



Independent Battery Distributors

FORKLIFT - SEALED - STATIONARY - SOLAR BATTERIES - CAR - TRUCK - DEEP CYCLE - MARINE

BATTERY CATALOGUE

Edition 4

sales@ibd1.com.au

94 Research Rd,
Pooraka, SA 5095
Tel: 08 8260 6111

5/937 Marion Rd,
Mitchell Park, SA 5043
Tel: 08 8296 6311

3/1 Westside Drv,
Laverton Nth, VIC 3026
Tel: 03 9315 3580

78 Dandenong Rd,
Frankston, VIC 3199
Tel: 03 9783 1807

Cnr Tenth St & Etiwanda Ave
Mildura, VIC 3500
Tel: 03 5021 1505

1/29 Lampton Ave,
Derwent Park, TAS 7009
Tel: 03 6272 1033

498 Stuart Hwy
Winnellie, NT 0820
Tel: 08 8947 3244

9/12-16 Sandford Street,
Mitchell, ACT 2911
Tel: 02 6241 1671

69a Auburn Street,
Wollongong, NSW 2500
Tel: 02 4227 4200

16 Scoresby Road,
Bayswater, VIC 3153
Tel: 03 9720 4001

412 Thompsons Road,
Geelong North, VIC 3215
Tel: 03 5277 9009

509 Midland Hwy,
Huntly, VIC 3551
Tel: 03 5448 8221

Unit 1/16 Reid St
Wodonga, VIC 3690
Tel: 02 6056 1590

sales@ibd1.com.au



Independent Battery Distributors

FORKLIFT - SEALED - STATIONARY - SOLAR BATTERIES - CAR - TRUCK - DEEP CYCLE - MARINE

Contents

IBD Story
Specialized Range and Fields
Choosing the right battery
Warranty
Technical Specifications and data
Application Guide
Technical Information
Procedure for testing batteries
Battery safety and Trouble Shooting
Frequently Asked Questions
Materials Safety Data
Battery Charges / Charging Batteries



Independent Battery Distributors

FORKLIFT - SEALED - STATIONARY - SOLAR BATTERIES - CAR - TRUCK - DEEP CYCLE - MARINE

NOTES:

This image shows a single sheet of white paper with horizontal blue ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

Independent Battery Distributors

FORKLIFT - SEALED - STATIONARY - SOLAR BATTERIES - CAR - TRUCK - DEEP CYCLE - MARINE

IBD Story



Independent Battery Distributors

FORKLIFT - SEALED - STATIONARY - SOLAR BATTERIES - CAR - TRUCK - DEEP CYCLE - MARINE

The IBD Story

Independent Battery Distributors (IBD) commenced trading as a family business in 1984 as Apollo Batteries SA Pty Ltd. The business was based out of a warehouse in Para Hills, SA. In 1985 it was relocated to Pooraka a neighbouring suburb & is now the head office for our branch distribution network.

The companies trading name was changed in 1995 to become Independent Battery Distributors & is now recognised as one of the leading independent battery companies in Australia.

The South Australian operation was further strengthened in 1992. The first branch opened at Marion, SA. which services the southern areas of Adelaide. With continued growth the company opened a second branch in Ballarat, This soon relocated to Laverton & is now the head office for our Victorian operation supported by both Frankston & Mildura branches providing complete state coverage.

In July 1989 IBD opened a warehousing distribution facility in Berrimah a suburb of Darwin to further strengthen our place in the Australian battery industry, due to continuous growth the operation moved to a larger location at Winnellie in 2014.

The Tasmanian operation commenced in 2012 with the opening of our sixth branch in Derwent Park & due to the growth of the Bosch program there was a need to have a Distribution outlet for the state of Tasmania. Further expansion in the North is planned in the coming years.

In May 2014 two new sub-stockists stores in ACT & Wollongong to cover all of ACT and Illawara region of NSW.

In 2015 IBD opened its 8th distribution centre located at Wodonga to assist with the distribution & growth throughout regional NSW.

Head Office SA



Marion SA



Laverton State Office Vic



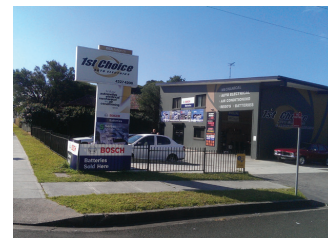
Frankston Vic



Tasmania



Wollongong, NSW



Canberra ACT



Specialised Range and Fields



Independent Battery Distributors

FORKLIFT - SEALED - STATIONARY - SOLAR BATTERIES - CAR - TRUCK - DEEP CYCLE - MARINE



Independent Battery Distributors

Specialises In a Range of Fields in the Battery Industry, List as follows

- * Fully sealed Calcium/Calcium maintenance free batteries to suit cars, 4x4, trucks & tractors.
- * Specializing in hard to find batteries - we stock the biggest range available.
- * Huge range of quality automotive batteries - dry charged and calcium hybrid.
- * True deep cycle batteries for all needs - 2V, 6V, 12V, 24V, 36V and 48V.
- * Marine Calcium/Calcium maintenance free range - with a 2 yr. warranty.
- * Motorcycle, maintenance free motorcycle - including Deka, Odyssey, HVT high performance batteries.
- * Traction and industrial batteries including a servicing division with on-site service.
- * Deep cycle US batteries, Full Frame Technology Bosch Deep Cycle.
- * Sealed lead acid, AGM, Gel batteries for alarms, UPS, golf buggy, wheelchairs and emergency lighting.
- * High Performance Optima and Odyssey batteries from the USA.
- * Loco, houseboat and remote power batteries made to order.
- * Solar panels.
- * Inverters - 150W to 4,500W.
- * Battery chargers both small and large - 6V, 12V, 24V, 36V and 48V.
- * Large range of accessories, terminals, jumper leads, battery boxes, power boxes and testers.
- * Narva Lighting for 4WD Market, Marine, Camping / Fishing.
- * Demineralized water manufactured on site, with bottles and drums available.



Choosing the Right Battery



Independent Battery Distributors

FORKLIFT - SEALED - STATIONARY - SOLAR BATTERIES - CAR - TRUCK - DEEP CYCLE - MARINE

Common Battery Terms Defined.

Volts (V)

The unit of measure for electrical potential.

Ampere (amp (A))

The unit of measure of electron flow rate or current through a circuit.

Ampere Hour (A/H)

The unit of measure for a battery's electrical storage capacity. If a battery is rated 100 A/H at a 20hr rate, then 100 dividend by 20 equals 5. The battery is capable of supplying 5 amps for 20 hours.

C.C.A. (Cold Cranking Amps)

The number of amperes a battery at - 18c (0°F) can deliver for 30 seconds and maintain a voltage of a least 1.2V per cell.

Reserve Capacity (RC)

This is the time in minutes that a new, fully charged battery will supply a constant load of 25A at 25°C without the voltage falling below 10.5V (for a 12V battery) or 5.25V (for a 6V battery).

Choosing the Right Battery.

A number of changes have taken place in recent years to the design of modern motor Vehicle and the need for increased electrical power requirements. Twenty years ago the average Ford or Holden had about ten electrical appliances including headlights. Vehicles of today, can have as many as one hundred some of which stay activated after the ignition switch has been turned off (eg car alarms and dashboard clocks). For this reason, it is essential to understand that battery manufacturers design and make Batteries of differing capacity, each suited to different applications.

Some vehicles are fitted with either AGM or calcium maintenance - free batteries. These Applications should be replaced only with the same maintenance - free battery, and AGM (Absorbed Glass Matt).

As an easy guide, if your vehicle fits into one or more of the following points, then you should always use a heavy duty battery.

1. Driven at night more than usual.
2. Fitted with a mobile phone or two - way radio.
3. Fitted with a stereo and speakers or driving spotlights.
4. Powered by diesel or other alternate fuel such as LPG.
5. Used for commercial purposes.
6. Operated in colder climates.
7. Installation in camper/caravans, we advise the to use of AGM.

If in doubt, ask your I.B.D representative to suggest the right battery for your application.

Choosing the Right Battery

Your Complete reference guide to selecting the proper replacement

Platinum Power Plus

- High cranking power.
- Up to 24 months nationwide warranty.
- Calcium maintenance free design.

The expanded grid technology use calcium positive and negative plates to provide superior grid strength and greater resistance to corrosion. Stronger protection against heat over-charging and minimal gassing and water loss, with a low self discharge rate with higher CCA and reserve capacity it is truly a maintenance free battery.



Calcium Marine King

- Superior cranking power.
- Up to 24 months nationwide warranty.
- Fully sealed maintenance free design.

With all the advantages of the Platinum Power 2000 battery along with higher specifications and more active material and acid retention capabilities allowing for more power and a much longer lasting marine battery. With high CCA's and reserve capacity and vibration resistance you know you will return home safely.



Platinum Power 2000

- Superior cranking power.
- Up to 36 months nationwide warranty.
- Fully sealed maintenance free design.

The expanded grid technology use calcium positive and negative plates to provide superior grid strength and greater resistance to corrosion. Stronger protection against heat over-charging and minimal gassing and water loss, with a low self discharge rate with higher CCA and reserve capacity it is truly a maintenance free battery.



Power 2000

- Superior cranking power.
- Up to 24 months nationwide warranty.
- Accesible hybrid design.

Power 2000 Accessible Range

Our Power 2000 accessible range combines the latest in calcium hybrid technology along with easy access fill caps.

Power 2000 range will provide good cold cranking amps and offer mild cycling use and is designed for the customers who prefer to maintain their own battery. Hybrid design antimonial alloy positive plates and calcium alloy negative plates are designed for the harsh climatic and road conditions of Australia. The hybrid design is less prone to corrosion and loss of active material. And antimonial allows battery to be readily re-charged.



Deep Cycle-King

- Superior cycling capabilities.
- Up to 12 months nationwide warranty.
- Designed for a maintenance scheme.

Deep cycle batteries provide sustained power over extended periods of time and are designed to be repeatedly discharged and re-charged. So choose a Deep Cycle King when you require long running power and the piece of mind your battery will last



Choosing the Right Battery



Compact bustion engines - Hybrid - Stop Straight Aircraft - Solar - Forklift - VRLA - SLA - UPS and Pure Lead AGM



Compact program, comprehensive coverage

The Bosch battery program offers comprehensive market coverage within a compact program. Three levels of performance are available, each colour coded to make selecting the right battery easy.

Bosch Battery S3 - for everyday economy

An Economical, maintenance-free solution for everyday vehicle, delivering Bosch's trademark reliability.

The everyday battery must offer the optimum balance of service life, resistance to self-discharge and consistent reliability, whilst remaining cost-effective. **S3** meets all these demands and offers applications for a wide range of modern vehicles

Bosch Battery S3+ - for economy + everyday life

An optimised power source for modern transport, **S3+** is a specially-engineered solution for the increasing demands of new vehicles and their abundance of safety and entertainment systems.

S3+ brings increased service life and a greater resilience to extreme conditions. An enhanced alternative to **S3**, **S3+** is still within reach of budget-conscious customers, with its extra life available for a very small premium.

Bosch Battery S4 - for longer life with extra power

A superior option for absolute dependability, **S4** is developed to exceed the demands of the growing medium sized vehicle sector and the prevalence of advanced equipment it has introduced.

With DVD players, parking distance control, lane-change warnings and active suspension systems making their way into the medium vehicle market, **S4's** reinforced outputs have them covered. Further-improved service life is supported by increasing warranty for optimal customer peace of mind.

Bosch Battery S5 - for the ultimate lifespan and performance

A premium opportunity, showing optimal Bosch refinement, **S5** is a partner for prestige vehicles and currently exceeds all international standards set by their manufacturers.

An executive choice, **S5** will take pride of place in the most advanced vehicles, supporting their overwhelming depths of technology and stronger demands for starting and cycling ability. **S5** is also your partner for extreme motoring, offering absolute commitment to performance.

Warranty



Independent Battery Distributors

FORKLIFT - SEALED - STATIONARY - SOLAR BATTERIES - CAR - TRUCK - DEEP CYCLE - MARINE

Warranty

The benefits under this warranty are in addition to other legal rights and remedies you may have in relation to batteries.

IBD warrants its batteries against defects due to faulty manufacturing for the following periods commencing from the date of purchase.

Sealed MF product - up to 36 month warranty *Private use, cars only
Sealed MF product - up to 24 month warranty *Private use, 4x4, Utes, Vans
Sealed MF commercial product - up to 12 month warranty
Sealed MF 4x4 commercial product - up to 12 month warranty
Accessible commercial MF product - up to 12 month warranty
Marine King Sealed MF product - up to 24 month warranty
Marine Accessible product - up to 12 month warranty
Cycle King deep cycle - up to 12 month warranty
Budget MF product - up to 12 month warranty
Taxi - up to 6 month warranty
Some batteries used with appliances including fridges, microwaves - up to 6 months warranty
All batteries for commercial use - 12 month warranty

Proof of purchase is needed to claim under this warranty. You must return the battery, with proof of purchase to any IBD reseller in person or freight pre-paid by you. You can find the contact details for your nearest IBD reseller by calling Head Office. Alternatively, you may, in person or freight pre-paid by you, return the battery to your nearest dealer, State or Territory office (for contact details see below).

If IBD (itself or through its reseller) finds on examination that the battery is defective due to faulty manufacturing and is within the specified warranty period, then the battery will be replaced with an equivalent battery free of charge. The warranty period is not renewed or extended as a result of this replacement.

The battery will not be covered by this warranty if:

- * It has been subject to overcharging, undercharging, abuse, physical damage, a faulty vehicle charging system, neglect (sulphation), a long period of storage or installation without reconditioning, failure to maintain acid levels (for accessible types), tampered markings or broken or removed vent plugs.
- * It is discharged: Sulphated plates.
- * It has been topped up with any liquid other than distilled water.
- * Damage caused by acid spillage due to improper topping up causing overfill (applied to accessible batteries).
- * It has been repaired or modified by a third party without IBD's consent.
- * The failure is caused by faulty terminals.
- * You have installed a battery that has a lower capacity than is originally specified by the manufacturer of the equipment in which the battery has been used.
- * The battery is damaged because of an explosion due to faulty connection (loose or reversed connection, frayed cables) or damage due to improper mounting or misapplication such as through the use of a deep cycle battery in the wrong application and vice-versa or
- * The defects are as a result of normal wear and tear.

This warranty does not cover the cost of labour for removal of the battery from the vehicle, or for the replacement of the battery into the vehicle, without IBD's prior written approval.

This warranty is given by Independent Battery Distributors ABN: 72 008 173 340
Email: ibd1@senet.com.au Telephone: (08) 8260 6111 Head Office

In Australia: Our goods come with guarantee that cannot be excluded under the Australian Consumer Law. You are entitled to a replacement or refund for a major failure and for compensation for any reasonably foreseeable loss or damage. You are also entitled to have goods repaired or replaced if the goods fail to be of acceptable quality and the failure does not amount to a major failure.

Technical Specifications and Data



Independent Battery Distributors

FORKLIFT - SEALED - STATIONARY - SOLAR BATTERIES - CAR - TRUCK - DEEP CYCLE - MARINE

Independent Battery Distributors

JIS/AS STANDARD SPECIFICATIONS MF BATTERIES

TYPE	R.C.	CCA (-18°C) SAE	SIZE(mm)				TERMINAL		HOLD DOWN	WET CHARGED (KG)
			L	W	H	T. H.	ASSEMBLY	TYPE		
U1-7MF	25	260	197	130	159	185	D	8	/	7.3
U1L-7MF	25	260	197	130	159	185	C	8	/	7.3
12N24-4MF	33	320	197	130	159	185	D	8	/	8.1
12N24-3MF	33	320	197	130	159	185	C	8	/	8.1
NS40LMF	49	330	196	128	200	220	C	3	B0/B1	9.9
NS40MF	49	330	196	128	200	220	D	3	B0/B1	9.9
NS40ZALMF	49	330	196	128	200	220	C	9/1	B0/B1	9.9
NS40ZAMF	49	330	196	128	200	220	D	1	B0/B1	9.9
N39/40MF	60	330	236	133	182	204	H	9	B6	10.6
NS60LMF	80	430	236	128	200	220	C	3	/	11.9
NS60MF	80	430	236	128	200	220	D	3	/	11.9
NS60ALMF	80	430	236	128	200	220	C	1	/	12.0
NS60AMF	80	430	236	128	200	220	D	1	/	12.0
N50MF	95	520	234	172	183	203	D	1	B9	15.0
N51MF	95	520	234	172	183	205	C	9	B9	15.0
N50EFMF	95	520	228	172	183	203	D	1	/	15.0
N51EBMF	95	520	228	172	183	205	C	10	/	15.0
N54MF	95	520	228	172	183	203	C	1	0/B9	15.0
50D20LMF	80	500	208	173	/	219	A	/	/	/
50D23LMF	85	500	213	165	200	/	A	F/LEDGE	/	/
55D23LMF	55	550	228	172	200	220	C	1	B0/B1	16.3
55D23RMF	55	550	228	172	200	220	D	1	B0/B1	16.3
N53MF	140	620	258	172	198	218	C	1	/	18.7
N52MF	140	620	258	172	198	218	D	1	/	18.7
N70ZMF	120	650	302	172	200	220	D	1	/	20.5
N70ZLMF	120	650	302	172	200	220	C	1	/	20.5
N70ZZLMF	160	720	302	172	200	220	C	1	/	21.7
N70ZZMF	160	720	302	172	200	220	D	1	/	21.7
N100MF	190	700	406	173	210	230	D	F/LEDGE	/	26.1
N100LMF	190	700	406	173	210	230	C	F/LEDGE	/	26.1
N100ZMF	194	760	406	173	210	230	D	1	/	27.4
N100ZLMF	194	760	406	173	210	230	C	1	/	27.4
N36MF	65	400	208	175	175	175	C	1	B13/4	11.5
DIN55MF	85	550	240	175	175	175	C	1	B13/4	13.9
DIN66MF	105	650	278	175	175	175	C	1	B13/4	16.2
DIN70-770	110	770	280	180	190	190	D	1	B13/4	20.6
DIN77LMF	105	700	311	175	175	175	C	1	B13/4	18.4
DIN88MF	135	800	352	175	175	175	C	1	B13/4	20.6
DIN90-912	125	912	310	180	190	190	D	1	B13/4	21.7
DIN100MF	135	800	352	175	190	190	C	1	B13/4	20.6
DIN110MF	135	920	393	175	190	190	C	1	B13/4	24.5
N36RMF	65	400	208	175	175	175	D	1	B13/4	11.5
N55RMF	85	550	240	175	175	175	D	1	B13/4	13.9
N55HMF	85	550	240	175	175	190	D	1	B13/4	13.9
N65D-MF	110	750	292	187	172	194	D	1	B13/4	19.94
N66HMF	105	650	278	175	175	190	D	1	B13/4	16.2

International specifications may be subject to changes without notification

Independent Battery Distributors

BCI STANDARD SPECIFICATION MF BATTERIES

Gr No.	TYPE No.	CAPACITY		CCA (-18°C) SAE	SIZE(mm)				TERMINAL		HOLD DOWN	WET CHARGED (KG)
		20Hr (Ah)	Min		L	W	H	T. H.	LAYOUT	TYPE		
U1 12N244	U1-170	18	25	170	197	130	159	185	1	8	/	7.3
	U1-220	24	33	220	197	130	159	185	1	8	/	8.1
	U1-270	30	43	270	197	130	159	185	1	8	/	8.9
NS60	51-390	45	67	390	236	128	200	220	1	1	/	12.0
	51R-390	45	67	390	236	128	200	220	0	1	/	12.0
25	25-520	72	117	520	228	172	200	220	1	1	B0/B1	16.8
35	35-520	72	117	520	228	172	200	220	0	1	B0/B1	16.8
AM58	58-500	55	85	500	240	175	153	173	1	1	B13/4	13.6
AM58R	58R-500	55	85	500	240	175	153	173	0	1	B13/4	13.6
24 N52	24-390	50	76	390	263	173	198	218	1	1	B9	15.3
	24-460	60	94	460	263	173	198	218	1	1	B9	16.6
	24-540	72	117	540	263	173	198	218	1	1	B9	17.9
24F N53	24F-390	50	76	390	263	173	198	218	0	1	B9	15.3
	24F-460	60	94	460	263	173	198	218	0	1	B9	16.6
	24F-540	72	117	540	263	173	198	218	0	1	B9	17.9
27 NY0Z	27-540	72	117	540	302	174	200	220	1	1	B1	19.7
	27-580	85	143	580	302	174	200	220	1	1	B1	21.1
	27-620	95	165	620	302	174	200	220	1	1	B1	22.4
24F N70ZL	27F-540	72	117	540	302	174	200	220	0	1	B1	19.7
	27F-580	85	143	580	302	174	200	220	0	1	B1	21.1
	27F-620	95	165	620	302	174	200	220	0	1	B1	22.4
31A STANDARD TERMINAL	31A-650	78	135	650	330	172	217	239	CENTRE TERMINALS	1	/	23.0
	31A-700	84	140	700	330	172	217	239		1	/	23.8
	31A-750	90	160	750	330	172	217	239		1	/	24.4
	31A-800	96	180	800	330	172	217	239		1	/	25.2
	31A-850	100	190	850	330	172	217	239		1	/	25.8
	31A-900	105	200	900	330	172	217	239		1	/	26.6
	31A-1000	95	170	1000	330	172	217	239		1	/	26.4
	31S-650	78	135	650	330	172	217	239		11	/	23.0
31S STUD BOLTS TERMINAL	31S-700	84	140	700	330	172	217	239		11	/	23.7
	31S-750	90	160	750	330	172	217	239		11	/	24.3
	31S-800	96	180	800	330	172	217	239		11	/	25.1
	31S-850	100	190	850	330	172	217	239		11	/	25.7
	31S-900	105	200	900	330	172	217	239		11	/	26.5
	31S-1000	95	170	1000	330	172	217	239		11	/	26.3
	31AS-650	78	135	650	330	172	217	239		12	/	23.1
31AS DUAL TERMINAL	31AS-700	84	140	700	330	172	217	239		12	/	23.8
	31AS-750	90	160	750	330	172	217	239		12	/	24.4
	31AS-800	96	180	800	330	172	217	239		12	/	25.2
	31AS-850	100	190	850	330	172	217	239		12	/	25.8
	31AS-900	105	200	900	330	172	217	239		12	/	26.6
	31AS-1000	95	170	1000	330	172	217	239		12	/	26.5
90	90-530	55	85	530	240	175	175	175	0	1	B13/4	13.9
91	91-550	58	90	550	278	175	175	175	0	1	B13/4	15.8
93	93-780	81	135	780	352	175	175	175	0	1	B13/4	20.6

Independent Battery Distributors

AS STANDARD SPECIFICATIONS VENTED ACCESSIBLE

TYPE	VOLTAGE	R.C.	CCA (-18°C) SAE	SIZE(mm)				TERMINAL		HOLD DOWN	WET CHARGED (KG)
				L	W	H	T. H.	ASSEMBLY	TYPE		
A50ZEX	12	94	460	258	170	198	218	(D) 1	1	/	16.2
A53	12	117	570	263	173	198	218	(C) 0	1	B9	17.5
A52	12	117	570	263	173	198	218	(D) 1	1	B9	17.5
A70ZZEX	12	117	570	302	172	200	220	(D) 1	1	/	19.3
A70ZZEXL	12	117	570	302	172	200	220	(C) 0	1	/	19.3
A70ZZ	12	141	650	302	172	200	220	(D) 1	1	/	20.6
A70ZZL	12	141	650	302	172	200	220	(C) 0	1	/	20.6
A90	12	167	720	347	173	210	230	(D) 1	1	/	24.5
A89	12	167	720	347	173	210	230	(C) 0	1	/	24.5
A94	12	284	1000	513	217	183	203	(E) 3	1	/	38.5
A22Z	6	316	1050	302	170	202	222	(A) 5	1	/	20.4
A100	12	167	720	406	172	206	229	(D) 1	1	/	26.0
A120	12	223	830	504	181	210	234	(F) 4	1	/	34.2
A150	12	284	950	507	220	210	234	(F) 4	1	/	39.9
A200	12	423	1200	516	276	215	239	(F) 4	1	/	52.5
A03	6	80	270	184	167	170	186	(A) 5	1	/	9.4
A50D20L	12	80	430	200	170	200	220	(C) 0	1	/	15.0

