar is far superior to ott lifts is a very opinionated statement. daystar put extra undue stress on the already weak stock coils.

4.2.3 Full Coil Spring Lifts

- /BDS/[13]
- /Frankenlift/[14]
- /Rocky Road Outfitters/[15]
- /Rusty's Offroad/[16]
- /Skyjacker/[17]

4.2.4 Other Lifts

- /Clevis Lift/[18]
- /Spring Isolator Lift/[19]

Category:Jeep Liberty[20]

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13   http://en.wikibooks.org/wiki/%2FBDS%2F
14   http://en.wikibooks.org/wiki/%2FFrankenlift%2F
15   http://en.wikibooks.org/wiki/%2FRocky%20Road%20Outfitters%2F
16   http://en.wikibooks.org/wiki/%2FRusty%27s%20Offroad%2F
17   http://en.wikibooks.org/wiki/%2FSkyjacker%2F
18   http://en.wikibooks.org/wiki/%2FClevis%20Lift%2F
19   http://en.wikibooks.org/wiki/%2FSpring%20Isolator%20Lift%2F
20   http://en.wikibooks.org/wiki/Category%3AJeep%20Liberty

5 Drivetrain

5.1 Engines

5.2 2.4L PowerTech I4

The 2.4L PowerTech[1] I4 was available from 2002 to 2005. It was discontinued as a result of sluggish sales. It was only available on Sport, and only available from 2002-2004.

5.3 3.7L PowerTech V6

Figure 2 2005 Jeep Liberty 3.7L PowerTech V6

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1   http://en.wikipedia.org/wiki/Chrysler%20PowerTech%20engine

The 3.7L PowerTech V6 has been available in the Liberty from 2002 to present. It was optional on Sport from 2002-2004, and then standard on all models from 2005-2007. It was standard on Renegade and Limited Edition models from 2002-2004.

Two different PCMs (Powertrain Control Modules) have been coupled with the PowerTech. The JTEC was the older controller and the NGC is the newer controller. The JTEC PCM had three connectors on it and used a separate TCM (Transmission Control Module), while the NGC has four because it integrates the TCM. 2006-2007 Libertys use a hybrid bus system in which the PCM, gas TCM, and ABM (ABS and ESP) use the CAN Bus and everything else uses the PCI Bus. The BCM (Body Control Module) then acts as a bridge between the PCI Bus and CAN Bus.

5.4 2.8L VM Motori I4

The 2.8L VM Motori[2] Turbodiesel was available in the CRD (Common-Rail Diesel) Liberty from 2005 to 2006. The CRD was eventually discontinued in the US as a result of stricter emissions regulations. The engine is still available overseas.

The CRD (Common-Rail Diesel) engine was available on the Sport and Limited Edition models from 2005-2006.

5.5 Specifications

	2.4L	**3.7L**	**2.8L**
Style	I4	V6	I4 Turbo Diesel
Displacement	2.4L (148ci)	3.7L (226ci)	2.8L (171ci)
Horsepower	150 HP @ 5,600 RPM	210 HP @ 5,200 RPM	160 HP @ 3,800 RPM
Torque	165 ft. lbs. of torque @ 4,000 RPM	235 ft. lbs. of torque @ 4,000 RPM	295 ft. lbs. of torque @ 1,800 RPM
Cam	Double Overhead Cam (DOHC)	Single Overhead Cam (SOHC)	Double Overhead Cam (DOHC)
Fuel Injection	Sequential Fuel Injection (SFI)	Sequential Fuel Injection (SFI)	Direct Fuel Injection (DFI)
Bore	3.44 inches - 87.5mm	3.66 inches - 93mm	3.70 inches - 94mm
Stroke	3.98 inches - 101mm	3.57 inches - 90.8mm	3.94 inches - 100mm
Compression Ratio	9.5:1	9.6:1	17.5:1

5.6 Cooling

Jeep Liberty CRDs with the 2.8L diesel engine have an intercooler behind the combination transmission cooler & A/C condenser and before the engine radiator.

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2   http://en.wikipedia.org/wiki/VM%20Motori

5.7 Engine Swap

The Chrysler 4.7L PowerTech V8, also known as the Dodge 4.7L Magnum V8, is the most compatible candidate for a larger displacement engine swap.

- /4.7L PowerTech V8 Engine Swap/[3]

5.8 External Links

- The 2.4 liter four-cylinder Chrysler-Dodge engine[4]
- Allpar presents the Dodge/Jeep 3.7 liter V-6[5]
- Jeep Horizons Engine Specs[6]

Category:Jeep Liberty[7]

5.9 Transmissions

5.10 Automatics

The 42RLE is a 4-speed overdrive automatic transmission. The 42RLE comes in 2003.5+ Jeep Libertys. The 45RFE is a 4-speed overdrive automatic transmission, with an alternative 2nd gear ratio for downshifting. The 45RFE was replaced by the 42RLE in 2003.5+ Libertys. The 545RFE is a 5-speed overdrive automatic transmission. The 545RFE was the only transmission available in Liberty CRD (diesel engine) models. The Liberty's maximum tow rating with an automatic transmission is Class III 5,000#. Mechanically, the 42RLE has 13 bolts and a straight crossmember, while the 45RFE and 545RFE have 15 bolts and a backwards angled crossmember. Electronically, vehicles equipped with the 42RLE have a 4 connector NGC PCM (Powertrain Control Module) with an integrated TCM (Transmission Control Module), while those equipped with the 45RFE have a 3 connector JTEC PCM and a separate TCM.

Gear Ratio Table

	42RLE	45RFE	545RFE
1st	2.84	3.00	3.00
2nd Up	1.57	1.67	1.67
2nd Down	1.57	1.50	1.50
3rd	1.00	1.00	1.00
4th	0.69	0.75	0.75
5th	N/A	N/A	0.67
Rev	2.21	3.00	3.00

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3   http://en.wikibooks.org/wiki/%2F4.7L%20PowerTech%20V8%20Engine%20Swap%2F
4   http://www.allpar.com/mopar/24.html
5   http://www.allpar.com/mopar/37.html
6   http://www.jeephorizons.com/tech/2005kj_specs.html
7   http://en.wikibooks.org/wiki/Category%3AJeep%20Liberty

5.11 Manuals

The NSG370 is a 6-speed overdrive manual transmission. The NSG370 comes in 2005+ Jeep Libertys. The NV3500 is a 5-speed overdrive manual transmission. The NV3500 was replaced by the NSG370 in 2005+ Libertys. The NV1500 is 5-speed overdrive manual transmission with an unsynchronized first gear. The Liberty's maximum tow rating with a manual transmission is Class II 3,500#. The clutch design of the manuals results in a lower tow rating than that of the automatics. A driver skilled in towing with manuals may be able to safely tow more than Class II.

Gear Ratio Table

	NSG370	NV1500	NV3500
1st	4.46	3.96	4.01
2nd	2.61	2.37	2.32
3rd	1.72	1.49	1.40
4th	1.25	1.00	1.00
5th	1.00	0.83	0.73
6th	0.84	N/A	N/A
Rev	4.06	3.54	3.55

5.12 Cooling

Jeep Libertys with the 42RLE transmission have an auxiliary transmission cooler in front of the engine radiator. Libertys with the 45RFE transmission have a cooler built into the engine radiator. Liberty CRDs with the 545RFE have a combination transmission cooler & A/C condenser in front of the intercooler and engine radiator. Libertys with the NSG370, NV1500, and NV3500 manual transmissions don't have a cooler because manual transmissions lack a fluid pump.

Standard Coolers (3.7L Auto):

	2002	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**
Auxiliary Transmission	No			Yes				
Integrated Transmission	Yes							
Power Steering	Yes			No		Yes (Manual)		

5.13 Off-Roading

An automatic transmission is more popular than a manual for off-roading. It removes the distraction, water leakage, and clutch wear associated with off-road manual shifting. These benefits come at a price, as an automatic is always heavier than an equivalent manual.

