Toyota Land Cruiser Frequently Asked Questions List
TLC FAQ v2.0 LAST MODIFICATION 3/15/98

Edited by Rob Mullen (RAMullen@wimsey.com)

Information shamelessly pilfered from:

Against All Odds: The Story of the Toyota Motor Corporation and the Family
that Created it
   by Yukiyasu Togo & William Wartman; New York, USA : St. Martin's Press,
   1999 ISBN 0-312-09733-6
Das Grosse Toyota LandCruiser Buch
   by Martin Braun, Thomas Ronnberg; Munich, Germany : AC Verlag, 1993.
   ISBN 3-86087-140-4
Downey Off Road Manufacturing Catalog
Specter Off Road Catalog
TLC Engine Conversion Kit Instruction Manual (Advance Adapters)
Toyota Land Cruiser: 1956-1984
   Compiled by R.M. Clark; Surrey, England : Brooklands Books Distribution
   Ltd.
   ISBN 1-85520-0473
Toyota Parts Microfiche
Toyota Trails (TLCA Newsletter)
Toyota Truck & LC Owner's Bible
   by Moses Ludel; Cambridge : Robert Bently, Inc., 1995
   ISBN 0-8376-0159-2
Toyota USA and Japan Service Bulletins
Toyota: A History of the First 50 Years
   by Toyota Jid&oring, sha Kabushiki Kaisha; Toyota City, Japan : Toyota
   Motor Corporation, 1988.
Toyota, Fifty Years in Motion: An Autobiography
   by Eiji Toyoda, Tokyo; New York : Kodansha International, 1987.
Toyota Repair manuals
Various 4x4 Magazines

Contributors (Although they may not have realized at the time :)
Rory Arms, Paul Bech, Gary Bjork, Drew Eckhardt, Lars Gottberg, Neil Kapperman, Steve Kopito, Kerry Manning, Willem-Jan Markerink, Andrew Murphy,
Park Owens, Marv Spector, Ian Staines, Roy Stockman, Toyota Canada Inc.

For the Land Cruiser WWW page, check out:
http://www.off-road.com/4x4web/tlc/tlc.html

TABLE OF CONTENTS
==========

1.0 Disclaimer

Well, here goes. I've decided to bite the bullet and try to set up the framework of a Land Cruiser FAQ. I do not claim to be a Land Cruiser expert--
all I am attempting to do is collect the knowledge that the experts on the
list have posted over time into one source. I welcome any suggestions, corrections, or additions to this FAQ. I also welcome "articles" about various projects (disc conversions/tranny swaps etc.) Your name will appear
alongside your article. The information in this FAQ is to be used AT YOUR
OWN RISK. I am not responsible for any
death/dismemberment/grief/increase of
libido that any errors or misinformation cause you! Also please note: There
are NO spelling mistakes in this document. Anything that looks wrong to you
is actually just a Canadian spelling ;).

Hopefully, with release v2.0, there will be a change in whe way the FAQ is
updated. In the past, I have been guilty of hanging onto each version of the
FAQ for a long time before releasing it, because I want the information contained in it to be "perfect." The rule of thumb I've been using is when the
FAQ doubles in size compared to the previous version, it's time to let go. From
v2.0 on, the updates will be more frequent. Unfortunately, this also

increases
the chances of mistakes being made.

I have decided that I have put too much work into this thing to leave it as
"quasi-public domain" Although I can't claim copyright on say, the 1st gear
ratio of an H42 transmission, this COLLECTION of information is my intellectual
property as is the what I believe to be unique tabular lay-out of the information.
In any case, you are free to use this information for non-commerical purposes
and distribute PROVIDED: You do not modify it in any way, you distribute it in
complete form (including this disclaimer), and you do not charge any kind of a
fee for its distribution.

2.0 The History of Toyota

NOTE: This section is responsible for most of the delay in getting this version
of the FAQ out for two reasons. First off, there is some very interesting
research I was hoping to include, but it didn't come together the way I'd hoped.
The other reason is that some of the information is not as well referenced as it
should be (I only have secondary references for the Jeep stuff) If you feel
that I've somehow slighted you by missing a reference, don't worry, I'm working
on them. You can speed things up by dropping me a line. On with the show...

Trucks played a pivotal role in the history of the Toyota Motor Company. In
most cases, the Land Cruiser was the vehicle that carried the Toyota banner
into new markets. However, a complete history of Toyota requires a look at
the man whos company provided the capital and inital production facilities
necessary for the founding of the Toyota Motor Company.

Sakichi Toyoda was born in 1867 in Yamaguchi, Japan. He had dedicated his
life to the invention of an automatic textile loom. In 1907, he formed
Toyoda's Loom works, a company that by 1930 had grown into the Toyoda
Automatic Loom Works (TALW).

Although he shared the inventiveness of his father, Kiichiro Toyoda did not
share the fascination with looms. Instead Kiichiro dreamed of building

automobiles. In March 1930, he began to build a prototype engine in a corner of the Toyoda Automatic Loom Works factory. By January 29, 1934, Kiichiro had made enough progress with his engine design that TALW established an Automobile Department. The first engine, a 3.4l I6 dubbed the Type A was completed in September 1934. The first complete automobile prototype, the Model A1 was completed in May 1935.

Due to restrictions on the domestic automobile industry, Kiichiro decided that would be better to focus on the production of trucks. As a result, the first prototype Toyota truck, the Model G1 was completed on August 25, 1935.

In July 1936, it was decided that the cars produced by TALW would be marketed under the name "Toyota." The name was chosen because it sounded better than Toyoda, the katakana characters used to represent it were more asthetically pleasing and consisted of eight strokes, a lucky number, and because the character was similar to the one representing growth. The Toyota Motor Co., Ltd. (TMC) was formed on August 28, 1937.

The Koromo Plant was officially opened in November of 1938. This plant would later become known as the Honsha Plant--the site of LandCruiser Production. The first vehicle produced at the new factory was the Model BM truck. A version of the 75hp engine used in this vehicle was to become the first engine in a Land Cruiser.

In 1941, the Japanese government instructed Toyota to produce a small, easily manoueverable truck that could be used in the expansion of their Pacific empire. In response, Toyota delivered prototypes of the 2-ton AK-10 in 1942. Unfortunately, it proved too cumbersome so production of light transport trucks was left to Nissan. No examples or photographs of the AK-10 vehicle exist. The only evidence of the AK-10 is a rough sketch. The truck featured an upright front grille, flat fenders that angled down and back like the FJ40, and headlights that mounted above the fenders on either side of the radiator. It had a folding windshield, and the cowl comes straight down to the floor. The rear tub does not exist as such, instead, there is more of a stake-sided bed. The spare tire stands vertically on the inside of the back wall of the

bed on
the driver's side. The pumpkins have the familiar offset and look to be similar in design to the Land Cruiser 9.5" and have a 6 wheel-stud pattern.
Most of the driveline of the truck was from the model BM truck.

The AK-10 arrived 1 year after the initial MA1 General Purpose was delivered
to the U.S. Military by Willys-Overland. The first shipment of MB "Jeeps"
didn't arrive in the Pacific until 1943. As a result, it was highly unlikely
that Toyota had seen a Jeep, never mind copied one. The Land Rover Series I
did not arrive on the scene until 1949 so any influence on the precursor to
the Land Cruiser is impossible.

TMC struggled throughout World War II. It was conscripted into making aircraft
engines and tried to continue producing trucks with what little raw materials
were available. After Japan's surrender in 1945, Toyota was allowed to begin
production of trucks to aid in the rebuilding of Japan. By 1947, production
had begun on the Model BM truck and the Model SB small truck.

In 1950, the U.S. military filed a special procurement order for 1000 4wd
vehicles to be used in the Korean War. Unfortunately, at this time, I am
unfamiliar with what the exact terms of the procurement order were. However,
here are the requirements that led to the Willys-Overland MA1:

1. It must have a load capacity of 600 pounds
2. The wheelbase must be under 75 inches
3. The height must be under 36 inches
4. The engine must run smoothly from three to fifty miles per hour
5. It must have a rectangular shaped body
6. It must have a two speed transfer case with four wheel drive
7. It must have a windshield that folds down
8. It must include three bucket seats
9. It must have blackout and driving lights
10. Gross vehicle weight must be under 1200 pounds (Conley 1981, 20)

Toyota responded with a prototype of the Model BJ on August 1, 1951. Its
characteristics were as follows:

1. Load capacity? Unknown
2. 94" wheelbase
3. Height? Unknown
4. Engine runs smoothly from three to fifty miles per hour
5. Rectangular shaped body
6. Single speed transfer-case

7. Folding windshield
8. 2 bucket seets and rear bench
9. No blackout lights
10. Gross vehicle weight of ~3000lbs.

There is very little correlation, considering the BJ has been accused by some to be a copy of the Jeep. The specifications are different because a completely different philosophy was employed in the design of the BJ. The Willys had been designed to be as light as possible, using an engine with roots in automobiles. Because of the low torque characteristics of the engine, a two-speed transfer case with extra gear reduction was used to allow passage over rough terrain. The BJ, on the other hand, was created using components from 2 and 4 ton trucks. The torque from the 6-cylinder B-85 engine did not require the extra gear reduction. Instead a 4 speed transmission with a 5.53:1 first gear was employed to get a little more low-end grunt.

The vehicle was dubbed the "Toyota Jeep," possibly as a result of the wording of the U.S. Army's procurement order. Fortunately, the right to the "Jeep" name was owned by Willys who forced Toyota to choose another name. On June 24, 1954, the name "Land Cruiser" was chosen.

In 1954, the first Land Cruisers were exported to Pakistan.

In 1955, 23 Land Cruisers were exported to Saudi Arabia. The vehicles proved to be wildly popular and exports grew steadily.

On Feb 21, 1956, the first two Land Cruisers were exported to Venezuela. These were quickly followed exports to Burma, Malaysia, and Puerto Rico.

Toyota entered the African market by sending Crowns and Land Cruisers to Ethiopia. Because marketing proved difficult with the large number of languages spoken in Africa, Toyota was forced to adopt the sales technique of driving a sample vehicle all over Africa and dealing direct with potential purchasers.

The U.S.A. was somewhat different in that in 1957, it received two Crowns before any Land Cruisers. However, the Crowns were found to perform poorly at the higher speeds of American Interstates. Toyota was forced to halt passenger car importing in 1960, leaving only the Land Cruiser to bear the company's name in the United States.

Toyota did not make the same mistake in Australia. The first vehicles sent there were Land Cruisers. They arrived in July 1959, and were marketed by Theiss Sales as commercial vehicles.

Toyota began to market the Model DA60 truck, its first powered by a diesel engine, in March 1957. However, brand loyalty was strong in Japan so Toyota was forced to establish links to Hino Motors, a diesel truck manufacturer. Hino would later provide the B and H series diesel engines used in Land Cruisers.

In May, 1959, Toyota do Brasil began Land Cruiser assembly in Brazil. This was the first case of knock-down kits being assembled outside Japan. Land Cruiser assembly started in 1963 in Venezuela, 1970 in Indonesia and Pakistan (although Pakistanni production was terminated in 1986), and 1977 in Kenya, and 1982 in Bangladesh.

Toyota's first exports to Europe were to Denmark, in 1964. That was quickly followed by exports to Finland, the Netherlands, Belgium, Switzerland, Great Britain, France, Italy, Austria, Greece, and finally, Germany.

It was not until 1964 that Toyota came to Canada. The first vehicles imported were the Crown, Land Cruiser, and Publica. The Publica proved to be unsuitable for the Canadian climate and was quickly withdrawn; however, by 1971, largely on the strength of Land Cruiser sales, Toyota had become the number one import brand in Canada.

Throughout the history of Toyota, it was the Land Cruiser that led the way into new export markets and proved Toyota toughness.

3.0 Introduction

Land Cruisers models are identified by an alphanumeric code. The code consists of the engine series designation letter(s) and the frame desgination number separated by a the letter "J." For example a 2 door with short wheel base and a 2F gasoline engine would be a FJ40. There are also auxilliary codes that follow the main model code and give further information about the vehicle. For instance, the code FJ40LV-KCW is the vehicle mentioned above

produced between 01/75 and 07/80 with left hand drive, 4 Speed Transmission,
Hardtop, Rear "ambulance" doors, and no roll bar produced for the European
market. The extra codes are necessary because of the huge number of variations of each vehicle offered world-wide. There were 2500 versions of
the 60 series alone. All the North American & most Australian Codes are described later in the FAQ. The only exception to the naming convention is
the 1951 BJ.

4.0 Body Styles

All Land Cruiser bodies (Except the Bundera and the 45 Wagon) are made by
Araco (Formerly Arakawa), a division of Toyota. Araco also manufactures the
interiors for Land Cruisers, Lexuses, and other Toyota cars and trucks. Toyota manufactures the Bundera/LandCruiser II, and Gifu Body manufactured the
45 Wagon. The remainder of the vehicle (except in some cases the engines) is
manufactured at Toyota's Honsya plant (Factory code A11)

SERIES	DESCRIPTION
AK-10	Predecessor to the Land Cruiser
BJ (B-85)	Very First Land Cruiser! Flat fenders, round rear wheel wells, vertical front grille
25	Looks more like 40 series except with no turn signals on the fenders round rear wheel wells and no headlight bezel
25 P	Pickup version of above
28	Similar to above with a longer wheelbase
28 V	Wagon version of above
35	Very similar to a 25
38	Wagon
40	2 Door with removable hard/soft top, folding windshield
41	Same as above
42	Essentially identical to 40 series
43 V	Slightly Longer 40.
43 W	2 Door version of the 45 Wagon
44	2 Door even longer wheelbase 40 (40 sized side windows followed by smaller ones
45 C	Cab & Chassis
L	Pick-up with square bed with tie-down loops on sides, removable hard/soft top
S	Pick-up with rounded bed with bevel on top rim like a 40. Had fixed hardtop until approx 1964 then removable hardtop
W	4 door 40 series, permanent top.
T	VERY long 2 door 40 with 2 sets of 40 style side windows on HT
46	Same as 45T except with 5 speed transmission & upgraded frame
47 V	VERY long 2 door with 2 sets of 40 style side windows on HT
47 L	Identical to 45 Series except with H series engine
47 C	Cab & Chassis
50	Brazillian made Bandierante soft top similar to 40

50 V Bandierante hard top similar to 40
50 VB Bandierante similar to 43
55 P2BL Bardierante extra-cab pickup. Similar to 45 series
55 B Bandierante short bed pickup similar to 45 series
55 BL Bandierante long bed pickup
55 Wagon with narrower appearance than 40 series. Front grille looks
like <
60 Square bodied wagon with a pair of round headlights
61 Similar to above except with a turbo
62 Square bodied wagon with 2 pairs of rectangular headlights
70 Square body 2 door with non-removable doors/hard top, sloping windshield and fenders that are a cross of a 40 and a 60.
70 LD Light Duty (Called "Bundera" in Australia) - 70 Series with 2L-T diesel
or 22R gas engine, lighter axles used in the pickup (with the 8" ring
gear), removable hard/soft top, and coil springs.
Bundera means "Rock Wallaby" in an aboriginal language
71 Essentially identical to the 70 series
71 LD Similar to 70 series except with squarer front end and smaller front
fenders
73 Like 70 series with 2 doors but longer body/wheelbase.
73 LD Longer wheelbase version of the 70 LD detailed above
74 Similar to 73 except with turbo engine
75 P Square bodied pickup with removable steel top
75 V Square bodied wagon with 2 doors and 2 windows per side in the rear
75 C Cab & Chassis
77 Four-door 70 series wagon
78 Virtually identical to above
80 Current rounded wagon
90 AKA Challenger/Prado/Colorado. NOT really a Land Cruiser, just a
re-badged/re-bodied IFS 4Runner.
MEGA Copy of a Hummer developed WITH the assistance of AM General. Complete
with gear reduction hubs, 4WS, Inboard 4 wheel disc brakes, Torsen LSD's
_WITH_LOCKS_, adjustable rear tire pressure

4.1 Availability (Model Year)

SERIES	AUS	CANADA	U.S.	JAPAN
AK-10	.....	.....	.....	42-?
BJ	.....	.....	.....	51-54
25	.....	NA?	58-59	55-59
28	.....	.....	.....	.....
35	.....	NA	NA	60
40	??-84	60-84	60-83	60-84
42	81-84	81-84	NA	82-84
43	.....	NA	NA	.....
45 L	??-84	63-80%	63-67+	60-67
S	.....	63-67?	63-67+	.....
W	.....	63?-68	63-67+	.....
46	.....	NA	NA	82-84

47	81-84	NA	NA	.....
55	.....	68-80	68-80	.....
60	??-90	80-87	80-87	.....
61	86-90	NA	NA	.....
62	85-90	88-89	88-89	.....
70	85-	85-87	NA	84-89
LD	85-92	NA	NA	.....
73	85-90	NA	NA	.....
74	85-90	NA	NA	85-89
75 P	85-	90?-#	NA	NA
W	85-	NA	NA	.....
77	NA	NA	NA	90-94
78	NA	NA	NA	93-96
80	90-	92-	90-	.....

+Some 67's were rebadged as '68's
%Industrial use only 81-89?
#Industrial use only

4.2 Specifications

	OVERALL	WHEELBASE		TRACK	SPRINGS		SPR LEN*		HANG WID#	
SERIES	LENGTH	MM	IN	FR/RR MM	FR	RR	FR	RR	FR	RR
BJ	3793	2400	94	1390/1350	LF	LF				
25	3838	2285	90	1390/1350	LF	LF				
40	3680	2285	90	1404/1400	LF	LF	1070	1070	686	970
42	3680	2285	90	1404/1400	LF	LF	1070	1070	686	970
43 W	3968	2430	96	1404/1400	LF	LF	1125	1265	686	970
43	4038	2430	96	1404/1400	LF	LF	1070	1265	686	970
45 L	4760	2950	116	1404/1400	LF	LF	1070	1265	686	970
W	4630	2650	104	1404/1400	LF	LF	1070	1265	686	970
S	4651	2650	104	1404/1400	LF	LF			686	970
47	4760	2950	116	1404/1400	LF	LF	1070	1265	686	970
50	3930	2285	90	1415/1400	LF	LF				
50 V	3930	2285	90	1415/1400	LF	LF				
VB	4395	2755		1415/1400	LF	LF				
55	4637	2700	106	1404/1400	LF	LF	1071	1155	686	970
55 2BL	5300	3355		1415/1400	LF	LF				
B	4900	2955		1415/1400	LF	LF				
BL	5300	3355		1415/1400	LF	LF				
60	4576	2730	108	1485/1470	LF	LF	1058	1160	796	1030
62	4576	2730	108	1485/1470	LF	LF	1058	1160	796	1030
70	3476	2310	90	1415/1400	LF	LF	1087	1156	640	940
LD	3476	2310	90		CO	CO				
73	4410	2600		1425/1400	LF	LF				
LD	4410	2600		1460/1440	CO	CO				
75 P	4995	2980		1415/1400	LF	LF	1087	1156	640	940
W	4885	2980		1415/1400	LF	LF	1087	1282	640	940
77					CO	CO				
80	4780	2850	112	1595/1600	CO	CO				
MEGA	5090	3395	134	1775/1775	CO	CO				

*SPR LEN (Spring Length) is defined as the distance between the centrelines of
the front and rear hangers for a spring.

#HANG WID is the lateral distance between spring hangers.

4.3 Stock Curb Weights (lbs)

SERIES	ENGINE	B	3B	15B-FT	F	2F	1FZE	1HD-FT
25					3142			
40	HT				3470	3792		
40	ST				3265			
80							4760	
MEGA				6284				

5.0 Engines
==========

5.1 Gas Engines

Gas Land Cruiser engines are manufactured by Toyota.
The F and 2F engines were also used in Toyota Forklifts.
The F engine is supposed to be based on the Chevy 225 I-6 "Cast Iron Wonder"
and some of the bottom end along with the water pump and several other components are supposed to be interchangeable.
The main differences between the F and the 2F are the 2F's larger bore, the F's 2 compression and 2 oil rings versus the 2F's 2 compression and single
oil ring and the fact that the F had two oil paths--through the filter or
through the engine compared to the 2F where all oil had to travel through the
filter before the engine.

5.2 Diesel Engines

Most of the diesels are made by Hino industries, a sub-contractor for Toyota.
Similar engines were used in Hino heavy trucks which are used in Canada, so
the drivetrain of Hino trucks may be adaptable. Hino engines similar to the B
and 3B are supposed to be used to run the refrigerator units on some refrigerated semi trailers. Some of the B and 3B diesels are manufactured by
Daihatsu and can be identified by the letter "D" on the timing cover.

Most diesels in Japan and Canada are 24V and therefore meet NATO military specs. However, Canadian 1985 (85/10) BJ70's and all Canadian BJ60's are 12V. In Europe, all diesels before 1984 and all diesels larger
than 4 cylinders after 1984 are 24V except for in the 80 series which uses
a 24/12V Series/Parallel switch to allow 24V starting and 12V while running.
Australian diesels are all 12V.

The B, H, and 2H were also used in Toyota Forklifts, Dyna and Coaster buses.

5.3 Other Engine Suppliers

Portugese BJ73's use a VM engine made by the Italian company Stabilimenti
Meccanici VM S.p.A. South African HJ75's use an Atlantis Diesel Engine licensed
from Perkins. The Brazilian made Bandeirantes used a Mercedes diesel engine.