AS STANDARD SPECIFICATIONS VENTED ACCESSIBLE (SPECIAL PURCHASE ORDERS)

TYPE	VOLTAGE	CAPACITY		SIZE(mm)				TERMINAL		HOLD DOWN	WET CHARGED (KG)
		20Hr (Ah)	5Hr (Ah)	L	W	H	T. H.	ASSEMBLY	TYPE		
95406	12	50	40	208	175	190	190	(C) 0	1	B13/4	13.4
95502	12	60	48	240	175	190	190	(C) 0	1	B13/4	16.0
95602	12	75	60	278	175	190	190	(C) 0	1	B13/4	18.8
95751	12	90	72	352	175	190	190	(C) 0	1	B13/4	22.8
95752	12	90	72	352	175	190	190	(C) 0	1	B13/4	22.8
95551	12	75	60	258	170	198	218	(C) 0	1	/	19.1
95802	12	100	80	406	172	206	229	(C) 0	1	/	28.6
95804	12	105	84	347	173	210	230	(C) 0	1	/	27.0
96051	12	130	104	513	189	192	216	(E) 3	1	/	34.4
96351	12	180	144	513	222	191	215	(E) 3	1	/	45.1
96801	12	225	180	516	276	215	239	(E) 3	1	/	58.8

AS STANDARD SPECIFICATIONS MARINE MF BATTERIES

TYPE	VOLTAGE	CAPACITY 20Hr (Ah)	CCA (-18°C) SAE	SIZE(mm)				TERMINAL		HOLD DOWN	WET CHARGED (KG)
				L	W	H	T. H.	ASSEMBLY	TYPE		
NS50PM	12	60	540	243	172	190	230	(D) 1	11	B9	15.4
HCM24	12	80	600	260	174	210	225	(D) 1	12	B7	17.7
NS70M	12	72	650	258	170	198	238	(D) 1	11	/	17.7
N70ZZM	12	84	720	302	172	200	240	(D) 1	12	/	20.9
HCM31	12	110	830	347	173	210	250	(D) 1	12	B7	24.8
HCM27	12	95	700	304	174	210	225	(D) 1	12	B7	21.1

Independent Battery Distributors

TRUCK BATTERY SPECIFICATIONS MF BATTERIES

DIN Gr No.	TYPE	CAPACITY 20Hr (Ah)	CCA (-18°C) SAE	SIZE(mm)				TERMINAL		HOLD DOWN	WET CHARGED (KG)
				L	W	H	T H	ASSEMBLY	TYPE		
D4-B0	DINAMF N120MF	135	900	503	182	193	214	E	1	/	34.2
		120	850	513	181	210	234	F	1	/	32.8
D5-B0	DINBMF N150MF	155	1000	503	216	193	214	E	1	/	40.1
		155	1000	513	210	195	223	F	1	/	40.1
D5-B0 N200MF	DINCMF N200MF	200	1100	513	273	215	235	E	1	B3	50.1
		200	1200	513	265	215	240	F	1	/	50.1

SPECIAL TRUCK MF PURCHASE ORDERS

DIN Gr No.	TYPE	CAPACITY 20Hr (Ah)	CCA (-18°C) SAE	SIZE(mm)				TERMINAL		HOLD DOWN	WET CHARGED (KG)
				L	W	H	T. H.	ASSEMBLY	TYPE		
D4-B0	62034MF	120	850	513	189	195	219	E	1	/	32.8
	64028MF	135	900	513	189	195	219	F	1	/	34.2
D4-B3 FOOT LEDGE	62035MF	120	850	513	189	195	219	E	1	B3	32.8
	62038MF	120	850	513	189	195	219	F	1	B3	32.8
	64036MF	135	900	513	189	195	219	E	1	B3	34.2
	63547MF	135	900	513	189	195	219	F	1	B3	34.2
D5-B0	64317MF	143	950	513	222	195	219	E	1	/	38.6
	64318MF	143	950	513	222	195	219	F	1	/	38.6
	67043MF	170	1050	513	222	195	219	E	1	/	41.4
	66516MF	165	1050	513	222	195	219	F	1	/	41.4
	68022MF	180	1100	513	222	195	219	E	1	/	42.9
	68029MF	180	1100	513	222	195	219	F	1	/	42.9
D5-B0 FOOT LEDGE	64314MF	143	950	513	222	195	219	E	1	B3	38.6
	64315MF	143	950	513	222	195	219	F	1	B3	38.6
	66038MF	160	1000	513	222	195	219	E	1	B3	40.1
	66040MF	160	1000	513	222	195	219	F	1	B3	40.1
	67045MF	170	1050	513	222	195	219	E	1	B3	41.4
	67039MF	170	1050	513	222	195	219	F	1	B3	41.4
	68036MF	180	1100	513	222	195	219	F	1	B3	42.9

AGM STOP START SEALED BATTERIES

TYPE	X-REF	CAPACITY 20Hr (Ah)	CCA (-18°C) SAE	SIZE(mm)				ASSEMBLY	TERMINAL TYPE
				L	W	H	T. H.		
LN 1	N36MF	50	560	206	174	189	189	C	RECESSED 2
LN 2	N55MF	60	680	240	174	189	189	C	RECESSED 1
LN 3	N66MF	70	760	276	174	189	189	C	RECESSED 1
LN 4	DIN77MF	80	800	341	174	189	189	C	RECESSED 1
LN 5	DIN100MF	95	850	352	174	189	189	C	RECESSED 1

AGM DEEP CYCLE SEALED BATTERIES

TYPE	X-REF	CAPACITY 20Hr (Ah)	CCA (-18°C) SAE	SIZE(mm)				ASSEMBLY	TERMINAL TYPE
				L	W	H	T. H.		
B8A24	(N52)	79	525	275	167	205	235	D	DUAL FIT
B8A27	(N70Z)	92	580	320	168	205	235	D	DUAL FIT
B8131DT	(N86)	105	800	329	171	205	238	D	DUAL FIT
B8A8D	(N200)	245	1450	497	278	220	250	F	1
B8A8D	LENGTH WITH HANDLES			+4.0					

Independent Battery Distributors

GOLF CART BATTERIES ACCESIBLE VENTED

TYPE	VOLTAGE	CAPACITY	SIZE(mm)				TERMINAL		HOLD DOWN	WET CHARGED (KG)
		20Hr(Ah)	L	W	H	T. H.	ASSEMBLY	TYPE		
BGC15	6	225	260	184	249	290	(A) 5	11	/	31.5
BGC8V	6	155	262	181	283		(A) 5	11	/	29.1

DEEP-CYCLE BATTERIES ACCESIBLE VENTED

TYPE	VOLTAGE	CAPACITY	SIZE(mm)				TERMINAL		HOLD DOWN	WET CHARGED (KG)
		20Hr(Ah)	L	W	H	T. H.	ASSEMBLY	TYPE		
EB12	6	108	228	171	187	206	(A) 5	1	/	15.0
EB39	12	40	242	135	177	217	(D) 1	11	B6	11.5
EB50	12	65	243	172	190	230	(D) 1	11	B9	16.3
EB60Z	12	75	258	170	198	238	(D) 1	11	/	19.2
EB70Z	12	90	302	172	200	240	(D) 1	11	/	22.9
EB86	12	105	347	173	210	250	(D) 1	11	/	27.1
EB100	12	105	406	172	206	250	(D) 1	11	/	28.8
EB200	12	215	521	278		250	(F) 4	11	/	52.5

AGM DRY CELL LEISURE BATTERIES - SEALED

TYPE	VOLTAGE	CAPACITY		SIZE(mm)				TERMINAL		HOLD DOWN	WET CHARGED (KG)
		20Hr(Ah)	CCA (-18°C) SAE	L	W	H	T. H.	ASSEMBLY	TYPE		
HVT50D	12	60	580	238	172	182	/	D	12	/	17.0
HVT70D	12	85	620	260	168	208	/	D	12	/	23.2
HVT70ZZD	12	100	780	308	168	210	/	D	12	/	27.4
HVT70ZZLD	12	100	780	305	168	210	/	D	12	/	27.4
HVT86D	12	130	1000	330	173	212	/	D	12	/	31.4
HVT270D	12	270	1700	522	255	220	/	F	12	/	80.0
HVTGC225	6	234	940	260	180	274	/	A	11	/	30.0
HVT6260	6	286	1125	295	180	298	/	A	11	/	36.0
LN1	12	50	560	206	174	189		A		B3	/
LN2	12	60	680	240	174	189		A		B3	/
LN3	12	70	760	276	174	189		A		B3	/
LN4	12	80	800	341	174	189		A		B3	/
LN5	12	95	850	352	174	189		A		B3	/

FRONT ENTRY MF BATTERIES - AMERICAN VEHICLES

TYPE	VOLTAGE	CAPACITY	SIZE(mm)				TERMINAL		HOLD DOWN	WET CHARGED (KG)
		CCA (-18°C) SAE	L	W	H	T. H.	ASSEMBLY	TYPE		
75-6MF	12	615	230	179	184	184				
78-6MF	12	750	260	179	184	204				

AGM STOP START BUDGETSEALED BATTERIES

TYPE	VOLTAGE	CAPACITY		SIZE(mm)				TERMINAL		HOLD DOWN	WET CHARGED (KG)
		20Hr(Ah)	5Hr(Ah)	L	W	H	T. H.	ASSEMBLY	TYPE		
AGM 60 (N55)		60	680	242	174	189	189	C		RECESSED 1 RECESSED 1	E&OE
AGM 70 (N66)		70	760	275	174	189	189	C			

Independent Battery Distributors

OPTIMA BATTERIES

PART No.	DESCRIPTION	CCA	R.C.	AH	SIZE(mm)			WEIGHT
					L	W	H	
34 (8002-002)	Red Top - Starting / SAE (LHP)	800	110	50	254	173	199	17.23
34/78 (8004-003)	Red Top - Starting / SAE & GM Term (LHP)	800	110	50	254	173	199	17.23
R34 (8003-151)	Red Top Starting / SAE (RHP)	800	110	50	254	173	199	17.23
75/35 (8022-191)	Red Top - Starting / SAE & GM Term (LHP)	720	110	44	238	173	199	15.03
25 (8025-160)	Red Top - Starting / SAE (LHP)	720	110	44	238	173	199	15.03
35 (8020-164)	Red Top - Starting / SAE (RHP)	720	110	44	238	173	199	15.03
6V (8010-044)	Red Top - Starting / SAE	800	110	50	254	88	199	9.20
34M (8006-006)	Blue Top - Starting / SAE & Stainless Steel Stud (LHP)	800	110	50	254	173	199	17.34
D27M (8027-227)	Blue Top - Starting / SAE & Stainless Steel Stud (LHP)	800	110	50	305	173	199	17.35
D34M (8016-103)	Blue Top - Dual Purpose / SAE & Stainless Steel Stud (LHP)	750	120	55	254	173	199	19.77
D31M (8052-161)	Blue Top - Dual Purpose / SAE & Stainless Steel Stud	900	150	75	326	166	242	27.18
D75/25 YT (8042-218)	Yellow Top - Dual Purpose / SAE & GM Term (LHP)	650	98	48	238	173	199	16.55
D35 YT (8040-218)	Yellow Top - Dual Purpose / SAE (RHP)	650	98	48	238	173	199	16.55
D51 (8071-167)	Yellow Top - Dual Purpose / SAE (LHP)	450	70	38	237	129	224	11.80
D51R (8073-167)	Yellow Top - Dual Purpose / SAE (RHP)	450	70	38	237	129	224	11.80
D34 (8012-021)	Yellow Top - Dual Purpose / SAE (LHP)	750	120	55	254	173	199	19.50
D34/78 (8014-045)	Yellow Top - Dual Purpose / SAE & GM Term (LHP)	750	120	55	254	173	199	19.77
D27F (8027-137)	Yellow Top - Dual Purpose / SAE (RHP)	830	140	66	305	172	225	22.72
D31A (8051-167)	Yellow Top - Dual Purpose / SAE	900	155	75	326	176	242	27.18
D31T (8050-160)	Yellow Top - Dual Purpose / 3/8" Stainless Steel Stud	900	155	75	326	176	242	27.1

Independent Battery Distributors

ODYSSEY BATTERY SPECIFICATIONS

TYPE	V	PHCA (5 sec)	CCA	HCA	MCA	NOMINAL CAPACITY		RESERVE CAPACITY MINUTES	SIZE(mm)			W (kg)	TERMINAL	Torque Specs Nm max	Internal Resistance mΩ	Short Circuit Current (A)
						20Hr(Ah)	10Hr(Ah)		L	W	H					
PC680	12	680	220	370	300	16	16	24	181.5	76.3	167.8	7.0	M6 Receptacle Or SAE 3/8" Receptacle	5.6	7	1800
PC925	12	925	380	625	600	28	27	52	168.6	179.0	128.0	11.8	M6 Receptacle Or SAE 3/8" Receptacle	6.8	5	2400
PC1200	12	1200	550	860	725	42	40	78	199.9	169.1	172.7	17.4	M6 Receptacle Or SAE 3/8" Receptacle	6.8	4.5	2600
PC1220	12	1220	680	960	860	70	64	135	302.0	175.0	1900	20.7	DIN Lead Post	N/A	5.7	2200
75-PC1230	12	1230	730	1050	815	55	50	100	240.3	177.5	183.4	20.6	SIDE 3/8" Receptacle	6.8	2.5	3100
75/86-PC1230	12	1230	730	1050	815	55	50	100	240.3	177.5	201.2	20.6	TOP SAE SIDE 3/8" Receptacle	6.8	2.5	3100
PC1350	12	1350	770	1080	960	95	88.5	195	377.0	175.0	190.0	27.4	DIN Lead Post	N/A	4.2	2900
25-PC1400	12	1400	820	1150	850	65	55	125	240.3	173.7	220.7	22.7	SAE	7.9	2.5	3100
35-PC1400	12	1400	820	1150	850	65	55	125	240.3	173.7	220.7	22.7	SAE	7.9	2.5	3100
34-PC1500	12	1500	880	1250	1050	68	62	135	275.6	171.7	198.8	22.4	SAE	6.8	2.5	3100
34R-PC1500	12	1500	880	1250	1050	68	62	135	275.6	171.7	198.6	22.4	SAE	6.8	2.5	3100
34/78-PC1500	12	1500	880	1250	1050	68	62	135	275.6	177.5	198.6	22.4	TOP SAE SIDE 3/8" Receptacle	6.8	2.5	3100
78-PC1500	12	1500	880	1250	1050	68	62	135	275.6	177.5	180.8	22.4	SIDE 3/8" Receptacle	6.8	2.5	3100
PC1700	12	1700	875	1325	1175	68	65	142	330.7	168.2	176.0	27.6	M6 Receptacle Or SAE 3/8" Receptacle	6.8	3.5	3500
65-PC1750	12	1750	930	1350	1070	74	65	135	300.5	182.9	188.7	20.3	SAE	7.9	2.0	5000
31-PC2150	12	2150	1150	1545	1370	100	92	205	330.2	172.7	239.0	35.3	3/8" Stud Or SAE	16.9-22.6	2.2	5000

OEM CONVERSION CHART

OEM PART NO.	IBD X REF	TYPE
GENERAL AUTOMOTIVE TYPE		
40B19R	NS40MF	MF
40B19L	NS40LMF	MF
40B19RS	NS40ZAMF	MF
40B19LS	NS40ZALMF	MF
AU22-530DF	N51EB-MF	MF
55D26L	NS70LMF	MF
55D26R	NS70RMF	MF
MARINE TYPE		
HCM24	N52HMF	MF
HCM27	N70ZZHMF	MF
HCM31	N89HMF	MF
AGM STARTING / DEEP CYCLE		
B8A24	B8A24	AGM
B8A27	B8A27	AGM
B8131DT	B8131DT	AGM
B8A8D	B8A8D	AGM
TRUCK / TRACTOR & 4x4 TYPES		
95D31L	N70ZZLMF	MF
95D31R	N70ZZMF	MF
31-930	31-1000MF	MF
31-930T	31-1000TMF	MF
95-E41	N100MF	MF
115F51	N120MF	MF
145G51	N150MF	MF
190H52	N200MF	MF
68032	DINBMF	MF
73011	DINCMF	MF
GENERAL AUTOMOTIVE TYPE		
22F-520	N54MF	MF
22F-520DF	N51MF	MF
22FR-520	N50Mf	MF
AU22R-520	N50EFMF	MF
55B24L	NS60LMF	MF
55B24LS	NS60ALMF	MF
55B24R	NS60MF	MF
55B24RS	NS60AMF	MF
55D23L	55D23LMF	MF
55D23R	55D23RMF	MF
57013 CAPTIVA PETROL	DIN70-770	MF
59095 CAPTIVA DIESEL	DIN90-912	MF
DEEP CYCLE		
DC24 MF TYPE	EB50Z ACC TYPE	
DC27 MF TYPE	EB70Z ACC TYPE	
DC31 MF TYPE		
RIDE ON MOWER		
UIR-260	12N24-3MF	MF
UI-260	12N24-4MF	MF
U.S. FITMENTS		
65-7MF	N65DMF	MF

MF - Maintenance Free

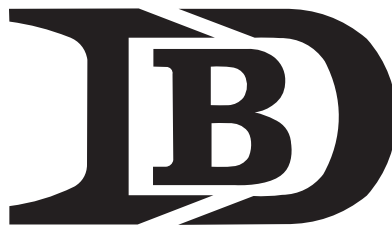
AGM - Absorbed Glass Matt

ACC - Accessible Vent Caps

OEM PART NO.	IBD X REF	TYPE
EUROPEAN AUTOMOTIVE S3+		
54316	N36MF	MF
55065	N36RHMF	MF
55066	N36HMF	MF
55457	N55MF	MF
55458	N55RMF	MF
55217	N55RHNF	MF
56219	N55HMF	MF
56318	N66MF	MF
56640	N66RHMF	MF
56638	N66HMF	MF
58515	N88MF	MF
58014	DIN77LMF	MF
PREMIUM RANGE GENERAL AUTOMOTIVE		
22NF-330D	N40M/N39MF	MF
50D20L	50D20LMF	MF
50D20R	50D20RMF	MF
22F-610	N54ZMF	MF
22FR-610	N50MZMF	MF
22F-610FD	N51ZMF	MF
22F-680	N54ZZMF	MF
22FR-680	N50MZZMF	MF
80D23L	80D23L	MF
80D23R	80D23R	MF
90D23L	55D23LMF	MF
90D23R	55D23RMF	MF
PREMIUM RANGE EUROPEAN		
60038	DIN100MF	MF
560.035	N55MF	MF
574.035	N66HMF	MF
574.135	N66RMF	MF
575.035	N66MF	MF
PREMIUM RANGE TRUCK / TRACTOR 4X4		
90D26R	N52MF	MF
90D26L	N53MF	MF
110D26L	N53MF	MF
110D26R	N52MF	MF
105D31R	N70ZZXMF	MF
105D31L	N70ZZXLMF	MF
125D31R	N70ZZZMF	MF
125D31L	N70ZZZLMF	MF
31-901	31-900MF	MF
31-901T	31-900TMF	MF
150F51	N120MF	MF
165G51	N150MF	MF
8D-1300	N200LMF	MF
AGM STOP START		
LN1 50A/H 560CCA	N36MF TYPE	AGM
LN2 60A/H 680CCA	N55MF TYPE	AGM
LN3 70A/H 760CCA	N66MF TYPE	AGM
LN4 80A/H 800CCA	DIN77MF TYPE	AGM
LN5 95A/H 850CCA	DIN100MF TYPE	AGM

TEMPERATURE COMPENSATED BATTERY STATE-OF-CHARGE (SoC) TABLE

Electrolyte Temperature		Wet Low Maintenance (Sb/Ca) or Wet Standard (Sb/Sb) Battery										Wet Maintenance Free(Ca/Ca) or AGM/Gel Cell VRLA (Ca/Ca) Battery				
Degrees Fahrenheit	Degrees Celsius	Specific Gravity Reading					Open Circuit Voltage Reading					Open Circuit Voltage Reading				
		100% SoC	75% SoC	50% SoC	25% SoC	0% SoC	100% SoC	75% SoC	50% SoC	25% SoC	0% SoC	100% SoC	75% SoC	50% SoC	25% SoC	0% SoC
120	48.9	1.249	1.209	1.174	1.139	1.104	12.663	12.463	12.253	12.073	11.903	12.813	12.613	12.413	12.013	11.813
110	43.3	1.253	1.213	1.178	1.143	1.108	12.661	12.461	12.251	12.071	11.901	12.811	12.611	12.411	12.011	11.811
100	37.8	1.257	1.217	1.182	1.147	1.112	12.658	12.458	12.248	12.068	11.898	12.808	12.608	12.408	12.008	11.808
90	32.2	1.261	1.221	1.186	1.151	1.116	12.655	12.455	12.245	12.065	11.895	12.805	12.605	12.405	12.005	11.805
70	21.1	1.269	1.229	1.194	1.159	1.124	12.643	12.443	12.233	12.053	11.883	12.793	12.593	12.393	11.993	11.793
60	15.6	1.273	1.233	1.198	1.163	1.128	12.634	12.434	12.224	12.044	11.874	12.784	12.584	12.384	11.984	11.784
50	10.0	1.277	1.237	1.202	1.167	1.132	12.622	12.422	12.212	12.032	11.862	12.772	12.572	12.372	11.972	11.772
40	4.4	1.281	1.241	1.206	1.171	1.136	12.606	12.406	12.196	12.016	11.846	12.756	12.556	12.356	11.956	11.756
30	-1.1	1.285	1.245	1.210	1.175	1.140	12.588	12.388	12.178	11.998	11.828	12.738	12.538	12.338	11.938	11.738
20	-6.7	1.289	1.249	1.214	1.179	1.144	12.566	12.366	12.156	11.976	11.806	12.716	12.516	12.316	11.916	11.716
10	-12.2	1.293	1.253	1.218	1.183	1.148	12.542	12.342	12.132	11.952	11.782	12.692	12.492	12.292	11.892	11.692
0	-17.8	1.297	1.257	1.222	1.187	1.152	12.516	12.316	12.106	11.926	11.756	12.666	12.466	12.266	11.866	11.666



Independent Battery Distributors

FORKLIFT - SEALED - STATIONARY - SOLAR BATTERIES - CAR - TRUCK - DEEP CYCLE - MARINE

Battery Assemblies-

Australian Standard Specifications(AS2149)

6 VOLT BATTERIES

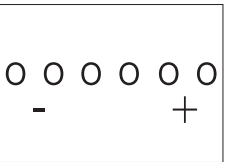


A

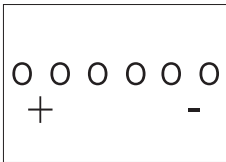


B

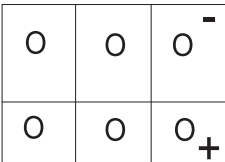
12 VOLT BATTERIES



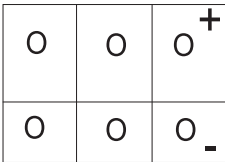
C



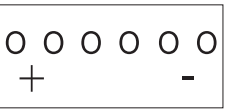
D



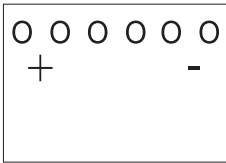
E Din Type



F



G



H CENTRE TERMINAL

- 1) Battery recommendations in this fitment guide are based on the latest information available. Due to battery compartment variations, it is recommended bonnet clearance and hold-down heights are checked.
- 2) Performance ratings and capacities shown in this fitment guide are calculated in laboratories in accordance with Australian Standard 2149. Battery performance may vary under different operating conditions.

NB: Specifications shown in this fitment guide are subject to change without notice.

NB: All Length, width and heights are in millimetres. All weight measurements are in kilograms.

AS2149 assemblies A, B, C and F, are right hand assemblies, whereas D, E, G and H are left hand assemblies. All specifications are subject to change without prior notice.