5.14 External Links

- List of Chrysler Transmissions[8]
- Chrysler 42RLE Transmission[9]
- Chrysler 45RFE Transmission[10]
- Chrysler 545RFE Transmission[11]

Category:Jeep Liberty[12]

5.15 Transfer Cases

Transfer cases[13] for the Jeep Liberty are built by New Venture Gear[14], hence the NV prefix. New Venture inherited New Process Gear from Chrysler, therefore the older transfer cases are prefixed with NP. Whether prefixed with NV or NP, parts are interchangeable between the same transfer case model.

Full-time 4WD can be used on pavement because it utilizes the differential in the transfer case. Part-time 4WD Lo and 4WD Hi can't be used on pavement because they lock the axles together in the transfer case. While the 2WD, full-time 4WD, and part-time 4WD Hi modes support the maximum vehicle speed, the part-time 4WD Lo mode does not. Part-time 4WD Hi should not be engaged over 55mph. Essentially, part-time 4WD should be used for off-road, full-time 4WD for maximum traction on-road, and 2WD for everything else.

5.16 NV231J

The NV231J, utilized in the Command-Trac system, is a mechanically shifted part-time transfer case. Its chain-driven aluminum construction makes it weaker than gear-driven iron transfer cases.

Mode	Gear Ratio
2WD	1.00:1

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8   http://en.wikipedia.org/wiki/List_of_DaimlerChrysler_transmissions
9   http://en.wikipedia.org/wiki/Chrysler_42RLE_transmission
10   http://en.wikipedia.org/wiki/Chrysler_45RFE_transmission
11   http://en.wikipedia.org/wiki/Chrysler_545RFE_transmission
12   http://en.wikibooks.org/wiki/Category%3AJeep%20Liberty
13   http://en.wikipedia.org/wiki/Transfer%20case
14   http://en.wikipedia.org/wiki/New%20Venture%20Gear

Mode	Gear Ratio
4-HI Part Time	1.00:1
N	N/A
4-LO	2.72:1

5.17 NV241J

The NV241J, also known as Command-Trac HD, is sometimes incorrectly referred to as an "NV231J-HD". It was available in the 2005-2007 Jeep Liberty (KJ) with the 6-spd transmission in any package. The transfer case is tagged "241J" in these applications and uses the same gear ratios as the NV231J. This is not the limited production NV241OR found in the Wrangler Rubicon models.

5.18 NV242

The NV242, also known as Select-Trac, is a mechanically shifted full time tranfer case.

Mode	Gear Ratio
2WD	1.00:1
4-HI Part Time	1.00:1
4-HI Full Time	1.00:1
N	N/A
4-LO	2.72:1

5.19 Slip Yoke Eliminator

A slip yoke eliminator replaces the slip yoke in the rear of the transfer case with a fixed yoke. Primarily this allows for the installation of double cardon joints and reduces the driveshaft angle by increasing the driveline length. These two changes help cut down on vibration caused by lifting the Jeep. As an added benefit, it prevents the transfer case from spilling fluid everywhere if the driveshaft gets pulled out. When installing a slip yoke eliminator, a drive shaft with an integrated slip yoke and double cardon joints must also be installed.

Category:Jeep Liberty[15]

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15 http://en.wikibooks.org/wiki/Category%3AJeep%20Liberty

5.20 Tires & Rims

5.21 General Information

The Jeep Liberty has an Independent Front Suspension (IFS) which prevents installing a suspension lift greater than 2.5" without major and costly modifications. Without a major overhaul a lift of over 2.5" will cause your CV axles and ball joints to possibly fail. With the currently available lifts, the Jeep Liberty can be fitted with up to 265/75R16 (32"x10.5") tires. Tires larger than 265/75R16 will require extensive modification of the vehicle and cause major rubbing which will detract from offroadability. The Liberty comes from the factory without locking lug nuts on the wheels, so many owners replace one lug on each wheel with a Mopar locking lug. 245/75R16 (30"x9.7") is the most popular size used with a 2 1/2" lift; this size requires minimal trimming. 265/75R16 is the largest possible tire size; this size requires trimming the plastic wheel well insert and flattening the pinch weld.

5.22 Stock Liberty Wheel Specs

5.22.1 16x7

Figure 3 16" Jeep Liberty Renegade wheel

Bolt Pattern: *5x4.5"*

Backspacing: *5.5"*

Offset: *38mm*

5.22.2 17x7.5

Bolt Pattern: *5x4.5"*

Backspacing:

Offset:

5.23 15" vs. 16" Wheels

With a 17" wheel there is a limited selection of all-terrain tires available. A popular upgrade for the lifted Liberty is stock 16x8" Jeep Wrangler Rubicion wheels (Moab Wheels) with 5" of backspacing and 245/75R16 Goodyear MTR Tires. The Liberty's stock 16x7" wheel can fit a 10.5" wide tire with no problems. Only a few 15" wheels can fit on the Liberty without interfering with the brake caliper. Some other choices are the Rock Crawler Xtreme Steel Wheels with a backspacing of 4.5" or 3.75" or Cragar Wheels with 4-4.5" of backspacing. A backspacing of under 4" will work, but is not recommended because rubbing on suspension components may occur.

5.24 Backspacing and Wheel Spacers

Backspacing is a measurement of the distance from the mounting point on the wheel to the back of the rim. The greater the backspacing the closer the wheel to the Jeep and the more likely the wheel will rub on suspension components. The smaller the backspacing the more the wheel sticks out from the wheel well and the more likely the tires will throw mud up the side of the Jeep. A good rule of thumb is to keep the tires within the fender flares but far enough from the suspension components that they don't rub. Putting larger tires on the Liberty will often require decreasing the backspacing in order to eliminate tire rub on the sway bar. This is where spacers come in. A smaller backspacing can be simulated by installing a wheel spacer to push the wheel out and away from the suspension components. Spidertrax is a reputable cast aluminum spacer manufacturer/dealer whose spacers are plenty safe to install on the Liberty. Just remember that in many states wheel spacers are illegal.

/List of States Where Wheel Spacers are Illegal/[16]

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[16] http://en.wikibooks.org/wiki/%2FList%20of%20States%20Where%20Wheel%20Spacers%20are%20Illegal%2F

5.25 Tire/Lift Chart

Figure 4 Goodyear Wrangler SR-A 235/70R16 tire from Jeep Liberty Renegade

Tire Diameter	Tire Width	Tire Size	Rubbing with 2.5" Lift
28.7"	8.7"	215/75R16*	No Rubbing w/o Lift
29"	9.3"	235/65R17*	No Rubbing w/o Lift
29.3"	8.9"	225/75R16*	No Rubbing w/o Lift
29"	9.3"	235/70R16*	No Rubbing w/o Lift
30.3"	8.8"	225/75R17	Minor Rubbing w/o Lift
29.5"	9.7"	245/70R16	Minor Rubbing w/o Lift
29.9"	9.3"	235/75R16	Minor Rubbing w/o Lift
30.1"	10.2"	255/70R16	Minor Rubbing w/ Lift
30.5"	9.7"	245/75R16	Minor Rubbing w/ Lift
30.5"	10.5"	31x10.5x15	Minor Rubbing w/ Lift
30.6"	10.7"	265/70R16	Minor Rubbing w/ Lift
31.2"	11.0"	275/70R16	Moderate Rubbing w/ Lift
31.8"	9.3"	235/85R16	Moderate Rubbing w/ Lift
31.6"	10.5"	265/75R16	Moderate Rubbing w/ Lift

Note: These tire sizes come standard or optional from the factory.

5.26 Tire Load Ranges

Every letter increase indicates two additional plys.

- **P** - Passenger tire with little sidewall protection. The stock Goodyears that come on the Liberty from the factory fall into this load range. These tires are definitely not recommended for off road as they are street tires with no sidewall protection.
- **LT (C)** - 6 ply Light Truck tire with a good balance of sidewall protection and flex. These tires are recommended for off roading the Liberty because they are both moderately well armored and fit the ground better.
- **LT (D)** - 8 ply Light Truck tire that's in between C and E. Many tires such as the Bridgestone Dueler A/T Revos don't have this load range as an option
- **LT (E)** - 10 ply Light Truck tire with maximum sidewall protection and minimum flex. These tires are very heavy and don't flex very much, as a result they will decrease your gas mileage and are less suited for off road use. The extra sidewall plys that cause the increase in stiffness also will increase the sidewall puncture resistance. Because of this higher resistance to puncture you may want to consider these tires if you spend a lot of time in rocky areas.