5.4 Engine Specifications

Legend

FUEL

- ID - Indirect Injection Diesel
- DD - Direct Injection Diesel
- EID - Electronically Indirect Injection Diesel
- T - Turbo
- EFIG - Gas Electronic Fuel Injection

MODEL	DISP (CC)	CYL	FUEL	HP@RPM	TORQUE FT-LB@RPM	VALVES	BORExSTROKE (mm) (mm)	COMP RATIO
B (GAS)	3386	6	G	85@3600	159@????	12 OHV	84x102	6.4:1
B	2977	4	ID	80@3600	141@2200	8 OHV	95x105	21:1
2B	3168	4	ID	93@3600?	159@2200	8 OHV	98x105	21:1
3B	3431	4	ID	90@3500	159@2200	8 OHV	102x105	20:1
13B-T	3431	4	TDD	120@3400	210@2000	8 OHV	102x105	17.6:1
14B	3661	4	DD	96@3400	177@2200	8 OHV	102x112	18.0:1
15B-FT	4104	4	TDD	155@3200	288@1800	16 OHV		
F (-60)	3878	6	G	105@3200	189@2000	12 OHV	90x102	6.8:1
F (60-)	3878	6	G	125@3600	209@2000	12 OHV	90x102	7.5:1
2F	4230	6	G	135@3600	210@1800	12 OHV	94x102	7.8:1
3F	3955	6	G	155@4000	219@3000	12 OHV	94x95	
3F-EFI	3955	6	EFIG	155@4200	220@2200	12 OHV	94x95	8.1:1
1FZ-???	4477	6	G	138@????	Low compression engine for low grade fuel			
1FZ-F	4477	6	G	190@4400	268@2800	24DOHC	100x95	9.0:1
1FZ-FE	4477	6	EFIG	212@4600	275@3000	24DOHC	100x95	9.0:1
H	3576	6	ID	90@3600	151@2200	12 OHV	88x98	21.0:1
H	3576	6	ID	95@3600	159@2200	12 OHV	88x98	19.5:1
2H	3980	6	ID	103@3500	177@2000	12 OHV	91x102	20.7:1
12H-T	3980	6	TDD	135@3500	231@2000	12 OHV	91x102	18.6:1
1HD-T	4163	6	TDD	165@3600	268@2000	12SOHC	94x100	18.6:1
1HD-FT	4163	6	TDD	168@3600	280@2500	24SOHC	94x100	18.6:1
1HZ	4163	6	ID	135@4000	187@2200	12SOHC	94x100	22.7:1
1KZ-T	2982	4	TID	125@3600	218@2000	8	96x103	21.2:1
1KZ-TE	2982	4	EID	130@3600	213@2000	8	96x103	21.2:1
2L	2446	4	ID	72@4000	115@2200	8SOHC	92x92	22.3:1
2L-T	2446	4	TID	86@4000	139@2400	8SOHC	92x92	20.0:1
2L-TII	2446	4	TID	90@4000	159@2400	8SOHC	92x92	21.0:1
1PZ	3469	5	ID	115@4000	170@2600	10SOHC	94x100	22.7:1

22R	2367	4	G	105@4800	136@2800	8SOHC	92x89	9.0:1
22R-E	2367	4	EFIG	114@4600	192@3400	8SOHC	92x89	9.0:1

OTHER

STABILIMENTI MECCANICI VM (ITALY)								
VM66A	2494	5	ID	108@4200	220@1600	10 OHC	88x92	22.0:1

ATLANTIS DIESEL (SOUTH AFRICA)								
ADE236	3860		DD	80@2800	220@1400	8 OHV	98x127	16.0:1

MERCEDES BENZ (BRAZILIAN BANDEIRANTE)								
OM314	3784		DD	85@2800	235@1800	8 OHV	97x128	17.0:1
OM364	3972		DD	90@2800	235@1800	8 OHV	98x133	17.3:1

5.5 Availability (Model Year)

SERIES	AUS	CANADA	U.S.	JAPAN
B		78-80	NA	74-80
2B				80-82
3B	81-90	81-87	NA	81-90
13B-T	??-90	NA	NA	84-90
F	58?-74	58?-74		55-74
2F	75-84	75-87		74-87
3F	84-92	NA	NA	
3F-EFI	88-92	88-92		88-92
1FZ-FE	93-	93-		93-
2H	81-90	85-87	NA	80-90
12H-T	86-90	NA	NA	86-90
1HD-T	90-95	NA	NA	91-
1HD-FT	95-			
1HZ	90-	95-+	NA	91-
2L		81-84	81-83	83-87
2L-T	86-93	84-85*	84-85*	84-87
2L-T-II				
1PZ	90-93	??91-+		
22R	84-92	81-88#	81-88#	

*In Toyota Diesel Pickups
#In Toyota Pickups
+Industrial Use Only

6.0 ENGINE/CHASSIS COMBINATIONS (PRODUCTION YEAR)

	B(GAS)	F
10	.....	.....
BJ	51-53	.....
25	54-59	55-59
28	.....	58-59
V	.....	58-59

```
35    .....  56-59


      B     2B     3B   13B-T 14B   F     2F    H     2H
40    74-78 ..... ..... ..... ..... 60-74 74-84 ..... .....
   V  74-78 ..... ..... ..... ..... 61-74 74-84 ..... .....
41    ..... 79-81 ..... ..... ..... ..... ..... ..... .....
42    ..... ..... 81-84 ..... ..... ..... ..... ..... .....
43    74-81 ..... 81-84 ..... ..... 60-74 74-84 ..... .....
44    ..... 79-81 ..... ..... ..... ..... ..... ..... .....
   V  ..... 80-81 ..... ..... ..... ..... ..... ..... .....
45 C  ..... ..... 81-84 ..... ..... 61-74 74-86 72-80 .....
45 L  ..... ..... 81-84 ..... ..... 61-74 74-85 72-80 .....
   S  ..... ..... ..... ..... ..... 61-74 74-85 ..... .....
   W  ..... ..... ..... ..... ..... 60-68 ..... ..... .....
46    ..... ..... ..... ..... ..... ..... ..... ..... .....
47 L  ..... ..... ..... ..... ..... ..... ..... ..... 80-85
47 C  ..... ..... ..... ..... ..... ..... ..... ..... 80-84
50 B  ..... ..... ..... ..... 96-   ..... ..... ..... .....
55 W  ..... 79-80 ..... ..... ..... 67-74 74-79 ..... .....
56 W  ..... ..... ..... ..... ..... ..... 74-79 ..... .....
   B  ..... ..... ..... ..... 96-   ..... ..... ..... .....

     3B    13B-T 2F    3F-EFI 2H     12H-T
60   81-89 ..... 80-84 .....  81-89  .....
61   ..... ..... ..... .....  .....  86-89
62   ..... ..... ..... 85-89  85-89  .....

     3B    13B-T 15B-T 2F    3F-EFI 1FZ-FE 2H    12H-T 1HD-T 1HD-FT 1HZ
1PZ
70   84-89 ..... ..... 84-85 85-92  93-    ..... ..... 90-   ...... 93-
90-
71   ..... 87-89 ..... ..... .....  .....  ..... ..... ..... ...... 93-
...
72   ..... ..... ..... ..... .....  .....  ..... ..... ..... ...... ...
. ...
73   84-89 ..... ..... 84-85 85-93  93-    ..... ..... 90-   ...... 93-
90-
74   ..... 87-
89 ..... ..... .....  .....  ..... ..... ..... ...... .... ...
75   84-89 ..... ..... ..... 85-92  93-    85-89 .....
90-   ...... .... 90-
77   ..... ..... ..... ..... .....  .....  ..... ..... 90-   ...... 93-
90-
78   ..... ..... ..... ..... .....  .....  ..... ..... ..... ...... 93-
...
80   ..... ..... ..... ..... 90-92  93-    ..... ..... 90-   95-    90-
...
MEGA ..... .....
95-   ..... .....  .....  ..... ..... ..... ...... .... ...

      2L    2L-T  2L-T-II 1KZ-T 1KZ-TE 22R   22R-E
70 LD 84-86 86-90 90-     ..... .....  84-88 88-
71 LD ..... ..... 91-93   ..... .....  84-88 ...
72 LD ..... 86-90 90-93   ..... .....  ..... ...
73 LD ..... 88-90 90-     ..... .....  ..... 88-
77 LD 90-93 ..... .....   ..... .....  ..... ...
```

78 LD .... 91-93 ....
78 LD 93-96

6.1 Selected Country Engine/Chassis Sales Figures (Model Year)

	CANADA									
Mod Yr	BJ40	BJ42	BJ60	BJ70	FJ40	FJ45	FJ55	FJ62	HJ60M	HJ60P
76					946		181			
77					1204	471	175			
78	160				1204	342	260			
79	279				130					
80	173		173		222	45	30			
81		765	451							
82		451	791							
83		167	614							
84		234	716							
85			460	388						
86				137					305	215
87				139					309	188
88								444		
89								120		

7.0 Performance/Fuel Economy
==========

	0-100km/h	Fuel Ecomomy (l/100km)
BJ40 4SPD 4.11 diff	29.9s	13.0
BJ42 4SPD 4.11 diff	24.4s	13.7
FJ40 4SPD 3.70 diff	18.7s	18.6
FJ60 4SPD 3.70 diff	16.3s	17.4
HJ60 4SPD 3.70 diff	22.7s	12.5
MEGA AUTO		25.3MPG@37MPH

8.0 Transmissions & Transfer Cases
==========
The H4X transmissions used with the gas engies use a 275mm clutch and have an
output shaft that is 1-1/16" in diameter and has 10 splines. H41 transmissions were never offered on US model Cruisers but may have been available in some Canadian 45 series pickups. The transmissions for B diesels
use a 1-1/2" longer input shaft with different splines and will not mate to
either an F or H series engine.

When the four speed was introduced in 1974, the transfer case ratio was raised and new helical cut gears were used that were wider and quieter than the earlier model. Until 1981, parking brake was mounted on the driveline after the transfer cases. In 1981, the new split-case transfer case was introduced. It featured a stronger idler shaft and the parking brake was moved to become part of the rear drum brakes.

8.1 Transmission & Transfer Case Ratios (All :1)

MODEL	ENGINE	DATES	SPDS	1ST	2ND	3RD	4TH	5TH	R	TFR	LW TFR
?FJ25?	F		4	5.41	3.12	1.77	1.000		5.44	NONE	
SPLINES											

BJ	B	52	4	5.53	3.48	1.71	1.000		5.60	NONE	
?B-85?	B(GAS)		4	5.299	2.843	1.634	1.000		5.299		
J30	F	69-75	3	2.757	1.691	1.000			3.676	2.313	10
H41	F		4	4.925	2.643	1.519	1.000		4.925	1.992	16
H42	F,B	73-75	4	3.555	2.292	1.410	1.000		4.271	1.992	16
		75-80	4	3.555	2.292	1.410	1.000		4.271	1.959	16
		81-89	4	3.555	2.292	1.410	1.000		4.271	2.276	19
H4??	F,B,H	81-	4	4.843	2.619	1.516	1.000		4.843	1.963	19
H55F	F,B,H,HZ	83-	5	4.843	2.619	1.516	1.000	0.845	4.843	1.959	19
NOT USA											
H5??	B		5	4.925	2.643	1.519	1.000	0.859	4.925	1.992	16
H150F	HZ		5	4.529	2.464	1.490	1.000	0.881	4.313	2.488	
H151F	3F,FZ,HD		5	4.081	2.294	1.490	1.000	0.881	4.313	2.488	
R151F	PZ,KZ	90-	4	4.313	2.330	1.436	1.000		4.220	1.963	19
A440F	F	-90	4	2.950	1.530	1.000	0.717		2.678	2.296	
A440F	F	90-91	4	2.950	1.530	1.000	0.717		2.678	2.488	
A442F	FZ,HD		4	2.950	1.530	1.000	0.765		2.678	2.488	
A????	15F-T		4	3.018	1.548	1.000	0.765		2.678	2.488	
G40	L,2L,R,1PZ		4	3.928	2.333	1.451	1.00		4.743		21
G52F	L, 2L,R		5	3.928	2.333	1.451	1.000	0.851	4.743	2.276	23
150R	2L-T		5	4.313	2.330	1.436	1.000	0.838	4.220	2.295	
????	2L-T, 1KZ-T		5	3.830	2.062	1.436	1.000	0.838	4.220	2.296	
????	1KZ-T, 1KZ-TE		5	3.830	2.062	1.436	1.000	0.838	4.220	1.959	

9.0 Axles
=========
Regular Land Cruiser axle housings are similar to a Ford 9" and differential
carriers are similar in construction to a Chevy 12bolt. The front and rear
differential housings are both offset to the right in all models except some
'58-62's which were centred. They have an 9.5" ring gear. The axle shafts
are 33mm in diameter (the same as a some Dana 60's) 1960-67 shafts had
10 coarse splines while 68 and later shafts have 30 fine splines. In
1968, the front axle CV joints changed from ball joints to Birfield.
Full Floating Axles have smaller shafts because the entire weight of the
truck is bourne by the wheel bearings and the shaft itself is not loaded
in flexure.

Light Duty axle housings are the same as those used in Toyota Pickup trucks.
They feature a smaller housing constructed similarly to the heavy duty Land
Cruiser. The ring gear is only 8" but the axle shafts are the same size and
have the same number of splines as the regular Land Cruiser.

All Land Cruisers produced after 1991 use a reverse-cut 8" ring gear in the
front and the 9.5" ring gear in the rear.

60/2 Series axles are 70mm wider than 40 series
70 Series axles are 20mm wider than 40 series

9.1 AXLE CODES

Axle codes are never located on the axle housings themselves. In trucks manufacturered after 1976, the axle codes are located on the build plate which can be found inside the engine compartment. The pinion (and sometimes
the ring gear have the tooth counts (from which the ratio can be calculated)
stamped into them.

```
Example: K 08 2
         ^ ^^ ^-2 spider gears
         | ++---4.11 ring/pinion ratio
         +------9.5" ring gear
```

First digit: ring gear size
G 8"
J 9.25"
K 9.5"

Second, third digits: ring/pinion gear ratio
(These numbers apply to ALL Toyota vehicles--known Land Cruiser ratios are
indicated)

01	3.30	
02	3.36	
03	3.545	
04	3.556	
05	3.70	HD Cruiser, Aftermarket HD Cruiser
06	3.889	
07	3.90	HD Cruiser
08	4.111	HD Cruiser, Aftermarket HD Cruiser
09	4.222	
10	4.375	
11	4.444	
12	4.625	
13	4.79	
14	4.875	
15	5.125	
16	5.286	
17	5.60	
18	5.714	
19	5.833	
20	6.167	
21	6.667	
22	6.78	
23	6.833	
24	7.64	
25	4.556	LD Cruiser, Aftermarket HD Cruiser
26	5.571	
27	3.364	
28	4.30	LD Cruiser
29	4.10	
30	3.727	
31	3.909	
32	6.591 or 5.583	

33 7.503 or 5.583
34 6.781 or 4.786
35 7.636 or 5.60
36 4.778
37 3.583
38 3.417
   4.88   Aftermarket HD Cruiser

Fourth digit: no of spiders, ltd slip/locker

Code	spiders	
2	2	open
3	2	LS
4	4	Locking Diff
5	4	LS

10.0 Production Codes

The production code of a Land Cruiser breaks down as follows:

aJnna[a-aa...]

The numbers/letters preceding the dash describe the body/frame style.

The first digit indicates the motor series (B/F/H/...)

The "J" indicates the vehicle came from the "J" production line

the 3rd and 4th digits are numeric and indicate the series
(25/40/60/...)

The 6th digit (if present) indicates steering position:

L	Left Hand Drive
R/<missing>	Right Hand Drive

The 7th digit (if present) indicates body type:

V	Hardtop
G	Luxury model/wagon
P	Pickup
<missing>	Soft top

The letters after the dash indicate options etc:

Transmission type

<missing>	3SPD
K	4SPD
M	5SPD
P	4SPD AUTO

Rear Door Type

<missing>	Tailgate
C	Swingout (Ambulance)
N	Lift-up Tailgate (Wagons Only)

Grade/Trim Level

E	VX

N	GX/LX
R	Standard

Aspiration

S	Standard
E	EFI
X	Turbocharged

The last letter usually indicates the intended market:

W	Europe
Q	Australia
Y	Japan
K	Canada
A	North America
V	Middle East

If the vehicle was delivered incomplete (usually as a cab and chassis) it
received the final designation of 3.

ABBREVIATIONS USED
ARL Australia
CAN Canada
FIN Finland (Potentially holds true for all of Europe)
GEN General Export
JAP Japan
ME Middle East
NA North America
USA ? :)

5F 5 Speed Manual
4F 4 Speed Manual
4FC 4 Speed Automatic
IV Incomplete Vehicle (Usually Cab/Chassis Only)
SOB Swing Out Back Door
LUB Lift Up Back Door
RB Roll Bar
PU Pickup
FRP Removable Fiberglass Top
ST Soft Top
SRF Low Roof
HRF High Roof

CODE	ENG	PRODUCTION	NOTES
BJ40			
LV-KCJK	B	3/78-7/80	CAN 4F SOB RB
LV-KCW	B	7/75-12/80	FIN 4F SOB RB
BJ42			
LV-KCJK	3B	8/80-10/82	CAN 4F SOB RB
LV-KCW	3B	10/80-12/82	FIN 4F SOB RB
LV-MCJK	3B	10/82-10/84	CAN 5F SOB RB
LV-MCW	3B	1/80-11/85	FIN 5F SOB RB
RV-KCQ	3B	8/80-10/82	ARL 4F SOB RB
RV-MCQ	3B	10/82-10/84	ARL 5F SOB

BJ45

LV-KCW	3B	10/80-8/85	FIN 4F TROOP
LP-KW	3B	10/80-11/85	FIN 4F PIC

BJ60

LV-KK	3B	8/80-10/81	CAN 4F
LG-KK	3B	10/81-10/82	CAN 4F
LG-MK	3B	10/82-10/85	CAN 5F

BJ70

L-KR	3B	11/84-8/88	GEN 4F ST
LV-KN	3B	8/86-8/88	GEN 4F HT LX
LV-KR	3B	11/84-1/90	GEN 4F HT
LV-MN	3B	8/86-1/90	GEN 5F HT LX
LV-MR	3B	11/84-1/90	GEN 5F HT
LV-MRK	3B	11/84-8/86	CAN 5F HT LX 12V
LV-MNK	3B	8/86-7/87	CAN 5F HT LX
R-KR	3B	11/84-1/90	GEN 4F ST
RV-KR	3B	11/84-1/90	GEN 4F HT
RV-MR	3B	11/84-8/88	GEN 5F HT
RV-MRQ	3B	11/84-1/90	ARL 5F HT

BJ73

LV-MN	3B	8/86-1/90	GEN 5F HT LX
R-KR	3B	8/86-1/90	GEN 4F ST
RV-MRQ	3B	11/84-8/86	ARL 5F FRP
RV-MNQ	3B	8/86-1/90	ARL 5F FRP LX

BJ74

V-PNX	13BT	10/85-1/90	JAP 4FC FRP
RV-PRXQ	13BT	10/85-8/86	ARL 4FC HT
RV-MNXQ	13BT	8/86-1/90	ARL 5F HT L
RV-MRXQ	13BT	10/85-8/86	ARL 5F HT
RV-PNXQ	13BT	8/86-1/90	ARL 4FC HT LX
RV-PEXQ	13BT	8/86-8/88	ARL 4FC HT VX

BJ75

LP-KR	3B	11/84-1/90	GEN 4F PIC
LP-MRV	3B	8/87-1/90	ME 5F PIC
LV-MRW	3B	5/85-12/89	FIN 5F TROOP
LV-MRP	3B	5/85-1/90	FIN 5F PIC
LV-KR	3B	11/84-1/90	GEN 4F TROOP
RP-KR	3B	11/84-1/90	GEN 4F PIC
RP-KR3	3B	11/84-8/86	GEN 4F PIC IV
PR-MR3	3B	11/84-1/90	GEN 5F PIC IV
RV-KR	3B	11/84-1/90	GEN 4F TROOP

FJ40

L-A	F	3/69-1/75	NA ST
LV	F	1/68-1/75	FIN HT
LV-A	F	3/69-1/75	NA HT LUB
LV-AC	F	4/72-1/75	NA HT SOB
LV-KCW	2F	10/75-5/79	FIN HT RB
L-KJA	2F	1/75-2/76	NA ST RB
L-KJA	2F	2/76-7/80	USA 4F ST RB
L-KJA	2F	8/80-10/81	USA 4F ST RB

LV-KCJA	2F	1/75-2/76	NA 4F HT SOB
LV-KCJA	2F	2/76-7/80	NA 4F HT SOB RB
LV-KCJA	2F	8/80-9/83	USA 4F SOB RB
LV-KJA	2F	2/76-7/80	NA 4F HT
LV-KCJK	2F	2/76-7/80	CAN 4F HT SOB RB
LV-KCJK	2F	8/80-10/81	CAN 4F HT SOB RB
LV-KJK	2F	2/76-9/77	CAN 4F ST
KJA	2F	8/80-11/81	NA
LV-KCJA	2F	8/80-9/83	NA
LV-KCJK	2F	8/80-10/81	CAN
R-KJC	2F	8/80-10/82	ARL 4F ST
R-MJQ	2F	10/82-10/84	ARL 5F ST
RV-KQ	2F	8/80-10/82	ARL 4F LUB
RV-KCQ	2F	8/80-10/82	ARL 4F SOB
RV-MCQ	2F	10/82-10/84	ARL 5F SOB
RV-KCQ	2F	8/80-10/84	ARL 4F TROOP SOB

FJ45

LP-KK	2F	6/76-7/80	CAN 4F PU
LP-B	F	3/69	
R-KJQ	2F	8/80-10/82	ARL 4F PU ST
RP-KQ	2F	8/80-10/84	ARL 4F PU
RP-KQ3	2F	8/80-10/82	ARL 4F PU IV

FJ55

LG	F	3/69-1/75	NA
LG-KA	2F	1/75-2/76	NA 4F
LG-KA	2F	2/76-7/80	USA 4F
LG-KK	2F	2/76-7/80	CAN 4F
LV-B	F	5/68-1/75	FIN
LV-KCW	2F	10/75-12/80	FIN 4F

FJ60

LV-KK	2F	8/80-10/81	CAN 4F
LG-KA	2F	8/80-8/87	NA 4F 'G'
LV-KA	2F	9/86-8/87	USA 4F
RG-KQ	2F	8/80-10/82	ARL 4F SRF LUB 'G'
RG-MQ	2F	10/82-11/84	ARL 5F SRF LUB 'G'
RG-MZQ	2F	5/83-11/84	ARL 5F HRF LUB 'G'
RV-KCQ	2F	8/80-10/82	ARL 4F SRF SOB
RV-MCQ	2F	10/82-11/84	ARL 5F SRF SOB

FJ62

LV-PNEA	3F-E	8/87-8/88	USA 4FC
LG-PNEA	3F-E	8/87-1/90	USA 4FC 'G'
LG-PNEK	3F-E	8/87-1/90	CAN 4FC 'G'
RG-MQ	3F	11/84-8/87	ARL 5F SRF LUB 'G'
RG-MZQ	3F	11/84-8/87	ARL 5F HRF LUB 'G'
RG-PQ	3F	11/84-8/87	ARL 4FC SRF LUB 'G'
RG-PZQ	3F	11/84-8/87	ARL 4FC HRF LUB 'G'
RG-MRCQ	3F	8/87-1/90	ARL 5F SRF SOB
RG-MNQ	3F	8/87-1/90	ARL 5F SRF LUB 'G'
RG-PNQ	3F	8/87-1/90	ARL 4FC SRF LUB 'G'
RG-MNZQ	3F	8/87-8/88	ARL 5F HRF LUB 'G'
RG-MEZQ	3F	8/88-1/90	ARL 5F HRF LUB VX
RG-PEZQ	3F	8/87-1/90	ARL 4FC HRF LUB VX
RV-MCQ	3F	11/84-8/87	ARL 5F SRF SOB

RV-PCQ	3F	11/84-10/85	ARL 5F SRF SOB

FJ70

L-KR	3F	11/84-8/88	GEN 4F ST
L-MR	3F	11/84-1/90	GEN 5F ST
L-MRV	3F	11/84-8/88	ME 5F ST
L-PR	3F	11/84-8/86	GEN 4FC ST
LV-KN	3F	8/86-8/88	GEN 4F HT LX
LV-KR	3F	11/84-1/90	GEN 4F HT
LV-MEV	3F	8/86-1/90	ME 5F HT VX
LV-MN	3F	8/86-1/90	GEN 5F HT LX
LV-MNV	3F	8/86-1/90	ME 5F HT LX
LV-MR	3F	11/84-1/90	GEN 5F HT
LV-MRV	3F	11/84-1/90	ME 5F HT
LV-PEV	3F	8/86-8/88	ME 4FC HT VX
LV-PN	3F	8/86-1/90	GEN 4FC HT LX
LV-PNV	3F	8/86-1/90	ME 4FC HT LX
LV-PR	3F	11/84-8/86	GEN 4FC HT
LV-PRV	3F	11/84-8/88	ME 4FC HT
R-KR	3F	11/84-8/86	GEN 4F ST
RV-KR	3F	11/84-1/90	GEN 4F HT
RV-MR	3F	11/84-1/90	GEN 5F HT
RV-MRQ	3F	11/84-1/90	ARL 5F HT

FJ73

L-KR	3F	11/84-8/88	GEN 4F ST
L-MR	3F	11/84-1/90	GEN 5F ST
L-MRV	3F	11/84-1/90	ME 5F ST
LV-MEV	3F	8/86-1/90	ME 5F FRP VX
LV-MN	3F	8/86-1/90	GEN 5F FRP LX
LV-MNV	3F	8/86-1/90	ME 5F FRP LX
LV-MR	3F	11/84-8/86	GEN 5F FRP
LV-MRV	3F	11/84-8/86	ME 5F FRP
LV-PEV	3F	8/86-8/88	ME 4FC FRP VX
LV-PNV	3F	8/86-1/90	ME 4FC FRP LX
LV-PRV	3F	11/84-8/86	ME 4FC FRP
RV-MRQ	3F	11/84-8/86	ARL 5F FRP
RV-PRQ	3F	10/85-8/86	ARL 4FC FRP
RV-MNQ	3F	8/86-1/90	ARL 5F FRP LX
RV-MNQ	3F	1/90-8/91	ARL 5F FRP LX
RV-PNQ	3F	8/86-1/90	ARL 4FC FRP LX
RV-MEQ	3F	8/86-8/88	ARL 5F FRP VX
RV-PEQ	3F	8/86-1/90	ARL 4FC FRP VX