NOTES:

This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

Independent Battery Distributors

FORKLIFT - SEALED - STATIONARY - SOLAR BATTERIES - CAR - TRUCK - DEEP CYCLE - MARINE

Application Guide



Independent Battery Distributors

FORKLIFT - SEALED - STATIONARY - SOLAR BATTERIES - CAR - TRUCK - DEEP CYCLE - MARINE

Application Guide

Passenger Cars & 4WD

Vehicle Make and Model	Year	Term Config.	OEM	Premium
ALFA ROMEO				
33	1974-92		54316	N36MF
75	1985-92		56318	N66MF
90	1985-92		56318	N66MF
147 Diesel / Petrol	03/2006-		55457	N55MF
156 inc Twin Spark / Wagon & GTA	1999-		55457	N55MF
159 JTDM	06/2006-		58014	DIN77LMF
159 JTDM Diesel	07/2008-		58014	DIN77LMF
164	1989-95		55457	N55MF
166	08/1999-07/2004		56318	N66MF
166	08/2004-		60038	DIN100MF
75TS	1985-92		56318	N66MF
75V6	1985-92		56318	N66MF
Alfasud	1974-92		54316	N36MF
Alfetta	1974-92		54316	N36MF
GT 2D	01/2005-		55457	N55MF
GTV	1989-95		22FR520	N50MF
GTV	2000-		56318	N66MF
GTV6	1989-95		22FR520	N50MF
Guiletta Sedan	07/1984-03/1986		54316	N36MF
Guiletta Hatchback	01/2011-		56219	N55HMF (190 HIGH)
Guiletta(Stop Start)	2013		LN2	AGM 55
Mito	07/2009-		54316	N36MF (190 HIGH)
Mito(Stop Start)	2013		LN2	AGM 55
Sprint	1974-92		54316	N36MF (175 HIGH)
Spider	1992-2000		56318	N66MF
Spider Twin Spark 2.0 & 3.0/ Conv.	2000-09/2006		55457	N55MF
Spider	10/2006-		58014	DIN77LMF
ASIA				
Rocsta	07/1993-03/1999		90D23L	55D23LMF
Rocsta (Diesel)	1992-93		95D31R	N70ZZMF
Rocsta (Petrol)	1992-93		22F520DF	N51MF
ASTON MARTIN				
DB7	10/1999-2005		60038	DIN100MF
Vanquish	11/2002-2005		60038	DIN100MF
AUDI				
5 + 5	1978-		56318	N66MF
2.6	1986-94		56318	N66MF
80	1986-94		56318	N66MF
100	1974-89		54316 - 55457	N36MF / N55MF
100 6Cyl	19994-		56318	N66MF
2.0E	1986-94		56318	N66MF
2.3E	1986-94		56318	N66MF
200T	1974-89		54316 - 55457	N36MF / N55MF
80 4Cyl	1994-		55457	N55MF
80 6Cyl	1994-		56318	N66MF
A3	1997-		55457	N55MF
A3 1.4T	10/2008-		56219	N55HMF (190 HIGH)
A3 2.0T	07/2008-		56638	N66HMF (190 HIGH)
A4	1995-98		56318	N66MF
A4	06/2001-03/2005		58014	DIN77LMF
A4 Avant	1995-98		56318	N66MF
A4 Quattro (Turbo B5)	1999-		55457 - 56318	N55MF / N66MF

Application Guide

Passenger Cars & 4WD

Vehicle Make and Model	Year	Term Config.	OEM	Premium
AUDI (Cont)				
A4 TDle (Diesel)	03/2010-		60038 - 60038	DIN100MF / DIN110MF
A4 V6 Sedan	1996-		56318	N66MF
A5 Coupe	10/2007-		58515 / 60038	N88MF / DIN100MF
A6	11/1997-08/004		58014	DIN77LMF
A6 & A6 V8	09/2004-		58014	DIN77LMF
A6 3.2 FSI	06/2005-		60038	DIN100MF
A8	05/1995-12/2008		60038	DIN100MF
A8	01/2009-		60038	DIN100MF
All Models	1967-73		22F520DF	N51MF
Avanti	1983-97		56318	N66MF
Avanti Wagon	1996		55457 / 56318	N55MF / N66MF
Fox 80	1974-89		54316 / 55457	N36MF / N55MF
Q5 4Cyl	03/2009-		56638 / 60038	N66HMF / DIN100MF
Q5 V6	03/2009-		60038	DIN100MF
Q7	07/2006-		60038 /	DIN100MF / DIN110MF
Q7 All Models	07/2006-		60038	DIN100MF
Quattro - A4	1983-97		56318	N66MF
Quattro V8	1990-92		56318	N66MF
RS4	05/2006-		60038	DIN100MF
S4	1993-		55457	N55MF
S6	01/2001-12/2004		58515 / 60038	N88MF / DIN100MF
S8	1998-2000		58515 / 60038	N88MF / DIN100MF
SE	1974-89		54316 / 55457	N36MF / N55MF
TT Coupe	1999-		55457	N55MF
TT Roadster	05/2000-		60038	DIN100MF / DIN110MF
TT RS	12/2009-		58014	DIN77LMF
NEW MODELS (STOP START)	2009-			AGM ONLY
A1 ALL MODELS	2010/2013		LN3	AGM66
A3 ALL MODELS	2006-2013		LN3	AGM66
A4 ALL MODELS	2007-2013		LN3	AGM66
A5 ALL MODELS	2008-2013		LN3	AGM66
Q5 ALL MODELS	2008- 2012		LN3	AGM66
BENTLEY				
Arnage	2004 - 08		90D26R	N52MF
Azure	1999 - 06		90D26R	N52MF
Brooklands	1992 - 97		90D26R	N52MF
Continental	1991 - 99		90D26R	N52MF
Continental Flying Spur	2005		90D26R	N52MF
Continental GT	2003 - 10		90D26R	N52MF
Eight	1984 - 92		90D26R	N52MF
Turbo R	1991 - 99		90D26R	N52MF
BMW				
118i	02/2005-		56318	66MF
120i	10/2004-		55457	N55MF
318i E36	04/1991-12/1999		56318	N66MF
318i E46	01/2000-07/2005		574.035	N66HMF (190HIGH)
320 Petrol	1994-1995		55457	N55MF
320d Diesel	06/2007-		58014	DIN77LMF
320i Deluxe / Standard	05/2005-03/2010		574.035	N66HMF (190HIGH)
325	1994 1995		55457	N55MF
325i	10/2006-		574.035	N66HMF (190HIGH)
335i	10/2006-		574.035	N66HMF (190HIGH)
520	11/1990-03/1996		58515 / 60038	N88MF / DIN100MF
525	03/1974-08/1988		56318	N66MF

Application Guide

Passenger Cars & 4WD

Vehicle Make and Model BMW (Cont)	Year	Term Config	OEM	Premium
528i	08/1977-11/2000		56318	N66MF
530	1994-		58515 / 60038	N88MF / DIN100MF
530D	11/2005-		60038	DIN100MF / DIN110MF
535i	01/1986-01/1993		56318	N66MF
535i	10/1996-10/2003		60038	DIN100MF
540	1994-		58515 / 60038	N88MF / DIN100MF
540i	12/2005-		60038	DIN100MF / DIN110M
645Ci	05/2004-		60038	DIN100MF / DIN110MF
650i	11/2005-		60038	DIN100MF / DIN110MF
2000	1967-75		55457 / 56318	N55MF / N66MF
2002	1967-75		55457 / 56318	N55MF / N66MF
2500	1967-75		55457 / 56318	N55MF / N66MF
2800	1968-75		55457 / 56318	N55MF / N66MF
3 Series1	1976-96		55457	N55MF
3 Series320 / 325	10/2000-		60038	DIN100MF / DIN110MF
3.0LA	1973-78		55457 / 56318	N55MF / N66MF
3.0S	1973-78		55457 / 56318	N55MF / N66MF
3.0Si	1973-78		55457 / 56318	N55MF / N66MF
316 2 Door	1997-98		55457	N55MF
323i	06/1979-12/1985		55457	N55MF
323i (in boot)	01/1996-		574.035	N66HMF (190HIGH)
325i	1994-1995		55457	N55MF
325i (in boot)	09/1988-03/1996		56318	N66MF
525i (in boot)	03/2003-		60038	DIN100MF / DIN110MF
325Ci	06/2004-02/2007		58014	DIN77LMF
328Ci	06/1999-09/2000		574.035	N66HMF (190HIGH)
328i	11/1995-10/2000		574.035	N66HMF (190HIGH)
330i	09/2000-02/2007		58014	DIN77LMF
353i	01/1986-11/2003		56318	N66MF
5 Series	1973-94		55457 / 56318	N55MF / N66MF
525E	1994-		55457 / 56318	N55MF / N66MF
6 Series	1977-88		55457 / 56318	N55MF / N66MF
7 Series	1988-96		58515 / 60038	N88MF / DIN100MF
735	03/1985-03/1987		56318	N66MF
8 Series	1990-1995		56318	N66MF
M3	1994-1996		56318	N66MF
M3	1997		58515 / 60038	N88MF / DIN100MF
M3	2007- 2011		LN3	AGM66
M3 CABRIOLET	2008- 2013		LN3	AGM66
S5	10/2007-		LN5	AGM100
X1	03/2010-		58014	DIN77LMF
X1S DRIVE	2009- 2012		LN3	AGM66
X1 XDRIVE ALL MODELS	2009- 2012		LN3	AGM66
X3	07/2004-		LN5	AGM100
X3 XDRIVE ALL MODELS	2008- 2010		LN3	AGM66
X3 XDRIVE D	2008- 2010		LN5	AGM100
X5	11/2000-		LN5	AGM100
X5 x Drive 3.5i	06/2010-		LN5	AGM100
X6	07/2008-		LN5	AGM100
Z3	01/1997-07/2000		56318	N66MF
Z3	08/2000-12/2002		574.035	N66HMF (190 HIGH)
Z4	03/2003-		56318	N66MF

Application Guide

Passenger Cars & 4WD

Vehicle Make and Model BMW (Cont)	Year	Term Config.	OEM	Premium
NEW MODELS (STOP START)	2010-			AGM ONLY
118D ALL MODELS	2007- 2013		LN3	AGM66
120D ALL MODELS	2007- 2011		LN3	AGM66
123D ALL MODELS	2007- 2013		LN3	AGM66
125i Coupe	2008- 2013		LN3	AGM66
320D ALL MODELS	2005- 2010		LN5	AGM100
330D ALL MODELS	2008- 2013		LN5	AGM100
520D	2007- 2010		LN5	AGM100
520D	2010- 2013		LN3	AGM66
730D	2008- 2012		LN5	AGM100
CHERRY				
J1	2011-		N55MF	55457
J2	2011-		N52MF	90D26R
CHEVROLET				
Early Models	1955-1971		22FR520	N50MF
Camaro	1982-2003		70-550	75 DT
Corvette	1991-1999		78-750	78 DT
Corvette	2006-		55457	N55MF
CHRYSLER. (see DODGE also)				
300C Petrol / SRT8	2007-		58014	DIN77LMF
300C Diesel	2007-		60038 / 58515	DIN100MF / N88MF
300C CRD	06/2006-		60038	DIN100MF
300C V8	11/2005-		58014	DIN77LMF
Crossfire	11/2003-		574.035	N66HMF (190 HIGH)
Neon	1997-99			AM58RMF
Neon	2000-2003		54316	N36MF
Nitro	2008-		55458	N55RMF
PT Cruiser	08/2000-02/2004		55457	N55MF
PT Cruiser	03/2004-		54316	N36MF
Prowler	2004-			AM58
Sebring	09/2007-			AM58
Valiant	01/1962-06/1981		22FR520	M50MF
Voyager	1997-		57013	DIN70-770 / N66RHM
Voyager	2012-		31A	31A Optima/DIN77LMF
CITROEN				
1200	1972-78		54316 / 55457	N36MF / N55MF
1220	1972-78		54316 / 55457	N36MF / N55MF
19GT	1986-94		56318	N66MF
6TRS	1986-94		56318	N66MF
AXGT	1990-94		56318	N66MF
Berlingo	08/1999-12/2005		54316 / 55457	N36MF / N55MF
Berlingo	2008- 2011		LN3	AGM66
BX1	1986-90		22F520	N51MF / N54MF
BX16TRS	1986-94		56318	N66MF
C3	11/2003-		55457	N55MF
C3	2009- 2013		LN3	AGM66
C4	04/2005-02/2009		55457	N55MF
C4	2009-2011		LN3	AGM66
C4 Picasso	2009-2013		LN3	AGM66
C5 4 Cyl Petrol	06/2001-01/2005		55457	N55MF
C5 V6 Petrol & all Diesel	06/2001-		56318	N66MF
C5 X7 ALL MODELS	2008-2013		LN3	AGM66
Club	1972-78		54316 / 55457	N36MF / N55MF

Application Guide

Passenger Cars & 4WD

Vehicle Make and Model CITROEN (Cont)	Year	Term Config.	OEM	Premium
CX2200	1976-83		22F520	N51MF / N54MF
CX2400	1976-83		22F520	N51MF / N54MF
CX2500IE	1984-85		55457	N55MF
CXPallas	1984-85		55457	N55MF
D Series	1967-75		22F520	N51MF / N54MF
Diesel Models	1976-88		56318	N66MF
DS Series	1967-75		22F520	N51MF / N54MF
DS3 DS4 ALL MODELS	2010-2013		LN3	AGM66
GS	1972-78		54316 / 55457	N36MF / N55MF
Pallas	1976-83		22F520	N51MF / N54MF
TRI	1986-94		56318	N66MF
TZI	1986-94		56318	N66MF
Xantia	1994-95		55457 / 56318	N55MF / N66MF
Xantia	1996-98		55457	N55MF
XM V6 Auto (HB)	1990-94		54316 / 55457	N36MF / N55MF
Xsara 5 dr. Hatch	1998-		55457	N55MF
DAEWOO				
All Models	1994-95		22FR520	N50MF
Cielo	10/1995-02/1998		22F520	N54MF
Espero	03/1995-07/1997		55457	N55MF
Kalos	04/2003-12/2004		22FR520	N50MF / 22FR-610
Lacetti	09/2003-12/2004		22FR520	N50MF / 22FR-610
Lanos	08/1997-03/2003		22FR520	N50MF / 22FR-610
Leganza	07/1997-01/2004		22FR520	N50MF / 22FR-610
Matiz	10/1999-12/2004		40B19R	NS40MF
Nubira	05/1998-05/2003		22FR520	N50MF / 22FR-610
Tacuma	11/2000-12/2004		22FR520	N50MF / 22FR-610
DAIHATSU				
Applause	1989-94		40B19RS	NS40ZAMF
Applause	1994-98		40B19L	NS40LMF
Charade Centro	03/1995-12/1997		40B19L	NS40LMF
Charade	04/1980-05/1996		40B19R	NS40MF
Charade	06/1996-12/2005		40B19L	NS40LMF
Copen	10/2003-12/2005		40B19L	NS40LMF
Cuore	07/2000-09/2003		40B19L	NS40LMF
Feroza (Diesel)	1989-95		95-E41	N100MF
Feroza (Petrol) 4WD	1989-97		40B19R	NS40MF
Handi Van	05/1981-06/1990		40B19R	NS40MF
Handi Van	03/1999-04/2002		40B19L	NS40LMF
Hi Jet	1983-85		40B19R	NS40MF
Mira	1990-94		40B19R	NS40MF
Mira (C Assy)	1994-		40B19L	NS40LMF
Move 5 Dr	1997-98		40B19L	NS40LMF
Pyzar 5 Dr 1.5	1998-		40B19L	NS40LMF
Rocky (Diesel)	1984-95		95-E41	N100MF
Rocky (Petrol)	1984-95		40B19R	NS40MF
Scat	1982-83		40B19R	NS40MF
Scat Diesel	1982-83		95-E41	N100MF
Sirion	07/1998-02/2005		40B19L	NS40LMF
Terios	07/1997-12/2005		40B19L	NS40LMF
YRV	07/2001-01/2005		40B19L	NS40LMF

Application Guide

Passenger Cars & 4WD

Vehicle Make and Model DAIMLER-(see JAGUAR listing)	Year	Term Config	OEM	Premium
DODGE-(see CHRYSLER also)				
Avenger	09/2007-		574.135	N66RMF
Avenger				AM58MF / N55RMF
Caliber	08/2006-		574.135	N66RMF
Caliber SXT	01/2007-		574.135	N66RMF
Calibre	07/2001-			AM58
Journey	08/2008-		574.135	N66RMF
Journey (Located Under Air Filter)	09/2001-			AM58
Nitro Diesel	2009-		95D31R	N70ZZMF
Nitro Diesel			125D31R	125D31R - Foot Ledge
Nitro Diesel 3.7 Petrol			574.135	N66RMF
Nitro Petrol	2009-		56640	N66RMF-No End Ledge
Nitro Petrol	2008-		55458	N55RMF
Ram			58014	DIN77LVMF
EUNOS				
Eunos 30X	11/1992-05/1996		55D23L	55D23LMF
Eunos 500	1993-96			AM58MF
800 (Miller Engine)	03/1994-05/1996		90D26L	N53MF
FERRARI				
Most Models	1965-95		22F520	N54MF
Maranello 550 5.5	1997-		58515	N88MF
Punto All Models	2006-		55457	N55MF
Spider 360	1999-		90D26R	N52MF
Testarossa	1995-		56318	N66MF / N55MF
Testarossa GT / 512	2001-		56318	N66MF
F355 V8 (Battery under R/F guard)	02/1995-07/1999		56318	N66MF / N55MF
328 GTB, 348 TBS, 355 GTB,			56318	N66MF
456 GT, 599 GTB, GTH, GTS			56318	N66MF
Maranello, Mondial, Mondial,	2003-		56318	N66MF
FIAT				
125	1968-79		22FR-520	N50MF
127	1968-79		22FR-520	N50MF
128	1968-79		22FR-520	N50MF
130	1973-80		22FR-520	N50MF
131	1973-80		22FR-520	N50MF
132	1973-80		22FR-520	N50MF
500	1961-71		22NF-330D	N39/40MF
500	02/2008-		54316	N36MF
500	2008-2013		LN2	AGM55
770	1961-71		22NF-330D	N39/40MF
850	1965-71		22NF-330D	N39/40MF
1100	1965-71		22NF-330D	N39/40MF
1500	1965-71		22NF-330D	N39/40MF
1800	1965-71		22NF-330D	N39/40MF
2100	1965-71		22NF-330D	N39/40MF
2300	1965-71		22NF-330D	N39/40MF
1100E	1961-71		22NF-330D	N39/40MF
110D	1961-71		22NF-330D	N39/40MF
124	1968-79		22FR-520	N50MF
500D	1961-71		22NF-330D	N39/40MF
600D	1961-71		22NF-330D	N39/40MF

Application Guide

Passenger Cars & 4WD

Vehicle Make and Model FIAT	Year	Term Config	OEM	Premium
850S	1965-71		22NF-330D	N39/40MF
Argenta	1983-85		55457	N55MF
Chroma 2.0 Auto (Sedan)	1988-89		55457	N55MF
Ducalo Maxi 160	02/2002-		58515 / 60038	N88MF / DIN100MF
Punto Diesel	07/2006-		55457	N55MF
Punto Petrol	10/2006-		54316	N36MF
Regata	1984-92		55457	N55MF
Ritmo	04/2008-		56219	N55HMF (190 HIGH)
Super Brava	1981-85		22FR-520	N50MF
X 1.9	1978-83		22FR-520	N50MF
FORD				
Bronco	1981-89		22F-520DF	N51MF
Capri (Australian Build)	1989-4/92		40B19LS	NS40ZALMF
Capri (Australian Build)	5/92-94		22F-520DF	N51MF
Capri (English Build)	1960-72		22NF-330D	N39/40MF
Capri GT 3000 V6	1970-73		22F-520DF	N51MF
Capri RS 3100 V6	1972-74		22F-520DF	N51MF
Corsair	1989-91		22F-520DF	N51MF
Cortina 4 Cyl	1962-74		22NF-330D	N39/40MF
Cortina 4 Cyl	1975-82		22F-520DF	N51MF
Cortina 6 Cyl	1972-82		22F-520DF	N51MF
Courier 4 X 4	1998		22FR520	N50MF
Courier Crew Cab (Diesel)	1986-94		95D31R	N70ZZMF
Courier Crew Cab (Petrol)	1986-94		40B19RS	NS40ZAMF
Courier PE Diesel	1998-		95D31R	N70ZZMF
Courier PE Petrol	1998-		55D23R	55D23RMF
Econovan JG Petrol	1997-98		40B19L	NS40LMF
Econovan Maxi	1997-98		40B19LS	NS40ZALMF
Econovan Maxi (Diesel)	1985-87		95D31R	N70ZZMF
Econovan Maxi (Petrol)	1985-92		40B19LS	NS40ZALMF
Econovan Maxi (Petrol)	03/2003-07/2006		55D23L	55D23LMF
Escape	02/2001-05/2006		90D26L	N53MF
Escape XLT	06/2006-03/2008		55D23L	55D23LMF
Escort	1970-75		22NF-330D	N39/40MF
Escort	1975-79		22F-520DF	N51MF
Explorer	10/1996-		65-7MF	N65DMF
Explorer V8	11/2001-		65-7MF	N65DMF
F100	1974-94		22F-520DF	N51MF
F250	1974-94		22F-520DF	N51MF
F250	02/2001-07/2007		65-7MF	N65DMF
F250 Dual Cab	2003-		65-7MF	N65DMF
F350	1974-94		22F-520DF	N51MF
F350	07/2001-07/2006		65-7MF	N65DMF
Falcon, Fairlane, LTD (XA-XF)	1972-85		22F-520DF	N51MF
Falcon, Fairlane, LTD (XF-EA)	1985-6/91		22F-520DF	N51MF
Falcon, Fairlane, LTD (EB-ED)	6/91-6/94		AU22-530DF	N51EBMF
Falcon, Fairlane, LTD (EF-EL)	7/94-7/98		AU22R-520	N50EFMF
Falcon, Fairlane, LTD (AU-AU2)	9/98-8/02		AU22R-520	N50EFMF
Falcon, Fairlane, LTD (BA)	9/02-09/2005		AU22R-520	N50EFMF
Falcon, Fairlane, LTD (BF)	10/2005-04/2008		AU22R-520	N50EFMF
Cougar	2000-		56318	N66MF
Courier 4 X 4	1998		22FR520	N50MF
Courier Crew Cab (Diesel)	1986-94		95D31R	N70ZZMF
Courier Crew Cab (Petrol)	1986-94		40B19RS	NS40ZAMF
Courier PE Diesel	1998-		95D31R	N70ZZMF
Courier PE Petrol	1998-		55D23R	55D23RMF

Application Guide

Passenger Cars & 4WD

Vehicle Make and Model FORD (Cont)	Year	Term Config.	OEM	Premium
Econovan JG Petrol	1997-98		40B19L	NS40LMF
Econovan Maxi	1997-98		40B19LS	NS40ZALMF
Econovan Maxi (Diesel)	1985-87		95D31R	N70ZZMF
Econovan Maxi (Petrol)	1985-92		40B19LS	NS40ZALMF
Econovan Maxi (Petrol)	03/2003-07/2006		55D23L	55D23LMF
Escape	02/2001-05/2006		90D26L	N53MF
Escape XLT	06/2006-03/2008		55D23L	55D23LMF
Escort	1970-75		22NF-330D	N39/40MF
Escort	1975-79		22F-520DF	N51MF
Explorer	10/1996-		65-7MF	N65DMF
Explorer V8	11/2001-		65-7MF	N65DMF
F100	1974-94		22F-520DF	N51MF
F250	1974-94		22F-520DF	N51MF
F250	02/2001-07/2007		65-7MF	N65DMF
F250 Dual Cab	2003-		65-7MF	N65DMF
F350	1974-94		22F-520DF	N51MF
F350	07/2001-07/2006		65-7MF	N65DMF
Falcon, Fairlane, LTD (XA-XF)	1972-85		22F-520DF	N51MF
Falcon, Fairlane, LTD (XF-EA)	1985-6/91		22F-520DF	N51MF
Falcon, Fairlane, LTD (EB-ED)	6/91-6/94		AU22-530DF	N51EBMF
Falcon, Fairlane, LTD (EF-EL)	7/94-7/98		AU22R-520	N50EFMF
Falcon, Fairlane, LTD (AU-AU2)	9/98-8/02		AU22R-520	N50EFMF
Falcon, Fairlane, LTD (BA)	9/02-09/2005		AU22R-520	N50EFMF
Falcon, Fairlane, LTD (BF)	10/2005-04/2008		AU22R-520	N50EFMF
Falcon FG	2008-		AU22R-520	N50EFMF
Falcon, Fairmont (FG Utility)	05/2008-		AU22R-520	N50EFMF
Falcon Utility XG (spacer required)	03/1993-03/1996		AU22R-520	N50EFMF
Festiva WA	1991-93		40B19LS	NS40ZALMF
Festiva WB	94-10/97		55D23L	55D23LMF
Festiva WF	11/97-2000		55D23L	N51EBMF/55D23LMF
Fiesta	04/2004-		54316	N36MF
Fiesta Turbo Diesel	10/2010-		56318	N66MF
Fiesta XR4	06/2007-		55457	N55MF
Focus 2L, 1.8L 4 Cyl	09/2002-		55457	N55MF
Focus ST 170	2002-		56318	N66MF
Focus XR5 5 Cyl	04/2006-		56318	N66MF
Focus Diesel	08/2007-		56318	N66MF
Focus Petrol	05/2005-		56318	N66MF
KA	1999-12/2003		54316	N36MF
Kuga	2000-		56318	N66MF
Landau	1973-79		22F-520DF	N51MF
Laser KJ	94-10/96		AU22-530DF	N51EBMF
Laser KA - KF	1981-8/91		40B19LS	NS40ZALMF
Laser KH	8/91-94		AU22-530DF	N51EBMF
Laser KL, KN	1996-2000		55D23L	55D23LMF
Laser KQ	2001-		55D23L	55D23LMF
Liata	94-10/96		AU22-530DF	N51EBMF
Liata	11/96-		55D23L	55D23LMF
Lynx KJ	94-10/96		AU22-530DF	N51EBMF
Maverick (Diesel)	1989-93		95D31L	N70ZZLMF
Maverick (Petrol)	1989-93		90D26L	N53MF
Meteor	1982-87		40B19LS	NS40ZALMF
Mondeo	07/1995-02/2000		55457	N55MF
Mondeo	10/2007-		55457	N55MF
Mondeo TDCi (Diesel)	10/2007-current		58014	DIN77LMF