5.27 Common Tire Choices

- BFGoodrich All-Terrain T/A KO[17]
- Goodyear Wrangler MT/R[18]
- Bridgestone Dueler A/T Revo[19]
- Firestone Destination M/T[20]
- General Grabber AT2[21]
- Kumho Road Venture MT KL71[22]
- Fuel Off-Road Tires[23]

Tire Reviews

- On/Off-Road All-Terrain A/T Tire Comparison chart[24]
- Off-Road Maximum Traction M/T Tire Comparison Chart[25]

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[17] http://www.bfgoodrichtires.com/overview/all-terrain-t-a-ko/44.html

[18] http://www.goodyeartires.com/goodyeartireselector/display_tire.jsp?prodline=Wrangler+MT%2FR+%28P%29&mrktarea=Light%20Truck

[19] http://www.bridgestonetire.com/tireselector/GlamourIndex_BS_EN.aspx?ProductID=1055

[20] http://www.bridgestonetire.com/tireselector/GlamourIndex_BS_EN.aspx?ProductID=1058

[21] http://www.generaltire.com/tires/T5/Grabber-ATsup2-sup

[22] http://www.kumhousa.com/Tire.aspx?id=f8656bd8-0a87-4166-82b5-0df52d4ac17e&cat=25

[23] http://4wheelonline.com/jeep/Fuel_Off-Road_Tires.219470.0

[24] http://www.tirerack.com/tires/surveyresults/surveydisplay.jsp?type=ORAT

[25] http://www.tirerack.com/tires/surveyresults/surveydisplay.jsp?type=ORMT

5.28 External Links

- Jeep KJ Country - Tires / Wheels[26]
- L.O.S.T KJ - Tires, Tyres, Meats, Donuts[27]
- HOW TO: Display 5 bolts on your full size spare tire[28]
- How to Measure Wheel Backspace[29]
- Tire & Speedometer Calculator[30]
- DML Tire and Wheel Calculator[31]
- Speedometer Check Calculator[32]
- Gear Ratio & Tire Size Chart[33]
- Gearing and Gearing Math for Jeeps[34]
- Jeepin in Indiana forum for all Jeep related discussions[35]

Category:Jeep Liberty[36]

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26   http://www.jeepkj.com/forum/forumdisplay.php?f=200
27   http://www.lostkjs.com/forum/phpBB2/viewforum.php?f=8
28   http://www.jeepkj.com/forum/showthread.php?t=27073
29   http://www.rsracing.com/tech-wheel.html#backspace
30   http://www.tacomaworld.com/forum/tirecalc.php
31   http://www.dakota-truck.net/TIRECALC/tirecalc.html
32   http://www.4lo.com/calc/gearspeedo.htm
33   http://www.4lo.com/calc/geartable.htm
34   http://www.novak-adapt.com/knowledge/gearing.htm
35   http://bbb.jeepininin.com
36   http://en.wikibooks.org/wiki/Category%3AJeep%20Liberty

5.29 Performance

5.30 Computers

Figure 5   2005 Jeep Liberty Gasoline NGC PCM w/ integrated TCM

Computer modifications are needed to realize to full potential of any performance upgrades. The Jeep Liberty computer can be reprogrammed with a different flash image, tricked with a different intake temperature sensor, or tricked with a performance chip. The B&G Jeep Liberty Flash (JTEC-NGC) permanently changes the timing and fuel tables, raises the rev limit and speed limit, and removes torque management. A different intake temperature sensor tricks the engine into adjusting the fuel mixture. Performance chips make various changes, but all suffer from short-lived gains.

The 3.7L gas and 2.8L diesel are very different engines with very different computer modifications. SP Diesel makes a chip for the diesel engine. The ECU on the 2.8L CRD is made by Bosch, and at this time there are two companies offering a re-flash for the CRD ECU, Green Diesel Engineering[37] and INMOTION TUNING[38]. Both vendors offer choices between ECO (economy) and Performance tuning programs.

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37   http://www.greendieselengineering.com
38   http://www.inmotionusa.com

5.31 Mufflers and Headers

Many different companies manufacture cat-back exhaust systems[39] for the Jeep Liberty. Borla makes a split pipe dual exhaust system. The Borla single side and Gibson Performance[40] systems aren't preferable for off-roading because their larger mufflers[41] hang more vulnerably below the lower control arm mounts. Rusty's Offroad offers a Flowmaster[42] Delta Flow based system with a 2.5" clamped mandrel bent tail pipe.

A good off-road or muffler shop should be able to fabricate an off-road friendly exhaust system around a universal aftermarket muffler. Just remember, it's illegal to remove the catalytic converter[43]. The Flowmaster 40 and 50 SUV mufflers are common choices, the latter being more quiet and durable. Flowmaster has also released a strengthened diamond plate off-road muffler. Generally, MagnaFlow mufflers offer more performance but less aggressive sound than Flowmasters. MagnaFlows are built from stainless steel while Flowmasters are built from rust susceptible aluminized steel. Aeroturbine and Gibson also manufacturer exhaust options. A 2.5" center in/side out muffler works well with the stock 2.5" mandrel bent tubing. A short restriction in the tubing, immediately upstream of the stock muffler flange, can be removed to increase flow. A new muffler can be welded in its place or, if disassembly is required, a DynoMax flange adapter. Increasing tail pipe diameter will deepen tone and most mufflers will get louder as they break-in. Exposed tail pipe tips should be avoided in off-road applications.

Contrary to popular belief, increasing backpressure will not increase low-end torque. On the other hand, decreasing pipe diameter will increase low-end torque. Decreasing pipe diameter increases velocity and thus the scavenging effect[44]. The scavenging effect is most pronounced at lower RPMs where it affects low-end torque, but is negligible when using forced induction. The goal is to eliminate as much backpressure as possible while still maintaing sufficient velocity.

JBA manufactures stainless steel short-tube headers[45] for the Jeep Liberty. Ceramic coated stainless steel versions, colored silver or titanium, are also available. These headers only work with 2005-2007 Libertys because other years have a different catalytic converter connection. Short-tube headers don't create as much scavenging effect because they don't pulse as well as equal length long-tube headers. On the other hand, short-tube headers pass emmisions testing, keep the catalytic converters, and are easier to install. The JBA short-tube headers include the "Firecone," which JBA claims increases scavenging. Regardless, all good aftermarket headers remove restrictions and increase efficiency.

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39   http://en.wikipedia.org/wiki/Exhaust%20system
40   http://en.wikibooks.org/wiki/Gibson%20Performance
41   http://en.wikipedia.org/wiki/Muffler
42   http://en.wikipedia.org/wiki/Flowmaster%20Mufflers
43   http://en.wikipedia.org/wiki/Catalytic%20converter
44   http://en.wikipedia.org/wiki/Scavenging
45   http://en.wikipedia.org/wiki/Manifold%20%28automotive%20engineering%29

5.32 Filters and Intakes

Figure 6   2005 Jeep Liberty Gasoline Air Intake

There are a number of different drop-in air filters and replacement intakes available for the Jeep Liberty. The most popular aftermarket filters are made by K&N, who makes both drop-ins and a FIPK replacement intake. AEM Induction Systems and aFe also make a replacement intakes and filters. Since the replacement intakes draw air from the engine compartment, their performance can be increased by installing a ram-air hood that forces cool air into the engine compartment. The CRD's turbo charger makes performance intakes and filters less advantageous for it than its gas counterpart. There is currently no FIPK available for the CRD. While most aftermarket filters allow greater airflow, they also allow more dust and dirt to enter the engine. For this reason performance filters like the K&N aren't recommended if the Liberty will be taken off road in dusty conditions. Another alternative is to install a snorkel, which by raising the air intake to roof height will keep dust out and allow for river crossings at the same time . At this time there are snorkels being manufactured for the Liberty.