FJ75

LP-MNV	3F	8/86-1/90	ME 5F PIC LX
LP-KR	3F	11/84-1/90	GEN 4F PIC
LP-KR3	3F	11/84-8/86	GEN 4F IV
LP-MR	3F	11/84-1/90	GEN 5F PIC
LP-MRV	3F	11/84-1/90	ME 5F PIC
LP-MR3	3F	11/84-1/90	GEN 5F IV
LV-KR	3F	11/84-1/90	GEN 4F HT TROOP
LV-MR	3F	11/84-1/90	GEN 5F HT TROOP
LV-MRV	3F	11/84-1/90	ME 5F HT TROOP
RP-KR	3F	11/84-1/90	GEN 4F PIC
RP-KR3	3F	11/84-1/90	GEN 4F IV
RP-MR	3F	11/84-10/85	GEN 5F PIC

RP-MR3	3F	11/84-1/90	GEN 5F IV
RP-MRN	3F	10/85-1/90	SA 5F PIC
RV-KR	3F	11/84-1/90	GEN 4F HT TROOP
RV-MRQ	3F	11/84-1/90	ARL 5F HT TROOP
RV-MRQ	3F	1/90-8/92	ARL 5F HT TROOP
RP-MRQ3	3F	11/84-1/90	ARL 5F IV
RP-MRQ3	3F	1/90-8/92	ARL 5F IV
RV-MRKQ	1FZ-FE	8/92-1/90	ARL 5F HT TROOP
RP-MRKQ3	1FZ-FE	8/92-1/90	ARL 5F IV

FJ80

L-GNPNEA	3F-E	1/90-8/92	NA 4FC
R-GCMRSQ	3F	1/90-8/92	ARL 5F SOB
R-GNMNSQ	3F	1/90-8/92	ARL 5F LUB GXL
R-GNPNEQ	3F-E	1/90-8/92	ARL 4FC LUB GXL
R-GNPEEQ	3F-E	1/90-8/92	ARL 4FC LUB VX

FZJ80

L-GNPEKA	1FZ-FE	8/92-1/90	NA 4FC
R-GCMRKQ	1FZ-FE	8/92-1/95	ARL 5F SOB
R-GNMNKQ	1FZ-FE	8/92-	ARL 5F LUB GXL
R-GNPNKQ	1FZ-FE	8/92-	ARL 4FC LUB GXL
R-GNPEKQ	1FZ-FE	8/92-	ARL 4FC LUB VX

HJ45

LP-KW	H	1/79-12/80	FIN 4F PIC

HJ47

RV-KCQ	2H	8/80-10/84	ARL 4F TROOP SOB
RP-KQ	2H	8/80-10/84	ARL 4F PIC
RP-KQ3	2H	8/80-10/84	ARL 4F PIC IV

HJ60

LG-KW	2H	11/80-11/85	FIN 4F
LG-MNW	2H	11/87-2/90	FIN 5F SRF LUB
LG-MNZW	2H	11/87-11/89	FIN 5F HRF LUB
LG-MK	2H	10/85-8/87	CAN 5F
LG-MW	2H	2/83-11/87	FIN 5F
LG-MZW	2H	4/84-11/87	FIN 5F HRF LUB
LG-PK	2H	10/85-8/87	CAN 4FC
RG-KQ	2H	8/80-10/82	ARL 4F SRF LUB 'G'
RG-MQ	2H	10/82-8/87	ARL 5F SRF LUB 'G'
RG-MNQ	2H	8/87-1/90	ARL 5F SRF LUB 'G'
RG-MRCQ	2H	8/87-1/90	ARL 5F SRF SOB
RG-MZQ	2H	5/83-10/85	ARL 5F HRF LUB 'G'
RG-PQ	2H	11/84-10/85	ARL 4FC SRF LUB 'G'
RG-PZQ	2H	11/84-8/87	ARL 4FC HRF LUB 'G'
RV-KCQ	2H	8/80-10/82	ARL 4F SRF SOB
RV-MCQ	2H	10/82-8/87	ARL 5F SRF SOB
RV-PCQ	2H	11/84-10/85	ARL 4FC SRF SOB

HJ61

LG-MXW	12HT	5/86-11/87	FIN 5F LUB 'G'
LG-MNXW	12HT	11/87-1/90	FIN 5F LUB 'G' (Special series 2/89-1/90)
RG-MXQ	12HT	10/85-8/87	ARL 5F SRF LUB 'G'
RG-MZXQ	12HT	10/85-8/87	ARL 5F HRF LUB 'G'
RG-PXQ	12HT	10/85-8/87	ARL 4FC SRF LUB 'G'

RG-PZXQ	12HT	10/85-8/87	ARL 4FC HRF LUB 'G'
RG-MNXQ	12HT	8/87-1/90	ARL 5F SRF LUB 'G'
RG-PNXQ	12HT	8/87-1/90	ARL 4FC SRF LUB 'G'
RG-MNZXQ	12HT	8/87-8/88	ARL 5F HRF LUB 'G'
RG-MEZXQ	12HT	8/88-1/90	ARL 5F HRF LUB VX
RG-PEZXQ	12HT	8/87-1/90	ARL 4FC HRF LUB VX

HJ75

LP-KR	2H	11/85-1/90	GEN 4F PIC
LP-MR	2H	10/85-1/90	GEN 5F PIC
LV-KP	2H	11/84-1/90	GEN 4F HT TROOP
RP-KR	2H	11/94-1/90	GEN 4F PIC
RP-KR3	2H	11/94-1/90	GEN 4F IV
RP-MR	2H	11/84-10/85	GEN 5F PIC
RV-KR	2H	11/84-1/90	GEN 4F HT TROOP
RP-MRQ	2H	11/84-1/90	ARL 5F PIC
RP-MRN	AD	10/85-1/90	SA 5F PIC (Atlantis Diesel Engine)
RV-MRQ	2H	11/84-1/90	ARL 5F HT TROOP
RP-MRQ3	2H	11/84-1/90	ARL 5F PIC IV

HDJ80

R-GNMNXQ	1HDT	1/90-1/95	ARL 5F LUB GXL
R-GNPNXQ	1HDT	1/90-1/95	ARL 4FC LUB GXL
R-GNMEXQ	1HDT	1/90-1/95	ARL 5F LUB VX
R-GNPEXQ	1HDT	1/90-1/95	ARL 4FC LUB VX
R-GNMNWQ	1HDFT	1/95-	ARL 5F LUB GXL
R-GNPNWQ	1HDFT	1/95-	ARL 4FC LUB GXL
R-GNPEWQ	1HDFT	1/95-	ARL 4FC LUB VX

HZJ70

RV-MRQ	1HZ	1/90-1/95	ARL 5F HT
V-MNS	1HZ	1/95-	JAP 5F ? LX
V-MNU	1HZ	1/95-	JAP 5F ? LX

HZJ73

RV-MNQ	1HZ	1/90-8/91	ARL 5F HT LX
RV-PNQ	1HZ	1/90-8/91	ARL 4FC HT LX

HZJ75

RP-MRQ	1HZ	1/90-	ARL 5F IV
RP-MRQ3	1HZ	1/90-	ARL 5F IV

HZJ80

R-GCMRSQ	1HZ	1/90-	ARL 5F SOB
R-GNMNSQ	1HZ	1/90-	ARL 5F LUB GXL

LJ70

L-KR	2L	11/84-1/90	GEN 4F ST
LV-KN	2L	8/86-8/88	GEN 4F HT LX
LV-KR	2L	11/84-1/90	GEN 4F HT
LV-MR	2L	11/84-1/90	GEN 5F HT
LV-MNX	2LT	8/86-1/90	GEN 5F HT LX
LV-MRX	2LT	10/85-8/86	GEN 5F HT
LV-MRXW	2LT	9/86-11/86	FIN 5F HT
LV-MNXW	2LT	11/86-12/92	FIN 5F HT (Special 6/87-11/87, 5/91-12/92)
R-KR	2L	11/84-8/88	GEN 4F ST

RV-KN	2L	8/86-8/88	GEN 4F HT LX
RV-KR	2L	11/84	GEN 4F HT
RV-MR	2L	11/84-10/85	GEN 5F HT
RV-MRX	2LT	10/85-8/86	GEN 5F HT
RV-MRXQ	2LT	10/85-8/86	ARL 5F HT BUNDERA
RV-MNXQ	2LT	8/86-1/90	ARL 5F HT BUNDERA LX
RV-MNXQ	2LT	1/90-8/92	ARL 5F HT BUNDERA LX
RV-MEXQ	2LT	8/86-8/88	ARL 5F HT BUNDERA VX
PZJ70			
RV-MRQ	1PZ	1/90-5/93	ARL 4F HT
RV-MNQ	1PZ	1/90-5/93	ARL 5F HT LX
-MRS	1PZ		JAP 5F ST
V-MNS	1PZ		JAP 5F HT LX
V-MRS	1PZ		JAP 5F HT
PZJ77			
HV-MNU	1PZ	1/90-1/94	JAP 5F HT LX
V-MRU	1PZ	1/90-1/94	JAP 5F HT
HV-MNS	1PZ	1/90-1/94	JAP 5F HT LX
V-MRS	1PZ	1/90-1/94	JAP 5F HT
RJ70			
L-KR	22R	11/84-1/90	GEN 4F ST
L-MR	22R	11/84-8/86	GEN 5F ST
L-MRV	22R	11/84-8/88	ME 5F ST
LV-KR	22R	11/84-1/90	GEN 4F HT
LV-KN	22R	8/86-8/88	GEN 4F HT LX
LV-MN	22R	8/86-1/90	GEN 5F HT
LV-MEV	22R	8/86-8/88	ME 5F HT VX
LV-MNV	22R	8/86-1/90	ME 5F HT LX
LV-MRV	22R	11/84-8/88	ME 4F HT
R-MRQ	22R	11/84-8/88	ARL 5F ST BUNDERA
RV-KR	22R	11/84-1/90	GEN 4F HT
RV-KN	22R	8/86-8/88	GEN 4F HT LX
RV-MRQ	22R	11/84-8/86	ARL 5F HT BUNDERA
RV-MNQ	22R	8/86-1/90	ARL 5F HT BUNDERA LX
RV-MNQ	22R	1/90-8/91	ARL 5F HT BUNDERA LX
RV-MEQ	22R	11/84-8/86	ARL 5F HT BUNDERA VX

11.0 Body Colour Codes

This list is by no means complete. I don't know the start/end date for most of the colours. When I precede a date by a "<" I'm sure of that date, but believe the colour was AVAILABLE BEFORE that date. If I put a "-<" before a date, the colour was PHASED OUT BEFORE that date.

CODE	COLOUR NAME	YEARS OFFERED				
		4x	55	6x	7x	80
012	Cygnus White	<71-76	<71-76			
033	White			80-		
113	Health Grey	<71-<79				
155	Dk Charcoal Grey Irrid.				87	

202	Green			
309	Freeborn Red	<71-84	<71-79	80-
414	Buffalo Brown	<71-<79		
415	Pueblo Brown	<71-<79	<71-<79	
416	Dune Beige		<71-80	
464	Beige	79-84		80-84
474	Dark Copper		-79	
4E9	Beige			85
4G8	Light Beige Irrid.			
532	Yellow	<76-<79,82?		
611	Dark Green	-<79		
621	Rustic Green (Dark)	<71-79		
622	Nebula Green	<71-<79	<71-<79	
653	Olive Green	<76-82		
681	Green (Medium)	81-83		
808	Horizontal Blue	<71-<75		
822	Royal Blue	<71-<79	<71-<76	
854	Blue (sky blue)	<76-80		
857	Nordic Blue (Dark)	79-84		80-84
	Feel Like Blue			
861	Bright Blue Irrid.			81-83
8B4	Night Blue Irrid.			85-
LM11				

Two Tone patterns

VEHICLE	YEARS	CODE	COLOURS USED
FJ55(L)V, V-B	71	C6580	113/012/113
	71	C6581	309/012/309
	71	C6582	415/012/415
	71	C6583	622/012/622
	71	C6584	822/012/822
FJ55LG	71	C6591	113/012/113
	71	C6592	309/012/309
	71	C6593	415/012/415
	71	C6594	622/012/622
	71	C6595	822/012/822

12.0 Decoding your ID plates

I'll describe the various ID plate types with their usual location in brackets.
Keep in mind, I've only seen North American plates so yours may be quite different. The extra-descriptive plate with the axle/transmission/colour codes
was not used until 1976. If your vehicle was sold in North America, there's a
99-44/100% chance that youre truck's got 4.11 gears and an H42 or J30 transmission anyways.

Pre-1974 ID Plate (FENDER APRON)

O	T O Y O T A	O
MODEL FJ40L		
___	ENGINE MODEL	F
|tep|	NUMBER OF CYLINDERS	6
~~	BORE	3.54 in
	STROKE	4.00 in

```
|         PISTON DISPLACEMENT   237 cu.in |
|       NO.  FJ40-000000                  |
|O        TOYOTA MOTOR CO., LTD.         O|
+-----------------------------------------+

1976 FJ55 (FENDER APRON)
+-----------------------------------------+
|O            T O Y O T A                O|
|   MODEL FJ55LG-KK                       |
|   ENGINE 2F           4230cc/257.9cu.in |
|   FRAME No. FJ55-86909                  |
|   COLOR/TRIM                            |
|   TRANS/AXLE                            |
|   PLANT/G.V.W.                    MADE  |
|        JAPANESE...                 IN   |
|O  tep   TOYOTA MOTOR CO., LTD.   JAPAN O|
+-----------------------------------------+
```

13.0 40 Series Specific Info

13.1 Production Timeline (US/Canada)

MODEL YEAR	ENG	TRANSMISSION	TRANSFER	OTHER
1960	F	3-on the tree	2.313:1	Start of prodution Small round FR turn signals Single brake master cyl resevoir
1963		3 on the floor (Option)		
1964				Flip-up roof vent removed Smooth headlight bezel
1965				Larger side windows and corner windows added
1968				30 fine spline axles replace 10 coarse splines Birfield joints replace ball joints in FR Siamese centre exhaust ports replaced One piece manifold gasket added Cable throttle linkage replaces rod Padded Dash Vin plate on door pillars
1969				"Improved" steering centre arm Small Rectangular FR turn signals Replaceable element oil filter replaced with catridge type (03/69)
1970				Dual resevoir master cyl Dual horns

1971			Power Brakes (07/70)
1972	3 on the floor STD		Smog pump appears (09/72) Domed pistons in F become standard (09/72) Additional wire added from starter to coil (12/72)
1973 (09/73)			Separate model for Calif introduced EGR system added (09/73) Extra gusseting added to spare tire carrier (03/73) Additional frost plugs added to block (09/73) Notched con-rod bearings replace knock pin (09/73) Additional oil hole for rocker lubrication added (09/73) Head bolts lenthened to 145.5mm (09/73) Two ridges added to valves for retainers (09/73) Front diff fill plug moved 20mm closer to centreline of axle (12/73) Saftey catch added on hood Ignition switch moved to steering column Factory AM radio Stronger steering box
1974	2F 4 SPD	1.999:1	4 Speed Transmission (8/74) Larger universal joints & flanges (01/74) Transfer shift rod notched for driveshaft clearance (1/74) Rectangular RR brake lights/turn signals RR lower shock bolt moves from axle to U- bolt bracket Clutch changed from coil spring type to diaphragm (08/74) Clutch slave moved from left to right side of bellhousing (08/74) Cover added to timing hole (08/74) No. 2 cover on bellhousing changed

from		steel to rubber (08/74) Clutch release fork boot modified) U-joint flange modified for better
grease		nipple access (11/74) Longest production run of any LC
(9/73-		12/74)
1975	1.959:1	Thicker side doors Ambulance doors replace
lift/tailgate		LG Square FR Turn Signals/side
markers		Wipers move to bottom of windshield Muffler moved from between frame rails to under rear tub Transfer Case shift lever size
increased		(03/75) Transfer Case gear area increased
(Start of		1.959 Case Ratio) (04/75) Valve seats improved (04/75)
1976		FR disk brakes (9/75) Larger brifields Front outer axle shafts changed
from 10		coarse splines to 30 fine splines Front spindles and bearings enlarged Build plate appears Transfer bushing diameter decreased
(02/76)		
1977		Tubular spare tire mount (09/76) Pop-out rear windows (08/76)
1978 2F,B		Diesel comes to Canada Fine spline pinion flange (1/78)
1979		3.73:1 Diff becomes standard on FJ 22 gal under-floor fuel tank Power steering becomes and option Air conditioning becomes an option Reclining Seats Catalytic converter Fewer, larger body mounts Squared off headlight bezel & wider
set		headlights Tail-lights grounded via wire
instead of		through housing (1/79)
1981 2F,3B	2.276	3B comes to Canada

		Improved 3B exhaust manifold
		Larger shackles, hangers & frame gussets
		Split case transfer case
		New RR brakes with 11.8" drums and single self-adjusting wheel cylinder (8/80)
		Parking brake moved from rear of TFR to rear drums
		Warn front hubs replaced with stainless steel Aisin units
		Front outer axle shafts shortened
		Rear heater moves under center console
		"Shield" shaped steering wheel centre
		Locking "Pocket"
		Chrome window weather stripping replaced with rubber
1983	4(40)/5SPD(42)1.959	Dash re-designed & includes digital clock
1984		Production CEASES! :(

Although production of the 40 Series Land Cruiser stopped in 1984, there is
still a _COPY_ in production. It is manufactured in Brazil and is called a
Bandeirante. It features a body/frame which is a copy of a Land Cruiser and
is powered by a Mercedes diesel motor.

13.2 More Production Info

These are some known dates associated with frame and engine numbers. This
should provide some assistance in determining the vintage of components.

DATE	FRAME NO.	ENGINE NO.	TRANNY NO.	NOTES
04/69	067429			Starting frame for '70
09/70	89034			Starting frame for '71
09/71	113001			Starting frame for '72
08/72	134102			Starting frame for '73 ST
08/72	134627			Starting frame for '73 HT
09/72	140174	F-406511		
03/73	144381			
05/73		F-434231		
09/73	160001	F-510001		Starting frame for '74
11/73			3J-425	
12/73	165428			
12/73	166077			
12/73	166226			

01/74	167459			
04/74		F-539555		
08/74	179420			4spd tranny
08/74	179455			3spd tranny
11/74	185078		4L-1104	
12/74	191096			Starting frame for '75
03/75	195335			
04/75	198572	2F-917420	5D-2128	Start of 1.959 tfr ratio
05/75	199225			
05/75	200074			
09/75	207793			Starting frame for '76
01/75	215536			
02/76	219424		602-2435	
09/76	231077			Starting frame for '77
09/77	256757			Starting frame for '78
01/79	298294			
05/81	341000			

14.0 55 Series Specific Info

14.1 Production Timeline (US/Canada) - Kerry Manning (D55guy@engr.colostate.edu)

Many of the FJ40 changes also apply

MODEL YEAR	ENG	TRANSMISSION	TRANSFER	OTHER
1969	F135	3 on tree	2.313:1	FT turn (Amber) mounted on side of engine cowling (wing style) Front parking lights (A) mounted in grill Brake lights (R) and rear turn signals (R) mounted at belt line Mini "scoops" mounted on hood
1970				Grill slightly modified Front turn signal (A) mounted on top of fender (simple pedestal style) Front parking lights (A) removed Mini "scoops" removed
1971				A/C becomes optional! (7/70) Temperature gauge changed (7/70)
	F155			Oil filler moved to valve cover (3/71)
		3 on the floor		Rod linkage replaces vacuum shift on t-case (3/71)

	Headlight bezel updated (3/71) Smaller windshield washer tank
(3/71)	
1972	Speedometer changed (9/71) Steering box and associated parts
changed	
	(4/72)
1973	Very minor modification to grill
(9/72)	
	Rear vent added (9/72) Two piece license plate light
replaces the	
	one piece (9/72) Heater changed with larger front
blower vent	
	(9/72) Dash changed to fit removable panel
for	
	easier access (9/72) Key moved to column (9/72) Steering wheel changed (9/72) Speedometer changed (9/72) Antenna changed (1/73)
1974	Wing window removed (9/73) Two piece fender emblem replaced
with one-	
	piece (9/73) ASCO Hubs become standard (9/73)
2F 4SPD	Oil filter moved to side of block Aluminum valve cover and water pump Smaller air cleaner on top of valve
cover	
	Hood changed to accommodate 2F air
cleaner	
1975	Front running lights (A) removed
(12/74)	
	Front turn signal upgrades to
combination	
	signal (pedestal style) (12/74) Exhaust system redesigned (1/75) Optional A/C redesigned (1/75) Lock added to fuel door (1/75) Door lock changed so door must be
unlocked	
	to be opened from inside (8/75)
1976	Larger, fine spline Birfields (9/75) Front disc brakes (9/75) Greatly improved brake booster
(9/75)	
	Temperature gauge changed (9/75) Retractable front seat belts (1/76)

	Optional A/C redesigned (2/76)
1977	Slight cosmetic modifications to tailgate (12/76) "TOYOTA" and "4 WHEEL DRIVE" emblems added to tail gate (12/76)
1978	Combination tail light (9/77) Combination gauge ammeter upgraded from warning light to actual gauge (9/77) Fuel gauge changed (9/77) Temperature gauge changed (9/77) Upgraded horn (9/77)
1979	Ring and Pinion ratio changed to 3.70 (1/79) Speedometer changed (9/79)
1980	The seen mystical legend of the 55 w/ factory p.s. Production ends

14.2 Frame Number dates

See the FJ40 section for engine number dates.

DATE	FRAME NO.	NOTES
04/69	013179	Starting frame for '70
09/70	018461	Starting frame for '71
09/71	024001	Starting frame for '72
08/72	029632	Starting frame for '73
12/72	031360	
09/73	037001	Starting frame for '74
11/73	038641	
12/73	038844	
12/73	038878	
01/74	039208	
08/74	043288	4spd tranny
08/74	043293	3spd tranny
11/74	045017	
12/74	046864	
12/74	046926	Starting frame for '75
03/75	049008	
04/75	049988	
05/75	050647	California
06/75	051761	
08/75	053910	
09/75	054106	Starting frame for '76
02/76	058666	
02/76	059587	
09/76	065053	Starting frame for '77
09/77	078501	Starting frame for '78

01/79 100328

15.0 60 Series Specific Info

15.1 Production Info

DATE	FRAME NO.	TRANNY NO.
5/81	013248	
5/81	014196	
11/86		6J-3857

Aftermarket tailgate lift struts
NAPA Balkamp Powerlift 819-5565

16.0 80 Series Specific Info

16.1 Full Time 4WD

All 80 series Cruisers sold in North America and Europe are full time 4wd. In Africa and Australia, a part-time system is still available. 80's produced between '90-'91 have an open center differential which is lockable in 4HI and automatically locked in 4LO. From '92 on, vehicles with ABS had a viscous coupling that sent a maximum of 30% torque the non-slipping axle. The differential is lockable in 4HI and automatically locked in 4LO.

16.2 Locking Differentials

Locking differentials were available as options in all 80 series. From 94 on, they were standard in Canada. The operation of the lockers is very elegant. When the differential lock dial is turned to the "Locked" position, it switches on a small electrical servo. The servo pushes on a dog clutch which is meshed with the splines on the axle shaft. The dog clutch slides along the axle shaft and engages on the side of the differential carrier. The axle is then completely locked. They were offered from the procuction date 8/92 onwards.