Application Guide

Passenger Cars & 4WD

Vehicle Make and Model FORD (Cont)	Year	Term Config.	OEM	Premium
Mustang	1963-74		22F-520DF	N51MF
Mustang	2002-			AM58MF
Probe	1994-97			AM58MF
Raider	1991-95		22F-520DF	N51MF
Ranger	12/2006-		95D31R	N70ZZMF
Ranger	2012-			DIN77LV
Ranger Standard 3.2L	2013			N66MF
Ranger Twin Cab Ute Diesel 3.2L Luxury Model	2012-		58014 / 60038	DIN77LMF/DIN100MF
Spectron	1983-95		40B19L	NS40LMF
Taurus	1996-1998			AM58MF
Telstar	1983-91		40B19LS	NS40ZALMF
TelstarAX	1991-95		22F-520DF	N51MF
TelstarAY	1991-95		22F-520DF	N51MF
Territory -All Models	2004-		AU22R-520	N50EFMF
Territory Diesel	2007-		574.035	N66HMF
Trader D409	1997-		90D26R	N52MF
Transit Van 2.5 Ltr Diesel	1994-97		AU22R-520	N50EFMF
Transit Van 2.5 Ltr Diesel / Petrol	1997-2000		55457	N55MF
Transit Van 4 Cyl	1991-95		22NF-330D	N39/40MF
Transit Van 6 Cyl	1973-81		22F-520DF	N51MF
Transit Van Diesel	2000-		56318	N66MF X2
F250 Dual Cab	2003-			N65DMF
FOTON				
Tunland Diesel	2012 -		95D31R	N70ZZMF
FSM				
Niki 650	01/1989-12/1993		55457	N55MF
GREAT WALL MOTORS				
SA220 Dual Cab Utility	07/2009-		55D23L	55D23LMF
V200 Diesel	2010		N70ZZMF	55D23LMF
V240 Dual Cab Utility	07/2009-		55D23L	55D23LMF
X240 Wagon - 4WD	10/2009-		55D23L	55D23LMF
X240 Sedan	2009-		55D23L	55D23RMF
X240	2012		90D26R	N52MF
HOLDEN				
All 6 Volt Models	1948-56			NO3 / N12
All Models	1956-80		22FR-520	N50MF
Adventra AWD - Wagon VY, VZ	2004-		22F-520	N54MF
Apollo	1989-92		40B19LS	NS40ZALMF
Apollo	1993-1997		55D23L	55D23LMF
Astra	1984-89		40B19LS	NS40ZALMF
Astra TR	1997-98		55457	N55MF
Astra	09/1998-		56318	N66MF
Astra (inc soft top)	2001-		56318	N66MF
Astra CDX	02/2004-		56318	N66MF
Astra CDTI (Diesel)	06/2006-		56318	N66MF
Barina	1985-94		40B19R	NS40MF
Barina	1994-01/2001		55457	N55MF
Barina (Workshop only)	02/2001-11/2005		56318	N66MF
Barina TK	12/2005-2011		22FR-520	N50MF
Barina Spark	10/2010-		55066	N36HMF
Berlina TM	2011-2013		LN3	AGM66
Calibra	1991-1996		55457 / 56318	N55MF / N66MF
Camira SL/E	1983-86		22FR-520	N50MF

Application Guide

Passenger Cars & 4WD

Vehicle Make and Model HOLDEN (Cont)	Year	Term Config.	OEM	Premium
Camira SL/E & SL/X	1987-89		22F-520	N54MF
Camira SL/X	1983-86		40B19LS	NS40ZALMF
Caprice Statesman	10/1974-06/1985		22FR-520	N50MF
Caprice	04/1995-06/1999		22FR-520	N50MF
Caprice	07/1999-		22F-520	N54MF
Caprice - Holden Assist-intellematics	08/2002-		22F-520	N54MF / OPTIMA 34R
Caprice WM	08/2006-		574.035	N66HMF
Caprice VE, VF	2006-2013		53368	N66HMF
Captiva Petrol V6	08/2006-		56640 / 57013	N66RMF / DIN70-770
Captiva Petrol 4 Cyl	2009		55217	55RHMF
Captiva 2.2l	2011-		60038	DIN100MF
Captiva Diesel	03/2007-		59095	DIN90-912
Captiva Diesel	01/2012		60038	DIN100MF
Colorado RC Petrol V6	07/2008-		110D26L	N53MF
Colorado RC 3.0 DT Diesel	07/2008-		95D31L	N70ZZLMF
Colorado	2011		60038	DIN100MF
Commodore/ Berlina / Calais	1978-1994		22FR-520	N50MF
Commodore/ Berlina / Calais	1995-08/1997		22FR-520	N50MF
Commodore/ Berlina / Calais VT, VX	06/1997-2001		22F-520	N54MF
Commodore/ Berlina / Calais/ Monaro VY, VZ	2002-08/2006		22F-520	N54MF
Commodore/ VY, VZ Sedan	2004-08/2006		22F-520	N54MF
Comm/ VY, VZ Ute, Wagon, Adventra AWD	2004-		22F-520	N54MF
Commodore VE V6 Sedan (in boot)	09/2006-		56219	N55HMF
Commodore VE V8 Sedan (in boot)	09/2006-		574.035	N66HMF
Commodore VE V6 Calais V	09/2006-		574.035	N66HMF
Commodore VE Ute (behind passenger seat)	09/2007-		56219	N55HMF
Commodore VE V8 SS Ute	09/2007-		56219	N55HMF
Combo Van	1996-		55457	N55MF
Combo Van (Workshop only)	11/2002-11/2005		55457 / 56318	N55MF / N66MF
Combo Van	12/2005-		55457 / 56318	N55MF / N66MF
Cruze	06/2002-06/2006		40B19L	NS40LMF
Cruze Petrol	06/2009-		55457	N55MF
Cruze Diesel	06/2009-		58014	DIN77LMF
Cruze Sr-V	01/2011-		56219	N55HMF
Drover	1985-87		40B19R	NS40MF
Epica Petrol	03/2007-		22FR-520	N50MF
Epica Diesel	07/2008-		59095	DIN90-912
Frontera	10/1995-03/1999		56318	N66MF
Frontera	04/1999-06/2004		90D26L	N53MF
HSV Grange - Holden Assist (Intellematics)	08/2002-		22F-520	N54MF / OPTIMA 34R
HSV(VE) Clubsport, Maloo, GTS, Senator, Grange	2006-2013		56638	N66HMF
HSV(VF) Clubsport, Maloo, GTS, Senator, Grange	2013-		56638	N66HMF
Gemini (Diesel)	1975-84		22F-520	N54MF
Gemini (Petrol)	1975-84		22NF-330D	N39/40MF
Gemini (Petrol)	1985-87		40B19R	NS40MF
Jackaroo (Diesel)	1979-92		95D31R	N70ZZMF
Jackaroo (Diesel)	1998-2000		95D31R	N70ZZMF
Jackaroo (Diesel) twin batteries	2000-		90D26R	N52MF
Jackaroo (Petrol & Diesel)	1993-95		22F-520	N54MF
Jackaroo (Petrol)	1983-87		55B24LS	NS60ALMF
Jackaroo (Petrol)	1987-91		22FR-520	N50MF
Jackaroo (Petrol)	1991-95		22F-520	N54MF
Jackaroo (Petrol)	1997-98		90D26R	N52MF
Jackaroo (Petrol)	1999-		55D23R	55D23RMF
Kingswood	1968-1977		22FR-520	N50MF
Nova	1989-91		22NF-330D	N39/40MF
Nova	1992-95		22NF-330D	N39/40MF
Phantom SS Ute	2000-		22F-520	N54MF

Application Guide

Passenger Cars & 4WD

Vehicle Make and Model HOLDEN (Cont)	Year	Term Config.	OEM	Premium
Piazza (Turbo)	1986-87		22F-520	N54MF
Rodeo (Diesel)	1981-12/1999		95D31R	N70ZZMF
Rodeo (Diesel)	01/2000-12/2006		95D31R	N70ZZMF
Rodeo (Diesel)	01/2007-		95D31R	N70ZZMF
Rodeo (Petrol)	1981-87		22NF-330D	N39/40MF
Rodeo (Petrol)	1988-11/1995		22FR-520	N50MF
Rodeo (Petrol)	12/1995-08/2005		55D23L	55D23LMF
Rodeo (Petrol)	09/2005-		90D26L	N53MF
Rodeo (Petrol) 4 Cyl	03/2003-06/2008		55B24LS	NS60ALMF
Sandman	1974-79		22FR-520	N50MF
Shuttle (Diesel)	1982-87		95D31R	N70ZZMF
Shuttle (Petrol)	1982-87		22NF-330D	N39/40MF
Special Vehicles GTS-R/SS	1996		22FR-520	N50MF
Sportwagon	03/2008-		56219	N55HMF
Statesman	1971-85		22FR-520	N50MF
Statesman	1990-1996		22FR-520	N50MF
Statesman	1997-07/2006		22F-520	N54MF
Statesman - Holden Assist (Intellematics)	08/2002-		22F-520	N54MF / OPTIMA R34
Statesman	08/2006-		56638	N66HMF
Suburban 4X4	1998		90D26R	N52MF
Sunbird	1977-79		22FR-520	N50MF
Tigra	10/2005-		56318	N66MF
Torana 4 Cyl	1967-74		22NF-330D	N39/40MF
Torana 4 Cyl	1974-79		22FR-520	N50MF
Torana 6/8 Cyl	1696-79		22FR-520	N50MF
Vectra (Imported)	1997-2006		56318	N66MF
Vectra JS (Aust made)	6/98-10/00		22F-520	N54MF
Viva JS	09/2005-		22FR-520	N50MF
Zafira	06/2001-		56318	N66MF
HONDA				
600	1968-74		40B19R	NS40MF
1300	1968-74		40B19R	NS40MF
20T	1968-74		40B19R	NS40MF
Accord	1982-1985		40B19RS	NS40ZAMF
Accord -2 DR and 4 DR	1986-1992		55B24RS	NS60AMF
Accord - wagon	1992-1993		55B24RS	NS60AMF
Accord - 4DR	1993		55D23R	55D23RMF
Accord - Exi	1994		55D23R	55D23RMF
Accord - Vti	1994-1998		55D23L	55D23LMF
Accord - Wagon	1994-1996		55D23L	55D23LMF
Accord - Exi	1995-1997		55D23L	55D23LMF
Accord - V6	1998-2002		90D26R	N52MF
Accord - Vti	1999-2003		55D23L	55D23LMF
Accord - 2.45 Vti	02/2008-		55B24LS	NS60ALMF
Accord - V6	2003-2004		90D26R	N52MF
Accord V6	2004-		90D26L	N53MF
Accord - V6	2005-2007		55D23L	55D23LMF
Accord - 3.5 V6	02/2008-		55D23L	55D23LMF
Accord - Vti	2004		55D23L	55D23LMF
Accord - Vti	2005-2007		55B24LS	NS60ALMF
Accord - Euro	2003-2007		55B24LS	NS60ALMF
Civic - 3 Dr	1988-2000		55B24RS	NS60AMF
Civic - 4 Dr	1988-2005		55B24RS	NS60AMF

Application Guide

Passenger Cars & 4WD

Vehicle Make and Model	Year	Term Config.	OEM	Premium
HONDA (Cont)				
Civic - 4 Dr	2006-2007		55B24LS	NS60ALMF
Civic - 5 Dr	1988-2005		55B24RS	NS60AMF
Civic - VTiR - Coupe	1996-2000		55B24RS	NS60AMF
Civic - Coupe	1996-2000		55B24RS	NS60AMF
Civic Type R	07/2007-		55B24LS	NS60ALMF
Civic Hybrid	03/2004-		40B19L	NS40LMF
Civic	2014		56219	N55HMF
Concerto 5 Dr	1989-1991		55B24RS	NS60AMF
CR-X	1988-1997		55B24RS	NS60AMF
CR-V	08/1997-12/2001		55B24RS	NS60AMF
CR-V	01/2002-		55B24LS	NS60ALMF
HR-V	1999-2000		55B24LS	NS60ALMF
Insight	03/2001-06/2004		40B19L	NS40LMF
Insight Vti Hybrid	12/2010-		40B19L	NS40LMF
Integra - SX	1986-1988		55B24RS	NS60AMF
Integra - LS	1990-1993		55D23R	55D23RMF
Integra - Gsi	1994-2001		55B24RS	NS60AMF
Integra - VTiR	1994-1999		55B24RS	NS60AMF
Integra - Type R	2000-2001		55B24RS	NS60AMF
Integra - Base and Type R	2002-2004		55B24LS	NS60ALMF
Integra - Base and Type S	10/2004-04/2007		55B24LS	NS60ALMF
Jazz	2003-		40B19L	NS40LMF
Legend 4 Dr and Coupe	1986-1990		90D26L	N53MF
Legend 4 Dr and Coupe	1991-2007		90D26R	N52MF
MDX	2003-2006		90D26L	N53MF
NSX MT and AT	1991-1994		55D23L	55D23LMF
NSX MT and AT	1995-2000		90D26L	N53MF
NSX AT	2000		55D23L	55D23LMF
NSX MT and AT	2001-2004		90D26L	N53MF
Odyssey 6 and 7 seater	03/1995-05/2004		55D23L	55D23LMF
Odyssey 4 Cyl	06/2004-		55B24LS	NS60ALMF
Odyssey V6	02/2003-05/2004		55D23R	55D23RMF
Odyssey 4 Cyl	2004		55B24LS	NS60ALMF
Prelude - 4WS	1988-1991		90D26R	N52MF
HUMMER				
H3 Holden	2007-		22FR520	N50MF / OPTIMA R34
American Hummer	1997-98		31-901	31-900MF
American Hummer	1999-			OPTIMA 34-78 F/Entry
HYUNDAI				
Accent	06/2000-		22F-520	N54MF
Coupe FX	07/1996-04/2002		22F-520	N54MF
Elantra	10/2000-		22F-520	N54MF
Excel	1983-95 / 2000		55D23L / 22F-520	55D23LMF / N54MF
Excel	1995-05/2000		22FR-520	N50MF
Getz	2002-		22F-520	N54MF
Grandeur	09/1999-01/2004		90D26L	N53MF
Grandeur	02/2006-		90D26L	N53MF
i20 Petrol (Fitting has 4 bolts)	07/2010-			50D23L
i30 Petrol	09/2007-		55D23L	55D23LMF
i30 Diesel CRDi	09/2007-		90D26L	N53MF
i30 Diesel	2007-2013		90D26L	N53MF
i45 Petrol	05/2010-		90D26L	N53MF
iLoad	02/2008-		95D31R	N70ZZMF (front ledge)
iMax	02/2008-		95D31R	N70ZZMF
Veloster	2012		CMF45L	N36MF
Veloster Turbo	2012		CMF45L	N36MF
i20 Petrol	10/2013		CMF45L	N36MF
Elantra Trophy	11/2013		CMF60L	55D23LMF
i30 Petrol	01/2014		56219	N55HMF
i30 Diesel	07/2013		56638	N66HMF
i30 Petrol	10/2013		95D31R	N70ZZMF
i30 Petrol	2013		90D26L	N53MF
i35 Diesel	10/2013-		95D31R	N70ZZMF
i35 Petrol	2013-		90D26L	NJ3MF

Application Guide

Passenger Cars & 4WD

Vehicle Make and Model	Year	Term Config.	OEM	Premium
HYUNDAI (Cont)				
iX 35 (Diesel)	02/2010-		95D31R	N70ZZMF
iX 35 (Petrol 2.4)	02/2010-		55D23L	55D23LMF
iX 35 (Petrol 2.0)	02/2010-		55D23L	55D23LMF
Lantra	1991-94		22FR-520	N50MF
Lantra	1995		22NF-330D	N39/40MF
Lantra GIS	1996-98		22F-520	N51MF / N54MF
Lantra SE	1996-98		22F-520	N51MF / N54MF
Lantra SE	1999-		22F-520	N51MF / N54MF
Lavita	10/2001-06/2004		22F-520	N51MF / N54MF
S Coupe	1990-95		22FR-520	N50MF
SX Coupe	07/1996-04/2002		22F-520	N54MF
Sante Fe	01/2001-09/2004		90D26L	N53MF
Santa Fe Petrol	09/2006-		95D31L	N70ZZLMF
Santa Fe Diesel	09/2006-		95D31L	N70ZZLMF
Sonata	1989-97		22FR-520	N50MF
Sonata	08/1998-05/2005		90D26L	N53MF
Sonata 4 Cyl	09/2001-05/2005		55D23L	55D23LMF
Sonata Elite	06/2005-		90D26L	N53MF
Sonata GLE	1994-95		55B24RS	NS60AMF
Sonata GLE	1996-97		22FR-520	N50MF
Sonata GLS	1988-95		22FR-520	N50MF
Sonata Petrol 2ltr - 2.4ltr	2015		90D26L	N53MF
Terracan	12/2001-		90D26R	N52MF
Terracan Diesel (Workshop only)	01/2005-		31-901	31-901
Tiburon	03/2002-		90D26L	N53MF
Trajet	07/2000-		90D26L	N53MF
Tucson	08/2004-		55D23L	55D23LMF
Tucson Elite	08/2004-		90D26L	N53MF
ISUZU				
D-Max Diesel 3.0L	2012-		95D31R	N70ZZMF
JAGUAR (Daimler)				
2.4 Litre	1956-69		95D31R	N70ZZMF / N70ZZX
3.4 Litre	1956-69		95D31R	N70ZZMF / N70ZZX
3.6 Litre	1987 onwards		55457	N55MF
3.8 Litre	1956-69		95D31R	N70ZZMF / N70ZZX
4.0 Litre	1987 onwards		55457	N55MF
420G	1966-71		95D31R	N70ZZMF / N70ZZX
420S	1966-71		95D31R	N70ZZMF / N70ZZX
Mark 10	1968-70		95D31R	N70ZZMF / N70ZZX
XF	06/2008-		60038	DIN100MF
XFR	08/2009-		60038	DIN100MF
XJ12	1995-		60038	N88MF / DIN100MF
XJ40 All incl Sovereign	1987-94		55457	N55MF
XJ6	1995-		60038	N88MF / DIN100MF
XJ6 All incl Sovereign	1972-87		90D26R	N52MF
XJ6V12	1972-87		90D26R	N52MF
XJR	1995-		60038	N88MF / DIN100MF
XJSV12	1991-95		56318	N66MF
XK8	1995-		60038	N88MF / DIN100MF
XKR	10/2002-		60038	DIN100MF
XJ Sovereign	1997-2003		60038	N88MF / DIN100MF
S Type R	01/2002-12/2005		60038	DIN100MF
X Type 2.1 V6	09/2001-02/2005		56219	N55HMF
X Type 2.5 V6	09/2001-02/2005		58014	DIN77LMF
X Type 3.0 V6	09/2001-02/2005		58014	DIN77LMF

Application Guide

Passenger Cars & 4WD

Vehicle Make and Model	Year	Term Config.	OEM	Premium
JEEP				
Cherokee	1994-97			AM58MF
Cherokee Sports	2005-		55458	N55RMF
Cherokee Sports	1997-97			AM58MF
Cherokee Sports - Diesel	1997-2001		58014	DIN77IMF
Cherokee Sports - Diesel	2002-			OPTIMA 34
Cherokee Sports - Petrol	01/2001-12/2004		22FR-520	N50MF
Cherokee KK Sport 3.7L	03/2011-		22FR-680	AM58 10" Case
Cherokee WK Grand V6	10/2011-		LN4	AGM77
Cherokee WK Grand Diesel	10/2011-		LN5	AGM88
Commander 6 Cyl	2006-09		60038	DIN100MF
Commander V8	2009-		60038	DIN100MF
Compass	01/2007-		55D23R	55D23RMF
Compass	10/2011-			AM58
Grand Cherokee	1996			AM58MF
Grand Cherokee WK	2011		AGM LN4-LN5	AGM88
Grand Cherokee SRT8	08/2006-		58014	DIN77LMF
Grand Cherokee Laredo	1997-12/1999		574.135	N66RMF
Grand Cherokee Laredo	01/2000-		56318	N66MF
Grand Cherokee	1999-		56318	N66MF
Grand Cherokee	03/2003-		60038	DIN100MF
Most Models	1974-85		22NF-330D	N39/40MF
Patriot	08/2007-			AM58MF
Patriot Petrol				AM58MF
Patriot CRD Diesel	04/2007-			34 RED TOP OPTIMA
Renegade	1982-85		22FR-520	N50MF
Wrangler JK 2.8 Diesel	2007-			31A OPTIMA
Wrangler Unlimited V6	2008		22FR680	N50MF
Wrangler 3.6L	2011-		56318	N66MF
Wrangler	1997-1998			AM58MF
Wrangler	1998-2000		574.135	N66RMF
Wrangler Sport V6	03/2007-			AM58MF
Wrangler Sport 3.8L Petrol	2001-		55458	AM58 10" Case
Wrangler CRD Sport				31A OPTIMA
Wrangler Diesel	2007-			D31A OPTIMA
KIA (Note) Many KIA models may have Foot Ledges				
Carnival	09/1999- 2006		90D26L	N53MF
Carnival VQ	2006-		95D31L	N70ZZLMF
Carnival Diesel VQ	2009-			HCM31
Carens	07/2000-12/2001		55457	N55MF
Cerato / Cerato Koop	07/2004- 10/2009		55D23L/55D23L	55D23LMF / 55D23LMF
Credos	05/1998-		55457	N55MF
Magentis	08/2006-		90D26L	N53MF
Mentor	12/1996-06/2000		55457	N55MF
Optima	05/2001-07/2006		90D26L	N53MF
Optima Platinum GDi	01/2011-		90D26L	N53MF
Pregio	08/2002-12/2005		95D31L	N70ZZLMF (LEDGES)
Rio 4 Dr Sedan / Rio Sports	07/2000- / 5/2010		CMF50D23L	50D23LMF solite/50D20LMF
K2900 CRDI Truck	4/2008		CMF90L	N70ZZLMF
Rondo	04/2008-		55D23L	55D23LMF
Shuma	01/2000-04/2001		55457	N55MF
Sorento / Sorento Petrol	10/2004- / 2009		90D26R / 55D23L	N52MF / N53MF (Foot Ledge)
Sorento CRDi Diesel / Sorento	10/2009 / 10/2007-2009		CMF89R	(Foot Ledge)
Soul Petrol	04/2009-			50D20L (LEDGES)
Soul CRDi Diesel	04/2009-		90D26L	N53MF
Spectra	05/2001-06/2004		55457	N55MF
Sportage 4WD	1997-98			AM58
Sportage 4WD	1999-		55457	N55MF
Sportage 4WD	10/2000-09/2004		55458	N55RMF