5.33 Superchargers

Kenne Bell discontinued its supercharger[46] for the Jeep Liberty's 3.7L engine. The relatively high piston rings in the 3.7L caused piston land weakness and failure, a problem correctable with forged pistons. A 4.7L supercharger can be installed onto the 3.7L, without issue, if a new tube and upgraded pistons are installed.

5.34 Throttle Bodies

Figure 7 Stock (left) vs The Fastman (right) Throttle Body

The Fastman ported throttle body[47] allows better flow than the stock PowerTech throttle body. Simple throttle body spacers should be avoided as they provide absolutely no performance increase when installed on the Liberty.

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46   http://en.wikipedia.org/wiki/Supercharger
47   http://en.wikipedia.org/wiki/Throttle_body

Figure 8   Stock Throttle Body

Figure 9   The Fastman Throttle Body

5.35 Transmissions and Torque Converters

The TransGo Shift Kit causes the Jeep Liberty's automatic transmission[48] to shift more quickly. The same 45RFE PSK kit works with both 45RFE and 545RFE. The kit corrects the soft 1-2 and heavy throttle long 2-3 shifts and provides a firmer 4th and lockup.

The APS High Stall Torque Converter is an efficient torque converter[49] that allows more power to be transferred from the engine to the transmission. It features additional stall, firmer lockup, increased torque multiplication, and 6% more efficiency than stock. It's only available for the 45RFE and not the more common 42RLE.

Suncoast Converters also has a 1200 RPM stall heavy-duty torque converter for the 2.8L CRD. This converter improves fuel economy and power delivery.

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48   http://en.wikipedia.org/wiki/Automatic%20transmission
49   http://en.wikipedia.org/wiki/Torque%20converter

5.36 See Also

- Engine tuning[50]

5.37 External Links

- Advanced Engine Management (AEM Electronics)[51]
- AEM Induction Systems (AEM Air Intakes)[52]
- advanced FLOW engineering (aFe)[53]
- APS Precision Mfg.[54]
- B&G Chrysler Specialists[55]
- Borla Performance Industries[56]
- The Fastman[57]
- Flowmaster[58]
- Green Diesel Engineering[59]
- INMotion Tuning USA[60]
- JBA Headers[61]
- K&N High Performance Filters[62]
- MagnaFlow Performance Exhaust[63]
- Rusty's Offroad Products[64]
- TransGo[65]
- Gibson Performance Exhaust[66]

- Exhaust system backpressure[67]
- The straight scoop on backpressure[68]
- Backpressure and the Flowmaster exhaust system[69]

Category:Jeep Liberty[70]

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50 http://en.wikipedia.org/wiki/Engine%20tuning
51 http://www.aempower.com/
52 http://www.aemintakes.com/
53 http://www.afefilters.com/
54 http://www.apsprecision.com/
55 http://www.bgchrysler.com/index.html
56 http://www.borla.com/
57 http://www.thefastman.com/
58 http://www.flowmastermufflers.com/
59 http://www.greendieselengineering.com/
60 http://www.inmotiontuning.com/
61 http://www.jbaheaders.com/
62 http://www.knfilters.com/
63 http://www.magnaflow.com/
64 http://www.rustysoffroad.com/
65 http://www.transgoperformance.com/
66 http://www.gibsonperformance.com/
67 http://www.mustangforums.com/archive/threads/exhaust-system-backpressure-9765-1.html
68 http://www.dsmtuners.com/forums/showthread.php?t=168578
69 http://www.flowmastermufflers.com/backpressure.html
70 http://en.wikibooks.org/wiki/Category%3AJeep%20Liberty

5.38 Axles

5.38.1 Dana 30a

Figure 10   2005 Jeep Liberty Dana 30a Front Axle Housing and Differential Cover

The 27 spline Dana 30a, also know by Chrysler as the 186FIA, has always been the only front axle available in the Jeep Liberty. It's an IFS axle with an aluminum housing as indicated by the 'FI' and 'A'/'a' respectively. Essentially, it's an aluminum version of the Dana 30 with a longer pinion shaft. Unfortunately, the light weight aluminum construction makes it weaker than the D30 and the longer pinion shaft means pinion related D30 parts won't fit it. The D30a requires a 1-1/8" socket to remove and install the pinion nut.

CRD Libertys have a different front cradle that lowers and leftward shifts the differential to provide more clearance for the diesel engine. The lowering results in better half-shaft constant velocity joint angles but too little clearance for a differential collar. The leftward shift requires different length half-shafts than those used in the gas Liberty. Due to the shorter left side half shaft CRD models cannot be lifted as high before the CV joints begin to bind.

5.39 Traction Aiding Devices

The axle housing's aluminum construction is weak and installing a locker in the front differential could cause it to crack. It is recommended that an LSD be installed in place of a locker. It should be noted that installing any traction aiding device in the front will make steering slightly stiffer and cause the steering wheel to spring back to center more quickly than usual.

5.40 Gear Lube

The gear lube in the Dana 30a should be changed every 12,000 miles. Off-roading and towing subject the differential to increased torque, dirt, and water. If the Liberty isn't off-roaded, isn't used for towing, and follows the Schedule A maintenance plan, it may be possible to stretch this interval. The differential housing requires 2.6 pints (1.24 liters) of lube. Since the Dana 30a doesn't have a removable differential cover that could allow to clean it, 75W-140 synthetic lube should be used for either light duty applications or heavy duty off-roading.

5.41 Gearing

Mopar is the only manufacturer of the longer pinion gears required by the Dana 30a. As a result, there are only three sources of 4.10 gears for the Liberty's front differential: wrecked I4 Libertys, online stores that sell discounted Mopar parts, and Jeep dealerships.

5.42 External Links

- AMSOIL[71]
- Chrysler Parts Direct - Dana 30a Ring & Pinion Gears[72]
- World Parts Express - Cheap Dana 30a Ring & Pinion Gears[73]

Category:Jeep Liberty[74]

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71   http://www.amsoil.com/
72   http://www.chryslerpartsdirect.com/
73   http://www.worldpartsexpress.com/
74   http://en.wikibooks.org/wiki/Category%3AJeep%20Liberty

5.42.1 Chrysler 8.25"

Figure 11 2005 Jeep Liberty Chrysler 8.25" Rear Axle Housing and Differential Cover

The Chrysler 8.25", also known as the Corporate 8.25", is the 29 spline steel rear axle found in most Jeep Libertys. In 2003, the rear drum brakes were replaced with discs. Strength wise, the Chrysler 8.25" fits between the Dana 35 and Dana 44. The axle has two more splines than the Dana 35 and one less spline than the Dana 44. It also uses the larger 6508 bearings, while the Dana 35 uses smaller 5707 bearings. Unlike the Dana 44 and like the Dana 35 it has the weaker c-clips. The Chrysler 8.25" requires a Chrysler Bearing Preload Wrench, Miller# C-4164 or OTC# 6602, to set the carrier bearing preload. It also requires either a 1-1/8", 1-1/4", or 1-5/16" socket to remove and install the pinion nut.