17.0 Buying/Inspecting a Land Cruiser

NOTE: This article is biased towards 40 series Land Cruisers, although it can be applied any model. Also, parts of this may sound a little like a sermon. This is because for me Land Cruiser ownership goes beyond possesing a vehicle

and well into the realm of the occult. Are YOU willing to sacrifice you life
for your Land Cruiser?

Furthermore, this article should be required reading for the new Land Cruiser
owner. Running through the pre-buy checklist will help you find potential
problems in your new truck, and see what maintenance needs to be done.

So you want to buy a Land Cruiser. First, some words of warning. If you're looking
at a 40 series, the vehicle will be at least 11 years old. It was built as an
offroad vehicle and as a result has probably taken alot more of a beating than a
car of a similar vintage. It will definitely require more upkeep than a new
vehicle.

With all Land Cruisers, newer is definitely better. Unlike the Jeeps whose
"quality" varied widely from year to year until Chysler "neutered" them all and
Land Rovers where some Series are shunned because their headlights are in the
wrong place, Toyota was continually improving the Land Cruiser. Check the
production timelines earlier in the FAQ to determine which features you can live
without and hence how old you're willing to go. The only exception to this rule
is if you're living under a fascist regime such as Kalifornia where ancient
frames are prized for their smog exempt status.

Usually long before someone decides to sell a Cruiser, they decide that they
should stop pouring money into it. Therefore, shortly after you purchase your
truck you can expect to have to dump a whole lot of money into it to fix little
things the previous owner couldn't be bothered to do. This can be VERY
discouraging. Don't worry. Once you get your truck into a roadworthy state, it
will remain there for quite some time. When I first got my truck, the fuel
gauge didn't work, most of the knobs were missing, the headlights had a nasty
habit of turning off instead of switching to high-beam, none of the interior or
signal lights worked, the u-bolt plates were cracked, the shackle pins were
about to rip out of the shackle plates, the rear tub was basically gone, along
with the bottom 2" of the hard top and rear doors.

Older Land Cruisers (Anything other than a 60 or 80) make lousy daily drivers.
They're loud, they suffer from a relatively harsh ride and vague-on road handling, and the gas ones get lousy fuel economy. Thanks to brick-like aerodynamics, side-winds quickly become tail-winds. You don't want to commute
in an FJ40.

Anyways, that said, there are some requirements that I believe a Land Cruiser
owner should meet. They need to have a steady income. I bought my Cruiser
while I was in university and wound up having to take a couple of years off to
work to be able to fix it up. If you're a starving student, you're probably
better off with a mini-truck. Parts are cheaper, and there's a whole lot more
of them so they're more "disposable"

If you've got a significant other, your relationship has to be up to the stresses imposed by the new arrival. It took a long time for my girlfriend to
adjust to being a "Land Cruiser widow" If a Land Cruiser is brought into a weak
relationship, there's always the chance you won't get to keep the house--then
you'd be without a garage to work in.

Actually, a garage is pretty much required. Lying out in the street is hazardous and people tend to walk off with tools they find lying on the sidewalk.

I also firmly believe that you should do EVERYTHING on your Cruiser AT LEAST
ONCE. If you have a professional mechanic attend to all you maintenance, you'll
be out of luck when something goes wrong miles from the nearest gas station

So you've warned anyone that cares about you that you'll never see them again,
and their only contact with you will be standing in the garage yelling at the
underside of your truck. You're mentally prepared to become the caretaker of a
disappearing breed. Time to go shopping.

You should start scanning the local classified ads for a couple of months before
you actually begin to shop in earnest. That way, you can begin to check out the
local price-structure. In certain parts of the U.S. and Eastern Canada, you may
only see one Cruiser a week, if that. Once you learn that the most ancient
truck costs more money than you have, you're ready to start making

calls.

When you finally locate a truck, it's time to go for a look. The things you should watch for can be grouped into several categories.

17.1 Engine

I'm not a fan of gas truck engines, so I can't offer too much help here. I've heard that the intake manifold tends to crack if the truck has been overheated.

Start by checking for coolant leaks from the hoses, water pump, and radiator. Next check for oil leaks from around the pushrod inspection plate that the blow-by tube comes from, the gasket between the oil pan and the block, and the vaccum pump if so equipped (diesel)

17.1.1 Diesel Engine

When the engine is fired up, watch how quickly the oil pressure builds. If the idle is high (the engine feels smooth instead of causing the whole truck to shake) There's probably either a hole in the diaphragm or the vaccum lines that go to it. Both are relatively cheap and easy to replace provided you buy Nippondenso and not Toyota parts. You can test a diaphragm by pulling off the top end of the "clear" vacuum hose that goes to the rearmost nipple on the injection pump and blowing into it. If you can build pressure, the diaphragm is still good.

It is normal for a cold diesel to blow a little white smoke at start-up. Black smoke usually means that the injectors need service, white smoke indicates under-injection of diesel (probably due to a perforated diaphragm), and blue smoke shows that oil heavier than diesel is burning (Ohh ohh!) When the truck is running, check for excessive exhaust coming out of the blow-by tube. If the truck has a noticable miss as it warms up, one of the glow plugs is shot. They have to be replaced as a set. The amount of blow-by will indicate the amount of wear in the engine.

17.1.2 Gas Engine

Pull the spark plugs and check them for oil fouling. If they're

coated, oil is
getting into the cylinder past the rings and valve guides.

17.2 Cooling System

With the engine COMPLETELY cold, remove the rad cap and check the coolant level.
If you can' actually see any coolant in the rad, there's probably a leak. If a
B/H series diesel is overheated or run with inadequate coolant, the heads are
prone to cracking. Carefully look at the rad. Usually leaks will show up as
whitish stains. When you return from a test drive, mist the rad with water. If all the water evaporates then the tubes aren't plugged. If there are
areas where the water evaporates and others where it doesn't [cold spots,
usually vertical sections of the rad] then the rad needs to be serviced [power
flushed or rodded-out]. You can also check for cold spots by using your hand but
there is often not a lot of space between the grille and the rad --> and you
could burn your hand. Be careful.

17.3 Electrical

In both gas and diesel Cruisers, check the alternator for excessive play. A
brand new onw is worth a small fortune. Rebuilt 12V ones are difficult to find
and 24V ones are virtually impossible. If a diesel alternator with a vacuum
pump on the back shows any signs of oil leakage, it's probably shot.

If you find that there are accessories (radio etc. attached to only one battery
of a 24V diesel, you can expect to replace the battery shortly. Drawing 12V off
one of the battery loads them unequally leading to undercharging of one and
overcharging of the other.

In 1974 and up 40 series, a dead bulb, bad ground, or wiring problem in a turn
signal will result in the indicator light in the dash sticking "on"

In 60 and 70 series the same type of problem will show up as the indicator light
flashing "double time"

17.4 Transmission/transfer

Check for leaks in all the gaskets and seals. Chances are, if a seal is leaking,
the bearing behind it is shot. Ask the owner what kind of lubricant

they're
using. Synthetic gear oil will often manage to seep past a seal that's good
enough for regular oil. If a seal is weeping synthetic gear oil, chances are
it's on its way out anyways.

Check for lateral play in the output yokes from the transfer case. Movement
intdicates bearings that are in need of replacement. If the movement is greater
than 1/8" chances are the gears themselves have been damaged once that occurrs,
the transfer case gets EXTREMELY expensive to re-build.

If a 40 series has been lifted more than 2", check to make sure that the notch
in the skid plate the front drive shaft passes through has been enlarged.
Otherwise, the rearmost yoke on the front driveshaft will bang on the plate
causing the bearings in the transfer case to fail.

With the truck parked on a level surface, take out the transmission fill plug.
If gear oil pours out of the plug, the seal between the transfer case and
transmission is probably shot. This is a cheap part, but replacing it pretty
much requires pulling the transfer and transmission. I also believe that when
this seal goes, it's not a bad idea to rebuild the transfer anyways. It is
usually the first internal problem that develops, and rebuilding the case when
it goes ensures that all the gears will still be in good shape.

A leak from the rear output flange of the transfer usually results in destroyed
parking brake shoes in pre-1981 transfer cases.

When test-driving the truck, feel how smoothly the truck shifts. It is normal
for four and five speed transmissions to be a little balky when they're cold.
The H55F 5 speed tends to be worse in this respect. If the transmission is
difficult to shift when warm, chances are the synchros are shot.

Transmissions/transfer cases popping out of gear is a desparate cry for a
rebuild. Left for any length of time, it will lead to severe gear/shift collar
damage.

17.5 Driveshafts

Check for play in the universal joints. Although a worn joint is cheap to fix, if the truck has been driven with the excessive vibration of a failed joint for any length of time, the transfer case and pinion bearings can suffer. Dents in the shafts can also cause vibrations and premature failure. Grab the shafts on either side of the slip joint and try to rotate each side in the opposite direction. If there's movement, or wose yet a "clicking" the slip joint splines are worn and will need to be replaced. Check that the univeral joints and slip-joints have been greased, but NOT just prior to your arrival. (There should be SOME dirt stuck to any traces of grease on the zerk-fittings or around the joints)

Grab the driveshaft on either side of the slip joint and try to rotate the two halves relative to each other. Any movement indicates that the splines in the slip joint are shot and either the driveshaft must be cut and the splines replaced, or the whole driveshaft must be replaced.

17.6 Rear Axle

Check the pinion flange for excessive play. Usually slop here will result in an a destroyed ring and pinion.

While inspecting the brakes, check for any signs of gear oil on the backing plates or brake shoes. Gear oil that has leaked past the seal at the outboard end of the axle tube will saturate the brake shoes and destroy them.

It is rare for a Cruiser to experience wheel bearing failure unless they've REALLY been abused.

17.7 Front axle

The above rules for checking the pinion bearings apply along with some potential problems for the steering knuckles. Check that there is a thin coating of grease covering the knuckle balls from top to bottom. Accumulations of crud on the knuckle balls can indicate one of two things. Grease indicates that the knuckle seals are shot. Gear oil indicates that the seal inside the axle tube. Either problem requires complete disassembly of the knuckles. If the

balls are
dry, they've been run improperly lubricated for quite a while and at least the
upper knuckle bearings will be destroyed. If the tire can be grabbed by the top
and rocked back and forth, either the wheel bearing is loose, or the knuckle
bearings are shot. Get someone else to try and rock the wheel and watch if it's
moving relative to the knuckle or if the knuckle is moving relative to the axle
tube. Quite often if the wheel bearings are loose, they are simply in need of
re-packing and adjustment.

17.8 Steering

In manual steering equipped Cruisers, check for gear oil in the steering box by
removing the breather vent located on the top. If there is none, the pitman-arm
seal has failed and the bearings are probably almost gone. If there is grease
in the steering box, the seal has failed, and the owner has at least tried to
extend the life of the steering box. It may be salvagable, but pulling the
pitman arm to replace the seal will require a very stout puller and possibly a
little heat from an oxy-acetelyne torch.

Have someone rock the steering wheel back and forth through a 90 degree arc
while you inxpect the steering box and centre arm (on 40's-55's) The centre arm
should rotate with no sign of "wobbling" If the steering tends to "stay where
it's left" while driving rather than returning to centre, the seller has
probably cranked up the centre arm to try to hide slop.

Check the ball joints with a pair of water-pump pliers. Squeeze the ball joint
from the top and bottom (taking care not to put pressure on grease nipples, if
present) if it "compresses," it is worn out. Replacing worn tie-rod ends is
relatively easy, but ensure that there's only play in the ball joint and not in
the threads between the rod and the end. This will require replacing the rods
themselves.

17.9 Brakes

To check the brakes, push the pedal down and hold it. If the pedal travels
slowly to the floor, there is a leak in the system. If it is apparent

the
system is leaking, start off by checking at each wheel. Remove each wheel in
turn and check for leaks. Look for leaks from the callipers on disc brake
equipped vehicles, and wheel cylinders on drum brake equipped vehicles.

On drum brake vehicles, put each drum back on and feel how easily it pulls off.
It is usually very difficult to coerce a drum to come off, but once you've
broken the "seal of rust," they should only be slightly snug--if they come off
too easily the wheel cylinders need adjustment. Out-of-adjustment wheel
cylinders will also show up when you depress the brake pedal in the form of
excessive pedal travel. Check the shoes for reasonably even wear and thickness
and look for any signs of scoring in the drums. Try to turn the adjusters on
the wheel cylinders. If they're seized, they will need replacement. You can
get a rough idea if the drums are warped or not by putting them back on the
truck and spinning them. There should be even resistance thought a complete
rotation.

Check all the steel lines for excessive corrosion or kinks. Flexible lines can
be checked by "kinking" them back on themselves. If the edge that is in tension
shows signs of cracks, it needs replacement.

17.10 Suspension

Many people will replace the factory suspension anyways, so for them damage here
is of little concern. If the stock suspension is to be retained, there are a
number of items that should be checked. Check the spring packs for broken or
bent leaves. If there are no shoulders on the bushings or the shackle pin doesn't
appear to pass through the centre of the spring eye/spring hanger the bushings will
need to be replaced. Check at theres no movement of the shackle pin relative to the
shackle plate. Pre-81 stock shackles are prone to the pins working loose.

Looking at the condition of the U-bolt ends below the spring plate will give
clues to the use of the vehicle. If the U-bolt ends are bent/scraped, the truck
has seen some off-road beating. While looking under the U-bolt plate, ensure

that you can see the nut and spring pin. The pin will sometimes break in the
middle of the spring pack causing the bottom chunk to fall out. Replacing the
pin requires removing/replacing the U-bolts as well.

Check that the shock mounts on the rear crossmembers and u-bolt plates aren't broken.
Frame/axle mounted broken pins must be cut out and new ones welded in. On 40 series,
the top front shackle mount pin will sometimes develop play relative to the shock mount
tower. If that is the case, it can temporarily be fixed by adding another washer to the
large-nut end of the pin, but will eventually require proper replacement which involves welding/boring out the tower.

17.11 Body

This is probably where you'll find the greatest variance in Land Crusiers. Some
trucks are pristine and have been hermetically sealed in their garages all
winter, whereas some have been used to launch boats in the ocean. The former
will have a body. The latter won't.

The problem areas for 40 series are: (probable order of occurence)

-along the seam between the sides of the body and the tops of the fenders in
the rear
-under the back doors
-the "box section" that runs under the door sills
-the lower edges of all doors
-on the fenders around the turn signals
-on the fenders where the support brackets from the frame attach
-along the sill that runs down in front of the doors
-the windshield frame under the rubber gasket
-the lower edge of the hard top and the steel drain sill under the fibreglass

The problem areas for the 60's and 70's are
-the lip around the fender wells
-the lower edges of all the doors
-the rear quarter panels
-under the rubber gasket around the windshield
-under the mud flaps
-basically any seam around the rear wheel-wells.
-the seams in the front footwells

Finding a 60 that has the dealer-installed aluminum running boards is a good
sign. Intact running boards indicates that the vehicle had never really been
used offroad and they also prevent the rocker panels/lower door edges from

being hit by spray from the tires, decreasing the liklihood of rust.

17.12 Frame

The most common areas for frame rust on a 40 series are the gusset plates above the rear-most spring hangers, the rear crossmember, and the diagonals that run from the frame rails to the crossmember. As long as the frame rails themselves are okay, most of the gussets/brackets can be replaced. If the steel looks like its "delaminating," it is shot.

On pre-1981 trucks, the frames also tend to crack where the boxing ends above the front-most rear spring perches. The crack tends to run longitudinally from the rear-most rivet on the perch towards the back of the truck. The spring perches can also be tweaked, especially if the truck has been running extended shackles. As you sight along the framerails the shackles should be perpendicular to the bottom flange. Tweaked fixed-pin spring perches are rarer, but if a rear one is out of alignment, chances are the frame has cracked.
Because of the stronger design, perch/hanger problems aren't as common on post-'81 40s and 42s. Feel through the holes on the inboard sides of the frame rails. Large flakes of rust are a sign of problems to come.

60s and 70s only real problems stem from rust. Their frame designs don't have the same large holes as on 40s so they're harder to clean and more prone to trapping crud and rusting. Feel through the small access holes for signs of rust flakes. The worst spots for frame rust on 60s and 70s are where the muffler is next to the frame. It is possible for the steel to be weakened to the point that a screwdriver can easily be poked through it with no outwardly visible warning signs. The other big problem area is the rearmost section of the frame where it is just a channel (as opposed to fully boxed)

17.13 Inspection Checklist

Here's a handy checklist to print out and take with you when going to look at a prospective purchase. It' based on the checklist used for the Coastal Cruisers annual safety inspection:

OWNER INFO

Name:_____ Directions to truck's location:_____
Address:_____
_____
Phone Number: (____)____-_____
_____

VEHICLE INFO
Model:_____ Production Date:_____
Mileage:_____

ENGINE

Oil Level	G A P
Oil Pressure	G A P
Motor Mounts	G A P
Spark/Glow Plugs	G A P
Carb	G A P
Governer Diaphragm	G A P

COOLING SYSTEM

Radiator	G A P
Overflow Bottle	G A P NA
Hoses	G A P
Belts	G A P
Water Pump	G A P

BATTERY TIE DOWNS

LF	G A P NA
RF	G A P NA

LIGHTS	Head Lights	Markers	Turn Signals	Brake	Reverse	License
LF	G A P	G A P	G A P			
RF	G A P	G A P	G A P			
LR		G A P	G A P	G A P	G A P	G A P
RR		G A P	G A P	G A P	G A P	G A P

SUSPENSION	Springs	Bushings	Shocks	Shackles	Centre Pins
LF	G A P	G A P	G A P	G A P	G A P
RF	G A P	G A P	G A P	G A P	G A P
LR	G A P	G A P	G A P	G A P	G A P
RR	G A P	G A P	G A P	G A P	G A P

EXHAUST

Manifold	G A P
Pipes	G A P
Muffler	G A P

WIPERS	G A P
HORN	G A P

STEERING

Box	G A P
Centre-Arm	G A P NA
Tie Rod Ends	G A P
Rag Joint	G A P NA

U-Joints G A P NA
Slip Joint G A P NA

BRAKES	Parking	Shoes/Pads	Drums/Rotors	Master Cyl.
LF		G A P	G A P	G A P
RF		G A P	G A P	
LR	G A P	G A P	G A P	
RR	G A P	G A P	G A P	

CLUTCH
Master Cyl G A P
Slave Cyl G A P

BEARINGS	Wheel	Knuckle	Pinion	Transfer Case Output
LF	G A P	G A P		
RF	G A P	G A P		
F			G A P	G A P
R			G A P	G A P

SEALS	Wheel	Knuckle	Pinion	Transfer Case Output
LF	G A P	G A P		
RF	G A P	G A P		
F			G A P	G A P
R			G A P	G A P

DRIVE SHAFTS	U-Joint	Slip Joint
FF	G A P	G A P
FR	G A P	
RF	G A P	G A P
RR	G A P	

BODY	Mounts	Seat Belts	Roll Bar/Cage Sup.
LF	G A P	G A P	G A P
RF	G A P	G A P	G A P
LM	G A P		G A P
RM	G A P		G A P
LR	G A P	G A P	G A P
RR	G A P	G A P	G A P

BODY	Fenders	Rocker Panels	Quarter Panels	Lower Door	Windshield
LF	G A P	G A P		G A P	G A P
RF	G A P	G A P		G A P	G A P
LR		G A P	G A P	G A P	G A P
RR		G A P	G A P	G A P	G A P

FRAME	Rails	Perches	Hangers
LF	G A P	G A P	G A P
RF	G A P	G A P	G A P
LR	G A P	G A P	G A P
RR	G A P	G A P	G A P

18.0 Drivetrain Swaps

18.1 Non-Toyota Equipment

There is really no limit as to the complexity of swaps you can attempt with a Land Cruiser. The most common modifications are swapping engines and transmissions. Let me begin by saying that I am not a big fan of putting non-Toyota equipment into Land Cruisers. I only decided to write this section because I got tired of people asking me about swaps and not being able to provide any answers. This section is incomplete and will probably remain that way for quite some time until fans of the various engines supply me with more info. Also, because I do not have first hand experience with anything in this section, the chances of me making errors is greater. If you have a functioning 2F in your truck, I would leave well-enough alone. The engine is VERY heavy duty, makes good low-end torque, will never overheat provided your cooling system is in good shape. An older F is potentially a better candidate to be removed and replaced with a more modern setup. It should be noted that once you pull the F series motor from your truck, it is no longer a FJ40/55/60/... I prefer the designation of V8J40. I will talk about engine swaps retaining a Toyota transmission, transmission swaps retaining a Toyota engine, swaping in a new engine and transmission simultaneously, and finally, I'll touch on transfer case and axle swaps.

18.2 Diesel Engine Swaps

I'm starting here because to me this is the swap that makes the most sense for a rock-crawling machine and is probably the least explored. As you'll figure out shortly, I'm pretty opinionated on this one and I welcome anyone to dispute my views. I believe that diesel engines are superior to gas ones for offroad use for many reasons. They tend to make usable torque at much lower engine speed than gas engines. This means you don't need nearly as low a crawl gear. They also feature a much flatter torque curve. There is no ignition system to fail because of moisture. They are not as affected by altitude, in fact, turbocharged diesels are virtually immune to altitude. In most cases, even though they have all the advantages of a fuel injected engine, such as the ability to

run at
extreme angles, they rely on mechanical injection which is considerably simpler
than electonic injection. Diesel engines also tend to get much better fuel
economy and greater cruising range than gas engines of similar displacement.

There are three commonly available engines that are suitable for swapping into
Land Cruisers. Probably the biggest obstacle to the conversion is finding the
engine itself. The GM engines are the only ones listed here that are available
in light-duty automotive applications. The others are all industrial/medium
duty truck engines. These motors tend to be snapped up as soon as the vehicle
they were in is wrecked and rebuilt by companies with exclusive licenses.
Unless you're willing to pay top dollar for a rebuilt unit (not a bad idea) you
have to somehow find a way to intercept a motor before the rebuilders get their
hands on it.

The most easily obtained is the GM 6.2l diesel. A conversion kit is
available from Mark's Adapters in Australia to mate a GM diesel to a Land
Cruiser 4 speed manual or automatic transmission. The GM V8 supposedly weighs
about as much as a big block, so pretty close to the weight of a 2F. The L65 is
found in C/K 2500HD trucks, C/K 3500 trucks and C/K 2500 Suburbans. The L56 is
found in C/K 1500 trucks. C/K 2500 LD Trucks, K1500 Blazers/Tahoes/Yukons, and
C/K 1500 Suburbans. The 6.2l is found in all pickups and Suburbans, and in
Chev/GMC P30/P3500 step vans.

The 8th digit in the VIN of the donor vehicle indicates the motor type:

MODEL	DESIGNATION LETTER
6.2L	C
6.2L	J
6.5L	Y
6.5LT (L56)	S
6.5LT (L65)	F

The GM 5.7l is without a doubt the worst diesel engine ever cobbled together.
It is the Olds 350 gas block that was converted to diesel. Probably 99% of
these motors have been blown apart for at least 10 years, but some may still be
kicking around. If someone offers you one, they are NOT your friend.

A slightly more rare engine that I see as being a better match to a Land Cruiser
is a Cummins B3.9 litre turbo diesel. It was used in among other things, Ford
E350 cube vans, and Case 580 Tractors.

PowerMark used to offer a conversion kit (p/n RK9525G) that was designed to
allow you to bolt in a B3.5/5.9 in place of a GM 292 I6 or 350 V8 in GMC cube
vans. In order to put this engine into a LC using the stock transmission, you
would simply need to get the motor mounts/bellhousing Advance Adapters sells for
putting a V8 in and use the Cummins engine instead, as well as possibly having
to modify the supplied intake system and radiator hoses. Unfortunately,
PowerMark has now gone out of business. Fleet Supply has bought up the
remainder of their stock and plans to continue production. They also plan to
introduce a kit for Chev/Ford pickups. The kits should be available from your
friendly neighbourhood Cummins dealer.