Application Guide

Passenger Cars & 4WD

Vehicle Make and Model KIA (cont)	Year	Term Config.	OEM	Premium
Sportage 4WD	10/2004-		90D26L	N53MF
Sportage 4WD CRDi	08/2007-07/2010		95D31L	N70ZZLMF
Sportage 4WD CRDi	08/2010-		95D31L	N70ZZLMF
Sportage Petrol	2008/2010		55D23L	55D23LMF
LADA				
Cevaro	1983-95		22FR-520	N50MF
Niva	1983-95		22FR-520	N50MF
Samara	1983-95		22FR-520	N50MF
LANCIA				
Beta	1974-85		54316 / 55457	N36MF / N55MF
Flavia	1996-75		54316 / 55457	N36MF / N55MF
LANDROVER				
Defender	1992-2000		31-901	31-901
Defender 110 (Petrol & Diesel)	1986-1992		22FR-520	N50MF
Defender 110 (Petrol & Diesel)	1992-2004		31-901	31-901
Defender 110 TD5 7 Extreme	1999-2004		60038	DIN100MF
Early series 1 & 2 Diesel (2x6 volt under seats)	1948-1977			N22Z X 2
Landrover (Petrol) - single 12 volt	1977-1984		95D31R	N70ZZMF
Series 3 Diesel	1978-1984		31-901	31-900
Discovery Petrol	1996-2004		90D26R	N52MF
Discovery Diesel	1996-1998		90D26R	N52MF
Discovery Petrol	1991-1995		90D26R	N52MF
Discovery Series 2 Diesel & Petrol	1999-03/2005		95D31R	N70ZZMF
Discovery Series 3 Petrol	04/2005-		58014 / 60038	DIN77LMF/ DIN100MF
Discovery Series 3 Diesel	01/2005-		60038	DIN100MF
Freelander (Petrol & Diesel)	1998-2004		56318	N66MF
Freelander TD4 & V6	11/2000-02/2004		58014	DIN77LMF
Range Rover	1984-1995		90D26R	N52MF
Range Rover Diesel	1990-1995		95D31R	N70ZZMF
Range Rover Diesel	1996-1998		90D26R	N52MF
Range Rover Diesel	1998-2003		60038	DIN100MF
Range Rover TD6	2003-2004		60038	DIN100MF
Range Rover HSE 4.4	08/2002-06/2005		60038	DIN100MF
Range Rover TD5 Extreme	2003-2004		31-901	31-901
Range Rover Vogue	2000-2004		60038	DIN100MF
Range Rover Vogue S/C V8	02/2007-			DIN110MF
LEXUS				
ES300	1992-2002-		55D23L	55D23LMF
ES300S	2003-		55D23L	55D23LMF
GS300	1998-		90D26L	N53MF
GS430	03/2005-		90D26L	N53MF
GS450h / GS460	05/2006- current		90D26L	N53MF
IS F	10/2008-		90D26L	N53MF
IS200	03/1999-10/2005		55D23L	55D23LMF
IS250	11/2005-		90D26L	N53MF
IS300	2002-		55D23L	55D23LMF
IS350	10/2010-		90D26L	N53MF
LS400 V8	1990-95		95D31L	N70ZZLMF
LS400	1996-		90D26L	N53MF
LS430	2004-		90D26L	N53MF
LS600 HL	11/2007-		95D31L	N70ZZLMF
LX470 Wagon	1998-		90D26L	N53MF

Application Guide

Passenger Cars & 4WD

Vehicle Make and Model LEXUS (cont)	Year	Term Config.	OEM	Premium
SC430	10/2001-		56318	N66MF
RX330	04/2003-02/2006		90D26L	N53MF
RX350	03/2006-		90D26L	N53MF
RX400h (Hybrid)	10/2006-05/2009		55B24LS	NS60ALMF
RX450h (Hybrid)	06/2009-			PS12550 (55AH)
IS250	06/2008		90D26L	N53MF X 2
LEYLAND				
Austin 1800 MK1 & MK11	1963-70		22NF-330D	N39/40MF
Austin Kimberly Tasman X6	1970-73		22NF-330D	N39/40MF
Marina 4- and 6- Cyl	1972-75		22NF-330D	N39/40MF
Mini	1959-71		22FR-520	N50MF
Mini	1971-78		22NF-330D	N39/40MF
Mini Clubman	1971-78		22NF-330D	N39/40MF
Mini K	1969-71		22NF-330D	N39/40MF
Moke	1966-83		22NF-330D	N39/40MF
Moke Californian	1966-83		22NF-330D	N39/40MF
Morris 1100	1966-83		22NF-330D	N39/40MF
Morris 1300	1966-83		22NF-330D	N39/40MF
Morris 1500	1966-83		22NF-330D	N39/40MF
P76 6- and 8- Cyl	1973-75		22F-520	N51MF / N54MF
LOTUS				
Elan	1989-92		54316	N36MF
Elise (all models)	1996-10		54316	N36MF
Esprit	1980-93		560035	N55MF
Excel	1985-92		56219	N55HMF
Exige	2001-04		55457	N55MF
Exige	2006-10		54316	N36MF
MAHINDRA				
Pick up All Models	2011		95D31R	N70ZZMF
MASERATI				
All models Early	08/1995-09/2000		22FR-520	N50MF
Quattroporte Sedan + Late Models	2000-		56318	N66MF

Application Guide

Passenger Cars & 4WD

Vehicle Make and Model	Year	Term Config	OEM	Premium
MAZDA				
626	1989		40B19LS	NS40ZALMF
121	1976-12/1997		40B19LS	NS40ZALMF
121 Metro	10/1996-12/2000		40B19LS	NS40ZALMF
121 Metro	01/2001-12/2002		40B19LS	NS40ZALMF
2	12/2002-05/2005		40B19LS	NS40ZALMF
2	06/2005-		55D23L	55D23LMF
3	01/2004-		55D23L	55D23LMF
3 MZR CD Diesel	11/2009-		90D26L	N53MF
323	1977-80		40B19R	NS40MF
323	1980-92		40B19LS	NS40ZALMF
323	1992-94		22F-520	N54MF
6	08/2002-12/2007		55D23L	55D23LMF
6	12/2008-		55D23L	55D23LMF
6 MPS	10/2005-		55D23L	55D23LMF
6 MZR CD Diesel	03/2009-		95D31L	N70ZZLMF
929	1994-97			50D20LMF
323 Astina	1994-09/1998		55D23L	55D23LMF
323 Astina	09/1998-09/2003		55D23L	55D23LMF
323 Protégé	1994-96		55D23L	55D23LMF
323 Protégé	1996-09/1998		55D23L	55D23LMF
323 Protégé	09/1998-09/2003		55D23L	55D23LMF
626 4 Cyl	12/1978-12/1995		40B19LS	NS40ZALMF
626 4 Cyl	07/1997-06/2002		55D23L	55D23LMF
626 6 Cyl	1992-94		55D23L	55D23LMF
626 6 Cyl	2000-		55D23L	55D23LMF
929 4 Cyl	1973-83		22FR-520	N50MF
929 4 Cyl	1983-87		40B19LS	NS40ZALMF
929 6 Cyl	1990-95		22F-520	N54MF
929 HE	1996		55D23L	55D23LMF
B2200 Diesel (Bravo)	1980-95		95D31R	N70ZZMF
B2200 Petrol (Bravo)	1980-95		40B19LS	NS40ZALMF
B4000 Bravo	10/2005-11/2006		56219	N55MF
B2500 Bravo Diesel	11/202-11/2006		95D31R	N70ZZMF
B2600			22FR-520	N50MF / N52MF
BT50 B3000 Diesel	11/2006-		95D31R	N70ZZMF
BT50 B3000 Diesel	2011-		58014	DIN77LMF
Capella	1970-78		55D23R	55D23RMF
CX5	2012-		90D23L	55D23LMF
CX7	11/2006-		55D23L	55D23LMF
CX7 Diesel	10/2009-		90D26L	N53MF
CX9 FWD Wagon	12/2007-		90D26L	N53MF
E1300	1978-83		40B19R	NS40MF
E1400	1984-86		40B19R	NS40MF
E1600	1978-83		40B19R	NS40MF
E2000	1984-12/1995		40B19L	NS40LMF
E2000	01/1996-07/2006		40B19L	NS40LMF
Eunos 30X	11/1992-05/1996		55D23L	55D23LMF
Eunos 500	06/1996-09/1999			AM58R
800 (Miller engine)	06/1996-10/2000		90D26L	N53MF
MPV	1993-95		22FR-520	N50MF
MPV	1998-		55D23L	55D23LMF
MPV 4x4 Traveller	1996-97		55D23L	55D23LMF
MX5 (Boot mount)	10/1989-08/2005		22NF-330D	N39/40MF
MX5 (Under bonnet)	09/2005-		55B24LS	NS60ALMF
MX6	1994-97			50D20LMF

Application Guide

Passenger Cars & 4WD

Vehicle Make and Model	Year	Term Config.	OEM	Premium
MAZDA (cont)				
MX6 4 Cyl & Turbo	1987-91		40B19LS	NS40ZALMF
MX6 6 Cyl	1991-95		22F-520	N54MF
Premacy	2001-			50D20LMF
RX3	1972-75		22F-520	N54MF
RX4	1973-1978		22F-520	N54MF
RX5	1976-1978		22F-520	N54MF
RX7	03/1979-02/1992		22F-520	N54MF
RX7	03/1992-02/1997		55D23L	55D23LMF
RX8	08/2003-		55D23L	55D23LMF
Savanna 1600	1972-78		40B19R	NS40MF
Savanna 808	1972-78		40B19R	NS40MF
Traveller	1983-89		40B19R	NS40MF
Triute 4 Cyl	02/2001-01/2008		55D23L	55D23LMF
SOME MODELS (STOP START)	2010-			EFB ONLY
MERCEDEZ-BENZ				
230	1974-95		56318	N66MF
250	1974-95		56318	N66MF
250	1968-78		56318	N66MF
260	1976-96		56318	N66MF
280	1973-86		56318	N66MF
300	1976-96		56318	N66MF
320	1976-96		56318	N66MF
400	1973-80		56318	N66MF
412	1998-		56318	N66MF
108D	1998-		56318	N66MF
180E	1991-93		55457 / 56318	N55MF / N66MF
190D	1986-87		58515 / 60038	N88MF / DIN100MF
190E	1984-94		55457 / 56318	N55MF / N66MF
190E 2.6	1988-91		55457 / 56318	N55MF / N66MF
230.4	11/1973-11/1976		56318	N66MF
230E	07/1981-02/1993		56318	N66MF
230GE	1986-89		56318	N66MF
240D	1974-82		58515 / 60038	N88MF / DIN100MF
250C	1968-78		56318	N66MF
250E	1968-78		56318	N66MF
280CE	1973-86		56318	N66MF
280E	1973-86		56318	N66MF
280SE	1973-86		56318	N66MF
280SEL	1973-86		56318	N66MF
280TE	1973-86		56318	N66MF
300CE	1976-96		56318	N66MF
300D	1976-96		56318	N66MF
300E	1976-96		56318	N66MF
300GD	1983-89		58515 / 60038	N88MF / DIN100MF
300SE	1976-96		56318	N66MF
300SEL	1976-96		56318	N66MF
380SEC	1981-86		56318	N66MF
380SEL	1981-86		56318	N66MF
380SL	1981-86		56318	N66MF
400S	1973-80		56318	N66MF
400SE	1973-80		56318	N66MF
450SEL	1976-80		56318	N66MF
450SLC	1976-80		56318	N66MF
560SEC	1986-92		58515 / 60038	N88MF / DIN100MF
560SEC	1986-92		58515 / 60038	N88MF / DIN100MF
560SEL	1986-92		58515 / 60038	N88MF / DIN100MF

Application Guide

Passenger Cars & 4WD

Vehicle Make and Model MERCEDEZ-BENZ (Cont)	Year	Term Config.	OEM	Premium
560SL	1986-92		58515 / 60038	N88MF / DIN100MF
A150 169 PETROL	2004-2009		LN3	AGM66
A160 Hatch 1.6ltr	1998-		55457	N55MF
A170	2004-2009		LN3	AGM66
A200 (W169) Under floor	05/2005-		56318	N66MF
C180	1997-98		58515 / 60038	N88MF / DIN100MF
C200	1994-		55457 / 56318	N55MF / N66MF
C200	1997-		58515 / 60038	N88MF / DIN100MF
C200 204 PETROL	2009-2013		LN2	AGM55
C200 Kompressor	11/2000-02/2002		60038	DIN100MF
C200 Kompressor	10/2002-		60038	DIN100MF
C200 Kompressor	2007-2010		LN3	AGM66
C220 W203 CDI	03/2001-06/2007		60038	DIN100MF
C220 W204 CDI	07/2007-		574.035	N66HMF
C230 Kompressor	2000-		574.035	N66HMF
C240	1997-98		58515 / 60038	N88MF / DIN100MF
C250	1994-		55457 / 56318	N55MF / N66MF
C250	1997-98		60038	DIN100MF
C250 CGI	01/2010-		56219	N55HMF
C250D	1998-		60038	DIN100MF
C280	1994-		55457 / 56318	N55MF / N66MF
CLK200	1997-		55457	N55MF
CLK230 Coupe	10/1997-02/2002		56318	N66MF
CLK320	1998-		58515	N88MF
CLK500	2002		56318	N66MF
CLK63 AMG	09/2006-		60038	DIN100MF
E220	1974-95		56318	N66MF
E220	1994-		55457	N55MF
E220	1997-98		60038	DIN100MF
E230	02/1996-05/2008		60038	DIN100MF
E240 Classic	1998-		60038	DIN100MF
E270 Diesel	2002		60038	DIN100MF
E280	08/1993-02/1996		55457	N55MF
E280	02/2005-		56318	N66MF
E320	1997-98		60038	DIN100MF
MB100 / MB140 Van	2002-		95D31L	N70ZZLMF
ML270 4X4	02/2000-		60038	DIN100MF
ML300 4X4 Cdi Diesel	12/2009-		60038	DIN100MF
ML320 4X4	09/1998-		60038	DIN100MF
ML320	2005-2009		LN5	AGM100
ML350 4X4	01/2004-		60038	DIN100MF
ML350	2005-2011		LN5	AGM100
ML63 AMG	2006-2010		LN5	AGM100
S280	1998-		60038	DIN100MF
S320	1998-		60038	DIN100MF
S420	1998-		60038	DIN100MF
S430	04/1999-02/2006		60038	DIN100MF
S500	1993-		60038	DIN100MF
S600	1998-		60038	DIN100MF
SL280	11/1995-04/1999		60038	DIN100MF
SL500	1993-		56318	N66MF
SL500	1993-		56318	N66MF
SL600	1998-		60038	DIN100MF
SLK200	11/1997-11/2000		56318	N66MF
SLK200 Kompressor	07/2000-07/2004		60038	DIN100MF
SLK230 Supercharged	02/1997-06/2004		56318	N66MF
Sprinter	1998-		56318	N66MF

Application Guide

Passenger Cars & 4WD

Vehicle Make and Model MERCEDEZ-BENZ (cont)	Year	Term Config.	OEM	Premium
Sprinter Cdi	05/2000-10/2006		60038	DIN100MF
TE	1974-95		56318	N66MF
Vito Van 108 CDI Diesel	08/1999-03/2004		60038	DIN100MF
Vito Van 112 CDI Diesel (Workshop only)	02/2001-03/2004		56318	N66MF
Vito Van 113 Diesel	1998-		56318	N66MF
Vito 113 Diesel	2002-		56318	N66MF
SOME MODELS (STOP START)	2010-			AGM ONLY
MG				
TF	1953-55		22F-520	N54MF
Magnette	1954-59		95D31R	N70ZZMF
MG Midget	1968-73		22NF-330D	N39/40MF
MGA 1500	1955-60			N03 X 2
MGA 1600	1955-60			N03 X 2
MGB 1800	1960-72			N03 X 2
MGF	03/1997-07/2002		55457	N55MF
MGTF	08/2002-06/2005		55457	N55MF
MG ZT	05/2002-06/2005		56318	N66MF
MINI				
Mini Cooper S R50	03/2002-02/2007		56219	N55HMF
Mini Cooper S R56	2006-2010		LN3	AGM66
Mini	03/2007-		56638	N66HMF
Mini Cooper R56	2006-2010		LN3	AGM66
Mini Works Clubman R55	2008-2012		LN3	AGM66
MITSUBISHI				
ASX Wagon	07/2010-		55D23L	55D23LMF
ASX Wagon Diesel	07/2010-		95D31L	N70ZZLMF
Centura 4 Cyl	1975-79		22FR-520	N50MF
Centura 6 Cyl	1975-79		22F-520	N54MF
Challenger	03/1998-03/2007		90D26R	N52MF
Challenger	2007-2013		95D31-R	N70ZZMF
Chalenger LS	2001-2004		22FR520	N50MF
Chrysler All Models	1971-78		22F520	N54MF
Colt All Models RA - RE	1981-91		40B19RS	NS40ZAMF
Colt	09/2004-		55D23L	55D23LMF
Colt Cabriolet	11/2006-		56219	N55HMF
Colt Ralliart	02/2007-		55D23L	55D23LMF
Cordia AA - AC	1983-87		40B19RS	NS40ZAMF
Delica	01/1989-12/1998		90D26R/95D31R	N52MF / N70ZZMF
Delica Diesel	All Years		55457	N55MF
Exlipse (L300)	1990-95		40B19LS	NS40ZALMF
Express (Diesel) L300	1979-87		95D31R	N70ZZMF
Express (Petrol) L300	1979-08/2002		40B19LS	NS40ZALMF
Express L300	09/1994-02/2006		40B19LS	NS40ZALMF
Express	03/2006-		55B24RS	NS60AMF
FTO V6	2001-		55D23R	55D23RMF
Galant (except hardtop)	1971-78		22FR-520	N50MF
Galant GSR - 24V HJ	1994-		55D23R	55D23RMF
Galant HA - HH	1978-94		22NF-330D	N39/40MF
Grandis	2004-		55D23L	55D23LMF
MiEV Start Battery	10/2010-		40B19L	NS40LMF
Lancer CA, CB, CC	09/1988-06/1996		40B19RS	NS40ZAMF
Lancer CE	07/1996-01/2003		40B19LS	NS40ZALMF
Lancer CG	02/2003-07/2005		40B19LS	NS40ZALMF
Lancer CH 2.4 Litre	08/2005-06/2007		55D23L	55D23LMF

Application Guide

Passenger Cars & 4WD

Vehicle Make and Model	Year	Term Config.	OEM	Premium
MITSUBISHI (Cont)				
Lancer CJ 2.0 Litre	07/2007-		55D23L	55D23LMF
Lancer LA, LB, LC	09/1974-08/1981		22NF-330D	N39/40MF
Lancer Evolution (in boot)	07/2008-		90D26L	N53MF
Magna	04/1985-03/1991		40B19RS	NS40ZAMF
Magna	04/1991-05/1997		22FR-520	N50MF
Magna	06/1997-09/2005		AU22R-520	N50EFMF
Mirage	1997-2003		40B19LS	NS40ZALMF
Nimbus UA	1984-91		40B19LS	NS40ZALMF
Nimbus UB	1984-91		40B19LS	NS40ZALMF
Nimbus UC	1984-91		40B19LS	NS40ZALMF
Nimbus UF	02/1992-10/1998		22NF-330D	N39/40MF
Nimbus UG	11/1998-05/2004		40B19LS	NS40ZALMF
Outlander	02/2003-2013		55D23L	55D23LMF
Pajero Diesel	1983-95		95D31R	N70ZZMF
Pajero Diesel	1996-1998		55D23L	55D23LMF
Pajero Diesel	1998-04/2002		55D23R	55D23RMF
Pajero Diesel	05/2002-		95D31L	N70ZZLMF
Pajero Petrol	1983-95		90D26R	N52MF
Pajero Petrol	1995-1997		55D23R	55D23RMF
Pajero Petrol	08/1997-06/2000		55D23R	55D23RMF
Pajero Petrol	07/2000-		55D23L	55D23LMF
Pajero iO 4WD 1.6Ltr 3 Door	1999-		55D23L	55D23LMF
Pajero iO 4WD 1.8Ltr 5 Door	1999-		55D23L	55D23LMF
Rosa Bus	08/2000-01/2005		55D23R	55D23RMF
Scorpion All Models	1978-85		22FR-520	N50MF
Sigma 1600	1977-85		22NF-330D	N39/40MF
Sigma 1850	1977-85		22NF-330D	N39/40MF
Sigma 2000	1977-85		22FR-520	N50MF
Sigma 2600	1977-85		22FR-520	N50MF
Starion	1982-87		22FR-520	N50MF
Starwagon 2.0, 2.4 Ltr	10/1986-08/2002		40B19LS	NS40ZALMF
Starwagon 2.0, 2.4 Ltr	09/2002-05/2004		40B19LS	NS40ZALMF
Starwagon 3.0 L300	1994-1996		90D26R	N52MF
Triton Petrol	10/1996-07/2001		55B24RS	NS60AMF
Triton Petrol MK	08/2001-06/2006		55D23R	55D23RMF
Triton Petrol ML	07/2006-		55D23L	55D23LMF
Triton Diesel	10/1996-		95D31L	N70ZZLMF
Vailant All Models	1971-1978		22F-520	N54MF
Verada V6 - All Models	1991-1999		AU22R-520	N50EFMF
380	10/2005-		55D23R	55D23RMF
NIKI				
Niki 650 (FSM Niki 650)	01/1989-12/1993		55457	N55MF
NISSAN				
200SX	1997		55D23R	55D23RMF
200SX	2000-		55B24R	NS60MF
280 Series	1978-84		22FR-520	N50MF
300ZX	03/1984-01/1996		22FR-520	N50MF
350Z	02/2003-		55D23L	55D23LMF
370Z	05/2009-		55D23L	55D23LMF
720 Diesel	1980-85		95D31R	N70ZZMF
720 Petrol	1980-85		22FR-520	N50MF
Bluebird	05/1981-06/1986		22FR-520	N50MF
Bluebird	1993-95		22F-520	N54MF
Datsun 1200	1970-79		22NF-330D	N39/40MF
Datsun 120Y	1970-79		22NF-330D	N39/40MF