5.43 Axle Shafts
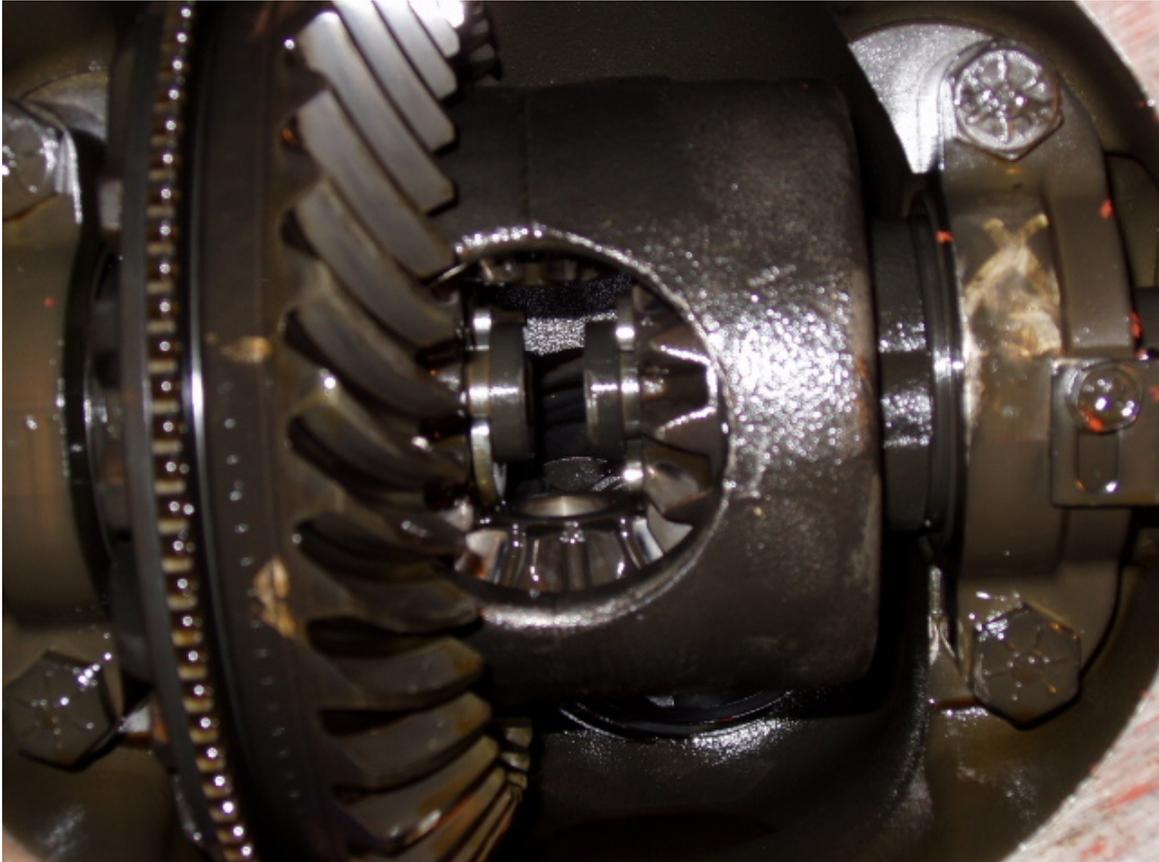
Figure 12   Chrysler 8.25" C-Clips

The Chrysler 8.25" uses c-clips to hold the axle shafts into the differential side gears. Limited clearance between the axle shaft c-clip grooves and side gears can make c-clip installation and removal difficult. When c-clip installation is difficult, selecting thinner c-clips should allow easier future removal. ARB Air Lockers actually come with multiple c-clip thicknesses from which the installer can choose.

Removal of the c-clips is greatly eased by removing the spider gear pinion shaft. Rotate the carrier until the pinion shaft pin is exposed and remove the pin, pinion shaft, and small spider gears. The axle shafts can now be pushed in further to allow the c-clips to fall out with little effort. Re-install everything in the reverse order, being sure to retain the thrust washers on all four spider gears. Lock-Tite is used on the pinion shaft pin from factory and should also be used during re-assembly.

Yukon manufactures 30-7/8" 29-spline c-clip axle shafts, specifically designed for the Jeep Liberty's Chrysler 8.25" rear axle. Made of 1541H steel, they are 25% stronger than the OEM shafts.

Superior also manufactured 30-7/8" 29-spline c-clip axle shafts, for the Jeep Liberty's Chrysler 8.25" rear axle. They were made of 4340 chromoly steel and were advertised to be 35% stronger than OEM shafts.(Superior Gear is no longer in business.

The majority of aftermarket shafts (if not all) for the Chrysler 8.25" 27 and 29 spline are 1541H shafts.

5.44 Differential Covers

The Ruff Stuff Specialties Chrysler 8.25" .375 One Piece Diff Cover is currently the only fabricated cover constructed of 3/8" plate steel with a 1/2" plate steel ring. It features a 1" fill plug. Many companies make 1/4" covers but Ruffstuff is the only company known for a 3/8" thick cover. This cover is welded inside and out and then machined flat.

The Blue Torch Fabworks 8.25" Differential Cover is constructed of 1/4" plate steel with a 3/8" plate steel ring. It's built to resist peel up and features a protected fill plug.

Moe's Metalworks 8.25" Differential Cover

The PML 8.25" Differential Cover is constructed of aluminum, features both a threaded fill plug and a threaded drain plug, and holds 3/4 quart more oil than stock. The cover also comes with heatsinking fins, but they must be ground off if the cover's to be used in conjunction with a fuel tank skid plate.

5.45 Gear Lube

The gear lube in the Chrysler 8.25" should be changed every 12,000 miles. Off-roading and towing subject the differential to increased torque, dirt, and water. If the Liberty isn't off-roaded, isn't used for towing, and follows the Schedule A maintenance plan, it may be possible to stretch this interval. The differential housing requires 4.4 pints (2.08 liters) of lube and, if a limited slip is present, 4 ounces (118 milliliters) of limited slip additive. Aftermarket differential covers will change the required lube volume. 75W-90 dino lube should be used for light duty applications and 75W-140 synthetic for heavy duty off-roading and towing.

5.46 Ring & Pinion Gears

Figure 13   Yukon Gear & Axle Chrysler 8.25" 4.10 Ring Gear

The following companies sell ring and pinion gear sets for the 8.25":

- Genuine Gear - considered the worst among off-roaders
- Motive Gear
- Richmond
- Sierra Gear & Axle - re-branded by West Coast Differential
- Superior Axle & Gear
- US Gear - considered the best among off-roaders
- Yukon Gear & Axle - Best Warranty in the Industry

5.47 External Links

- Ruffstuff Specialties[75]
- Blue Torch Fabworks[76]

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75   http://www.ruffstuffspecialties.com/
76   http://www.bluetorchfab.com/

- Crane Hi Clearance[77]
- Motive Gear[78]
- PML[79]
- Randy's Ring & Pinion - Yukon Gear & Axle[80]
- Richmond[81]
- Rusty's Offroad - Superior Axle & Gear[82]
- Sierra Gear & Axle[83]
- Superior Axle & Gear[84]
- US Gear[85]
- West Coast Differentials - Sierra Gear & Axle[86]
- Yukon Gear & Axle[87]

Category:Jeep Liberty[88]

5.47.1 Dana 35C

The Dana 35C is a steel rear axle found in some 2002 Jeep Libertys. Strength wise, it's weaker than the more common Chrysler 8.25" rear axle. The Dana 35C is different from the Dana 35. The "C" in the model number refers to *custom* , not *complete* . It indicates that Dana Corporation ships their Dana 35 to DiamlerChrysler who then builds it.