I think the Cummins B5.9, as used in Dodge Ram is definitely too heavy to put
into a 40 series, and is a little heavy for a 55/60/80 series. It is also a
little on the long side. The above mentioned kit would also work for a B5.9.

The best diesel swap into an FJ40 I've ever seen is the Isuzu 3.9l diesel, model
number 4BD1T. Two of its applications were in Isuzu NPR series cab-forward
trucks, and LINK-BELT LS2700CII (4BDIT). I also believe it was used in the GM
Forward 3000-4000 series trucks. There are two paths for putting an Isuzu
diesel into a Land Cruiser. The first involves a factory Isuzu adapter
bellhousing. It is designed to mate any SAE #3 flywheel cover to a GM manual
transmission with a 5.125" bore (SM420). The bellhousing bears the casting
number WF 150015. Unfortunately, this bellhousing has recently been
discontinued. There are still some around--try your local Isuzu dealer. A
better option is an adapter ring. I have yet to locate a commercial source for
these--the one I've seen was made years back by a company that has since gone
out of business. The ring allows a GM bellhousing with a 350 bolt pattern to be
attached to an SAE #3 flywheel cover. Using the adapter ring, it would be
possible to attach the 4BD1T directly to a Toyota transmission with an Advance

adapter Chev->Toyota bellhousing.

18.2.1 Isuzu Engine Specs

MODEL	DISP (CC)	CYL	FUEL	(INDUST) BHP*	TORQUE FT-LB	COMP RATIO
4BD1	3856	4	DD	88@2800	181@1600	17.1
4BD1T	3856	4	TDD	105@2500	240@1600	17.5:1
6BD1	5785	6	DD	142@2800	289@1600	17.5:1
6BD1T	5785	6	TDD	163@2500	375@1800	17.5:1

MODEL	BORE (IN)	STROKE (IN)	DRY WT (LBS)	LENGTH (IN)	WIDTH (IN)	HEIGHT (IN)
4BD1	4.02	4.64	710	35.3	24.4	30.4
4BD1T	4.02	4.64	719	35.2	25.3	33.2
6BD1	4.02	4.64	1003	44.6	24.6	33.2
6BD1T	4.02	4.64	1089	44.6	26.4	37.4

*Figures according to SAE J1349 Gross BHP test. "Automotive" BHP of the 4BD1T for
instance is actually 121@3000.

18.2.2 Cummins Engine Specs

MODEL	DISP (CC)	CYL	FUEL	BHP	TORQUE FT-LB	DRY WT (LBS)	LENGTH (IN)	HEIGHT (IN)	BORE (IN)
4BT3.9	39xx	4	TDD	105@2500	260@1500	705	30.1	35.6	
4BTA3.9-120	39xx	4	TDDA	120@2500	302@1500	725	30.1	35.6	
6AT3.4	3434	6	TDD	120@3600	221@2000	665	32.9	31.7	
6BT5.9-160	59xx	6	TDD	160@2500	400@1500	880	39.6	36.8	
6BTA5.9	59xx	6	TDDA	180@2500	451@1500	905	40.7	36.8	

18.2.3.1 GM Diesel Specs

MODEL	YEARS AVAIL	DISP (CC)	CYL	FUEL	STOCK HP	TORQUE FT-LB	COMP RATIO
5.7L		57xx	V8	ID	.....	.....	.....
6.2L	-94	62xx	V8	ID	150	250@2500	.....
6.5L	94-	65xx	V8	ID	170	290@2000	.....
6.5LT (L56)	94-		V8	TID	180@3400	360@1700	21.5:1
6.5LT (L65)	94-		V8	TID	190@3400	385@1700	21.5:1

18.2.3.2 GM Diesel Swap Specifics - Aaron Leach (AARONL@corel.com)

The GM 6.2L mounts very similarly to a GM gas V8. The back of the engine has
the same bolt pattern as the 350

Most of the same directions that come with the small block kit from Advance
The engine can mount so that it is about three inches from the radiator, and
then the centerline of the engine was placed at 12 inches from the left inside
frame rail to the center of the engine--essentially the same as the

small block
Chevy engine. One thing to remember is that the 6.2 is a wide engine. The stock
steering box has to be removed to make the engine fit. Installing a power
steering conversion, such as the Saginaw box is required. Also, because of the
width of the engine, the steering shaft should be lengthened an extra eighteen
inches. That prevents the U-joint from hitting the exhaust manifold. The
cruise control mechanism can be removed, and part of the air intake system must
be removed for hood clearance. There is a spacer between the engine mount and
the block that is needed to fit the engine properly.

What You Can Use, and What You Cannot
Here is a list of things you can use with the conversion, and what you cannot:

-you can use all GM Chevy transmissions: TH350, TH400, 700R4, SM420, SM465, etc.
-you cannot use a gas engine torque convertor, you have to use a diesel one.
-you cannot use a gas engine flex plate or flywheel. The diesel's is balanced.
-Also, when using a flex plate, there are two kinds, a lock-up type, and a non
lock-up type. Each uses a different torque convertor.
-the injector pump has an overflow tube. You will need to run a return line to
the fuel tank.

You will want to install a diesel tachometer. These run off the alternator.
Diesels use their own starters--you will not be able to use a gas engine one.
Diesels also use their own engine cooling fan.
One battery will probably fit, but two might be difficult. You can get a box
made that fits behind you seat that will hold two batteries.
It might be wise to already have a lift installed because the drive line might
hit the oil pan.
With the automatic transmissions, you might have drive line problems in the
rear. My drive line for the TH350 is going to be about twelve inches. The TH400
and the 700R4 are about 5 inches longer than the TH350.
You will need a filter that takes water out of diesel fuel.
The diesel RPMS top out around 3500. An over drive transmission, higher
differential gears, or larger diameter tires will help with this situation.

Wiring the engine up

The engine is quite easy to wire up. First of all, the wires going to the starter are the same as they are on the gas engines. Secondly, the coil wire goes to the injector pump. There are two prongs on the injector pump. Which ever prong you put the coil wire on, you will need to jump a wire from there onto the other prong. You can throw the coil away, you will not need it. Also, the wire that went from the coil to the distributor is not needed.

To wire the glow plugs up, you can run a wire to a push button switch, then from there to two 70 amp relays, one for each side of the engine. If you don't want to hold the button down to control the glow time, you can add a timer relay.

You can also hook this up to the ignition. The only difference is that the ignition would be your push button switch part of it.

18.2.4 Nissan Diesel Specs

MODEL	DISP (CC)	CYL	FUEL	BHP	TORQUE FT-LB	COMP RATIO
SD33T	3245	6	T?D	101@3100	175@2200	21:1

MODEL	BORE (IN)	STROKE (IN)	DRY WT (LBS)	LENGTH (IN)	WIDTH (IN)	HEIGHT (IN)
SD33T	3.27	3.94				

FUEL
- ID - Indirect Injection Diesel
- DD - Direct Injection Diesel
- T - Turbo
- A - Aftercooled (erroniously called Intercooled by most)

18.3 Gas Engine Conversions

Ok, you've put up with my compression-ignitionist rantings for a while and have made it into the section that interests most people. There are some advantages to replacing your F series motor with a newer V8. The V8 weighs 250lb less than the F, which leads to a big improvement in your power to weight ratio. Because the newer motor is a little more effecient, and also because of the weight savings, you will get improved fuel economy. The engine that is most commonly swapped into a Land Cruiser is the venerable Chev 350. Other conversions, in approximate decreasing order of quantity are Chev 307, 383, 305, 400,

327, Ford
302/5.0l, Chev 454, Pontiac 455, Chev 4.3l V6. Swapping a Chev 235 I6 into a
Cruiser is pointless because it is basically identical to an F. The Chev 292
may be a worthwhile swap for those who want that "authentic straight-six feel"
Unfortunately, this engine is quite fuel hungry like the 2F and parts aren't
nearly as common as for the 350.

Even though distributor placement at the front of Ford engines is probably
better than the rear placement of Chev small block distributors, and the Ford
302 weighs 80lb. less than a 350, Chev engines are probably used ten times more
frequently. The big reason is parts availability. While ford was wandering
around in Windsor and Cleveland, the 350 changed very little over the years.

For that reason, a plain 350 is probably the easiest choice for an engine
conversion. There are a variety of conversion kits available and the engine can
be found in both carburated and fuel injected forms. For those looking for more
low-end torque, a 383 is probably the best choice. A 383 is a 350 that's been
bored .030 over and uses a 400 crank and 350 connecting rods. A 383 is superior
to a 400 because the bore of the 400 is too large. There's no space left
between the cylinders for water jackets so cooling is compromised.

There are only a couple of reasons for putting a motor bigger than a 383 or even
building a high horsepower 350. They are if you intend to put on tires that are
so large that re-gearing to return the tire:gear ratio to something approaching
a stock level is impossible, if you drive your truck in deep mud, snow, or sand,
or if you never quite managed to get that adolescent desire to try to peel your
tires off your rims out of your system.

On the other side of the coin, the 4.3l Chev 6 is probably a little too small
for even a 40 series.

Key engine design features to keep in mind are the bore and stroke. Engines
with a larger bore than stroke (oversquare) are better suited to high-RPM
operation, while engines with a larger stroke than bore are better for

lugging
down at low RPMs. A longer stroke also allows for a lower compression ratio and
lower octane fuel.

Once you have decided which engine you want to use, the next step is to choose
an adapter type. Depending on the engine you have selected, you can either
use a bellhousing from Advance Adapters, a Ranger torque splitter, or a Mark's
Adapter.

In order to use an Advance Adapter bellhousing, the flywheel from the engine
manufacturer must be used. In the case of small block engines, the
manufacturer's heavier truck type flywheel is required and is advantageous
because it will allow for smoother operation of the engine at lower revs. The
advantage of using an Advance Adapter bellhousing is the low cost of the adapter
itself. This savings leads to higher expenses elsewhere though. Because the
Advance Adapter bellhousing is approximately the same thickness as the stock
Toyota one, the engine, transmission, and transfercase will have to be shifted
forward to all sufficient firewall clearance. The movement of the transfercase
will require modified driveshafts. The use of the Advance Adapter bellhousing
will also require a custom clutch only offered by Advance Adapters. It's
probably best not to use a clutch that is not univerally available.

The use of a Ranger Torque Splitter provides several advantages. Foremost, you
get a 27% overdrive for lower revs on the highway. You can use a stock
Chev/Ford bellhousing and clutch. The Torque splitter functions as an adapter.
it can be ordered with Chev or Ford bolt and inputshaft patterns on the front
and Toyota input shaft patterns on the back. Finally, the 7-8" of extra
thickness of the Ranger means that driveshaft modifications are not required.
The Ranger is said to put the fan a little closer to the radiator than ideal
though.

The third option is the Mark's adapter. Their kit consists of a bellhousing and
flywheel that are 3-1/2" deeper than stock. The extra depth places the engine
perfectly with no driveshaft modifications. The extra thick flywheel also
provides extra damping to allow for smoothly lugging down the revs in

the rocks.

18.3.1 GM Engine specs

MODEL	YEARS AVAIL	DISP (CC)	CYL	FUEL	STOCK HP	TORQUE FT-LB	COMP RATIO
231 B	.....	....	V6	G	.....	.....	.....
252 B	.....	....	V6	G	.....	.....	.....
235 C	.....	....	I6	G	120-150	.....	.....
250 CPOB	.....	....	I6	G	.....	.....	.....
262	75-76	....	I6	G	110	.....	8.5:1
265	55-57	....	V6	G	162-225	.....	8.0:1
265 C	94-	4343	V6	G	163	.....	.....
265 C(HO)	94-	4343	V6	G	200	.....	.....
267 C	79-81	....	V6	G	115-125	.....	.....
283 C	57-67	....	V8	G	135-230	.....	8.5:1-11.0:1
283FI							
292 C	.....	....	I6	G	.....	.....	.....
302 C	67-69	....	V8	G	290	.....	11.0:1
305 C	76-94	....	V8	G	125-230	.....	8.5-9.0
307 C	68-73	....	V8	G	115-195	240@2000	8.5-9.0
327 C	62-69	....	V8	G	150-235	.....	8.8-11.3
327FI C		....	V8	EFI-G	370		
350 C	67-	....	V8	G	145-300	300@2000	8.5-11.0
350 C	.....	....	V8	EFI-G	.....	.....	.....
383 C	NEVER	....	V8	G	.....	.....	.....
400 C	70-80	....	V8	G	150-180	.....	8.5-9.0
454 C	.....	....	V8	G	.....	.....	.....
455 P	.....	....	V8	G	.....	.....	.....
500 V	.....	....	V8	G	.....	.....	.....

MODEL	BORE (IN)	STROKE (IN)	WEIGHT (LBS)	LENGTH (IN)	HEIGHT (IN)
235 C	3.56	3.96			
262 C	3.671	3.10	.....	.....	.....
265 C	3.730	3.00	550	25	26-1/2
267 C	3.500	3.48	.....	.....	.....
283 C	3.875	3.00	550	25	26-1/2
302 C	4.000	3.00	550	25	26-1/2
305 C	3.736	3.48	.....	.....	.....
307 C	3.875	3.25	550	25	26-1/2
327 C	4.000	3.25	.....	.....	.....
350 C	4.000	3.48	550	25	26-1/2
400 C	4.125	3.75	550	25	26-1/2

B - Buick
C - Chev
O - Oldsmobile
P - Pontiac
V - Cadillac

18.3.2 Ford Engine Specs

MODEL	YEARS AVAIL	DISP (CC)	CYL	FUEL	STOCK HP	TORQUE FT-LB	COMP RATIO
260			V8	G	164@4400	258@2200	8.8:1
289	64-		V8	G	200-271	282-312	9.3:1

300		4916	I6	G	-150	.....	.....
302	68-	4948	V8	G	210-235	295-318	8.5:1
302		4948	V8	EFI-G	.....	.....	.....
351W	69-	....	V8	.....	250-300	355-380	8.6:1
351C		....	V8	.....	.....	.....	.....
351M		....	V8	.....	.....	.....	.....
460		....	V8	EFI-G	250	355..	.....

MODEL	BORE (IN)	STROKE (IN)	WEIGHT (LBS)	LENGTH (IN)	HEIGHT (IN)
260	3.8	2.87			
289	4	2.87			
302	4	3.0	425		
351W	4	3.5	510		
351C			550		
351M			550		
400M			550		
460					

18.4 Transmission Swaps

The three domestic transmissions most commonly swapped into a Land Cruiser are the SM420 (used in Chev trucks until 1969) SM465 (used in Chev trucks from 1969-1992) and NV4500 (used in GM and Dodge trucks from 1992-)

MODEL	MAKER	OFFERED IN	DATES	SPD	1ST	2ND	3RD	4TH	5TH	R
SM420	Muncie	GM Trucks	47-67	4	7.05	3.57S	1.70S	1.00S		7.05
SM465	Muncie	GM Trucks	68-92?	4	6.54	3.58S	1.70S	1.00S		6.09
NV4500	New	GM Trucks	92-94	5	6.34S	3.44S	1.71S	1.00S	0.73S	6.34
	Vent-	Dodge Trucks	92-	5	5.61S	3.04S	1.67S	1.00S	0.74S	5.61S
	ure gear	GM Trucks	94-	5	5.61S	3.04S	1.67S	1.00S	0.74S	5.61S

MODEL	LENGTH (IN)	BORE (IN)
SM420	10.5	4.686
SM465	12.0	5.125
NV4500	12.0	5.125

Legend
S following a gear ratio indicated synchronized

The SM420 is probably the most popular transmission swap for a LC because of its extremely low first gear. It also has the advantage of being virtually a direct bolt-up to a three Toyota 3 speed bellhousing. All that is required is some minor drilling, a pilot bearing adapter, and a throwout bearing sleave, and an

adapter and spud shaft to go between the transmission and transfer case. The biggest disadvantage with the SM420 is parts availability. Because the transmission hasn't been made in almost 30 years, many of the parts have been discontinued. Adapting the transmission to a truck that formerly had a 4 speed transmission is also a bit more involved, requiring either an adapter bellhousing or a modified 3 speed bellhousing to be fitted.

The bolt pattern and bore of the SM465 is different so it will not bolt up to either the 3 speed or 4 speed bellhousing. Although it has a higher first gear ratio, this transmission definitely a better than the swap for those removing a Toyota 4 speed because the parts will be readily available from your local GM dealer. The SM465 is also somewhat beefier than the SM420.

The NV4500 is probably the ultimate domestic transmission. It has both granny low and overdrive in a package that is approximately the same length as an SM420. It is built to handle high horsepower and torque so the internals are very strong. The big drawback for this transmission is that because it is so new, it is very rare in junkyards. It is also extremely popular which drives the price up. The early GM unit is the hardest to find. Probably the ultimate setup is the Early GM/Late GM and Dodge hybrid which gives you the low first gear of the early GM unit combined with the better third gear ratio and synchronized reverse of the Late GM/Dodge transmission.

Of course, all the above mentioned transmission swap will require driveshaft length changes.

If you swap a domestic transmission in along with a domestic engine, matters are simplified. You just have to find the domestic bellhousing that will fit your engine and has the correct bore for your desired transmission.

18.5 Transfer Case/Axle Swaps

Swapping a non-Land Cruiser transfer case into your truck is a difficult proposition. This is due to the fact that all but the very early Land Cruiser axles have both differentials offset to the passenger's side. Virtually all domestic vehicles have the front differential offset to the driver's or passenger's side while the rear differential is centred. If you use a domestic

transfer case with Land Cruiser axles, you will wind up with a two-plane driveshaft angle. Apparently, the axle housing can be reversed to decrease the
angle, but this is still a very unadvisable setup.

If a domestic transfer case is required, the axles should be replaced as well.
Dana 60s and up are the only axles that are comparable/superior in strength to
the stock Land Cruiser axles. Reverse-cut Dana 60s have the pinion located
above the centreline of the ring gear and will result in somewhat improved
driveshaft angles in trucks with a great deal of lift.

19.0 Maintenance/Modifications

19.1 Aluminum Tubs - Rob Mullen (RAMullen@wimsey.com)

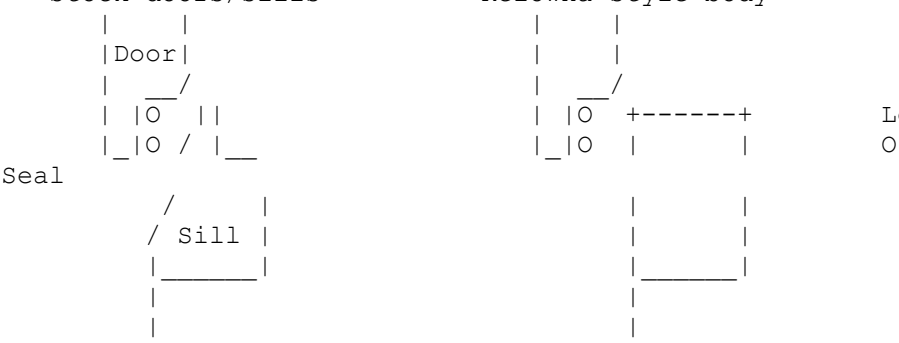
I've got an Aluminum tub on my Cruiser and I love it. It sure beats having
things fall out the rust holes in the back and getting a spray of water on you
from where the rear wheel wells used to be :) There are two schools of thought
when it comes to tubs:

Retain the steel sills (my style)
Description/Materials:
   The steel sills around the doors and along the top of the tub were retained
   (the remainder of the sheet metal is cut away with an air nibbler) Mine goes
   from the firewall back. My tub is all 1/8" Aluminum plate with bits of
   6061-T6 1/8" wall structural (round corner) square tubing/channel for body
   mounts and gas tank strap mounts.
Cost:
   Mine cost me CA$2400 (US$1700+/-) but that included a new fuel tank & sender,
   and I also got a "better shape than mine" hard top thrown in for free (a
   one-time lucky break for me) Keep in mind that my tub was for the body style
   with the gas tank under the floor and required quite a bit of bending on a
   hydraulic brake to make the right shape.
Advantages:
   + Doors and hard top fit properly
   + Slightly more body rigidity
   + Sides are held on with pop rivets + a few tack welds and can be easily
     removed/replaced if damaged
Disadvantages:
   - Steel can continue to rust along the edges until pop rivets

securing
aluminum to steel pull out (requires finding some steel sqaure tubing with
the same OD as the sill's ID shoving it in and re-riveting--I'm probably
going to have to do this soon on the driver's side at least)
- not a "bolt-on" installation - requires a reasonably skilled sheet metal
worker to cut old steel away nicely
- not widely available. Most tubs in this style are home made/made by local
Cruiser gurus and are therefore harder to find (Mine was built by a
Cruiser fanatic that used to make aluminum boats for a living)

All aluminum (style manufactured in Kelowna--Aqualu/Land Cruiser Solutions)
Description/Materials:
One note: The tubs I'm talking about is made by a Kelowna, B.C. company
called Aqualu Industries. These are sold east of the Mississippi by
Land Cruisr Solutions. Anyways, on with the description:

The entire tub behind the "drip rail" that runs down in front of the door
hinges is hacked away. The sills are replaced with 6061-T6 1/8"
round-edge... which leads to the door/hard top fit problems described by Gary
Bjork. Here's a quickie ascii illustration of the cross-section of the lower
part of the door and sill to show you:



As you can (hopefully) see, the stock doors fit flush into the body whereas
the "Kelowna Style" stick out by an amount equivalent to the width of the
bottom edge of the door (about 1/2"?) The hard top also sticks out by this
by the width of the bottom edge. The tub is made from material thinner than
1/8" (3/32", I think) and is available with both checker and smooth sides.
If you only run a soft top and soft doors, the fit problems I described above

will not really be noticable.

There is now a version of the tub available with "factory-style" sills. It
costs extra though.

Cost:

	NO SILLS	SILLS
EARLY-78	CA$1955 (~US$1396)	CA$2475 (~US$1768)
79-84	CA$2346 (~US$1675)	CA$2865 (~US$2046)

Advantages:
+ minimal cutting - true bolt-on installation
+ don't have to worry about sills rotting away
+ if your're truck has been rolled/crashed you instantly get a straight tub!
+ much easier to move to a newer/better Cruiser if you buy one at a later date

Disadvantages:
- door/top fit problems outlined earlier (if you cheap out and don't get
sills)
- completely welded together - if you tweak it, you have to live with it

So there you have it, everything you ever wanted to know about aluminum tubs
(but were afraid to ask) ALMOST. Here's a few details that apply to both styles:

Aluminum is MUCH more difficult to paint than steel. A good finish would
probably require going to a high-end paint shop (Your local "Oh-Oh, better get a
new paint job" place probably couldn't handle it)

Aluminum tubs can't really be fixed if they're severly kinked/dented (or at
least not as well as a conventional steel sheet metal body. I talked to my
insurance agent about mine and she thought that replacing my tub in the event of
an accident would be covered under the same heading as aluminum pick-up canopies.

Aqualu makes aluminum front fenders, but they were kind of ugly IMHO. Because
they could only roll and not stamp the fenders, they couldn't duplicate the
compound curves at the front of the fender and just left off the last little
curve on the front of the fender. They sold for something like CA$395 a pair

Finally, for those of you that don't like aluminum, I have seen a replacement
tub made out of 3/16" STEEL! I suspect it would have made the truck

into a
complete slug, however resistance to small arms fire would be a huge advantage
to anyone living in LA/Washington/Detroit :)

19.2 Breather Relocation - Rob Mullen (RAMullen@wimsey.com)

NOTE: It's been a while since I've done this and may have forgotten something, also, this is the last article I typed in for v1.0 so I'm pretty
fried. If I say something that seems wrong, it probably is. Anyone who tries these directions, drop me a line and let me know if I missed anything.