Application Guide

Passenger Cars & 4WD

Vehicle Make and Model NISSAN (Cont)	Year	Term Config.	OEM	Premium
Datsun 1300	1972-81		22FR-520	N50MF
Datsun 1600	1968-72		22FR-520	N50MF
Datsun 180B	1972-81		22FR-520	N50MF
Datsun 200B	1972-81		22FR-520	N50MF
Datsun 240K/Z	1971-78		22FR-520	N50MF
Datsun 260C/Z	1971-78		22FR-520	N50MF
Dualis	12/2007-		56219	N55HMF
E20	1974-80		22FR-520	N50MF
EXA	1987-91		22F-520	N54MF
EXA Turbo	1983-87		40B19L	NS40LMF
Gazelle	1983-86		40B19LS	NS40ZALMF
Grande	2008-		55D23R	55D23RMF
Maxima	1990-95		22F-520	N54MF
Maxima	02/1995-12/1999		90D26L	N53MF
Maxima (A-33, V6)	2000-		55D23L	55D23LMF
Maxima ST V6	2002-		55D23L	55D23LMF
Maxima & Touring 30S	1996-97		55D23L	55D23LMF
Micra	05/1995-08/1996		40B19L	NS40LMF
Micra	09/1996-12/1997		40B19LS	NS40ZALMF
Micra	12/2007-		55B24L	NS60LMF
Murano	07/2005-		55D23L	55D23LMF
Navara Diesel	1985-11/2001		95D31R	N70ZZMF
Navara Diesel	12/2001-11/2006		95D31R	N70ZZMF
Navara Diesel	12/2006-		574.035	N66HMF
Navara Diesel	2010-		95D31L	N70ZZLMF
Navara D40 Diesel	2012		58515 / 60038	N88MF / DIN100MF
Navara Petrol 4/6 Cyl	1986-		55D23R	55D23RMF
Navara V6 Petrol	2010-		56219	N55HMF
Nomad	12/1986-10/1992		40B19RS	NS40ZAMF
NX Coupe	1992-96		40B19L	NS40LMF
Pathfinder	1987-06/2005		55D23R	55D23RMF
Pathfinder ST-L	07/2005-		574.035	N66HMF
Pathfinder Ti Diesel	07/2005-		574.035	N66HMF
Patrol Diesel	1980-85		95D31R	N70ZZMF
Patrol Diesel	1985-88		95D31R	N70ZZMF
Patrol Diesel	1989-03		95D31L	N70ZZLMF
Patrol Petrol	1974-80		22FR-520	N50MF
Patrol Petrol	1980-89		90D26R	N52MF
Patrol Petrol	1989-98		95D31L	N70ZZLMF
Patrol Petrol	1999-		90D26L	N53MF
Patrol TDI	2012-		95D31R	N70ZZMF
Patrol Y61 (4X4 Turbo Wagon, deisel)	2000-		95D31L	N70ZZLMF
Patrol Y61 Wagon 4X4 (Turbo)	2001-		95D31L	N70ZZLMF
Pintara	1986-89		22FR-520	N50MF
Pintara	1989-92		22F-520	N54MF
Prairie	1983-85		40B19R	NS40MF
Pulsar ET Turbo	01/1984-07/1987		40B19LS	NS40ZALMF
Pulsar	05/1983-07/1993		40B19LS	NS40ZALMF
Pulsar	08/1993-06/2000		40B19L	NS40LMF
Pulsar Sedan	07/2000-01/2006		40B19L	NS40LMF
Pulsar Hatchback	11/2002-01/2006		55457	N55MF
Pulsar Plus Sedan	10/1997-09/2000		40B19L	NS40LMF
Pulsar Q	1997-99		40B19L	NS40LMF
Pulsar SSS 5 Dr	1998-		55D23R	55D23LMF
Pulsar N14	2014-		40B19L	NS40LMF
Serena	1992-94		22FR-520	N50MF
Skyline	1997-1999		22FR-520	N50MF
Skyline	1986-90		22FR-520	N50MF

Application Guide

Passenger Cars & 4WD

Vehicle Make and Model NISSAN (Cont)	Year	Term Config.	OEM	Premium
Skyline R32	1990-1993		40B19R	NS40MF
Skyline R33 (Boot Mounted)	1993-1998		55D23L	55D23LMF
Skyline R34	1998-		55B24R	NS60MF
Stanza	1978-83		22FR-520	N50MF
Stagea	1992-		40B19L	NS40LMF
Sunny	1979-81		22NF-330D	N39/40MF
Silvia	01/1988-12/1994		40B19R	NS40MF
Terrano II	1998		55D23R	55D23RMF
Tiida	02/2006-		55B24L	NS60LMF
Urvan Diesel	1981-95		95D31R	N70ZZMF
Urvan Petrol	1981-95		22FR-520	N50MF
Vanette	1981-95		40B19RS	NS40ZAMF
Vector	1988-93		40B19LS	NS40ZALMF
X-Trail 4X4 T30 Wagon	02/202-		55D23L	55D23LMF
X-Trail Diesel	07/2008-		55D23L	55D23LMF
PEUGEOT				
205	1989-95		55457	N55MF
404	1962-70		22FR-520	N50MF
405	1989-95		54316	N36MF
504	1970-81		22FR-520	N50MF
505	1980-89		95D31R	N70ZZMF
206 Petrol & Diesel	08/1999-01/2001		55457	N55MF
206 Petrol & Diesel	02/2001-		56219	N55HMF
207	03/2007-		55457	N55MF
3008 Petrol	06/2010-		56219	N55HMF
3008 HDI Diesel	06/2010-		574.035	N66HMF
306	4/1994-12/2001		56219	N55MF
307 Petrol	12/2001-		56219	N55HMF
307 HDI Diesel	10/2003-06/2008		574.035	N66HMF
308 (Workshop only)	02/2008-		574.035	N66HMF
406 Coupe	10/1997-08/1999		55457	N55MF
406ST	1996-97		55457	N55MF
406	09/1999-		56219	N55HMF
407	09/2004-		55457	N55MF
407 HDI	02/2005-		55457	N55MF
407 HDI V6	03/2006-		56318	N66MF
4007	01/2010-		95D31L	N70ZZLMF
504 LTI	1975-76		22NF-330D	N39/40MF
604 SL	1978-87		22FR-520	N50MF
GLD	1979-82		95D31R	N70ZZMF
RCZ Coupe	10/2010-		56219	N55HMF
Scenic	05/2001-06/004		55457	N55MF
Scenic	02/2005-		56318	N66MF
Traffic	2004-		56318	N66MF
Virage	1977-80		22NF-330D	N39/40MF

Application Guide

Passenger Cars & 4WD

Vehicle Make and Model	Year	Term Config	OEM	Premium
PORSCHE				
Boxster	01/2000-		56318	N66MF
Cayenne	06/2003-		60038	DIN100MF
Cayman	10/2006-		56219	N55HMF
Panamera	10/2009-		55457 / 56318	N55MF / N66MF
356 (6 Volt)	1954-60			N12D
924	1977-82		55457	N55MF
928	1980-92		60038	DIN100MF
944	03/1982-03/1991		55457	N55MF
968	1992-95		55457	N55MF
911 Most Models	1969-95		55457 / 56318	N55MF / N66MF
911T	1968-73		54316	N36MF
911 GT2	2001-		56318	N66MF
911 Carrera, S, Cabriolet	2001-2004		56318	N66MF
928S	1980-92		60038	DIN100MF
928S4	1987-99		56318	N66MF
944S	1983-92		55457	N55MF
PROTON				
All Models	1995		55D23R	55D23RMF
Jumbuck	02/2003-		55D23R	55D23RMF
Jumbuck	Late model		22FR-520	N50MF
M21 2 Door Coupe	1997-		55D23R	55D23RMF
Persona	1997-		55D23R	55D23RMF
Satria C90	1997-98		55D23R	55D23RMF
Savvy	04/2006-		55B24LS	NS60ALMF
Waja	11/2001-12/2005		55D23L	55D23LMF
GEN 2	10/2004-12/2005		55458	N55RMF
RAMBLER				
Hornet	1970-76		22FR-520	N50MF
RENAULT				
14	1977-80		22NF-330D	N39/40MF
16	1968-77		22NF-330D	N39/40MF
25	1985-91		54316 / 55457	N36MF / N55MF
16TL	1968-77		22NF-330D	N39/40MF
16TS	1968-77		22NF-330D	N39/40MF
17TL	1973-80		22NF-330D	N39/40MF
17TS	1973-80		22NF-330D	N39/40MF
18GTS	1980-83		22NF-330D	N39/40MF
19TXE	1991-95		54316 / 55457	N36MF / N55MF
20TS	1979-84		22F-520	N54MF
21TSE	1985-91		22F-520	N54MF
25GTV	1985-91		22F-520	N54MF
Clio	12/2001-		55457	N55MF
Clio Sports	05/2001-		54316	N36MF
Fuego GTX	1982-87		22FR-520	N50MF
Kangoo	09/2004-		574.035	N66HMF
Laguna	2002-04		55457	N55MF
Laguna / Estate	2001-		55457	N55MF
Laguna 2.2 dci Diesel	11/2006-		56318	N66MF
Master	09/2004-		60038	DIN100MF
Megane	05/2001-		55457	N55MF
Megane Auto	07/2006-		56318	N66MF
Scenic	05/2001-06/004		55457	N55MF
Scenic	02/2005-		56318	N66MF
Traffic	2004-		56318	N66MF / N88MF

Application Guide

Passenger Cars & 4WD

Vehicle Make and Model	Year	Term Config.	OEM	Premium
RENAULT (cont)				
Traffic Virage	Late model 1977-80		58515 22NF-330D	N88MF N39/40MF
ROLLS ROYCE				
All Models Before 1986 All Models After 1986	Before 1986 After 1986		95D31R 90D26R	N70ZZMF N52MF
ROVER				
75	1995		56318	N66MF
75	1965-69		95D31R	N70ZZMF
90	1965-69		95D31R	N70ZZMF
100	1965-69		95D31R	N70ZZMF
825	1988-92		22NF-330D	N39/40MF
827	1988-92		22NF-330D	N39/40MF
2000	1965-75		22FR-520	N50MF
3500	07/1968-02/1972		22FR-520	N50MF
2000TC	1965-75		22FR-520	N50MF
416i	1986-87		22NF-330D	N39/40MF
416i	1987-89		22F-520	N54MF
Quintet	1983-86		22NF-330D	N39/40MF
SD1-3500	1979-86		22FR-520	N50MF
SD1-3500 SE	1979-86		22FR-520	N50MF
Series 2 SE	1983-85		22FR-520	N50MF
SAAB				
95	2001-		56318	N66MF
93	1998		55457	N55MF
93 Aero	11/2001-		56318	N66MF
9000	01/1987-12/1997		55457 / 56318	N55MF / N66MF
900	03/1979-10/1993		55457	N55MF
93 (soft top)	1999-01/2005		56318	N66MF
9-3 Vector TiD	11/2007-		574.035	N66HMF
9-3	02/2005-06/2010		574.035	N66HMF
95 SE	1998		56318	N66MF
95 Series	2000		110D26L	N53MF
All Models	1972-84		22FR-520	N50MF
All Other Models	1984-92		22FR-520	N50MF
SEAT				
Cordoba Petrol	1994-		55457	N55MF
Cordoba Diesel	1994-		56318	N66MF
Ibiza 1.2/1.5	1994-		55458	N55MF
Ibiza 1.6/1.8	1994-		56318	N66MF
Toledo Petrol	1994-		55457	N55MF
Toledo Diesel	1994-		56318	N66MF
All Models	1995-		55457 / 56318	N55MF / N66MF
Cordoba	1997-98		56318	N66MF
SKODA				
Octavia	10/2007-		574.035	N66HMF
Octavia Tdi	10/2007-		574.035	N66HMF
Roomster	10/2007-		56219	N55HMF

Application Guide

Passenger Cars & 4WD

Vehicle Make and Model	Year	Term Config.	OEM	Premium
SMART				
City Coupe	05/2003-01/2004		55066	N36HMF
Forfour	10/2004-01/2007		55066	N36HMF
Fortwo	01/2004-		55066	N36HMF
Roadster	11/2003-01/2007		55066	N36HMF
SSANYONG				
Korando 4WD Petrol	02/1988-06/2000		22FR-520	N50MF
Korando	05/2004-06/2007		95D31R	N70ZZMF FOOTLED
Kyron	2005-		95D31R	N70ZZMF FOOTLEDGE
Musso Diesel 2.9 / 3.2	1997-		95D31R	N70ZZMF FOOTLEDGE
Musso Petrol	1996-97		95D31R	N70ZZMF FOOTLEDGE
Rexton	06/2003-		95D31R	N70ZZMF FOOTLEDGE
Stavic	11/2005-		95D31R	N70ZZMF FOOTLEDGE
SUBARU				
Brumby	10/1980-03/1994		40B19L	NS40LMF
1800 Series	1973-90		40B19L	NS40LMF
4WD Wagon	1983-90		40B19R	NS40MF
Fiori	1989-92		40B19R	NS40MF
Forester	1997-98		40B19L	NS40LMF
Forester	1999-		55D23L	55D23LMF
Forester S 4 Cyl Turbo	02/2011-		55D23L	55D23LMF
Forester 2.0D Diesel	07/2010-		90D26L	N53MF
Liberty Heritage	11/1990-08/2003		40B19L	NS40LMF
Heritage	2000		40B19L	NS40LMF
Impreza 2Lt Turbo	2004-06		55D23L	55D23LMF
Impreza	1993-98		40B19L	NS40LMF
Impreza 2.5Lt	2000-06		40B19L	NS40LMF
Liberty B4	08/2001-08/2003		40B19L	NS40LMF
Liberty B4 Turbo	08/2001-08/2003		55D23L	55D23LMF
Outback 2.0D	10/2009-		90D26R	N52MF
Outback 2.5	1997-		55B24L	NS60LMF
Outback 3.0	08/2000-		55D23L	55D23LMF
Outback Late Model	2013-		55D23R	55D23RMF
Sherpa	1983-89			12N24-4MF
Sportswagon	1997-98		40B19L	NS40LMF
SVX	1992-95		22F-520	N54MF
Tribeca	11/2006-		55D23L	55D23LMF
Vortex	1986-89		40B19R	NS40MF
WRX	1997-11/2002		55B24L	NS60LMF
WRX	12/2002-		55D23L	55D23LMF
WRX Sti	02/1999-		55D23L	55D23LMF
SOME MODELS (STOP START)	2010-			EFB ONLY
SUZUKI				
993CC	1999		40B19L	NS40LMF
L50 / LJ80 / LJ81	07/1974-12/1981		40B19R	NS40MF
Alto	1996		40B19LS	NS40ZALMF
Alto	1998		40B19L	NS40LMF
Alto	2010		40B19R	NS40MF
APV van	2010		55B24R	NS60MF
Baleno (Wagon & GTX)	04/1995-11/2001		40B19L	NS40LMF
Baleno X90	1995-96		40B19L	NS40LMF
Carry	2001-		40B19L	NS40LMF
Carry Van	1971-96		40B19R	NS40MF
Cino 3 Dr	1998-		40B19L	NS40LMF

Application Guide

Passenger Cars & 4WD

Vehicle Make and Model SUZUKI (Cont)	Year	Term Config.	OEM	Premium
Grand Vitara	1998-02/2005		55D23L	55D23LMF
Grand Vitara	09/2005-07/2007		55B24L	NS60LMF
Grand Vitara	08/2007-		55D23L	55D23LMF
Grand Vitara Diesel	01/2008-		90D26L	N53MF
Ignis	10/2000-02/2005		40B19L	NS40LMF
Jimny 3 Dr 4WD	10/1998-		40B19R	NS40MF
Kizashi	04/2010-		55D23L	55D23LMF
Liana	10/2001-		40B19L	NS40LMF / NS60LMF
Mighty Boy	1971-96		40B19R	NS40MF
R+ Wagon	1997-98		40B19L	NS40LMF
Sierra	1986-93		40B19R	NS40MF
Sierra SX / SJ80	1986-93		40B19R	NS40MF
Swift	01/1985-05/2000		40B19R	NS40MF
Swift S 5 Dr Hatchback	02/2005-		55B24R	NS60MF
SX4	08/2007-		55B24R	NS60MF
Vitara	1986-92		40B19R	NS40MF
Vitara	1993-94		40B19R	NS40MF
Vitara	1995-2000		55D23L	55D23LMF
Vitara	2000-		55D23L	55D23LMF
Vitara Soft Top	1997		40B19L	NS40LMF
XL-7	07/2001-12/2005		55D23L	55D23LMF
X90 Targa 2 Dr	1996-		40B19L	NS40LMF
TOYOTA				
86 Petrol	2014		55D23L	55D23LMF
100 Series Diesel	2000		95D31L	N70ZZLMF
100 Series Petrol	1998-		90D26L	N53MF
4 Runner 4 Cyl	1984-95		22FR-520	N50MF
4 Runner V6	1974-95		55D23R	55D23RMF / N52MF
Aristo (Grey Import)	01/1991-12/1997		55D23L	55D23LMF
Ascent	2000-		40B19L	NS40LMF
Aurion	10/2006-		55D23L	55D23LMF
Avalon (4 models)	07/2000-12/2005		55D23L	55D23LMF
Avante	1985-87		40B19LS	NS40ZALMF
Avensis	12/2001-10/2003		55B24LS	NS60ALMF
Avensis	11/2003-		55D23L	55D23LMF
Bundera Diesel	1984-90		95D31R	N70ZZMF
Bundera Petrol	1984-90		90D26R	N52MF
Camry	1983-85		40B19LS	NS40ZALMF
Camry	1985-87		22F-520	N54MF
Camry 4 Cyl	05/1987-02/1993		40B19LS	NS40ZALMF
Camry VZV21 V6	06/1988-02/1993		55D23L	55D23LMF
Camry 4 & 6 Cyl	3/1993-08/2002		55D23L	55D23LMF
Camry 4 & 6 Cyl	09/2002-2008		55D23L	55D23LMF
Camry Hybrid	03/2010-		D34	D34 Optima
Camry Hybrid	2012		D34	D34 Optima
Celica	1972-84		40B19LS	NS40ZALMF
Celica	1985-86		22F-520	N54MF
Celica ST 184	1986-02/1994		55D23L	55D23LMF
Celica	03/1994-11/1999		55D23L	55D23LMF
Celica	11/1999-03/2006		55B24LS	NS60ALMF
Corolla	1964-11/1982		40B19LS	NS40ZALMF
Corolla	12/1982-11/1986		40B19LS	NS40ZALMF
Corolla	12/1986-11/1998		22NF-330D	N39/40MF
Corolla	12/1998-12/1999		40B19L	NS40LMF
Corolla	2000		40B19L	NS40LMF
Corolla	2000-01		40B19L	NS40LMF

Application Guide

Passenger Cars & 4WD

Vehicle Make and Model TOYOTA (cont)	Year	Term Config.	OEM	Premium
Corolla	2002-01/2006		40B19LS	NS40ZALMF
Corolla	02/2006-07		55B24LS	NS60ALMF
Corolla Sportivo (Sth African Build)	05/2003-04/2006		22NF-330D	N39/40MF
Corona	1964-82		22NF-330D	N39/40MF
Corona	1983-87		40B19LS	NS40ZALMF
Cressida	1964-82		22NF-330D	N39/40MF
Cressida	1983-93		22F-520	N54MF
Cressida	1994-		55D23L	55D23LMF
Crests (super customer)	1990		55D23L	55D23LMF
Crown	1964-70		22NF-330D	N39/40MF
Crown	1971-88		22F-520	N54MF
Echo	10/1999-10/2005		55B24RS	NS60AMF
Hi Ace Petrol	1974-08/1998		22FR-520	N50MF
Hi Ace Petrol Inc Commuter Bus	09/1998-		55D23R	55D23RMF
Hi Ace Diesel	09/1998-09/2000		90D26R	N52MF
Hi Ace Diesel	10/2000-		95D31R	N70ZZMF
Hi Lux Diesel	1984-11/1997		55D23R	55D23RMF
Hi Lux Diesel	12/1997-04/2005		95D31R	N70ZZMF
Hi Lux Diesel	05/2005-		95D31L	N70ZZLMF
Hi Lux Petrol 2.7L	1997-04/2005		55D23L	55D23LMF
Hi Lux Petrol	1984-95		55D23L	55D23LMF
Hi Lux Petrol V6	05/2005-		90D26L	N53MF
Kakadu	2009-12		95D31L	N70ZZLMF
Kluger	2004-12		90D26L	N53MF
Landcruiser(HZJ 105 Series)	2000-		95D31L	N70ZZLMF
Landcruiser Diesel	1974-95		95D31R	N70ZZMF
Landcruiser Diesel 100 Series	03/1998-05/2001		95D31L	N70ZZLMF
Landcruiser (FZJ-105R Series	1999		90D26L	N53MF
Landcruiser (HDJ-80R) Turbo Diesel	1991		90D26L	N53MF
Landcruiser (HDJ-100R) Turbo Diesel (x2 Bat)	06/2001-		95D31R /L	N70ZZMF / N70ZZLMF
Landcruiser 200 Series V8 Turbo Diesel (x2)	11/2007-		95D31R /L	N70ZZMF / N70ZZLMF
Landcruiser 200	2010-		95D31L	N70ZZLMF
Landcruiser Petrol FJ45	01/1979-12/1984		22FR-520	N50MF
Landcruiser Petrol F	1984-96		95D31R	N70ZZMF
Landcruiser Petrol 100/105 Series	1997-		95D31L	N70ZZLMF
Landcruiser Petrol V8 (UZJ100R)	03/1998-		90D26L	N53MF
Landcruiser Prado	1996-2002		55D23L	55D23LMF
Landcruiser Prado	2003-		90D26L	N53MF
Landcruiser Prado	03/2000-			
Landcruiser Prado Diesel	02/2003		95D31R	N70ZZMF
Landcruiser Prado Diesel	03/2003-		95D31L	N70ZZLMF
Landcruiser 80 Series	1995-97		95D31L	N70ZZLMF
Levin (Corolla)	1999		40B10L	NS40LMF
Lexcen	1989-96		90D26L	N50MF
Lite Ace	1980-92		40B19LS	NS40ZAMF
MR2	1987-12/1999		22NF-330D	N39/40MF
MR2	10/2000-		55B24LS	NS60ALMF
Noah	2002		55D23L	55D23LMF
Paseo	1991-96		22FR-520	N50MF
Paseo	1997-		55D23R	55D23RMF
Prado 4 Cyl + V6	1996-		90D26L	N53MF
Prado 3000 Turbo Diesel	2000-		95D31L	N70ZZLMF
Prius	06/2009-		55B24LS	NS60AMF /
Prius / Prius Taxi Small Post	07/2009-		55B24R	NS60MF / OPTIMA
Rav4	1996-09/2003		55B24LS	NS60AMF
	10/2003-			

Application Guide

Passenger Cars & 4WD

Vehicle Make and Model TOYOTA (Cont)	Year	Term Config.	OEM	Premium
Rav4	01/2006		55D23R	55D23RMF
Rav4	02/2006-		55D23L	55D23LMF
Rav 4 CV6	10/2007-		90D26L	N53MF
Rukus	05/2010-		55D23L	55D23LMF
Sahara	2003-2011		95D31L	N70ZZLMF
Sahara V8 Diesel	2011-12		95D31L	2 X N70ZZLMF
Spacia Van 2.0 Ltr	1995-96		22FR-520	N50MF
Spacia Van 2.0 Ltr	1996-98		40B19R	NS40MF
Soarer	1992-		55D23L	55D23LMF
Sprinter	1983-87		22F-520	N54MF
SR5 (140 Series diesel)	1999		95D31R	N70ZZMF
SR-5 Turbo Diesel -140 Series	1999		95D31R	N70ZZMF
Starlet	1996-06/1997 07/1997-		40B19RS	NS40ZAMF
Starlet	10/1999		55B24RS	NS60AMF
Supra	1983-87		22NF-330D	N39/40MF
Supra	1988-92		22F-520	N54MF
Surf Petrol (2 Batteries)	1990-		22F-520/90D26L	N52MF / N53MF
			95D31R	N70ZZMF
Surf Diesel (2 Batteries)	1990-		95D31L	N70ZZLMF
Tarago	1983-87		40B19RS	NS40ZAMF
Tarago	1988-05/2000 06/2000-		55D23L	55D23LMF
Tarago	05/2003		55B24LS	NS60ALMF
Tarago	06/2003- 11/1983-		55D23L	55D23LMF
Tercel	04/1988		22NF-330D	N39/40MF
Town Ace SBV	1997-		40B19R	NS40MF
Ultima (Corolla)	2000		40B19L	NS40LMF
	10/1995-			
Vienta	10/2000		55D23L	55D23LMF
Yaris	11/2005-		55B24LS	NS60ALMF
TRIUMPH				
2500S/TC	1971-76		22NF-330D	N39/40MF
Dolomite / Sprite	1975-78		22NF-330D	N39/40MF
Herald All Models	1959-75		22FR-520	N50MF
Spitfire All Models	1959-75		22FR-520	N50MF
Stag	1973-78		22FR-520	N50MF
TR2 to TR7	1954-82		22FR-520	N50MF
Triumph 2000 All Models	1975-78		22NF-330D	N39/40MF
VOLKSWAGEN				
1300 12 Volt	1969-70		54316 / 55457	N36MF / N55MF
1300 6 Volt	1963-69			N03
1500 12 Volt	1969-70		54316 / 55457	N36MF / N55MF
1500 6 Volt	1963-69			N03
1600 12 Volt	1969-70		54316 / 55457	N36MF / N55MF
1600 6 Volt	1963-69		60038	N03
9C	1999		55457	N36MF / N55MF
Amarok TDI	02/2001-		56219	DIN100MF
Beetle Petrol	01/2000-09/2005		574.035	N55MF
Beetle Petrol	10/2005-		56219	N55HMF
Beetle TDI Diesel	10/2005-		55457	N66HMF
Bora (4 & 5 Cyl)	2000		56318	N55HMF
Bora V5	2002-		574.035	N55MF