Category:Jeep Liberty[89]

77   http://www.cranehiclearance.com/
78   http://www.motivegear.com/
79   http://www.yourcovers.com/
80   http://www.ringpinion.com/
81   http://www.richmondgear.com/
82   http://www.rustysoffroad.com/
83   http://www.sierragear.com/
84   http://www.superioraxle.com/
85   http://www.usgear.com/
86   http://www.differentials.com/
87   http://www.yukongear.com/
88   http://en.wikibooks.org/wiki/Category%3AJeep%20Liberty
89   http://en.wikibooks.org/wiki/Category%3AJeep%20Liberty

5.47.2 Gearing

Figure 14 Yukon 4.10 Chrysler 8.25" Ring & Pinion Drive Pattern
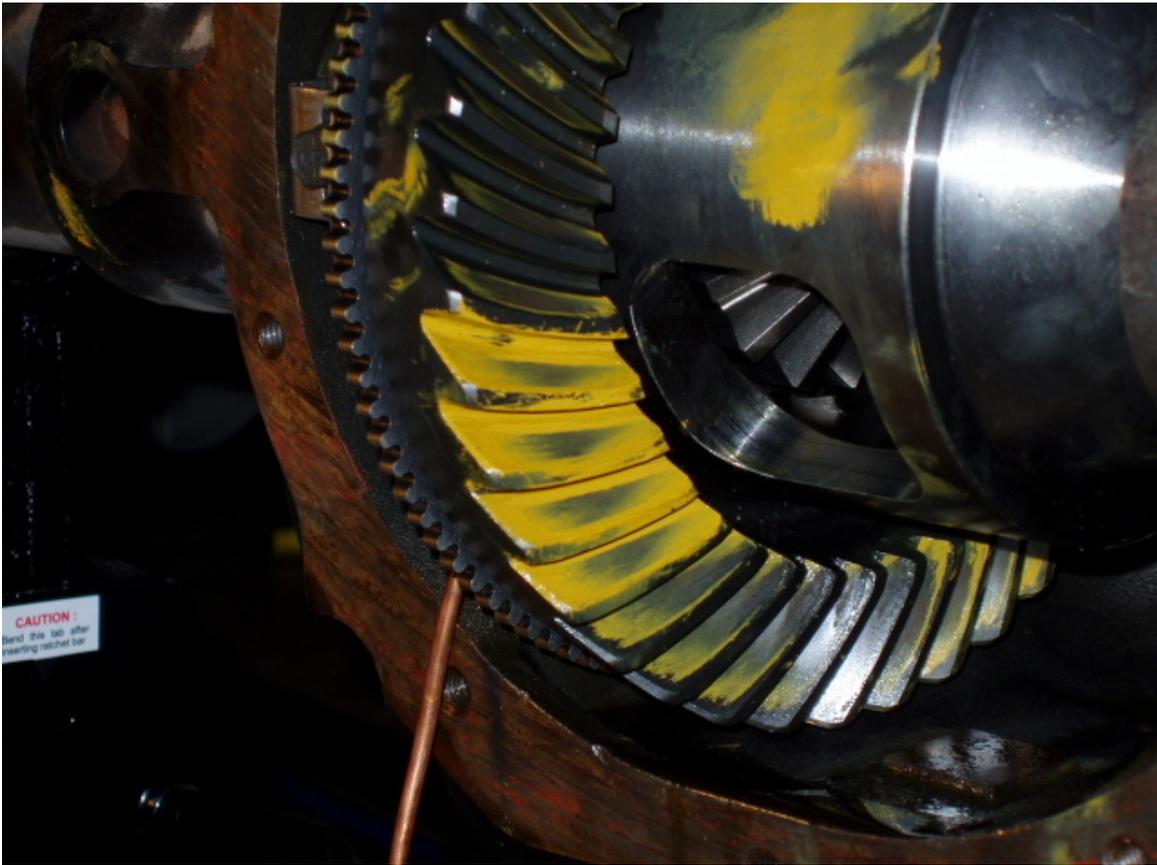
Figure 15 Yukon 4.10 Chrysler 8.25" Ring & Pinion Coast Pattern

While larger tires give the Jeep Liberty more ground clearance they also regear it to a numerically lower gear. Therefore, it is often a good idea to eventually regear the differentials to a numerically higher gear in order to compensate for the increase in tire size. When chaning gear ratios, both the front and rear differentials need to be regeared simulatnaeously. Generally, as long as the front are rear ratios are within two tenths of each other there won't be any problems. To break in the new gears the Liberty should be run at low speeds for five hundred miles and then the differential lube should be changed. See each axle's specific page for more information on regearing it. To identify your rear axle and gear ratio check the ID tag on the driver's side axle tube near the brake rotor.

Stock Gear Ratio Table

	2.4L (2002-2004)	3.7L (2002-2004)	3.7L (2005-2006)	2.8L (2005-2006)
Automatic	4.10	3.73	3.73	3.73
Manual	4.10	3.73	3.55	N/A*

*A manual transmission wasn't available in North American 2.8L diesel models

5.48 External Links

- Gear Ratio & Tire Size Chart[90]
- Gearing and Gearing Math for Jeeps[91]

Category:Jeep Liberty[92]

5.48.1 Limited Slips

Limited Slip is a traction aiding differential that will supply a percentage of torque to the tire with the most traction. It works by binding the two side gears of the differential against the carrier when a set speed difference is reached between the two gears. Essentially, if one wheel starts spinning faster than the other by a substantial amount the clutches will step in and prevent any further spin. Unfortunately, the clutches in limited slips aren't especially strong and are overcome if the slip becomes too great. For this reason, many people opt for a locker instead because it provides 100% lock up.

Posi is a slang term for the limited slip differential. Named after GM' "Posi-Traction" unit, which was built by Eaton.

5.49 Front Dana 30a

- /Detroit TrueTrac/[93]

5.50 Rear Chrysler 8.25"

- /Trac-Loc LSD/[94]
- /Auburn High Performance/[95]
- /Detroit TrueTrac/[96]

5.51 See also

- Limited Slip Differential[97]

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90   http://www.4lo.com/calc/geartable.htm
91   http://www.novak-adapt.com/knowledge/gearing.htm
92   http://en.wikibooks.org/wiki/Category%3AJeep%20Liberty
93   http://en.wikibooks.org/wiki/%2FDetroit%20TrueTrac%2F
94   http://en.wikibooks.org/wiki/%2FTrac-Loc%20LSD%2F
95   http://en.wikibooks.org/wiki/%2FAuburn%20High%20Performance%2F
96   http://en.wikibooks.org/wiki/%2FDetroit%20TrueTrac%2F
97   http://en.wikipedia.org/wiki/Limited_slip_differential

5.52 External Links

- Eaton (Detriot TrueTrac)[98]
- Auburn[99]
- Ring Pinion (Auburn and Dura Grip)[100]

Category:Jeep Liberty[101]

5.52.1 Lockers

A locker works by locking the two side gears of the differential to the carrier. In a manual selectable locker the two wheels are in 100% lock until the locker is disengaged. In an automatic locker the two wheels are always locked together until one needs to spin faster than the other, as is the case when cornering. Automatic lockers work in the reverse of limited slips in that they're normally locked and only unlock during turns, rather than being normally unlocked and only resisting wheel speed difference during slip. A locker is better than a limited slip because it will give the driver 100% lock and won't give out when a large amount of slip is encountered.

5.53 Front Dana 30a

- /ARB Air Locker/[102]
- /Aussie Locker/[103]

5.54 Rear Chrysler 8.25"

- /ARB Air Locker/[104]
- /PowerTrax No-Slip/[105]
- /Detroit Locker/[106]

5.55 See also

- Locking Differential[107]

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98   http://www.detroitlocker.com
99   http://www.auburngear.com
100 http://www.ringpinion.com/b2c/PartCats.aspx?SearchMode=Brand&BrandID=3
101 http://en.wikibooks.org/wiki/Category%3AJeep%20Liberty
102 http://en.wikibooks.org/wiki/%2FARB%20Air%20Locker%2F
103 http://en.wikibooks.org/wiki/%2FAussie%20Locker%2F
104 http://en.wikibooks.org/wiki/%2FARB%20Air%20Locker%2F
105 http://en.wikibooks.org/wiki/%2FPowerTrax%20No-Slip%2F
106 http://en.wikibooks.org/wiki/%2FDetroit%20Locker%2F
107 http://en.wikipedia.org/wiki/Locking_differential

5.56 External Links

- ARB 4x4 Accessories[108]
- Eaton - Detriot Locker[109]
- Richmond Gear - Powertrax[110]
- Torq Masters Technology - Aussie Locker[111]

Category:Jeep Liberty[112]

108 http://www.arb.com.au/
109 http://www.eatonperformance.com/
110 http://www.richmondgear.com/
111 http://www.offroadlockers.com/
112 http://en.wikibooks.org/wiki/Category%3AJeep%20Liberty

6 Armor

6.1 Skid Plates

The skids should be installed in the following order: transfer case skid, transmission skid, engine skid. This rear to front ordering prevents the skid overlap from catching obstacles when driving forward.