Depending on what year and model of Cruiser you own, you may have the pop
valve axle breathers mounted directly to the axle housing. If you truck ever
sees any water off-road (or good flooding on road) this set-up is inadequate.
The check valves always become clogged. This either allows water to stream
into your axle housing, or worse, does not allowing your axle to breathe which
results in blown seals which THEN let water in. For water over bumper height,
even Toyota's breather hoses that reach up to the frame height aren't enough.

Fortunately, replacing your breathers is both simple and cheap. First you
must remove the check valves. Before doing this, ensure the area around the
breather is free of mud/grime--you don't want to have any grit falling into
the breather hole and wearing your ring and pinion. Once the valves are out,
check the threads to determine if they're fine or coarse (all breathers after
1971 are fine thread. Some rear breathers from prior to 71 are coarse. I am
not sure if this procedure would work with coarse threads so attempt it at
your own risk. Temporarily pop the valves back in and go to your hardware
store.

You will need 2 1/4" brass right angle NPT to compression fittings, 2 plastic
ferrules and hose inserts, 15' of 1/4"OD nylon hose (poly will do in a pinch, a T
junction with compression fittings on all sides, a whole whack of small
*zip-ties, a 10mm tapping die (same thread as your breathers), some 3/8"
washers, 2 M10x1.25 nuts, 3" of 1/4"ID rubber hose (like fuel line), 2 1/4" hose
clamps, cutting fluid (oil will do in a pinch), Blue Loctite 242, and
(recommended but not required) 15' of corregated wire loom covering

that will
fit over the pipe. If your axles are the style where the rear breather comes
up through the brake line T, you will also need a 1-1/2" length of 3/8" brass
pipe (often available as a pre-threaded length) and a fitting for joining the
pipe to the right angle fitting.

The following procedure applies to situations where the brass pipe and coupler
are not required.

1. Re-cut the NPT threads on the angle fittings with a 10mmx1.25 die. If you
   don't have a die handle, you can always use a wrench, but this increases
   your chances of cross-threading. Don't forget 1 turn forwards, 1/2 turn
   back, and use lots of cutting fluid. You may have a couple of threads that
   are messed up because of interference between the metric and NPT threads,
   but it should still be strong enough.
2. Coat the threads on the fitting with Blue Loctite
3. Thread a M10x1.25 nut onto the right angle fitting.
4. Thread the right angle fitting into the axle until it won't go any farther
   (DO NOT OVERTIGHTEN -- the brass is nowhere near as strong as steel)
5. Back the fitting off until it's pointing in the direction you want.
6. Tighten the bolt.

The following procedure applies to those who bought the brass pipe and coupler

1. Coat the coupler's threads with Blue Loctite. Thread the pipe into one end and
   the right angle fitting into the other.
2. Re-cut the threads on the pipe as per #1 above. Cut approximately 5/16" of
   threads.
3. Coat the pipe's threads with Loctite
4. Thread the assembly into the axle. (If tightens pointing in the wrong
   direction, remove it and try shimming it with a washer so it points in the
   right direction)

Once the angles are in place, you can put on the hose.

1. Remove the compression nut and brass ferrule from the right angle fitting.
2. Plan out the routing of your hose. It is best to have it travel up along
   the brake lines, that way there is less of a chance of the hose being
   damaged by branches etc under the truck. A good location for the T is

right against the brake line L that is mounted on the frame below the master cylinder. True hard-core types who don't mind the smell of gear oil can route the line that comes off the T through the firewall into the passenger compartment for maximum fording ablility. Otherwise if you're not equipped with a snorkle, plan to send the line up along the fire wall to hood height. Those lucky enough to have snorkels should route the line up the back side of the snorkle.

3. Once you've planned the route, cut the plastic tubing and loom cover to the required lengths.
4. Slide the compression nut and a plastic ferrule onto each end of the hose.
5. Place the hose inserts inside each end of the hose to prevent it from being crushed when you tighten the compression nuts.
6. Slide the hose into the angle fitting, and tighten the compression nut.
7. Route the hose along the frame of the truck and attach the other end to the T.
8. Snap the loom cover over the hose and zip tie it securely to the frame or a brake line along its whole length.
9. Place the compression nut ferrule and hose insert onto one end of the hose that is to be routed up along the firewall/into the passenger compartment/up the snorkle and tighten it down.
10. Thead/stuff the one of the old breather pop valves into the rubber hose and clamp it securely with a hose clamp.
11. Fit the other end of the rubber hose over the top of the plastic tubing and clamp it with the second hose clamp.

Now your axles are waterproof (if the seals are good :) Unfortunately, there are still two breathers you must worry about for SERIOUS fording. They are on the transfer case and steering box. Unfortunately, I haven't gotten around to relocating these yet. All that will be required when I do this is splicing two more T's into the plastic tubing. The steering box should require a procedure identical to the one outlined here, but I think the transfer case may have a different sized breather plug and require something more creative.

19.3 G.M. HEI distributors for F/2F Motors - David Dannenberg (suedave@pond.com)

Unfortunately, what I present here will not allow a one banana mechanic to go to spend twenty bucks at a junk yard then an hour under the hood and end up with an HEI in his FJ--not one that works anyway. This conversion can be either relatively simple or relatively cheap, but not both at this point. I'll explain below, but first a word or two about the shortcomings of the Toyota ignitions and the advantages of the HEI.

The Toyota ignitions have one or a number of disadvantages, depending which particular distributer one is stuck with. The early units feature a points system, and a pretty lousy points system at that. Compared to a later GM points system for example they are a pain to set, and not of very good quality. Even good points systems have the disadvantage of physical wear of the contacts themselves as well as the rubbing block which makes contact with the lobe on the distributer shaft causing them to open and close

Another aside: converting a Toy points to electronic. One can get around the problem of having points by obtaining a conversion kit from Crane Cams. This kit consists of a Hall effects switch utilizing some sort of electronic gizmo to do the job of the points (which is to send an electronic pulse back to the coil causing the field to collapse and the coil's stored energy to be sent out the wire to the distributer). This kit costs around a hundred bucks I think and is reputedly about a one banana installation. However, even conversion of the stock distributer to electronic leaves one with at least one and possibly two other inherent shortcoming of the Toy ignition.

The Toy coil is pretty poor. It is comparatively weak (20,000 volts or something). The other problem with the Toy coil is that it doesn't saturate quickly enough so that at high RPMs it is not fully saturated when the point closes and causes it to discharge its energy. That is, at high speed, one doesn't even get the measly 20KV or whatever it is designed to produce. The performance problem created by this is high speed miss--failure of some of the plugs to fire every time they are supposed to. This may or may not be very noticeable in the pedal except maybe when under load such as when

trying to
blast on over that mountain pass, but it could be noticeable at the tail pipe
(if one had a sniffer I suppose) and at the gas pump--well, the gas gauge
anyway.

The last problem with some Toyo ignitions, especially late electronic ones, is
that they are, in common parlance, "smogged". That is, their advance curves are
not set up to optimize performance as determined by acceleration, torque, and
horse power, but to optimize emissions, especially at idle. Without getting into
the details and nuances of this (which, like all of this, I have only
rudimentary understanding of), the smogged distributors are set up so that at
low RPMs the ignition is actually vacuum retarded, and such that the vacuum
advance does not occur until much higher RPMs than would be optimal. For
practical purposes this translates to that frightening feeling in the pit of the
stomach one gets when trying to merge or pass on the highway in an FJ60--you
know, 0-60 in five minutes while all you can see in your rear view mirror are
one headlight and the letters A C K written backwards across part of an enormous
radiator grille.

The GM HEI can resolve all of these problems! (and it makes Julienne fries).
I'll address them one at a time. The points issue becomes moot because, as the
name implies, the HEI is all electronic. Again without getting into details that
are both out of my depth unimportant for the purposes of this discussion, an
electronic ignition accomplishes communication between the distributer and the
coil with an electronic (read: not mechanical) device. The guts of the
distributer contain a commonly available module held in place with two
fasteners, a condenser, and a field coil. None of these parts move, so in
theory at least, none of them wear. The only moving part is the rotor (and
obviously the shaft to which the rotor is fixed).

An aside: It is often said that the problem with an electronic ignition is that
if it does fail, you are dead in the water (sometimes literally) with no hope of
repair, whereas with a points system you always have the option of adjustment or
replacement of components in the field (or stream, as the case may be). There is

truth to this, but distorted truth. It is true that one can't pop open the ignition module (a thing about the size of a pack of Dentine--Chicklets for those of you in SA--with two wires and two screw holes), jam a wrench in there and fix it. But,the points system is many times more likely to fail in the first place. Second, it is no big deal to carry a spare module, field coil, and condenser in your glove box--even ones stripped off a junked vehicle. It is true that new these parts cost considerably more $ than a set of points, but over time one is unlikely to use one module for every, say, 50 sets of points and the ones from the junk yard will likely get you home.

The second problem with Toy ignitions, that of weak spark and inadequate saturation, is solved by the HEI coil. According to the guys at K&A in California (see below), the HEI produces 90,000 volts (!) consistently at any RPM that we could imagine generating in one of our engines. I have also heard that the HEI coil produces 60,000 volts or even only 45,000 volts which is still double what the Toy puts out. This translates to hotter spark which translates to better cold starting, better running and adios to high speed miss. This alone is something one can feel in the pedal (and see in the decreased rate of decent of the needle on the gas gauge). With this much energy the spark plugs can be gapped way open--some people go as far as 65 or even 85, mine are at 45--which helps also (I think by making a bigger and thus more effective spark. Someone who knows please feel free to explain this).

Yet another aside: I suppose that one could, if satisfied with the advance curve of the stock distributer, but desiring electronic reliability and HEI umph, perform the hall effects (Crane Cams) conversion mentioned above, and install the HEI coil only, along with good ignition wires and spark plugs and get about everything the full (coil and distributer) HEI conversion offers. That'd make it a two banana $125 job. Someone try this and report back to us all.

The last Toy problem that one can resolve with the HEI is that of horrible advance curve. This is not solved by anything inherent in the HEI distributer except that there is such a wide range of advance parts available--

springs and
diaphragms--that the distributer can be built to do almost anything desired
(even making julien fries at precisely at 2100 RPMs). This is one of the aspects
of the conversion that jumps its rating from 2 to almost 4 bananas. It is also
second aspect of the system that gives it such a great feel (the first being the
voltage discussed above).

Before briefly sketching the options and methods for converting to the HEI, I
must tell you the performance gains. I can start cold without choking the engine
(I do use the hand throttle a bit to facilitate warm up). I have what feels like
way more torque and horse power. I can accelerate much faster and smoother than
before and maintain speed more easily. Around town I shift gears much less
frequently. Many corners and hills that I used to take in second gear I now take
in third, corners and hills I used to take in third I now take in fourth. In
many more instances than pre-HEI I can start out from a stop in second gear or
overdrive first without slipping the clutch. Driving is just so much more
pleasurable. I keep telling people that with the HEI and the OME I feel like I
have a new vehicle. Those of you with the OME know what I mean. Now imagine that
dramatic a change in your engine. (Remember though, that much of this drama is
tied to the advance curve--if you have a comparatively unsmogged vehicle, your
stock distributer may have a decent curve already, so the big change will be in
reliability and high RPM performance, not low end torque and acceleration. Your
challenge will be more to match your existing curve, not to improve it).

So, I bet you are wondering how to accomplish this astonishing transformation of
your slugabed TLC into a rocket ship--well decently performing vehicle anyway.
There are four ways that I know of. I will describe each in descending order of
cost and ascending order of reliability and work.

1. K&L Engineering In Mira Loma California (714) 735-4182 manufactures HEIs
   specifically for TLCs. By manufacture I mean that they take an HEI, strip it
   down, wind precisely engineered advance springs and mill precisely engineered

cams to get the desired advance curve, then put it on a modified Sun distributer machine to check it all out. I believe that they will relocate the gear as necessary. They have done many TLCs, and if they have not done your year and model they may ask you to send your stock distributer so that they can check it in their Sun machine first to learn the factory curve which they will match and tweak in the HEI they will build for you. These guys have been building racing engines and using HEIs on all sorts of vehicles (VWs even) for years and really seem to know what they are talking about. DISCLAIMER: I have never actually purchased anything from them and do not work for or represent them. I did however pick their brains mercilessly whilst GMF Bob and I worked out our own approach to the conversion. The K&L distributer will cost in the neighborhood of $300.

2. Toyotas R Us in Salida Colorodo. (719) 539-7733 also will sell you an HEI for the TLC. They are also really nice guys whose brains I picked pretty thoroughly. They do a conversion using off the shelf parts and I think charge around $235 with a core. As far as I can tell they do not use a distributer machine or wind springs or grind cams to match advance curves. I did not get the feeling when I spoke with them (1-2 years ago by now) that they had not done any conversions in late model Cruisers. I do not think that they swap of move the distributer gear, but CHECK WITH THEM, DO NOT RELY ON MY INTERPRETATION OF CONVERSATIONS I HAD A LONG TIME AGO. Again, they are real nice people with a good reputation. They told me their system works. It is not, AFIK, and IMHO, as sophisticated as the work done by K&A. I have not actually purchased anything from them, and do not in any way represent them.

3. Wayne Kitter of Up & Over Innovations in Chester PA (610) 358-3179. He also offers an HEI for the TLC. He moves the gear, and sets it up (advance curve) using off the shelf components and a Sun machine. Sounds like he knows what he is doing.

4. Do it yourself. If you have been reading through all this expecting to come upon step by step part by part instructions now is your time to be

disappointed. If you are expecting to get the general idea and be pointed in the right direction to get started, I hope and intend that the following will be useful to you.

The swapping of GM parts onto F and 2F engines is possible because the F was essentially a "metricized" GM 225.

The distributer is caused to rotate by a gear on its shaft which engages a gear on the engine's cam shaft. The tip of the distributer shaft also turns the oil pump. A 1977 CHEVROLET NOVA DISTRIBUTER will fit the 2F engine block in all respects. However, the gear on the Nova distributer is located in a slightly different place than the Toyota one. So the FIRST STEP, after getting a good reliable rebuilt '77 Nova distributer or getting a junked one and crossing your fingers IS TO RELOCATE THE TOYOTA DRIVE GEAR TO PRECISELY THE SAME PLACE ON THE GM DISTRIBUTER SHAFT AS IT WAS ON THE TOYOTA SHAFT. Use a caliper. Go to a machine shop. Do not mess around with this. I can tell you from painful experience that a few thousandths of an inch of difference in location is plenty enough to create force on the shaft pulling it down into the field coil gradually wearing through the insulation until it suddenly and catastrophically shorts out. Not big fun.

Now that you have relocated the gear, the next step is to obtain or fabricate some kind of clamp to hold it in place. Straightforward--eyeball the situation and make something or ask at the parts source (store or junk yard) for something that will work

Now the real fun begins. The advance curve on the '77 Nova is not correct for the TLC (at least it was not for mine). So get out a vacuums gauge and tachometer and chart your advance under various conditions with various commonly available springs and advance diaphragms (GM makes them incrementally from something like 5-25 degrees) and at various static timing settings. Watch your temperature gauge too as you road test it. I can tell you--again from painful experience--that if the timing is too far retarded you can run hot enough that it simply shuts down, even though it is smooth and the only other problem is

lack of power (like duh, I know now). And of course too far advanced and it'll
knock like crazy and you could even crunch a valve. Eventually you will hit upon
a combination that will work for your vehicle. It will help to chart the
performance of your stock unit too. This is already charted to some extent in
the back of the Toyota engine manual. This is the science and voodoo of this
project and is what the folks at K&L do on their machine. Personally, I think
that is well worth 300 bucks, except that you are deprived of the pleasure of
eventually getting it right yourself.

I haven't mentioned the coil in awhile. Some HEI systems had the coil mounted on
the distributer cap, some remotely. They are (for practical purposes),
electronically equivalent. In an FJ60, a remote coil must be used because the
bigger cap of the cap mounted units will not clear the line to the oil cooler.
The cap mounted unit may fit on other models. The coil needs only the hot that
supplies the toy coil, a ground, and the ignition wire to the cap. Easiest part
of the conversion.

GM F Bob and I have had it in our heads for a long time to make and market a kit
to take the guess work out of doing the HEI to TLC conversion. It would contain
stuff to make the gear relocation simple, and charts for selecting the correct
advance and other parts. It would be inexpensive, intended more as a service to
the community than to make a lotta' money. The buyer would source his or her
own distributer and maybe some other stuff. Unfortunately GM F Bob is too busy
with school and his family and I am too busy with work and my family to put this
together anytime before next summer at the earliest.

So if you are very patient, you may be able to get a kit for under $75 that will
help you do an HEI conversion yourself in under two hours utilizing locally
available parts. If you are ambitious, I think that the information I have
provided will get you started. If you are in a hurry contact K&L and/or Toyotas-
R-Us. If you have any questions or corrections, fire away and I'll do my best.
One thing nice about this upgrade to your Toyota is that it is reversible: you
can always go back to your Toy system in about a half hour's time. No

permanent
modifications are made to your Toy engine.

19.4 Glow Plugs - Rob Mullen (RAMullen@wimsey.com)

It is considerably cheaper to buy your glow plugs from somebody other than
Toyota. NGK makes 2 models that fit B's, 3B's, and 2H's. The part number for
the 24V version is Y197R. The 12V version is not available in North America.

In the event that your glow plugs fail far from civilizaton, it is still possible to start your truck (as long as it is not too cold outside) Simply
heat a largish pot of water until it is about to come to a rolling boil. Then
pour the hot water over the intake manifold and injection nozzles of the truck.
The truck should start as if you'd actually used the glow plugs. If the truck
still won't start, try several more pots of water to heat the manifold further.

To test glow plugs, remove the aluminum bus bar that connects them. With an
Ohm-meter, check continuity of the plugs. If you detect an open circuit, the
glow plug is no good. Glow plugs should be replaced as a set. If only one is
replaced, it will put an unequal load on the others, causing them to burn out
more quickly

19.5 Owner's Manual Maintenance Schedules - Toyota

These are from an owner's manual. Although the manual was (C)Toyota, it also contained the instruction on the Table of Contents page:

Please leave this Owner' Manual in this vehicle at the time of resale. The next
owner will need this information also.

Probably 75% of the original owners didn't follow the directions, so I'm going
to reprint this section. It should also be noted that I don't agree with some
of the times given--they should be considered as the MAXIMUM duration.

The year of the owner's manual the information was taken from is indicated next
to the engine model in the heading. E-mail me (RAMullen@wimsey.com) if your
owner's manual lists different intervals.

Maintenance operations:
A - Check and/or adjust as necessary

I - Inspect and correct or replace as necessary
R - Replace, change, or lubricate

19.5.1 Gas Powered Vehicles (2F-1983)

SERVICE INTERVAL:	x1000mi	15	30	45	60
	x1000km	24	48	72	96
	months	12	24	36	48
BASIC ENGINE COMPONENTS					
1 Valve Clearance		A	A	A	A
2 Drive belts (1)		.	I	.	I
3 Engine oil & filter		10000mi (16000km) or 8 months			
4 Engine coolant (2)		.	.	.	R
5 Cooling & heater system hoses & connections		.	.	.	I
6 Exhaust pipes & mountings		I	I	I	I
FUEL SYSTEM					
7 Idle speed & fast idle speed (3)		A	.	.	.
8 Choke System		.	I	.	I
9 Air Filter		.	R	.	R
10 Fuel lines & connections		.	I	.	I
11 Fuel tank cap gasket		.	.	.	R
IGNITION SYSTEM					
12 Spark plugs		.	R	.	R
13 Ignition wiring		.	I	.	I
EMISSIONS SYSTEMS					
14 Charcoal cannister		.	.	.	I
15 Fuel evaporative emission control		.	.	.	I
CHASSIS & BODY					
16 Clutch Pedal		I	I	I	I
17 Brake pads & discs		I	I	I	I
18 Brake linings & drums		I	I	I	I
19 Brake lines & hoses		I	I	I	I
20 Steering linkage		I	I	I	I
21 Steering knuckle & chassis grease		R	R	R	R
22 Propeller shaft grease		R	R	R	R
23 Wheel bearing grease		.	R	.	R
24 Transmission transfer & diff. oil		I	I	I	I
25 Bolts & nuts on chassis & body		I	I	I	I

(1) After 60000mi (96000km) or 48mo, inspect every 15000mi (24000km) or 12mo
(2) After 60000mi (96000km) or 48mo, replace every 30000mi (48000km) or 24mo
(3) After 30000mi (48000km) or 24mo, adjustment is not necessary

19.5.2 Diesel Powered Vehicles (B-1978)

SERVICE INTERVAL:	x1000mi	15		30		45		60
	x1000km	12	24	36	48	60	72	84	96
	months	6	12	18	24	30	36	42	48
BASIC ENGINE COMPONENTS									

1	Valve Clearance	.	A	.	A	.	A	.
A								
2	Drive belts	.	I	.	R	.	I	.
R								
3	Engine oil	3750mi (6000km) or 3 months						
4	Engine oil filter	R	R	R	R	R	R	R
R								
5	Engine coolant (1)	.	.	.	R	.	.	.
R								
6	Cooling & heater system hoses	.	I	.	I	.	I	.
I								
	& connections							
7	Exhaust System	I	I	.	I	.	I	.
I								
FUEL SYSTEM								
8	Idle speed & maximum speed	.	A	.	A	.	A	.
A								
9	Fuel filter	.	R	.	R	.	R	.
R								
10	Feed pump filter	.	.	.	I	.	.	.
I								
11	Injection pump governor diaphragm	.	I	.	I	.	I	.
I								
12	Injection timing & nozzles	.	.	.	I	.	.	.
I								
13	Air Filter	.	I	.	R	.	I	.
R								
14	Fuel tank cap, lines, & connections	.	.	.	I	.	.	.
I								
PREHEATING SYSTEM								
15	Glow Plugs	.	I	.	I	.	I	.
I								
CHASSIS & BODY								
16*	Brake & clutch pedal & parking brake	I	I	I	I	I	I	I
I								
17	Brake linings & drums	I	I	I	I	I	I	I
I								
18	Brake pads & discs	I	I	I	I	I	I	I
I								
19	Brake lines & hoses	I	I	I	I	I	I	I
I								
20*	Brake fluid level	I	I	I	I	I	I	I
I								
21	Vacuum pump oil hoses	.	I	.	I	.	I	.
R								
22	Steering box, linkage, & gear box oil	I	I	I	I	I	I	I
I								
23*	Transmission transfer & diff. oil	I	I	I	R	I	I	I
R								
24	Wheel bearing grease	.	.	.	R	.	.	.
R								
25*	Steering knuckle & chassis grease	R	R	R	R	R	R	R
R								
26*	Propeller shaft grease	.	R	.	R	.	R	.
R								
27	Bolts & nuts on chassis & body	I	I	.	I	.	I	.
I								

28 Emergency locking retractor system	.	I	.	I	.	I	.
I							
29 Seat Belt Warning System	.	I	.	I	.	I	.
I							

Under severe driving conditions, service interval should be shortened as shown
on the table below:

MAINTENANCE ITEM	OP	INTERVAL	UNDER CONDITIONS
Engine oil	R	3000km	A,B,C,D,E
Engine oil filter	R	6000km	A,B,C,D,E
Exhaust system	I	6000km	A,B,C
Air filter	I	6000km	D
Brake linings & drums	I	12000km	A,B,C,D
Brake pads & discs	I	6000km	A,B,C,D
Steering wheel, linkage & gearbox oil	I	6000km	C
Transmission transfer & differential oil	R	24000km	A,B
Steering knuckle & chassis grease	R	6000km	C
Propeller shaft grease	R	12000km	A,C
Bolts & nuts on chassis & body	I	12000km	A,B,C

CONDITIONS
A: Pulling a Trailer
B: Driving primarily short diantances
C: Driving on rough roads
D: Driving on dusty roads
E: Driving in extremely cold weather

18.5.3 Diesel Powered Vehicles (3B-1983)

SERVICE INTERVAL:	x1000mi	15	30	45	60
	x1000km	24	48	72	96
	months	12	24	36	48
BASIC ENGINE COMPONENTS					
1 Valve Clearance		A	A	A	A
2 Drive belts		I	R	I	R
3 Engine oil		3750mi (6000km) or 3 months			
4 Engine oil filter		7500mi (12000km) or 6 months			
5 Engine coolant (1)		.	.	.	R
6 Cooling & heater system hoses & connections		.	.	.	I
7 Vacuum pump oil hoses		I	I	I	R
8 Exhaust pipes & mountings		I	I	I	I
FUEL SYSTEM					
9 Idle speed & fast idle speed (2)		A	A	.	.
10 Fuel filter		.	R	.	R
11 Feed pump filter		.	I	.	I
12 Injection pump governor diaphragm		I	I	I	I
13 Air Filter		.	R	.	R
14 Fuel lines & connections		.	I	.	I
15 Fuel tank cap gasket		.	.	.	R
CHASSIS & BODY					

16* Clutch Pedal	I	I	I	I
17 Brake pads & discs	I	I	I	I
18 Brake linings & drums	I	I	I	I
19 Brake lines & hoses	I	I	I	I
20 Steering linkage	I	I	I	I
21* Steering knuckle & chassis grease	R	R	R	R
22* Propeller shaft grease	R	R	R	R
23 Wheel bearing grease	.	R	.	R
24* Transmission transfer & diff. oil	I	I	I	I
25 Bolts & nuts on chassis & body	I	I	I	I

(1) After 60000mi (96000km) or 48mo, inspect every 15000mi (24000km) or 12mo
(2) After 30000mi (48000km) or 24mo, adjustment is not necessary

Whenever you drive off-road through sand, mud, or water, check the following items as soon as possible:

- Brake pads and discs
- Brake linings and drums
- Brake lines and hoses
- Steering linkage and knuckles
- Transmission, transfer, and differential oil
- Wheel bearings
- Propeller shafts

19.6 Ride Harshness - Rob Mullen (RAMullen@wimsey.com)

Short wheel base trucks ride rough and there is not a whole lot that can be done about it. There are a few options to soften the ride though. In order of "Bang-For-The-Buck" they are:

1. AVOID ADD-A-LEAFS!
   These will make your Cruiser ride like the axles are bolted directly to the frame.

2. Keep lifts as small as possible.
   The higher up you are, the more pitching motions of the truck are amplified.

3. Use the right shocks.
   Unless your truck is equipped with some bizarre ultra-heavy-weight PTO winch, stay away from 70-30 high-pressure gas shocks like KYB Gas-A-Justs. They'll give a brutal ride. Hydraulic shocks like the cheapest Trailmasters, or Rancho RS5000s are better, but their valvings still aren't right. RS9000s give you more valving range, but unless you're desert pre-running, only settings 1-3 are really useful.