Application Guide

Passenger Cars & 4WD

Vehicle Make and Model VOLKSWAGEN (Cont)	Year	Term Config.	OEM	Premium
Caddy	02/2005-11/2010		54316 / 55457	N66MF
Caddy	12/2010-		55457	N66HMF
Caravelle	1982-87		56318	N36MF / N55MF
Caravelle	1988-97		55457 / 56318	N55MF
Caravelle (see transporter)	2001-		574.035	N66MF
Caravelle 2.5 Ltr	1998		574.035	N55MF / N66MF
Crafter	03/2007-		55457	N66HMF / DIN100MF
EOS Convertible	03/2007-		574.035	N66HMF
Golf	2002-		56219	N55MF
Golf GT	05/2007-		56219	N66HMF
Golf Generation	06/2003-07/2004		56219	N55HMF
Golf GTi	05/2005-09/2009		574.035	N55HMF
Golf GTi	10/2009-		574.035	N55HMF
Golf R	06/2010-		56219	N66HMF
Golf TDi	08/2004-		574.035	N66HMF
Golf TSi	03/2009-01/2010		56219 / 56318	N55HMF
Golf TSi	02/2010-		54316 / 55457	N66HMF
Golf Diesel	1978-82		56219 / 56318	N55MF / N66MF
Golf Petrol	1975-82		56318	N36MF / N55MF
Golf Petrol	1990-12/2002			N55MF / N66MF
Golf VI Petrol/Diesel	2008-		LN3	AGM66
Golf VI Variant Diesel	2009-		LN3	AGM66
Jetta	02/2006-		54316	N66MF
Karmann Ghia 6 Volt	1960-1970		22F-520	N03
Karmann Ghia 12 Volt	1960-1970		22F-520	N36MF
Kombi	1974-87		54316 / 55457	N54MF
Micro Bus	1974-83		55457	N54MF
Parsal late model (Stop Start)			LN3	
Passat Turbo 3B Series	03/1998-04/2001		54316 / 55457	N36MF / N55MF
Passat Diesel	1975-83		58014	N55MF
Passat Petrol	1974-78		58014	N36MF / N55MF
Passat 1.8T	05/2001-10/2002		574.035	DIN77LMF
Passat V6	05/2001-07/2004		55457	DIN77LMF
Passat CC	02/2009-		574.035	N66HMF
Passat GL & VR6	1997		574.035	N55MF
Passat Fsi Turbo	04/2006-		56638	N66HMF
Passat Diesel	08/2009-		56638	N66HMF
Polo	1997		56219	N55MF
Polo 1.4 Petrol	11/2010-			N36HMF
Polo 1.9 TDi Diesel	11/2005-			N55HMF
Polo Tsi	05/2010-		55066	N36HMF
Polo GTi Petrol	2010-		LN3	AGM66
Transporter	1997		55457 / 56318	N55MF / N66MF
Transporter	1997/2003		55457	N55MF
Transporter 1.9 2.0 2.5 DUAL WB	2004		56318	N66MF
Transporter	2004/2005		58014	DIN77LMF
Tiguan	08/2008-		56219	N55HMF
VR6	1999-		55457	N55MF
Touareg 7la Diesel	2004-2006		LN5	AGM100
Touareg 7l6 Diesel	2006-2008		LN5	AGM100

Application Guide

Passenger Cars & 4WD

Vehicle Make and Model VOLVO	Year	Term Config.	OEM	Premium
1800,142,144,145,164 Series	1962-75		22FR520	N50MF
240, 242, 244, 245 Series	1975-86		90D26R	N52MF
240, 242, 244, 245 Series	1986-91		56318	N56MF
260 Series	1975-86		90D26R	N52MF
360 Series	1984-87		54316	N36MF
440 Series	1993-95		55457	N55MF
740, 850, 940, Series	1985-97		55457	N55MF
760, 940 Series	1983-95		55457	N55MF
C70	2001-Onwards		56318	N66MF
C70 Coupe	1996-Onwards		55457	N55MF
Cross Country Stn Wagon	2000-Onwards		56318	N66MF
S40, S60	2000-Onwards		56318	N66MF
S40 2.4i, 2.4SE	2004		55457	N55MF
S40,S70	1996-Onwards		55457	N55MF
S80 Coupe, S90	1997-Onwards		56318	N66MF
V40	1996-Onwards		55457	N55MF
V70	1997-Onwards		56318	N66MF
XC60	2009-2011		5663A	66HMF
XC90 Diesel	2003-Onwards		60038	DIN100MF
XC90 Petrol	2003-Onwards		56318	N66MF
C30 Petrol	2006-		LN3	AGM66
C30 Diesel	2006-		LN3	AGM66
C70 Diesel	2006-		LN3	AGM66
XC60 Petrol	2006-		LN3	AGM66

Technical Information



Independent Battery Distributors






FORKLIFT - SEALED - STATIONARY - SOLAR BATTERIES - CAR - TRUCK - DEEP CYCLE - MARINE

Technical Information

1. Introduction

The Technical information section provides essential information on the operation, characteristics, design, handling and charging of lead-acid batteries as well as the correct procedures for using, stocking and maintaining batteries for road vehicles, in addition to providing information on the main areas of care needed to be taken for the safety of staff who work with IBD batteries, so as to get the most from our products and for customer satisfaction.

1.1 Safety Warnings and Standards

	Observe the information on the battery, the battery's operating manual and the vehicle's operating manual.
	Wear eye protection as a precautionary measure when working on the battery.
	Keep acid and filled batteries out of reach of children. Keep out of reach of children when working on the battery.
	<p>Fire, sparks, naked flames and smoking are prohibited:</p> <ul style="list-style-type: none"> * Avoid creating sparks when handling cables and electrical equipment as well as those caused by electrostatic discharge. * Avoid short-circuits. Never connect the positive terminal to the negative terminal of the same battery because it will cause a short circuit. A short circuit can cause burns, fire or the explosion of the battery. * Clean with damp cloth only and wear appropriate clothing. Dry cleaning cloth might become electrically charged and produce sparks.
	<p>Danger of explosion:</p> <ul style="list-style-type: none"> * An explosive oxyhydrogen gas mixture is formed when batteries are charged. Explosive gases can cause blindness and injury.

Technical Information Cont.

1.1 Safety Warnings and Standards



Corrosive hazard:

- * Battery acid is extremely corrosive. The acid can cause burns and blindness. Under normal operation conditions, there should be no contact with the electrolyte (diluted sulphuric acid). Please note that when the casing of a battery with fixed electrolyte is destroyed or damaged, bound electrolyte in glass fibre mats or jellified electrolyte is as corrosive as when liquid.
- * Wear protective gloves and goggles.
- * Do not tilt the battery permitting acid to



First Aid:

- * Acid coming into contact with eyes should be rinsed for several minutes using clear water. Then consult a doctor without delay.
- * Acid on the skin or clothes should be neutralized immediately using acid neutralizer or soap suds and rinsed with plenty of water.
- * If acid is swallowed, drink plenty of water and consult a doctor immediately.



Warning:

- * The enclosure becomes brittle with time, therefore: Do not expose batteries to direct sunlight.
- * Discharged batteries can freeze so store in a place where they are protected from frost.
- * It is dangerous to use tools such as hammers on the battery terminals when connecting cables.
- * Never rub with dry cloth on the battery casing. This might produce sparks because of electrostatic discharges and can cause an explosion



Disposal:

- * Dispose old batteries at a battery collection point.
- * Never dispose old batteries as household waste.
- * If a battery with glass fibre materials is destroyed or damaged, the released fibre material must be disposed in line with the official regulations.
- * Do not let electrolyte penetrate into the sewerage system, the soil or into groundwater.



Corrosive hazard:

- * The item is hazardous according to the criteria of Work Safe Australia.

Technical Information Cont.

2 Battery Recharging Procedure.

2.1 Battery Charging Indicators

Charging of the battery is required when the:

- * Storage period is 3 months for accessible batteries, 6 months for MF batteries less time for batteries stored over 25°C and can be discharged within a shorter period in extreme circumstances.
- * Colour of state of charge (SOC) indicator turns black.
- * Battery operating current voltage (OCV) is less than 12.4V.

2.2 Steps Prior to Charging

- * Wear protective glasses whilst handling the battery.
- * Do not carry out charging near fire or spark.
- * Do not charge damaged or frozen battery.
- * Boost charge is not recommended.
- * If the battery has accessible screw-in plugs, check the electrolyte level in each cell and top up with distilled water to just cover the plates. Then after charge top up.
- * Do not switch on the charger until battery has been connected. Do not switch off the charger until charging is complete.
- * Position the batteries so that there is a space of at least 20 mm between them.
- * Only use batteries with the same capacity and same state of charge in the same circuit. This prevents the slightly discharged batteries from being overcharged when connected to the same circuit as a battery that needs a longer time to recharge.
- * Batteries must always be connected in series, that is, the positive pole of a battery should be connected to the negative pole of the neighbouring battery, thus the positive pole of the first battery and the negative pole of the last battery will always be open.
- * All of the batteries for recharging should have their density and/or open voltage checked, so that the batteries could be grouped (based on state of charge) for the purpose of placing them in the right circuit for the recharging process.

Warning: Never connect the positive pole to the negative pole of the same battery or in the same series, as this will cause a short circuit.

Check that the connections (lugs) make good contact by twisting them slightly while pressing them onto the pole.

2.3 Recharging with a Constant Current

When charging the battery with a constant current, the voltage will increase slowly during the recharging. Towards the end, the voltage increases rapidly and the process should be stopped at the voltage value limit.

Example: 45Ah battery.

Recharging Current: $45 \times 0.1 = 4.5\text{A}$ (10% of the nominal capacity of the battery).
The recharging time depends on the state of charge of the battery.

Technical Information Cont.

OCV in stable condition	State of charge	Battery capacity (200Ah)					
		35-40	41-50	51-65	66-75	76- 90	91-110
12.5 - 12.59	70%	3x4	4x4	5x4	6x4	6x5	7x5
12.4 - 12.49	60%	3x6	4x6	5x6	6x6	6x7	7x7
12.3 - 12.39	50%	3x8	4x8	5x8	6x8	6x9	7x10
12.2 - 12.29	40%	3x10	4x10	5x10	6x10	6x12	7x12
12.1 - 12.19	30%	3x13	4x12	5x12	6x12	6x14	7x15
Below 12.09	20%	3x15	4x14	5x14	6x14	6x16	7x17

Warning: The battery temperature must not exceed 50°C during the recharging process.

Note:

- * The above table shows approximate Ah and charging hours needed for recharging according to the battery capacity and the OCV under a constant current charging method. Accordingly, the Ah or the charging hours may be adjusted depending on the type and the state of the charged battery.
- * Always charge the battery according to the amount of charge needed. Prolonged charging times, especially with a constant current, could cause the battery to become overcharged, causing an unnecessary loss of water in the process.
- * Avoid quick charges that are done without controlling the temperature, current or time.
- * Some batteries below 12.1V can be hard to recharge due to the long time elapsed since the last re-charge. It is very difficult to recover its original performance.

2.4 Recharging with a Constant Voltage.

When using this charging method, the initial current applied to the battery should be limited to 25A and the voltage to 14.4V.

The battery charging time will vary according to its state of charge, as shown in the table below:

Battery voltage when empty (volts)	Recharging Time (hours)
12.00 to 12.20	6 to 12
11.80 to 11.99	10 to 16
11.50 to 11.79	16 to 20
11.00 to 11.49	20 to 24
Deeply discharged batteries	24 to 30

Warning: the battery temperature must not exceed 50°C during the recharging process.

Technical Information Cont.

2.5 Action During and After Recharging

* Electrolyte Temperature

The electrolyte temperature, hence the battery container temperature must not exceed 50°C. The recharging process should be stopped if this temperature is exceeded.

The process may be resumed once all batteries in the recharging circuit reach 45°C or less.

* Recharging Time

We recommend waiting approximately 20 minutes to allow gases to dissipate before removing the leads from the batteries, as some batteries remain in a charged state and can generate sparks. Replace the vent caps and gas tubes, if they were removed. Wash the battery using warm water and dry it.

3. Battery Usage and Defects

3.1 Jump Start

When performing a jump start using jumper cables, there can be bursts of high voltage when connecting the cables. If the vehicle's electrical system is not protected against such surges, they can cause damage to sensitive electronic components, like the ABS system, the airbags control units, etc.

Please follow the vehicle manufacturer's operating instructions!

* Do not attempt to jump start a damaged battery.

* When giving starting aid with jumper cables, high voltage peaks of several hundred volts can occur when connecting the cables. If the vehicle electrical system is not protected from these peaks, they can damage sensitive electronic components.

* Only use standardized battery jumper cables. Only connect batteries of the same nominal voltage.

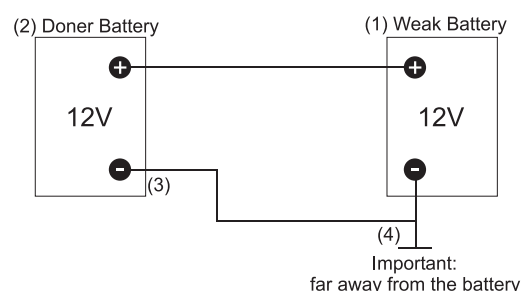
* Before giving starting aid, try to figure out the reason for the battery weakness. If the reason is a failure in the vehicle electrical system, starting aid should not be given. The battery or the electric system of the vehicle giving starting aid might become damaged.

* **Warning:** Always protect your eyes and hands from the battery.

How to do it: 4 easy steps

1. Turn off both vehicle engines.
2. Connect the positive terminals (1) and (2) and then connect the charged battery's negative terminal (3) with a bare metallic point (4) away from the battery of the vehicle requiring assistance.
3. Start the engine in the vehicle providing assistance, followed by the engine in the vehicle requiring assistance for a maximum of 15 seconds.
4. Disconnect the cables in reverse order (4-3-2-1). Use only standard jumper cables for connecting the batteries. Connect only batteries with the same nominal voltage.

Caution: Before performing a jump start, try to find out what caused the battery failure. If the cause was a fault in the electrical system, do not jump start. The battery or the electrical system of the vehicle providing the jump start could be damaged.



Technical Information Cont.

3.2 Battery Installation and Removal

Modern vehicles are equipped with sensitive electrical system such as airbag controllers, ABS, stability and traction control units, onboard computers, etc. For some vehicles, it is necessary to follow certain procedures in order to install or take the battery out of service. For example, the electrical components may require resetting after they have been turned off.

Please follow the vehicle manufacturer's operating instructions!

1. Switch off the engine and all electrical equipment before installing or removing the battery.
2. Install only batteries that are fully charged and undamaged.
3. Install the type of battery recommended for the particular vehicle.
4. Avoid causing short-circuits with tools or cables. After having installed the battery in the vehicle, remove the covers from the terminal poles just before connecting the cables to the terminals.
5. For removing, disconnect the negative terminal (-) first and then the positive terminal (+). Before installing the battery, clean the surface inside the vehicle. Fix the battery safely and securely. If the battery is not securely installed, it will be subjected to a larger degree of vibration which can reduce its service life. Friction between the battery container and the support area can cause damage and wear to the container. Also, the container can rupture, causing the electrolyte to leak out.
6. Clean the battery terminals and its lugs. Lubricate them lightly with acid-free grease. When installing, connect the positive terminal (+) first, then the negative terminal (-). Check that the terminal lugs are firmly in place. Make use of the accessories from the previous battery such as hose connections, terminal supports and covers for terminals. Use the top-up caps supplied.
7. At least one vent must remain open to avoid the risk of an explosion.

3.3 Taking the Vehicle out of Service

When a vehicle is taken out of service (for example, when it is used only seasonally), charge up the battery and store it in a cool place. If it is necessary to leave the battery in the vehicle, disconnect the negative terminal. Check the OCV of the battery every two months. If the OCV is below 12.4V, recharge the battery. Ensure you check with the vehicle manufacturer if it is OK to disconnect.

3.4 Technical Information on Battery Problems

3.4.1 Manufacturing Defects

Short Circuit / Dead Cell / Minor Faults

If a battery has a service life that is less than 12 months, the problem is usually caused by a dead cell, that is, one of the cells has a density value that is much lower than the others. The affected cell bubbles visibly during the high-discharge test. To evaluate the density, a high-discharge test should be carried out. In some cases, the dead cell may be visible in the form of a sulphated cell.

Internal Breakage

The battery has good density values, but the voltage across the terminals cannot be measured.

Technical Information Cont.

3.4.2 Mishandling and Warranty Exclusion

The following technical problems are caused by mishandling the battery. Such cases are not subject to warranty.

Low State of Charge

A low state of charge is the first stage of deep discharge. With a low state of charge, the active material will not have sustained any damage.

The battery can still be charged with a standard charger.

The causes of a low state of charge are:

- * A defective alternator.
- * A low voltage output from the regulator.
- * High contact resistances caused by loose cable connections or dirt on the cable terminals.
- * Slack drive belts.
- * Insufficient engine running time due to short journey times.
- * Subsequent addition of electrical equipment.
- * Defective equipment causing continuous discharge.

Deep Discharge

A battery suffers a deep discharge when its capacity is totally used up. The longer the battery remains in this state, the greater will be the damage done to the active material. The plates begin to suffer sulphation and recharging becomes impossible. This damage is irreversible.

Possible causes of deep discharge are:

- * See 'Causes of Low State of Charge'
- * Headlights or other electrical equipment are not switched off.

A battery in a good state of charge will usually have a load-free voltage >12.6V. Therefore, the voltage without charge for each cell is about 2.1V. If there is a short circuit in just a single cell, this will result in a reduction of about 2.1V of the terminal voltage, which would be a typical 'short-circuit' voltage of 10.5V. The likelihood of two cells within the same battery having a short circuit is very low. In the case of two cells with short circuits, the OCV drops by 4.2V to a value of 8.4V. In order to exclude the effects of long shipment and storage times on the terminal voltage, as well as the possibility of two cells with short circuits etc., only batteries with a load-free voltage lower than 09.98 volts are regarded as deeply discharged and a claim on warranty will be rejected.

Sulphation

If a battery is left in a discharged state for an excessive period of time, there will be a chemical reaction known as sulphation, which will certainly compromise its performance. During the discharge process, lead sulphate is generated on the positive and negative plates and distributed evenly among them. The longer the battery is left in a discharged state, the more the small sulphate crystals grow into larger crystals and it becomes very difficult to convert these back into lead dioxide. Sulphation can become visible in the form of a white/grey layer on the plates. In most cases, this damage is irreversible and the battery cannot be used anymore.



Figure 1 - Picture of battery with deep discharge and sulphation

Technical Information Cont.

Sulphation can either occur during storage or if the battery is installed in a vehicle (or equipment) that is not used for a long period of time. While in a vehicle, the battery is constantly drained by the clock, the alarm system, etc., resulting in a decrease in the level of charge of the battery and, after a certain period of time, sulphation of the plates. However, even a disconnected battery undergoes sulphation due to self-discharge.

The causes of sulphation can be summed up as follows:

- * There is an excessive lapse of time between one recharging and the next.
- * An engine starter battery is used for "deep cycles". This type of battery is not resistant to deep discharges.
- * The battery is undercharged or the charging and adjustment of level is carried out incorrectly.
- * Low electrolyte level: a battery plate exposed to air starts to experience sulphation immediately.

Sulphation (lead sulphate) impedes the chemical reaction between the acid (electrolyte) and the active material (made up of lead) on the plates and it prevents normal operation of the battery. Even after recharging, the voltage will be low ($<12.4V$), but usually the cells will show equal values. Sulphation is not a manufacturing defect.

Acid Stratification

Acid stratification is a common cause of battery failure. In a stratified battery, the electrolyte is concentrated at the bottom and the top half of the cell has very little acid. Stratification takes place when the battery is kept with low charge (below 80%) and is never fully recharged. Short journeys that include the use of the windscreen wipers and electric heaters contribute to this phenomenon. Acid stratification reduces the general performance of the battery.

Figure 2 shows a normal battery in which the acid is distributed evenly from top to bottom. This battery has a good performance because the correct concentration of acid is distributed evenly over the plates. Figure 3 shows a stratified battery in which the acid concentration is light at the top and heavy at the bottom. A light acid limits the plate activation, speeds up corrosion and reduces the performance. On the other hand, high acid concentration at the bottom artificially increases the open circuit voltage. The battery seems to be fully charged, but it delivers low starting power. High acid concentration also results in sulphation and further reduces the already low conductivity. If this condition goes undetected, it will ultimately result in battery failure.



Figure 2- without acid stratification



Figure 3- with stratification

Overcharging

Overcharging is often caused by an unsuitably high temperature in the engine compartment. Other than this, a defective voltage regulator is often another cause of overcharging. A high level of corrosion, loose particles of positive active material, damaged active material and high water consumption are characteristics of overcharging.

A low level of electrolyte and a black layer on the filler caps are usually evidence for an overcharged battery. Excessive water consumption leads to an increase in electrolyte density. Also, a high temperature results in a lower internal battery resistance, causing an increase in the charge current and this increases the effect of overcharging.

Technical Information Cont.

Physical Damage

The battery container and the terminals will suffer obvious damage if the battery is installed incorrectly, if the cables are wrongly connected or if the cables are hammered incorrectly into the terminals.

In addition, if the terminal poles are melted, this indicates that the battery has had a short circuit or loose terminals including the terminal connection on the engine.

(Figure 4)



Figure 4- melted battery terminal

Incorrect Application

Batteries recommended by IBD match or exceed the original equipment specifications. Choosing a battery of lower capacity or power will result in a shorter service life and premature battery failure. Usually, the result is a low charge level together with the effects described above.

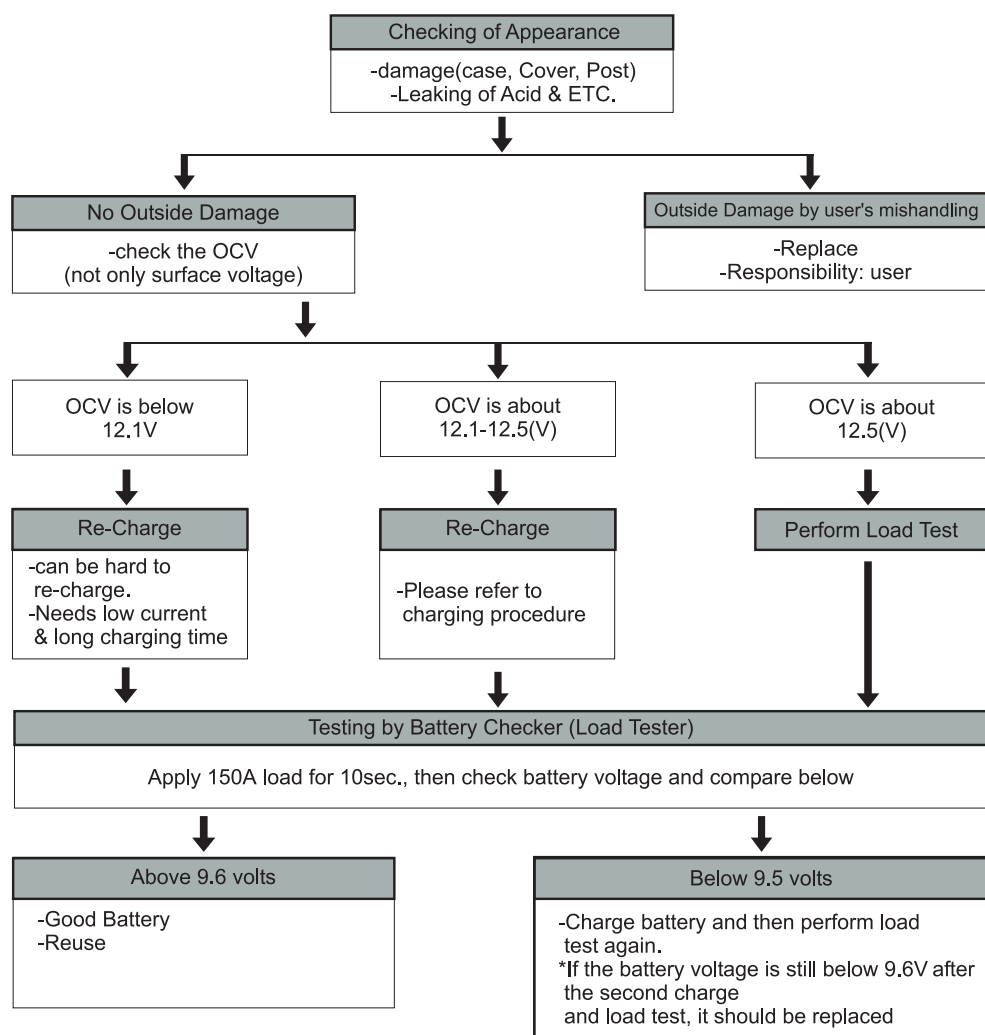
Wear and Tear

During the charging and discharging cycle, the battery plate material (active material) moves about due to the electrochemical processes occurring. Every time that the battery undergoes a charging or discharging cycle, a small amount of active material comes loose from the plates. This normal ageing process, caused by the charging and discharging cycle, results in a loss of battery capacity and ultimately, the loss of its capacity to start the vehicle or power its equipment.