6.1.1 Engine

The Jeep Liberty's OEM engine skid plate is strong but scrapes up a lot of dirt when off roading. The Skid Row Front skid plate, constructed of 3/16" steel, is a good replacement. The Skid Row skid fits all 2002-present Libertys, including the CRD, and includes an engine oil filter drain hole.

6.1.2 Gas Tank

The Jeep Liberty's OEM gas tank skid plate is strong, but sometimes bends, causing the gas tank to crack. The Skid Row Gas Tank skid plate, constructed of 3/16" steel, is a good replacement. The Skid Row skid is compatible with most hitch receivers and differential guards and includes a heat shield to protect the plastic gas tank from exhaust heat. The Skid Row skid fits all 2002-present Libertys. Rusty's Offroad also makes a gas tank skid for the Liberty.

6.1.3 Transfer Case

The Jeep Liberty's transfer case has an aluminum body and needs protection. Fortunately, the OEM transfer case skid plate is plenty strong enough and probably won't need replacement. The Skid Row Front Skid Plate and Rusty's Off Road Transfer Case Skid, both constructed of 3/16" steel, are possible replacements. The Skid Row skid fits all 2002-present Liberty's, including those with the NV242 transfer case, and includes a transfer case oil drain hole.

6.1.4 Transmission

The OEM transmission skid plate is the weakest of the Jeep Liberty's skids and should be replaced first. The All J Products Super Skid, constructed of 1/4" steel with formed sides, reinforcing ribs, and outriggers, is a very durable replacement. Currently, the Super

Skid comes in two different models: the Super Skid I fits 2002-2003 gas Libertys and all CRD Libertys, while the Super Skid II fits 2004-2006 Libertys. The Skid Row Engine & Transmission Skid Plate and Rusty's Offroad Engine Tranny Skid, both constructed of 3/16" steel, are also good replacements. The Skid Row skid fits all 2002-present Libertys, including the CRD, and includes an engine oil drain hole.

6.2 Rock Rails

6.2.1 JCR Offroad Inc.

These sliders are designed for hardcore off-road abuse. The main tube is made with 3"x2" boxed tubing with a .188" wall. Side tubes are 1.75" x .125 wall (where applicable.) They bolt to the pinch seam with 5 bolts and the main legs off the sliders mount with 8 bolts to the uni-body. Giving you a total of 13 bolts PER SIDE! Some drilling required, but easily installed. These sliders are created by professional fabricators; therefore the welds, fitment, and attention to detail are second to none. - See more at: `http://www.jcroffroad.com/product/KJ-SL3.html#sthash.F6wqmo7R.dpuf`

6.2.2 All J Products Boulder Bars

6.2.3 Carolina Rock Shop Rock Rails

Carolina Rock Shop makes rock rails for the Jeep Liberty. The CRS rock rails bolt to the unibody in three separate places, but do not bolt to the pinchweld. For added strength and lower maintenance the rails can be welded rather than bolted directly to the unibody. There is some concern as to whether these rails could be easily torn off as they don't have pinchweld bolts, but there is no evidence to confirm this.

6.2.4 Mopar Rock Rails

6.2.5 Rock Lizard Skink Sliders

Rock Lizard Fabrications produces the Standard Skink Slider and two different variations of it. The Standard Skink Slider is the base rock rail without any extra features. The Skink Step Slider extends three inches further from the body, thus allowing it to function as a step. The Skink Super Slider has an added tube to protect the doors from trees and rocks. The tube extends from the base rail to just past the plastic door trim. All the Sliders bolt to the Liberty with two dual-arm three-bolt unibody mounts and one large seven-bolt pinch weld mount. The arms extend from unibody mounts in a triangular fashion to reinforce the entire rail. The rails are shipped bare and should be painted with a rust preventer before installation. Powder coat is not recommended because it's more expensive and will only chip off when the rails come into contact with obstacles off road.

6.2.6 Rocky Road Outfitters Rock Rails

6.2.7 Rusty's Offroad - Rocker Panel Skids

6.3 Bumpers

6.3.1 ARB Bull Bar

Figure 16   ARB 2005-2007 Jeep Liberty Bullbar

ARB manufactures the most popular bull bar for the Jeep Liberty. It features air bag approval, ventilation, recessed lamp and Hi-Lift provisions, tow points, and a grey powdercoat. Inside, it supports a winch and factory foglights. Outside, it supports lights, antennas, and off-road flags via four pre-drilled holes. While the bull bar weighs less than 100 lbs, spacers or stiffer springs should be used in the front struts to counteract spring sag. There are two versions, one for 2002-2004 Libertys and one for 2005-2007 Libertys. The 2002-2004 model uses the factory turn signals, requires fender flare trimming, and supports the Warn HS9500, XD9000, M8000, and M6000 winches. The 2005-2007 model uses new turn signals, doesn't require fender flare trimming, and supports the Warn XD9000, M8000, M6000, and 9.5XP winches.

6.3.2 Rock Lizard Monitor Lizard Front Bumper

6.3.3 Rock Lizard Komodo Dragon Rear Bumper

6.4 Differential Guards

- Poison Spyder - Rock Ring
- Four X Doctor - Diff Guard
- Rusty's Offroad - Diff Guard
- Rocky Road Outfitters - Diff Guard

6.5 External Links

- All J Products[1]
- ARB 4x4 Accessories[2]
- Carolina Rock Shop[3]
- Four X Doctor[4]
- JParts.com[5]
- Mopar[6]
- Poison Spyder[7]
- Rock Lizard Fabrications[8]
- Rocky Road Outfitters[9]
- Rusty's Off-road Products[10]
- Skid Row Offroad[11]

Category:Jeep Liberty[12]

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1   http://www.boulderbars.com/
2   http://www.arbusa.com/
3   http://www.carolinarockshop.com/
4   http://www.fourxdoctor.com/
5   http://www.jparts.com/
6   http://www.mopar.com/
7   http://www.spydercustoms.com/
8   http://www.rocklizardfabrications.com/
9   http://www.rocky-road.com/
10   http://www.rustysoffroad.com/
11   http://www.skidplates.com/
12   http://en.wikibooks.org/wiki/Category%3AJeep%20Liberty

7 Recovery

There is a factory recovery option available for the Jeep Liberty that includes three Mopar tow hooks; two front and one rear. A cheaper and more versatile option is a front or rear hitch receiver[1] accompanied by a hitch clevis or winch. Yet another option is to replace the front tow hooks with a bumper or bullbar with integrated recovery provisions. All of these alternatives require removal of an existing hooks.

7.1 Mopar Hooks

Figure 17   OEM Front Tow Hook MY2005

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1   http://en.wikibooks.org/wiki/..%2FAccessories%2FTowing_Hitches

Figure 18 OEM Rear Tow Hook MY2005

Each front tow hook sandwiches the unibody bumper between the hook base and an m-bolt/clip-nut combination. The clip-nut on both the front and rear hooks is a common automotive fastener which may be available at well stocked hardware stores. The m-bolt used with the front tow hooks is not a common fastener and will need to be purchased from a dealer.

7.2 Electric Winches

The ARB bullbar for the Liberty KJ is designed accommodate the Warn M8000 winch.