4. If you have the Rancho 2.5" 7 leaf Lift, you can improve the ride

quality
by modifying the spring wrappers. Rancho makes the wrappers too tight
for proper spring movement. If you pry open the outermost sets of wrappers, the ride will become softer and your articulation will increase
by several inches. The remaining three wrappers are sufficient to prevent
spring pack shifting.

5. If your truck is lifted, you can soften the ride by removing one of the
short leaves. Unfortunately, removing a leaf will also decrease ride
height and load capacity.

6. Front shackle reversal
See the section on shackle reversals.

7. Polyurethane Bushings/Greasable Shackles
Adding polyurethane bushings will not soften the ride but will improve
handling by preventing the springs from twisting relative to the mounts.
Polyurethane is also required for greasable shackles because dino-based
grease will break down rubber bushings quickly. Using after-market
shackles will further improve handling by resisting shackle twisting,
while greasable pins allow the springs to move more freely to absorb
bumps.

19.7 Saginaw Power Steering Conversion-Park Owens (rokcrwlr@rapidnet.com)

The parts for a Land Cruiser power steering mod the way I did it include:

4 turn/4 bolt box from a salvage yard
Potential Donors:
Buick LeSabre '65-68
Buick Special '64-69
Camaro '67-74
Chev Passenger '65-70
Chevelle '64-69
Firebird '67-70
Grand Prix '70
Nova '68-69
Olds Jetstar 88 '64-66
Olds F85 '64-69
Pontiac Catalina, Ventura & 2+2 (w/o air) '67-68
Pontiac Catalina and Ventura (w/o air) '69-70
Tempest '64-69
pump; reman or salvage yard
(2) #5-103X U-joints (Spicer)
(2) #10-4-13 End Yokes (Spicer)

(1) #10-3-13X Slip Yoke (Spicer)
(1) #10-4-501SX Steering Yoke (Spicer)
(3) feet of 3/16" key shaft
(3) pieces of 3/16" key stock
(1) #FWG34R Pillow Block (Federal-Mogul)
(1) Dropped Pitman Arm
(1) Tie Rod
(1) Tie Rod End
(2) Custom hoses

When you remove the current drag link and center pivot steering assembly, you
can cut the drag link to 26 inches, re-thread, and use for new tie rod between
new pitman arm and existing Cruiser steering tie rod.

If you or anyone else would like a copy of the templates I used to enclose the
front frame rails on both the passenger and driver's side, please send a SASE
envelope to me at:

Dakota Territory Cruisers
P O Box 2238
Rapid City, SD 57709

Notes: A three inch diameter hole will need to be cut/drilled through the cross
member under the radiator on the driver's side...does not weaken it in any way.
You'll also need some spacers made of gas pipe to put in the frame rail before
you enclose it to keep it from being crushed when you tighten down the ps box.
Also, if you get a 4 bolt box, you do not need any additional support for the ps
box to the passenger side frame rail.

19.8 Shackle Reversals-Rob Mullen (RAMullen@wimsey.com)

There are essentially two schools of design when it comes to Shackle reversals.
The first is a bolt-on kit that involves some kind of drop bracket at the front
of the frame and shackle hangers that bolt on below the frame. The second is
more involved and results on the front perch being mounted directly below the
frame, the shackle hanger being recessed into the frame, and the knuckles cut
and welded to correct caster angles.

Why go to all that trouble? In an effort to improve the high-speed on-road
handling of FJ40s. There are two principals that help improve the handling of
a vehicle with reversed shackles.

On a vehicle with the shackles at the front of the front springs as the spring compresses vertically, the axle moves forwards. That means that as a tire hits an obstacle, the spring tries to push the tire forwards, harder into the obstacle. With the shackles at the back of the springs, when the tire hits an obstacle, the springs compress and the axle is essentially allowed to pivot up and backwards away from the obstacle. That action results in a less jarring ride. This action is only really noticeable at non-low range type speeds, that is, it makes no difference to rock crawling type activities.

The second effect of reversing the shackles is that the momentum of the truck pulls the springs, rather than pushing them. The effect is minimized with perfect bushings and shackles, but any wear in the bushings will result in the shackles rocking side-side which the axle housing to yaw slightly which leads to vague handling. With the shackles on the rear of the springs, the shackles are forced to follow the axle housing, instead of vice versa, so wear is not as much of a factor.

There are some drawbacks with reversing the shackles though. If the axle was left in the stock position and the driveshaft was left the stock length, when the springs compressed, the axle would move backwards, the splines in the slip joint would bottom out, and the output shaft of the transfer case would be punched out the back. To avoid this nasty mess, most shackle reversals either move the axle forwards, or require that the front driveshaft be shortened. The problem with simply pulling the slip joint further apart to make up for the increased movement of the axle is less engagement of the splines of the driveshaft. That will accelerate spline wear. Diesels naturally tend to wear out front driveshafts faster, either due to the vibration, or because of blow-by tube oil discharge diluting the grease. Spline life can be maximized by religious greasing of the slip joint, but it will never equal that of a stock-suspension geometry vehicle.

There are essentially two styles of shackle reversals available: One designed

by Land Cruiser Advanced Handling and manufactured by BTB, and a similar kit from Renegade Fabrication, and the other offered by Warden's Auto Repair and FabTech. I'll refer to the former as a "high" reversal and the latter as a "low" reversal for reasons that should become apparent. Both styles have advantages and disadvantages. BTB will soon be introducing a third kind of reversal that is essentially a hybrid of the two styles and will probably be the best option.

The high reversal is basically a bolt-on kit (although it can be welded) It consists of two approximately 7" "towers" that attach to the front of the frame horns and that serve as the fixed point for the springs, hangers that bolt to the underside of the frame near where the fixed perches used to reside, and spacers for the bump stops.

The large "towers" are required to maintain proper caster angle despite the fact that the perches are slung under the frame. If the towers were shorter, there would be excessive caster and the vehicle would be undriveable. The large towers and perches under the frame effectively lift the front of the vehicle 1.5" relative to the rear of the vehicle. The combination of moving the springs down from the frame, and dropping the bump-stops serve to prevent the driveshaft's slip joints from bottoming out. The main advantage of the high reversal is that a competant back-yard mechanic can undertake with less risk of damaging the handling of the vehicle. The main disadvantage of the kit is the towers. They decrease the approach angle slightly compared to the stock shackles.

One effect is a bit of a mixed blessing. If a stock truck smacks the front spring eye/shackle hard into a rock, a bent or broken spring will result because the spring is being compressed axially to failure. With the high reversal, if the tower is smacked into a rock, the spring will not be affected, but it is possible for the unboxed passenger's side framehorn to buckle.

The Advanced Handling/Current BTB and Renegade kits have some key differences. The former retains the springs in the stock direction. The latter flips the springs

around so the military wraps are at the front, which is superior for a couple reasons. It means that the towers don't have to angle as far forwards to move the axle, which gives a slightly better approach angle. The towers also don't have to be quite as low because the military-wrapped eye of the spring actually comes up higher than the un-wrapped eye. Unfortunately, the Renegade kit also requires 4 degree shims.

The low reversal should only be attempted by professionals. I think there only three shops that are currently doing it: BTB, FabTech, and Warden's Automotive. It is usually done as part of a spring-over conversion. With this reversal, the stock fixed spring perchs are relocated to the front of the frame horns. A hole is cut through the frame, and the tube for the shackle is welded in place. The allignment of the spring attachment points rotates the leading edge of the springs upwards, and if used with a stock axle housing would lead to excessive caster. To ensure proper caster, the knuckles on the axle housing are cut off, rotated, and re-welded. A properly done spring-over conversion also requires the knuckles to be rotated to tip the pinion up, so two problems are solved at once. Even with a spring-under configuration, this style of reversal greatly improves the approach angle.

19.9 Silicon Clutch Diagnosis-John Barron (jbarron@uvic.ca)

Here is a test sequence for the fan. Apparently it is possible to replace the fluid in the fan clutch if the old has leaked out. It is a silicone oil/silicone based product from what I have been told, and is avaialable from Toyota AFAIK. There is a small valve inside the fan-clutch housing that opens by way of the thermostatic (bimetal) coil on the front of the housing. If the thermostatic coil is dead then ou will have to replace the whole unit or rob the part ([if it's even possible] from a wrecking yard unit). There is also a bearing in the clutch itself and that can wear out so beware.

The viscous coupled fan on Toyota pick-ups and LCs will often change its sound as it engages and disengages. It will go from a gentle "whirrring" sound to a really loud "roar." Often the loud roar of the fan is noticeable for a few moments just after the engine has been started and then it quietens down considerably. This is *normal*.

The fan on my LC almost never engages and so I don't often hear the roaring noise BUT the fan on my GF's pick-up (2L-T) does engage willingly and roars like crazy when the engine is running a little hotter than normal (ie: towing monstrous trailers up mountains in the summer)...the sound is always associated with a very prompt drop in the operating temperature of the engine down to the low side of normal--at which point the noise subsides.

You can check the fan clutch operation by spinning [by hand] the fan when the engine is cold [and OFF]: it should spin about 1/3 to 1/2 a turn or so and then stop [sometimes a bit more]. There should be a bit of resistance to the movement. If the engine has just been run and is [a little] warm the fan will spin quite freely--this is okay. If the engine is really *screaming hot* AND there has been good flow of air over the radiator then the fan clutch *may* be engaged and should provide a decent amount of resistance to spinning.

There are no really definitive tests for this procedure AFAIK.

[Please note: the repeating the test sequence too many times in quick succession will cause the fan to spin more and more freely as you "test" it.]

If your fan doesn't ever engage [no roar] and your engine runs hot you may have either: a defective fan clutch OR a blocked radiator OR a defective thermostat OR a combination of these three problems. The fan clutch needs hot air flow over the rad to engage...

To check rad performance [in your back yard] you can drive until your vehicle has reached normal operating temperature and then mist the rad with water. If all the water evaporates then the rad is probably alright [as in not blocked]. If there are areas where the water evaporates and others where it doesn't [cold spots, usually vertical sections of the rad] then the rad needs to be serviced [power flushed or rodded-out]. You can also check for cold spots by using your hand but there is often not a lot of space between the grille and the rad --> and you could burn your hand. Be careful.

A rad shop can remove your radiator and check the flow for you if you think that it's blocked.

A sticking/dead thermostat will also cause the engine temperature to be

higher than normal --this is another issue-- but it will also prevent the
fan clutch from doing its job as very little hot coolant will be entering
the radiator and no hot air will be passing over the fan....Your interior
heater will be really hot [when temp set on high] and your rad cool-ish if
this is the situation...replace the thermostat with a new one that is right
for the climate where you live.

Lastly: if the fan clutch is screwed you may be able to see the silicon
fluid leaking from the clutch housing...then again, maybe not. A very few
clutch fans I have seen are permanently engaged [jammed inside, bad bearing
etc...]. In any of these situations you need to replace it. See your local
Auto-Wrecker, Auto Parts store or Toyota parts person.

19.10 Steering Wandering-Rob Mullen (RAMullen@wimsey.com)

There are four basic components in the 40 series steering system that can wear
out/go out of adjustment and cause steering slop/wandering. They are the tie
rod ends, drag link end, centre arm, and steering box.

A small amount of play in each of the tie rod ends can add up to a huge amount
of steering slop. The only way tie rods should be able to be moved by hand is
to rotate slightly on an axis that runs through the ball joints at each end of
the rod. Even this motion should feel "snug." If the tie rod can be moved in
any other direction the ball joints are probably worn and should be replaced.

The drag link connects to the pitman arm that comes off the steering box. If
the link can be moved in a fore-aft motion without the pitman arm moving, the
end is out of adjustment. The adjustment procedure is fairly simple. Remove
the cotter pin, and with a very large slot screwdriver tighten the end plug as
far as you can, then back it out 1/2 turn. Finally, put in a new cotter pin.

The centre arm probably accounts for most 40 series steering problems. It is
located on the drivers side in front of the front frame crossmember. To test
if your centre arm is worn or needs adjustment, have someone turn the
steering wheel back and forth while you stand in front of your truck.

The
centre arm shaft should only rotate about a vertical axis and not twist
side-side. If the shaft twists, it may only be out of adjustment. To
adjust
it, loosen the lock bolt on top of the centre arm. Next remove the top
cap.
Check inside the arm for grease. If there is none, chances are you
centre arm
is scrap, but it's worth packing it and re-testing it anyways before
you blow
$100 on a re-build kit. Once you've filled the housing with grease,
replace
the top cap. Tighten it down as far as you can then back it of 1/4
turn.
Then tighten the locking bolt. Finally, repeat the steering wheel turn
test.
If the shaft still twists, you need a re-build.

The 40 series manual steering box will only fail to outlive you if one
of two
things happen: it's run without oil, or its not adjusted periodically.
The
only way for the oil to get out is if the sector shaft seal fails.
Should
this happen, you can limp home by packing the housing with grease until
you have
time to replace the seal. Adjustment of the steering box should only be
attempted after reading the Toyota Steering or Body/Chassis manual.

If you are running larger than stock tires, you will need a larger than
stock
steering dampener to stop wandering. IMHO, the Old Man Emu stabilizer
is the
way to go. It is a VERY sturdy bolt-in replacement for the stock
stabilizer.
The other alternative is to get something like the Rancho kit or
Heckthorn
"Big Yellow" which require adding brackets to the axle and tie rod. I
believe
the OME unit is superior because it puts the stabilizer higher up where
it is
less likely to be smacked by rocks or submerged in water, it doesn't
introduce
any strange off-axis forces in the tie rods and it doesn't require the
cheezy
clamp-on brackets.

Steering can also be improved by using polyurethane bushings/aftermarket
shackles as detailed in the section on Ride Harshness.

19.11 Spring Over Conversions-John Barron (John_Barron@bc.sympatico.ca)

Reverse, completely, your front leaves. No drilling, military wrap at
the
front. Spring in proper orientation.

Put the spring bushing eyes into the frame at the back and at the rear

of
the front. You will have to carefully line the front ones up as the frame
is not parallel to the centreline of the rig there.

Box in the rear frame where the spring bushing eyes are going to go with 3/16" plate.

Box in the right front frame horn with 3/16" plate and brace the corner a
bit where it joins with the first front cross member. Lots of stress here.

The front *differential flange* should sit at about 10 to 12 degrees after
you have turned the ball ends. The caster ahould be set to 4 degrees. As it
is now the diff flange is at about 3 deg (give or take) and the balls at about 1 degree (give or take) compared to the perches. SO this means that
the ball ends should be turned about 12 degrees total (adding 3 deg caster
and turning the diff up to 12 deg by adding 9 degrees of rotation).

Be careful to turn the knuckle balls without knocking them sideways or you
might affect the camber a bit. I used a large heavy pipe through the king
pin bearing holes and tapped it around with a hammer--the pipe applied pressure to both ends of the ball at once and should not have messed up the
caster.

You should use a double cardan rear and front joint although you can get away without it if you're careful and only using the front drive at lower
speeds.

If you're careful you will get about 4" lift over where you are now (going
up by SPOA and down by the recessing of the bushing eyes). This is not too
much in the big picture and it gives you the advantage of the SPOA.

One more thing...the rear springs are often re-drilled so that the rear axle is located rearward 1.5". This is not necessary if you get a set of FJ60 series front springs and use them at the rear instead. Just take a few
measurements to be sure that this will work. And you will need OME big bushing to small bolt type (if your rig is before 1981) to fit the 60 series springs.

Okay, yes they are welded on to the axle ends but it is not a butt weld. The balls are sleeved into the axle housing about two inches. The trick is
to cut the welds out or cut *just* next to the welds and then turn the knuckle ends.

Start with a stripped-down and clean axle housing. Then remove the shock mounts, the steering stop flanges, and the brake line brackets if they are in the way. What I then did was to take a hose clamp and place it up to the ball end as close to the weld as possible, I used this as a guide to scribe a line right next to the weld. I then took my 4.5" angle grinder with a cutting wheel (about 1/8" thick or so) and I carefully cut into the axle tube about 3/16" to 1/4" deep around the scribed line. I knew just how deep to go because I could see the difference in the metals and a very faint oily line where the knuckle ball and the tube meet. Make sure that your cut is complete all the way around and that you haven't either gone too deep or that you missed an area. I then checked to see that I had made a complete cut by gently tapping on the ball with a hammer to move the ball out about 1 or 2 thousandths of an inch. I then ground the welds around the ball smooth along an inch or two of circumference and polished them up with a sanding disc.

From here I made a little calculation to see how many millimetres I would need to turn the balls around the circumference to get the number of degrees I needed. I found the axle that I was using to be about 80mm in dia so I calculated X number of mm around the circumference is Y degrees. I then carefully scribed a very faint straight line along the axle tube and the ball and another line on the axle tube to where I wanted the ball to be once the desired amount of turning had been achieved I then punched the lines with a very fine sharp punch to be sure they stayed. I then took a piece of 3.5' by about 1.5" dia tube and put it through the two king pin bearing holes and gently applied pressure as I tapped the tube with a hammer to rotate the balls. Once the scribed lines lined up I re-did my measurements and checkd to see if the amount of turning was correct. A few taps later it was perfect. I then double checked the angles with an angle finder and saw that I was right to about 1/4 of a degree (the accuracy of the angle finder).

C=(pi)(dia)
X= (3.14159265)(80)
X=251.3274mm

360degrees/251.3274mm= 1.432394 degrees/mm

251.3274mm/360degrees= 0.6981317 mm/degree

so 12 degrees required turning is (12)(0.6981317mm)= 8.37758mm around

the
circumference

The tires, if you are going to go above 33", like to 35s, will rub on the
front portion of the rear wheel well. Moving the axle back eliminates this
trouble and is also good as it makes the rear shaft a little longer thereby
slightly decreasing the operating angle of the driveshaft.

19.12 Transmission and Transfer Removal Tips-Rob Mullen
(RAMullen@wimsey.com)

The transmission and transfer case should be removed as a unit, even if you
only need to remove the transfer case. The transmission will separate easily
from the bellhousing whereas separating the transfer case from the
transmission usually requires a puller. Removing the transmission also allows
you to inspect the clutch and pilot bearing.

Save your old large-eye rubber spring bushings. They are great for removing
the shifter from your manual transmission. Instead of using two screwdrivers
to push and twist (and scratch) the shift lever cap, use the bushing. First,
remove the ball at the end of the shifter. Slide the bushing (narrow end
down) to the base of the shifter. Then slide a 19mm or larger box end wrench
(or the end of a large crescent wrench) down the shifter. Clamp a set of
Vise-Grips on to the bushing tight enough to twist it, but not so tight as to
clamp it to the shifter. Then while pushing down HARD on the box-end wrench,
twist the Vise-Grips clockwise. The shift lever cap should pop right off.

The pilot bearing should be replaced every time you remove the transmission as
it is an inexpensive part that can cause major headaches if it fails. The
easiest way to remove the pilot bearing is by making your own "hydraulic
cylinder." This is much easier than it sounds. Simply push grease through the
central hole in the bearing until the cavity behind it is filled. Then push a
cylindrical object that isn't too much larger than the inner diameter of the
bearing into the hole. The grease that is displaced should pop the bearing out.

Putting the tranny back in is a tiresome process. An engine hoist is essential if you want to preserve your sanity. Jacking the tranny/transfer assmebly from below is virtually impossible. You should buy 3 M12x60x1.25 or so bolts to help you allign the transmission. Manouver the tranny into position so that the input shaft is through the throw-out bearing and at least one of the tranny-bellhousing holes is alligned (the lower passenger side one is a good place to start) Thread one of the longer M12 bolts through the tranny and into the bellhousing (be sure there's alot of thread going into the bellhousing so it won't tear out if it has to take some of the tranny's weight. Next, rotate the tranny about the bolt until another hole is alligned. Pop in another of your M12 bolts in. You may have to level the tranny a little before you can get the last bolt in. (Put it on the passenger's side--it's easier to remove) You should then be able to walk the tranny along the bolts until its right up snug with the bellhousing. It may take a little push to close the final 1/4" gap.
If there is resistance before this point, chances are the tranny's input shaft is not going through the pilot bearing properly. BE CAREFUL. If you crush the pilot bearing, you'll have to repeat the whole removal/installation process!
Once the tranny is in position, put one of the stock length bolts into the driver's side top hole. Finally, remove the allignment bolts one by one and install the stock bolts.

19.13 V8J40 Cooling Tips - Fred Welland (fwelland@prcrs.prc.com)

CONTRIBUTORS	ENGINE	FAN	RAD	USUAL TEMP
Fred Welland	350 (400)	7 BLADE AIRCO	2F	190-230
Karl Klashinsky	350	Electric	5/6 CORE	200-210
Mike Bennett	350		5-CORE X-FLO	200-210
Mike Sousa	350	7 BLADE CADDY	4-CORE	185-200

TEMPERATURE RANGES
The ideal maximum temperature for a SB Chevy in a Land Cruiser is 200 degrees Fahrenheit. The maximum allowable is probably in the 230-240 range.

FAN TYPES
Flex fans are generally regarded as the poorest type for extreme cooling.
Clutch fans are the next worst
Electrical fans are the next. They have two advantages: the ablility

to be
manually shut off during water crossings to prevent splashing, and greater fuel
economy. However, a single electrical fan does not move enough air--a dual fan
push-pull arrangement may be better though.
It is generally agreed that some type of fixed pitch fan with many deep blades
is the best. It will move the greatest amount of air, however, it will provide
your truck with DC-3 on takeoff roll sound-effects and will function as an
excellent screw in water crossings. Some sources of thes monster props are air
conditioning suppliers and Cadillacs.

WATER PUMPS & HOSES
A high flow water pump can be good for as much as a 10 degree
temperature drop.

For extreme temperature duty, molded hoses tend to be more rupture-resistant
than flexible ones.

TEMPERATURE SENDER PLACEMENT
In most cases, the sender is located on the side of the block between
cylinders 1 and 2.

LOWERING STOCK RADIATOR
Piece of cake. I hoped I could just slide the radiator down in the u-shaped
channel and drill some new holes. Nope, I couldn't get the radiator down
enough: you might be able to. If not, take out the radiator and u-shaped
mount. The radiator mounts to the u-shaped mount and the u-shaped mount sits
on two brackets extending back from the front crossmember. Figure out where
you want the radiator to sit (fore and aft) and then cut off enough of the
existing brackets so the radiator and mount will move straight down. Figure
out how low you want the radiator to sit and then weld two pieces of angle
iron to the ends of the brackets to make a new lower shelf for the u-shaped
mount to sit on.

When I got my radiator low enough, the corner of my u-shaped mount wanted to
occupy the same space as my steering column shaft. I chopped a section out of

the u-shaped mount for clearance around the steering shaft and just reinforced
the inside of the mount with another small piece of steel. Looks funny, but
it works. Bend, cut, weld, or something so you can reattach the side braces
and your down the road!

FAN SHROUDS
Some claim that a fan shoud makes all the differnce in the world, however some
there are also those that say installing a shroud had no effect.

OIL COOLERS
Adding an oil cooler should make a difference in your engine temperature because
theoretically you now have two paths for heat to leave the engine. Adding an
oil cooler has the advantage of increasing your oil capacity (although it will
cost you more for an oil change)

COOLANT ADDITIVES
> Water Wetter is available from any Super Shops. It's $6.95/bottle. If they
> don't have it in stock they will order it for you.

Water Wetter is made by Redline. You can order it directly from them at
1-800-624-7958 if you can't find it locally. However, it may be subject
to a minimum order. It works.

19.14 Which Wheels Work? - Rob Mullen (RAMullen@wimsey.com)

There are essentially four "periods" to consider when looking at which wheels
your Land Cruiser will accept. They are: Early-75 drum brakes, 76-89
disc/finned drum brakes, 90-91 disc brakes, and finally 92+ four-wheel disc
brakes.

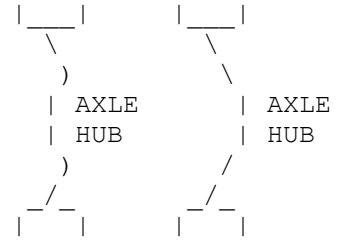
With the first two "periods", the ABSOLUTE maximum backspacing is 3.75" With
that backspacing, chances are good that wheel weights that snap onto the lip of
the rim (as opposed to sticking to the inboard/outboard faces) will rub on the
tie rod ends--especially with 60 and 70 series.

The IDEAL backspacing is 3.5"--that will give you lots of clearance.

Early drum brakes are relatively easy to fit wheels wheel to along as the
backspacing is correct.

With disc brakes (as used on the 40, 60, and 70 series) and finned drum brakes
(as used on the 45 series) even if you find a wheel with the right

backspacing,
there is still a chance it will not work. This is more of a problem
with 16"
rims than 15". The problem is a result of the cross-section of the
"disc" of
the rim. The followin will sort of illustrate the problem:



On disc-brake equipped trucks, the rounded "indent" of the rim on the
left will
hit the calliper, while the rim on the right will clear the calliper.
On
vehicles equipped with finned drum brakes, the profile of the trum is
such that
the rounded indent will push against the drum before the studs are fully
tightened.

Rims that do not clear will require wheel spacers, of which there are
two
varieties.

The first tend to be relatively cheap, are made from cast pot-metal
or aluminum, and tend to be about 1/4" thick. They are standard
equipment on
vehicles of the DEVIL! They are EVIL and will bring much unhappiness
to you,
your family, and all future generations bearing your name. They are
totally
incapable of withstanding the forces generated by off-road driving.

The second type are much heavier duty. They're usually machined
aluminum or
steel, and are closer to 1" thick. They bolt onto your hubs, then have
a set of
their own studs that alternate with the stock ones. The rims are
actually
bolted to the spacers themselves, and not to the vehicle's hub.

The following rims DEFINITELY work on all drum and pre-89 disc brake
equipped
trucks:

Brazilian made 16x7" Mangels Series 10s (3.54" backspacing--3.75"
backspacing
  is a tight fit)
Brazilian made 16x7" Mangels Series 90s (not sure what the backspacing
is rated
  as, but is actually ~3")
Note that all steel Mangels sold in North America are now made in the

US and WILL
NOT fit.
15" Eaton Monster Wheels (3" backspacing)
15x8" Superior White Spoke Wheels (3.5" backspacing)
15x8 American Eagle 589s (backspacing-3.5?)

The following rims DEFINITELY DO NOT work:

Any American Racing 16"
ANY Canadian Superior 16"
Alcoa/Mickey Thompson Classic/Challenger 16"
US made Mangels in the plain white boxes
8-spoke Toyota aluminum wheels from pre-91 80 Series Land Cruisers, and
  86+ Pickups/4Runners

I've also heard that American Racing has changed the design of their rims so
most of their 15s don't fit.

I'd appreciate it if people could tell me what works on their trucks with
LC/Hilux disc-brake equipped axles (fit isn't nearly as much of an issue with drum brake equipped trucks)

In 1989, the design of the hub was changed to be more like that of the Hilux.
That meant that up to 4" of back-spacing was permissable. Since the mating
surface of the hub was moved further outboard, calliper clearance was not as
much of an issue.

In 1992, the wheel size of LCs was changed to 16" that was to allow adequate
clearance between the rims and the rear disc brakes. Fitting 15" wheels to a
>1992 truck equipped with rear disc brakes requires grinding a little off the
callipers.

20.0 Land Cruiser Clubs

20.1 North America

Toyota Land Cruiser Association (TLCA)
PO Box 607
Placerville, CA 95667-0607
Kara Patston (Membership): KPatston@aol.com
Gary Bjork (Toyota Trails Editor): TLCAEditor@aol.com
Membership Services:1(800)397-3260 24hr voice/fax

Chapters:
This information (esp. Contacts and Phone #'s) may change fairly regularly,
contact TLCA for more info.

Basin & Range Cruisers
1639 East 4500 South
Salt Lake City, UT 84124
Contact: Jack Christensen
(801)277-6629

Beach'N'Toys
405 S Rose St.
Escondido, CA 92027
Contact: Brad Phillips
(619)747-1822

Capital Land Cruiser Club
45655C Woodland Rd.
Sterling, VA 20166
Contact: James Asti
(703)404-8115

Cascade Cruisers
10045 S. Marquam Circle
Molalla, OR 97038
Contact: Peter Poling
(503)642-9164

Coastal Cruisers
2360 Douglas Road
Burnaby, B.C.
Canada
V5C 5B2
Contact: Dave Romaniuk
(604)299-5600
E-contact: Rob Mullen
RAMullen@wimsey.com

Gold Coast Cruisers
761 Coronado Pl.
Oxnard, CA 93030
Contact: Lary Moczulski
(805)984-3309

Georgia Cruisers
PO Box 467691
Atlanta, GA 31146
Contact: Steve Clevenger
(404)446-9115

High-N-Dry Four Wheelers
9432 E. Ave. T-10
Littlerock, CA 93543
Contact: Mike Greear
(805)944-3881

Keystone Cruisers, TLCA of PA
1063 E. Caracas
Hershey, PA 17033
Contact: Ken Johannsen
KJohannsen@aol.com

Massachusetts Coastal Transit Authority
3 Federal St.
Newburyport, MA 01950
Contact: Tedd Brown
(508)465-6021

Mid-Ohio Land Cruisers
1791 E. Orange Rd.
Lewis Center, OH 43035
Contact: Bill Scott
(614)548-6214

Mountain Transit Authority
PO Box 54024
San Jose, CA 95154
Contact: Bill Youngman
(408)629-0949
billfj4045@aol.com

Nor-Cal Marauders
13880 Noble Way
Red Bluff, CA 96080
Contact: Jim Bosman
(916)527-4129

Rising Sun 4 Wheel Drive Club of Colorado
4125 S. Lisbon Way
Aurora, CO 80013
Contact: Chris Hatfield
(303)680-1292
Toy4x4s@aol.com

Southeast Land Cruiser Association
208 Reidhurst Ave.
Nashville, TN 37203
Contact: Rainey Kirk
(615)320-0129

Southern Nevada Land Cruisers
PO Box 28004
Las Vegas, NV 89126
Contact: David Hawkins
(702)452-8471

So. Cal. TLCA
PO Box 1291
Sunset Beach, CA 90742
Contact: Ed Bailey
(714)841-9944

Totally Landcruisers of New Jersey
PO Box 114
Eatontown, NJ 07724
Contact: Al Kaplan
(908)458-3413

TLCA Los Angeles County
1849 Lucretia Ave.
Los Angeles, CA 90026
Contact: Bill Ferguson
(213)250-4179

TLCA Ventura County (founding chapter)
PO Box 367
Ventura, CA 93002
Contact: Michelle Bolton
(805)647-5263

Toyotally Awesome Cruisers of Auburn
PO Box 5482
Auburn, CA 95604
Contact: Marty Patton
(916)268-9312
E-Contact: Jeff Hassi
JHassi@aol.com

Toys 4 Fun
PO Box 4086
Fresno, CA 93744
Contact: Chuck Parks
(209)432-9468

Toys on the Rocks
PO Box 546
Placerville, CA 95667
Contact: Jerry Schroeder
(916)642-0303

Virginia Land Cruiser Association
205 Bayview Dr.
Yorktown, VA 23692
Contact: Bill Baxter
(804)877-9136

Washington Timber Toys
PO Box 2963
Woodinville, WA 98072-2963
Contact: Gordon Quehrn
(206)483-3531

Windy City Land Cruisers
4741 Montgomery Ave.
Downers Grove, IL 60515
Contact: Jim Today
(708)968-7820

20.2 Australia

Toyota Landcruiser Club of Australia (Victoria) Inc.
PO Box 363
Hawthorn, Vic 3122

Toyota Landcruiser Club of Australia (SA) Inc.

PO Box 55
Oaklands Park, SA 5046

Toyota LandCruiser Club of Queensland Inc.
PO Box 8309
Wooloongabba, Qld 4102
bg@data3.com.au
http://www.sofcom.com.au/4WD/Clubs/Au/Qld/TLC.html

Toyota Landcruiser Club of Vic, Geelong Branch
PO Box 515
Geelong, Vic 3220

Toyota LandCruiser Club (NSW)
PO Box 2
Bankstown, NSW 2200
rains@ozemail.com.au

Toyota LandCruiser Club of W.A.
P.O. Box 518
Cloverdale, W.A. 6105

20.3 Netherlands

Toyota Landcruiser Club The Netherlands
c/o Jos Coppes
Albionstraat 12
5809 AD Leunen
the Netherlands
phone: 0478-512935 (day)
and: 0478-583290 (evenings)

21.0 Parts Suppliers

Legend
N New Parts
U Used Parts
C Catalog Available
S Service or Custom Work
V Complete Vehicles
* Specialty Products

21.1 North America

Advance Adapters, Inc.
N,C Engine/Transmission/TC Adapters
PO Box 247
Paso Robles, CA 93447
(805)238-7000 FAX (805)238-4201
www.advanceadapter.com
sales@advanceadapter.com

Advanced Four Wheel Drive Systems
S
1102 South 200 West

Salt Lake City, UT 84101
(801)521-2334 FAX (801)521-2335

All American Enterprises 4x4
4830 N. Hwy 97
Klamath Falls, OR 97601
(541)882-5313

Aqualu Industries
3251-A Sexsmith Road
Kelowna, BC Canada
(604) 765-6714 FAX (604)765-6704

ARB-U.S.A.*
Air Lockers, ARB bumpers,
1425 Elliott Ave. W Old Man Emu Springs, Shackles
Seattle, WA 98119
(206)284-5906 FAX (206)284-6171
arbusa@halcyon.com

Brown's Toyota City
N New parts at wholesale
7167 Ritchie Hwy.
Glen Burnie, MD 21061
1-800-848-4451

BTB Products
N,U,M,S Adv. Adapters, PS Conv,
Compressors
825 Civic Center Dr. #8 Springs, Disc Conv, Cages, Tire
Racks
Santa Clara, CA 95050
(408)984-5444 FAX (408)984-0155
btbprod@btbprod.com
http://www.btbprod.com/Home.html

Clifford Performance
N,C 6-1 Headers, camshafts, EFI kits
2330 Pomona-Rincon Rd.
Corona, CA 91720
(714)734-3310 (714)734-3405

Colorado Toyota Specialists
26366 Sutton Rd.
Conifer, CO 80433
(303)838-4772

Con-Ferr
N,C Bumpers, Skid Plates, Shackles,
Diff
123 South Front St., Dept. FW0495 Skids, Roof Racks, Storage Boxes
Burbank, CA 91502-1983
(213)849-1800, (818)848-2025,2330,6993
FAX(818)848-1011

"Cool Cruisers" of Texas
V,N Sells Restored Land Cruisers,

Body
101 - 5101 Grisham Drive
Rowlett (Dallas Suburb), TX 75243
(214)707-8993 FAX (972)303-4600
coolfj40@gte.net
http://www.coolcruisers.com
Panels, Bolt-on Air Conditioning
NO CATALOGS OR OTHER PARTS AVAILABLE

Cruiser Parts
2659 Williams Hwy
Grants Pass, OR 97257
(541) 479-5500

Desert Toyota
N
7150 East 22nd Street
Tucson, AZ, U.S.A. 85710
(520)296-8535 FAX (520)790-2900
spiketgr@aol.com
New Toyota Parts

Downey Off-Road Manufacturing
N,C,M
10001 S. Pioneer Blvd.
Santa Fe Springs, CA 90670
(213)949-9494 FAX (213)949-5718
Tanks, Bumpers, Cams, Adapters, Clutches, Dietributors, Tops, Diffs

FabTech Manufacturing & Off Road, Inc.
N,U,S,C
#9 - 150 Campion Rd.
Kelowna, B.C.
Canada V1V 1L9
(604)765-0019 FAX (604)765-1419
http://shop.info-tec.com/fabtech/
fabtech@info-tec.com
14ga Steel Tubs, Fenders, PS Conversions, Restored LC's, Shackle Reversal

Front Range Cruisers
N,U
2406 North Logan Ave.
Colorado Springs, CO. 80907
(719)633-8178 FAX (719)475-7609
Grimes@pcisys.net
Buy/Sell/Trade

Hadley Industries
U,V,N,S,D
4785 Pratt
Metamora, MI 48455
(810)797-4120

Interior Auto Wrecking
U, V
3101 45th Ave.
Vernon, B.C.
Canada V1T 3N7
(604)545-2104 FAX (604)542-3335
Used FJ/BJ/HJ Parts

James Toyota
172 Route 202

Flemington, NJ 08822
(908)788-5700 FAX (908)788-7887
info@toyotaoutlet.com
http://www.toyotaoutlet.com

Jim's Fuel Injection Service
N — Diesel injector service,
112-1083 East Kent Ave. — Diesel fuel pump parts
Vancouver, B.C. — Bolt on turbo kits
V5X 4V9
(604)324-1715

K & L Engineering*
6355 Smith Ave.
Mira Loma, CA 91725
(714)735-4182

Land Cruiser Advanced Handling
N,S — Suspension Correction (Shackle
1029 S.E.24th — Reversal), Springs, Spring Over
Albany, OR 97321 — Conversion
(541)926-8122

Land Cruiser Connection
N,S — Restoration, Repairs, Rebuilds,
Custom
45661B Woodland Road — Fabrication, ARB/OME,
Fibreglass Panels
Sterling, VA
(703) 404 8115
jasti@landcruiserconnection.com
http://www.landcruiserconnection.com/

Land Cruiser Recycling
N,U,V
PO Box 11727
Blacksburg, VA 24060-1727
(703)961-2053

Land Cruiser Solutions
Al Tubs, Grilles, Tailgates,
Fenders,
20 Thornell Rd. — Running Boards
Newton, NH 03858
(603)382-3555
LandCruiserSolutions.Inc@worldnet.att.net

Land Cruisers Unlimited
U,N,S — Steel 1/2 Doors, Tail Lights,
Tire
E. 7555 Ohio Match Road — Carriers, FR/RR Discs, Bumpers
Rathdrun, ID 83858
(208)687-2607

Laughing Horse Design
12205 Lockey Lane Ste 12
Auburn, CA 95602

(916)888-8200

Lou Fusz Toyota
N,C
10725 Mancheser St.
St Louis, MO, 63122
1-800-325-9581(CA/US) (314)-966-5404
FUSZTOYOTA@aol.com
New Toyota Parts, Accessories, & Performance Parts

Malotte Manufacturing Co., Inc.
N,C
PO Box 305
Lincoln, CA 95648
(916)645-8111
Fibreglass tubs, tops, fenders

Man-A-Fre
N,U,M,C
5076 Chesebro Rd.
Agoura, CA 91301
(818)991-6689 FAX (818)991-7105
sysmgr@man-a-fre.com
http://www.man-a-fre.com/
6-1 Headers, Carbs, Toyota Parts, Rebuilt Parts, Lights, Springs, Shocks, LSD's, Old Man Emu, ARB, Con-Ferr Advance Adapters

Mark's Off Road Enterprises
N,U,D,S,M
437 N. Moss Street
Burbank, CA 90501
(818)953-9230 FAX (818)953-7225

Marlins Auto & Truck Repair
S
1543-B N. Maple
Fresno, CA 93703
(209)252-1584
Marlin Crawlers?

Nairobi Outfitters
grillguards/winchmounts
PO Box 1211
Goleta, Ca 93117
(805)682-7933
Extreme duty
Expedition quality vehicle modifications/fabrication, tech support

National Spring
N
Dept. OR
1402 N. Magnolia Ave.
El Cajon, CA 92020
(619)441-1901
Custom springs/lift kits

Northwest Off-Road Specialties
N,C,F
1999 Iowa St.
Bellingham, WA 98226
(206)676-1200 FAX (206) 676-5401
80 Series Accessories ONLY

Olympic Off Road
N,U,S,V,D
3735 S Pine Suite E
Tacoma, WA 98409
(206)473-5797

Ozone Off-Road, Inc.
N,U,S,C,V — Performance items, fibreglass bodies,
4623 Canyon Ridge Ln — V8 conv., suspension, frame mounted
Reno NV 89503 — roll bars/cages

Performance Products
N,C
7658 Haskell Avenue
Van Nuys, CA, U.S.A. 91406-2005
(800)423-3173 FAX (800)752-6196
performprod@msn.com

PowerTrax/Lock Right*
245 Fischer Ave. B-4
Costa Mesa, CA 92626
(800)562-5377 FAX (714)545-5425
powertrax@aol.com

Pull Pal / Premier Power Welder
S
P.O. Box 639
Carbondale, CO, U.S.A. 81623
(970)963-8875 FAX (970)963-8875

Ramsey Winch Co.*
Winches?! :)

PO Box 581510
Tulsa, OK 74158
(918)438-2760 FAX (918)438-6688

Renegade Fabrication — Service or Custom Work, Specialty
18447 N. 33rd Avenue — Products
Phoenix, AZ, U.S.A. 85023-1050
(602) 938-3185

R&M Specialty Products*
Onboard hot-water showers

PO Box 1683
Windsor, CA 95492
(707)838-3869

Rocky Mountain Offroad Specialties
365 Bonny Street, Suite A
Grand Junction, CO, U.S.A. 81503
(800) 524-6005

Specter Off-Road, Inc.
N,U,M,C — New/Used Toyota USA/NON USA

Parts
21600 Nordhoff St.
Chatsworth, CA 91311
(818)882-1238 FAX (818)882-7144
Specterlc@aol.com
http://www.sor.com/

3-2-1 Headers, Conn-Ferr

Sterling McCall Lexus/Toyota
10422 Southwest Freeway
Houston, TX, U.S.A. 77074
(713)995-2600 FAX (713)995-2695

Stevens Creek Toyota, Inc.
N,S,V
4425 Stevens Creek Blvd.
Santa Clara, CA 95050-7395
(408)984-1234 FAX (408)246-8028
http://www2.sctoyota.com

Sun Performance Products
17 Musick
Irvine, CA, U.S.A. 92718
(714) 588-8567, Fax: (714) 588-0142

Air compressors

TLC Restoration and Sales
S,V
14743 Oxnard Street
Van Nuys, CA 91411
(818)785-2200 FAX (818)785-2209
http://www.tlc4x4.com/
jward@tlc4x4.com

Owner: Johnathan Ward
Restored FJ40s/60s/62s

TLC Mechanix
N,U,S,V
122 S. Lillie Lane
Fayetteville, AR 72701
501-582-4TLC (4852)
TLCMEX@aol.com

Owner: Adrian McGlaughlin
Power steering, disc brakes, V8 conversions, suspensions, custom fabrication.

TLC Offroad
N,U,S
2360 Douglas Rd.
Burnaby, BC
Canada
V5C 5B2
(604)299-5600
RAMullen@wimsey.com

New/Used Parts, ARB/OME, 24V bulbs,
Nippondenso glow plugs

Toyotas "R" Us
U,S
7730 CR 150
Salida, CO 81201
(719)539-7733

TPI Land Cruiser Parts And Accessories

N,U
1042 Jasperson Drive
Madison, TN 37115
(615)865-4499 FAX (615)860-6074
www.tpilandcruiser.com

Truck Sales Co. Off-Road Center
N,U,M,S,V
2211 Dickerson Road
Nashville, TN 37207
(615)262-5850

Toyota Racing Development (TRD U.A.A., Inc.)
355 East Baker
Costa Mesa, CA 92626
(714)444-1188
1(800)688-5913

Warden's Auto Repair
N,U,S,V
640 Main St.
Placerville, CA 95667
(916)622-9242 FAX(909) 338-6709

SM420-3 SPD TC adapter kits
Bullet Proof CNC Milled Transfer Cases

W.E. For Wheel
N,U
PO Box 601
Crestline, CA 92325
(909)338-5120 FAX (989)338-6709

21.2 Australia

Don Kyatt 4WD Parts & Accessories
N,S
172 Roden St.
West Melbourne, Vic
AUSTRALIA 3003
(03)329-8200

Direct importer of spare parts, ARB Stockists

177 Chesterville Rd.
Moorabbin, Vic
AUSTRALIA 3189
(03)555-0455

108 Regency Rd.
Ferryden Park, SA
AUSTRALIA 5010
(08)243-1966

Four Wheel Drives
N,U,C
304 Middleborough Rd.
they've
Blackburn, South Vic
AUSTRALIA 3130
(03)9890-0500 FAX (03)9898-6374
fwd@fwd.com.au

Mail order world wide since 1955
If it's off a four wheel drive,
got it and will get it to you

www.fwd.com.au

Leo's Cruisers
2 Panamuna Ave
Taylors Lakes
Victoria
AUSTRALIA 3038.
613 93902670 CELL 613 15 329433

Early FJ40's and FJ55's, fibreglass body panels

Mark's Adapters
22 Sinclair Road
Dandenong, Victoria
AUSTRALIA 3175
(03) 9793 3388 (03) 9706 8148
marks4wd@ozemail.com.au
http://www.ozemail.com.au/~marks4wd/