Figure 19 Liberty (KJ) recovering itself with a Warn M8000 winch

Category:Jeep Liberty[2]

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2   http://en.wikibooks.org/wiki/Category%3AJeep%20Liberty

8 Electrical

- /Auxiliary Lights/[1]
- /Batteries/[2]
- /CB Radio/[3]
- /ESP/[4]
- /Head Units/[5]
- /Firewall Penetration/[6]
- /Overhead Consoles/[7]
- /PCI Bus/[8]
- /Satellite Radios/[9]

8.1 External Links

- L.O.S.T KJ - Electronics...Stereo...GPS...CBs[10]
- Jeep KJ Country - Electronics[11]
- Basic Car Audio Electronics[12]

Category:Jeep Liberty[13]

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1   http://en.wikibooks.org/wiki/%2FAuxiliary%20Lights%2F
2   http://en.wikibooks.org/wiki/%2FBatteries%2F
3   http://en.wikibooks.org/wiki/%2FCB%20Radio%2F
4   http://en.wikibooks.org/wiki/%2FESP%2F
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7   http://en.wikibooks.org/wiki/%2FOverhead%20Consoles%2F
8   http://en.wikibooks.org/wiki/%2FPCI%20Bus%2F
9   http://en.wikibooks.org/wiki/%2FSatellite%20Radios%2F
10 http://www.lostkjs.com/forum/phpBB2/viewforum.php?f=45
11 http://www.jeepkj.com/forum/forumdisplay.php?f=201
12 http://www.bcae1.com/
13 http://en.wikibooks.org/wiki/Category%3AJeep%20Liberty

9 Accessories

9.0.1 Towing and Cargo

- /Rack Systems/[1]
- /Towing Hitches/[2]

9.0.2 Suspension

- /Control Arms/[3]
- /Sway Bar Disconnects/[4]
- /Ball Joints/[5]
- /Tie Rods/[6]

9.0.3 Other

- /Onboard Air/[7]

9.1 External Links

Category:Jeep Liberty[8]

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1   http://en.wikibooks.org/wiki/%2FRack%20Systems%2F
2   http://en.wikibooks.org/wiki/%2FTowing%20Hitches%2F
3   http://en.wikibooks.org/wiki/%2FControl%20Arms%2F
4   http://en.wikibooks.org/wiki/%2FSway%20Bar%20Disconnects%2F
5   http://en.wikibooks.org/wiki/%2FBall%20Joints%2F
6   http://en.wikibooks.org/wiki/%2FTie%20Rods%2F
7   http://en.wikibooks.org/wiki/%2FOnboard%20Air%2F
8   http://en.wikibooks.org/wiki/Category%3AJeep%20Liberty

10 Abbreviations & Terms

0-9

- 2WD = Two Wheel Drive
- 4WD = Four Wheel Drive

A

- ABS = Anti-Lock Braking System
- A/T = Auto Transmission
- A/T = All-Terrain
- ATF = Automatic Transmission Fluid
- AWD = All Wheel Drive

B

- BCM = Body Control Module
- BFG = BF Goodrich
- BHP = Brake Horsepower
- BJ = Ball Joint
- BJC = Ball Joint Contact
- BS = Backspacing

C

- CA = Control Arm
- CEL = Check Engine Light
- CG = Center of Gravity
- CID = Cubic Inch Displacement
- COG = Center of Gravity
- CPS = Crankshaft Positioning Censor
- CRD = Common Rail Diesel
- CV = Constant Velocity

D

- DC (DCX) = Daimler-Chrysler Corporation
- DFI = Direct Fuel Injection
- DOHC = Double Overhead Cam

E

- ECM = Engine Control Module
- EFI = Electronic Fuel Injection
- EGR = Exhaust Gas Recirculation
- ESP = Electronic Stability Program

- EJS = Easter Jeep Safari
- EVIC = Electronic Vehicle Information Center

F

- FWD = Front Wheel Drive
- FT. LBS. = Foot Pound
- FIPK = Fuel Injection Performance Kit (K&N's Air Intake)
- FSM = Factory Service Manual

G

- GVW = Gross Vehicle Weight
- GVWR = Gross Vehicle Weight Rating

H

- HP = Horsepower

I

- IAC = Idle Air Control
- IAT = Intake Air Temperature
- IFS = Independent Front Suspension

J

- JK = Jeep Wrangler (2007+)
- JBA = Jeepin' By Al

K

- KJ = Jeep Liberty (2002-2007)
- KK = Jeep Liberty (2008+)
- KS = Knock Sensor
- KPL = Kilometers per Liter
- KPH = Kilometers per Hour

L

- LWB = Long Wheel Base (SJ, XJ, ZJ, WJ, KJ)
- LCA = Lower Control Arm
- LBJ = Lower Ball Joint
- LSD = Limited Slip Differential
- LBS-FT = Pounds Foot of Torque

M

- MAP = Manifold Absolute Pressure
- MAT = Manifold Air Temperature
- MFI = Multi-Port Fuel Injection
- MIL = Malfunction Indicator Light
- M/T = Manual Transmission or Mud-Terrain
- MPFI = Multi Point Fuel Injection
- MPG = Miles Per Gallon
- MPH = Miles Per Hour

- MPI = Multi Port Injection
- MPV = Multi-Purpose Vehicle

N

- NP = New Process
- NV = New Venture
- NVG = New Venture Gear

O

- O2S (OS) = Oxygen Sensor
- OC = Open Circuit
- OEM = Original Equipment Manufacturer
- OME = Old Man Emu
- OBA = On Board Air
- OBD = On Board Diagnostic

P

- P/N (PN) = Part Number
- PCM = Powertrain Control Module
- PCV = Positive Crankcase Ventilation
- PSI = Pounds per Square Inch

Q

R

- RE = Rubicon Express
- RPM = Revolution Per Minute
- RWD = Rear Wheel Drive
- RWHP = Rear Wheel Horsepower

S

- SFI = Sequential Fuel Injection
- SFA = Solid Front Axle
- SRA = Solid Rear Axle
- SAS = Solid Axle Swap
- SOHC = Single Overhead Cam
- SRS = Supplemental Restraint System
- SWB = Short Wheel Base (CJ, YJ, TJ, JK)
- SS = Speed Sensor

T

- TB = Throttle Body
- TBI = Throttle Body Injection
- TC = Tire Carrier or Transfer Case
- TD = Turbo Diesel
- TDC = Top Dead Center
- TDI = Turbo Direct Injection
- TPS = Throttle Position Sensor

- TPMS = Tire Pressure Monitoring System
- TSB = Technical Service Bulletin

U

- UCA = Upper Control Arm
- UBJ = Upper Ball Joint
- UBJC = Upper Ball Joint Contact

V

- VIN = Vehicle Identification Number

W

- WOT = Wide Open Throttle

X

Y

Z

11 Resources

This page contains a collection of links that the authors of this WikiBook have found to be useful for further information about the Jeep Liberty. Much of our own knowledge came from these sources, therefore we'd like to acknowledge them here and pass on their usefulness to the reader.

11.1 Information

- L.O.S.T. KJ[1]
- Jeep KJ Country[2]

11.2 Parts

- AutoTruckToys.com - Jeep Liberty Accessories and Jeep Liberty Parts[3]
- Drivewire.com - Jeep Liberty Parts Catalog[4]
- Junk Yard Dog - Used Auto Parts Junkyard Search[5]
- Just For Jeeps - Mopar Jeep Accessories and Jeep Parts[6]
- Mopar - Original Equipment Parts and Accessories[7]
- NewMoparParts.com - New Original Equipment Parts[8]
- PartsTrain.com - Hard to Find Auto Parts and Truck Parts[9]
- CarId.com - Automotive Aftermarket Accessories[10]
- Savage Jeep Parts - Original Equipment Parts[11]
- Troy's KJ Links and Parts[12]
- World Parts Express - New OEM Parts[13]
- Car Parts and Accessories - Info to buy and find the cheapest components[14]

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1   http://www.lostkjs.com/forum/phpBB2/index.php
2   http://www.jeepkj.com/forum/index.php
3   http://www.autotrucktoys.com/liberty/
4   http://www.drivewire.com/jeepparts/jeeplibertyparts.html
5   http://www.junkyarddog.com/cgi-bin/requester/requester.cgi
6   http://www.justforjeeps.com/
7   http://mopar.com/
8   http://www.newmoparparts.com/mopar-parts.htm
9   http://www.partstrain.com/
10   http://www.carid.com/
11   http://jparts.com/
12   http://www.youngs.org/kjparts/default.asp
13   http://www.worldpartsexpress.com
14   http://carpartsinfobuy.com/

- Thread on L.O.S.T. listing even more places to buy parts[15]

Category:Jeep Liberty[16]

15   http://www.lostkjs.com/forum/phpBB2/viewtopic.php?t=6020
16   http://en.wikibooks.org/wiki/Category%3AJeep%20Liberty

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18   Chapter 14 on page 69

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