A battery has a finite number of cycles that it undergoes before losing its capacity. Vehicles that do a large number of short journeys, such as taxis, mini cabs, trucks and buses, reach the maximum number of cycles in a shorter time than vehicles that do longer journeys. As a result, the batteries used in these types of vehicles may exhibit the above mentioned symptoms earlier than expected.

Technical Information Cont.

3.5 Checking for Malfunction by Load Tester



4. Inspection, Storage and Stacking

4.1 Inspection on Receipt of Goods

Before unloading the consignment of batteries, please check the details on the invoice against the goods delivered and your order details.

Check:

- * The battery type.
- * The quantities.
- * Damaged batteries, batteries that were not transported in a horizontal position or those with leakage of electrolyte, should be rejected and sent back to the supplier, at the carrier's expense.

After unloading and before stocking the batteries, check:

- * The age of the battery, calculating this from its date of manufacture.
- * The open circuit voltage.
- * Do a visual inspection (container, cover, terminals, charge indicator, colours, and labels).

Technical Information Cont.

4.2 Storage

The batteries should be stored in a horizontal position on wooden pallets or rack (not tilted). Do not place them directly onto the ground, because small stones or sharp edges on the concrete floor can damage the battery container and cause leaks.

Batteries should be stored in a dry place and must not be exposed to direct sunlight. The storage temperature should be between 10C and 35C. Storage temperatures that are higher than this will result in greater water consumption, corrosion and self-discharge. The storage temperature must not exceed 35C. The maximum period for storing decreases when batteries are stored at high temperatures.

4.3 Stacking

In order to avoid scratches and damage of labels, do not store unpackaged batteries on top of the other.

Always ensure that the instructions for stacking batteries are followed. Batteries up to 75Ah may be stacked in up to 5 tiers; batteries above 90Ah in up to 3 tiers and batteries above 150Ah in a maximum of 2 tiers. Do not remove the plastic shrink-wrapping. Use cardboard or polystyrene as an additional layer between the batteries.

Do not stack batteries with their terminal poles protruding without taking special measures to protect these terminals and to ensure that the stack is stable.

Follow the First in / First out (FiFo) procedure strictly. Following the FiFo procedure means that the first battery stored in stock is also the first battery to leave.

Procedures for Testing Batteries



Independent Battery Distributors

FORKLIFT - SEALED - STATIONARY - SOLAR BATTERIES - CAR - TRUCK - DEEP CYCLE - MARINE

Procedure for testing batteries E&O may apply

1. Inspection

Inspection for obvious problems such as a low electrolyte levels when accessible or utilizing the Eye indicator, with Maintenance Free; loose, corroded or swollen cables, corroded battery terminals or posts; loose hold-down clamps; dirty or wet battery top; or leaking, cracked, bulging or damaged battery cases or terminals.

2. Test Voltage

Refer to General Guideline In Testing Batteries.

3. Electronic test Battery

Use an electronic style test, if within 15% of CCA capacity put back in service. If low refer to General Guideline In Testing Batteries.

Comments. - For Electronic testers, they are a guideline only for CCA ratings and whether fit for application.

4. Charge

Change the battery to 100% State-of-charge if required. Use a specified charger to suit the correct battery. (WET 15.80v, CALCIUM MF 16.20v, AGM14.40v, GEL 14.20v) all require a different peak voltage. Some manufacturers may vary in peak voltages. AGM, GEL must have temperature compensators on the charger to eliminate swollen batteries due to excessive heat from charge.

5. Load test

Using a Carbon Pile Load Tester, Load the battery for the specified CCA rating during the first 5 to 10 seconds. The battery will indicate whether it will pass or fail. The standard time for the testing is 30 seconds to 7.20 volts, however this rating is designed for a manufacturer to test for the first and last battery of each production @ 18.c degrees. To determine whether the production is manufactured within the specifications of the rating of the battery.

Comments: A battery load test, will not give the same reading as when load tested multiple times. Deep Cycle test*

	Warranty adjudication guide	Chances of being a genuine (manufacturing fault)
1.	4 week or under	5% chance
2.	1-6 months	20% chance
3.	6-12 months	10% chance
4.	Over 12 Months	5% chance
5.	Deep cycle - manufacturing fault, well within the first 1-3 months *A true test is a *21 day old battery* -18c degrees* loaded at a current over 20 hours for a min 5 cycles up to 80 cycles depending on accuracy and test required.	

General Guideline in Testing Batteries

E&O may apply

A) 00.00v to 00.90v: **Open circuit / over discharged**, Remove from service.
Warranty only applicable as a result of a post / inter-cell connection failure or a straight manufacturing fault.
Internal examination at a cost is required for warranty. Note refer to *

B) 01.20v to 08.98v: **Incorrectly charged or maintained**. Application fault.
Remove from service No warranty. Minimal chance of recovery. Note refer to *

C) 08.98v to 9.98v : **Possible over-discharged or shorted**. Remove from service.
Recharge and re-test. Minimal chance of recovery and being covered under warranty. Note refer to *

D) 09.98v 10.98v: **Possible broken inter-cell connector or straight short**. Remove from service. Possibly covered under warranty, unless evidence exists of excessive use, incorrect charging or negative growth both of which not covered under warranty. Must be within w/period.

E) 10.98v to 12.55v: **Possible flat need recharge and retesting**. Flat batteries are not covered under warranty.

F) 12.55v to 12.75v: **Fully Charged**, if major straight short, failure under load remove from service, warranty applies if within specified warranty period.

Comments Major Low CCA is not normally covered under warranty. There are many reasons for low CCA. Incorrectly charged, sulphated, excessive use, negative growth, etc. (Electronic battery testing may suggest to replace battery and it states the battery is not fit for starting your vehicle). This does not necessarily mean it's a manufacturing fault and covered under warranty. The magic eye is only an indicator, if the battery is charged or not. This test has up to 30% variance and should only be used as a quick guide.

G) 12.75v to 13.00v: Low CCA at these voltages are normally an indicator of the battery being Sulphated and therefore not covered under warranty. Low CCA is normally not a manufacturing fault and more than often an application or customer fault. Many factors may vary the output of the battery. Using an electronic battery tester is one method of quick testing and should only be used as an initial indicator as charging / discharging and load-testing may be required.

*in particular cases internal examinations are the only way to determine the actual fault, but are costly and time consuming and should only be performed by a battery specialist. Generally the application determines why the battery has failed.

—

|

|

—

—

|

|

—

Battery Safety and Troubleshooting



Independent Battery Distributors

FORKLIFT - SEALED - STATIONARY - SOLAR BATTERIES - CAR - TRUCK - DEEP CYCLE - MARINE

Battery Safety

Lead acid batteries generate explosive gases. Keep sparks, flames and lighted cigarettes away from the battery. When charging or using the battery in confined spaces, provide ample ventilation. Lead acid batteries contain sulphuric acid as electrolyte. Use extreme care when handling acid. If electrolyte contacts the skin, wash with large amounts of water and neutralize with solution of baking soda and water. Should electrolyte contact the eyes, flush immediately with large amounts of clean water and seek medical advice.

Always shield eyes when near batteries. When charging batteries never work in a closed room. Always turn battery charger or ignition off before disconnecting a battery.

Trouble Shooting

No response when ignition key is turned to start.

Check for loose, dirty or corroded terminals. Check for excessively low electrolyte levels. Check age of battery (batteries typically have a life span of 2-3 years in normal running conditions). Have vehicle ignition checked by a qualified technician.

If a maintenance free battery is applicable.

Inspect the "Check-eye" and compare to the colour chart. This should always be either green or blue in colour.

Battery requires constant topping up of electrolyte.

This is a common symptom that the vehicle is overcharging the battery (have a qualified technician check the charging system). Excessive under bonnet temperatures can also be a cause of electrolyte loss. Overcharging or excessive heat can cause premature battery failure.

Vehicle motor cranks slowly.

Check for loose, dirty or corroded terminals. Check that no electrical drain is present (eg: lights left on). This can also indicate that battery is losing capacity as it nears the end of its useful life.

Frequently Asked Questions



Independent Battery Distributors

FORKLIFT - SEALED - STATIONARY - SOLAR BATTERIES - CAR - TRUCK - DEEP CYCLE - MARINE

Frequently Asked Questions

Q - What is the difference between a cell and a battery?

A - The smallest electrochemical unit of a battery is called a cell. The cell does not have a complete container or contacts ready for use and is usually connected to neighbouring battery cells by means of soldered contacts.

Unlike a cell, it is easy to recognize a battery by its completed container that is equipped with contacts that are ready for use. Additionally, the container bears the manufacturer's name clearly printed on it, the name of the type, the battery voltage, etc.

Q - How is the battery constructed?

A - A 12V starter battery contains six individually separated cells that are connected in series in a polypropylene container. Each cell contains an element (cell package) that is made up of a set of positive and negative plates. In turn, these sets comprise lead plates (lead grid and active material) and micro-porous insulation material (separators) between the plates with opposite polarities. The electrolyte is diluted sulphuric acid. It permeates the pores of the plates and the separators and fills up the voids in the cells. The terminals, the cell connectors and the plate connections are all made of lead. A thermal sealing process is used to permanently bond the battery to its container, providing a superior quality seal for the battery.

Q - What is the electrolyte?

A - The electrolyte is diluted sulphuric acid that permeates the pores of the plates and separators. It fills up the voids in the cell. The sulphuric acid component is responsible for turning pure water conductive so that it can be used as electrolyte.

Q - What happens when a battery becomes discharged?

A - If a device (for example, a lamp) is connected to the terminals of a lead-acid battery, the difference in power between the poles results in a flow of electrons leaving the negative pole and flowing through the device and on to the positive pole.

This flow of electron transforms the lead dioxide on the positive plate and the spongy lead on the negative plate into lead sulphate. This chemical process consumes the sulphuric acid and yields water. The specific gravity of the electrolyte is thus decreased and it is because of this that the state of charge of the battery can be determined, by measuring the specific gravity of the electrolyte.

Q - What happens when a battery is charged?

A - When a battery is being charged, the flow of electrons and the chemical process that occur during discharge are reversed. The result of the charging process is that the lead sulphate that is formed during the discharge process is once again converted into lead dioxide, lead and sulphuric acid and this restores the necessary chemical energy that will be converted into electrical power during future use.

An optimum charge voltage is important for charging a battery. If the voltage is too high, the water will be electrolysed. This reduces the electrolyte level over a period of time. If the voltage is too low, the battery cannot be adequately charged and this can also reduce its service life.

Q - What are the consequences of a short circuit in the battery?

A - An external short circuit can occur if the battery terminals are connected by any type of conductive material. Depending on the battery system, a short circuit can have serious consequences. Lead-acid batteries are very powerful and a short circuit can cause burns, fires or an explosion of the battery.

Never connect the positive pole of the battery to its negative pole. When installing the battery, or when attaching the connecting cables to the battery poles, take all necessary measures to avoid short-circuits caused by tools or other conductive materials.

Q - What does the abbreviation OCV mean and what does it tell me concerning the battery?

A - OCV stands for Open Circuit Voltage - the voltage in an open circuit. Other common terms are 'off-load voltage' or 'voltage without load'. As the name indicates, OCV is the voltage measured between the two poles of the battery when the battery is not under load (no current consumption).

The OCV changes on completion of the charging or discharging process due to the effects of polarization and diffusion. The battery should be set aside, in a state of rest, sometimes up to a few days, until it reaches a stable state. If the OCV is measured shortly after a charging or discharging process, it will not be possible to obtain a correct value for the state of charge.



Frequently Asked Questions

Q - What is meant by battery capacity?

A - The capacity is the amount of electrical power that a battery can deliver under specific conditions. It is the product of the current and the time (ampere-hour, Ah).

The capacity is not a fixed parameter, but depends, among other things, on the following factors:

- * The level of the discharge current (the larger the discharge current, the smaller the capacity that can be used).
- * The discharge process according to time (the capacity will be greater if there is a pause during the discharge than if the discharge process is continuous).
- * The age of the battery (due to the loss of active material from the plates, the Ah capacity decreases when the battery is coming to the end of its service life).

Q - What does cold start performance mean?

A - For a car battery used to supply electrical power to the starter motor, the starting capacity at low temperatures is usually more important than the Ah capacity. Cold start performance is defined according to different norms in different countries. Its value is indicated in amperes.

For example, according to the SAE J537, Normal cold start performance is the maximum amount of current that a battery can produce for 30 seconds at -18°C without falling to 7.2V or below.

Q - What does self-discharge mean?

A - Even if no consumption device is connected to the battery, "it is drained" electrically after a certain period of time since the electrochemical processes cannot be stopped or avoided, as they are part of any battery technology. This is not a phenomenon that is limited only to lead-acid batteries.

The self-discharge rate increases at higher temperatures. Therefore, batteries should be stored in a place with a low temperature .

Due to this effect of self-discharge, the state of the battery should be checked regularly during its storage period (for example, if you decide not to use your vehicle over a certain period of time) as the battery may require recharging and this should be done when necessary, or use a battery maintainer charger.

Q - What is the effect of temperature on the performance of a battery in general?

A - Of all the environmental factors, temperature has the greatest effect on the charge of the battery and its discharge behaviour. The reason lies with the electrochemical reactions that depend on temperatures and occur during the electrode-electrolyte interface, which are regarded as the very heart of the battery. If the temperature drops, the value of the electrode reaction also decreases. If the battery voltage remains constant but the discharge current drops, then the battery power output will also decrease. The opposite effect occurs if the temperature increases, namely, the battery power output will increase.

Temperature also affects the speed of the transport process within the electrolyte and its porous electrodes. A rise in temperature speeds up the transport processes and a drop in temperature slows them down. The charge/discharge performance of the battery may also be affected. The higher the temperature, the greater the rate of self-discharge will be, and vice-versa.

The effects of relative humidity will depend on the battery system. These play a key role in "open" battery systems (in contrast with closed battery systems).

Q - What effect does heat have on the battery?

A - Extreme heat causes the water in the battery electrolyte to evaporate. Additionally, heat speeds up the corrosion of the positive battery grid. In the long term, these conditions will adversely affect the service life of the battery. Avoid using or storing a battery at high temperatures.

Q - Can I use a starter battery for other purposes?

A - Each battery should be used only according to what is recommended for it in order to ensure optimum performance. There are many types of batteries, including starter batteries for cars or trucks, batteries for motorcycles, semi-traction batteries, etc.

They differ one from the other, not just in their external appearance, but also in their internal technology. For example, the layout of the positive and negative grid may differ (thicker/thinner, weaker/stronger grid structures), different lead alloys may be used for the positive and negative grids and different separation materials may be used. So, each battery is optimised for a particular application and may not give full performance if used for another purpose.

Frequently Asked Questions

Q - Why should you not use a starter battery as a power supply source for long periods of time?

- A -** The main task of a starter battery is to supply a high electrical power output for a short period of time, which is what is needed to start a combustion engine. Electrodes with large surface areas are necessary in order to deliver such high outputs of electrical current. This is achieved by using a large number of thin electrodes connected up in parallel.

Performing this cycle on a permanent basis, that is, with a 60% to 80% charge and discharge of the nominal capacity with average currents over a long period of time, can generate strong mechanical forces within the thin battery plates. Such forces can cause a separation of the active material from the electrode grids and result in premature battery wear. Therefore, for a discharge of 60% to 80% of the nominal battery capacity, use special batteries that were designed for the particular type of application.

Q - What is the electrical system of a vehicle?

- A -** Basically, the electrical system of a vehicle comprises an energy storage device (the battery), a device for converting (the generator) and several consuming devices (electrical equipment).

The starter motor (an electricity consumer) starts the engine using electrical power supplied by the battery. When the engine is running, the generator converts mechanical energy into electrical energy and, depending on the revolutions per minute (rpm) of the generator and the amount of electrical equipment connected up, under ideal conditions there will be enough energy to feed all of the consuming devices and charge the battery. If the load demanded by the electrical equipment is greater than the current supplied by the generator, the voltage of the vehicle's electrical system will drop below the battery voltage and cause it to lose its charge.

Q - How does the charging system of a car work?

- A -** The charging system of a modern vehicle comprises two components:
- * **The alternator:** This is a mechanical device that is driven by a secondary belt from the engine. It supplies the continuous voltage needed to recharge the battery while the engine is running.
 - * **The voltage regulator:** This monitors the state of charge of the battery and adjusts the activity of the alternator according to what is needed for charging the vehicle's battery and supplying the power needed to operate the vehicle's accessories.

Q - What do I need to do to install or remove the battery from the vehicle?

- A -** Modern vehicles are equipped with sensitive electrical systems, such as airbag controllers, ABS, stability and traction control systems, onboard computers etc. With some vehicles, it is necessary to follow certain procedures when installing or removing the battery. So, be sure to adhere to the vehicle manufacturer's instructions!

The following steps need to be taken:

- * Switch off the engine and all the other electrical equipment before installing or removing the battery.
- * Install only batteries that are fully charged and undamaged.
- * Install the type of battery recommended for the vehicle.
- * Avoid causing short-circuits with the tools or cables.
- * When removing the battery, disconnect the negative terminal (-) first followed by the positive terminal (+). Before installing the battery, clean the surface of the installation location.
- * Fix the battery firmly in place. If it is not firmly fixed in place, it will be affected considerably by vibrations and this can reduce its service life. Friction between the battery container and its support area can result in wear to the container, causing it to break and the electrolyte to leak out.
- * Clean the battery terminals and the connection terminals. Lubricate them lightly with non-acidic grease to prevent oxidation.
- * When installing the battery, connect the positive terminal (+) first followed by the negative terminal (-). Check that the terminal connections are firm, but do over-tighten them.
- * Use the fittings from the old battery, such as the hose connection, terminal supports and terminal covers.

Frequently Asked Questions

Q - How can I extend the life of my battery?

- A -** 1. The battery surface areas should be kept clean and dry. Otherwise, leakages of current may occur, causing an additional loss of charge. Use only a damp anti-static cloth to clean the battery. Check from time to time that the battery and its terminals are properly in place. Tighten them, if necessary, but do not use undue force so as not to damage the battery or the terminal connections.
2. Batteries should always be kept with the largest amount of charge possible so as to prevent the formation of large lead sulphate crystals. Never store batteries in a discharged or partially discharged state!
3. Check stored charged batteries regularly and recharge them when the acid density falls below 1.20 kg/l or if the open circuit voltage (OCV) drops below 12.4V

Q - Should I add water to the battery?

- A -** No, (100% maintenance-free batteries), require no water replacement during their entire service life (thus they are totally sealed).

Q - How often should I replace my battery?

- A -** The service life of a battery varies from one vehicle to another and it depends on many factors. If the performance of the vehicle's starting system is poor, or if a failure is shown on the dashboard instrumentation, take the vehicle to a workshop to have the electrical system / starter system checked.

If you install additional electrical equipment in the vehicle, such as amplifiers, navigation systems, electrical window openers, etc., be sure to also install a battery with a larger capacity. The original size of the battery suggested by the vehicle manufacturer corresponds to the original equipment of the car. Additional electrical equipment will use up more energy from the battery and this result in a permanent state of low charge if you do not install a larger battery. A permanent state of low charge will result in the reduction of the service life of your battery.

Q - Why doesn't it seem possible to recharge the discharged battery?

- A -** If a battery is stored for a prolonged period in a state of low charge, the grids experience sulphation, a process in which the active material is transformed into white sulphuric acid (an irreversible state). The longer it is left in this state, the more difficult it becomes to recharge the battery. So, recharge any discharged battery as soon as possible.

A battery with deep discharge should be charged with 1/20 of the capacity of the battery. If it does not recharge under these conditions, you will need to replace it.

Any attempt to charge it using a larger current will probably damage it and result in its complete discharge. Recharging a battery with deep discharge using a high-power charger will, at best, have no effect or worse cause permanent damage to the battery.

Q - What kind of problems could arise during use?

- A -** * Low charge level: This is caused by a defective alternator, extremely short journeys or an excess of electrical equipment. Dirty terminals can cause a loss of current. The battery is not fully charged and parts of the active material have become inactive (sulphation).
The consequences are a loss of capacity and reduced starting power.
- * Overcharging: This is caused by a defective voltage regulator. Overcharging results in high water consumption, extreme electrode corrosion and severe damage to the battery.
- * Strong cyclical use: This is caused by numerous discharging and recharging deep cycles. Usually, these charges do not occur under normal circumstances, unless the starter battery is frequently activated in congested traffic with lots of stop-start activity, or when it is used for other purposes, for example in taxis, to operate loading platform on trucks or as a traction battery (there are special batteries for such applications).
- * Wrong size of battery: Choosing a battery with an inadequate capacity for a vehicle results in a larger cyclical charge and damage to the battery. Such damage also results from excessive power consumption by electrical equipment installed subsequently (for example, sound systems, portable telephones, stationary heating, fridges).

Frequently Asked Questions

Q - How can I do a simple check for poor battery operation?

A - Perform the following list of steps, one at a time, to check the state of the battery.

1. **Check the outer surfaces of the battery.** Damage (for example, cracks) to the external surface of the battery can cause leakage of electrolyte which, in turn, results in corrosion of the car. A dirty battery surface can cause discharge. So, keep it as clean as possible. Use only a damp anti-static cloth for cleaning.
2. **Check the charge indicator.** Starter batteries are fitted with a charge indicator. It is a fast and convenient way to get a first impression on the state of charge of the battery.
3. **Measuring the voltage (OCV).** Let the car engine rest for about one hour after switching it off before measuring the voltage. Based on the measured value of the voltage, you can work out the state of charge. The voltage of your battery should be between 12.2V and 12.8V. A voltage that is lower or higher may be an indication that there is a fault in the electrical system of the car or that the battery is damaged. In these cases, have the battery checked at an authorised workshop.
4. **Check the battery using a professional battery testing instrument.** Check with the nearest authorised dealer for more information concerning the state of the battery.

Q - What are some of the causes of battery discharge in a car?

- A -**
- * Forgetting to turn off electrical equipment, for example, fog lights or improperly shut doors that keep the dome light switched on.
 - * The electricity load exceeds the capacity of the vehicle's alternator. For example, when the car is stopped the generator supplies only 10% to 30% of its capacity. Discharge may occur if there is an excessive demand for electrical power at such time.
 - * An increase in the number of electrical accessories in the car. The capacity of the generators may not be adequate for feeding all the accessories.
 - * Long journey times at low speed or electrical overcharging during night trips. For example, driving in urban traffic, proceeding with many stops and starts, or on congested roads, together with an excessive use of the air conditioning or other electrical components.
 - * Problems with the voltage regulator or with electrical components.
 - * Loose connections between the terminals and the cables.
 - * Leaving the vehicle parked for long period of time.
 - * Poor operation of the starting device (ignition), requiring excessive ignition.
 - * Loose fan belts, which reduces the capacity of the generator.
 - * The wearing of wire insulations in older cars caused by abrasion, which can cause the current to leak to other parts of the car.
 - * Spent batteries.

Q - What should I do with my old or damaged battery?

- A -** Car batteries contain lead and sulphuric acid. These materials are hazardous if disposed of in regular refuse or thrown out in the open. Most of the battery and its materials are recyclable. To help protect the environment, adhere to the following instructions:
- * Never dispose of spent batteries or their components in domestic refuse.
 - * Stores, manufacturers, importers and scrap dealers take spent batteries and these end up going to secondary foundries for recycling. When you buy a new battery, hand in the spent one to the workshop.
 - * If a battery is destroyed or damaged, the leaked electrolyte, lead plates and separators should not be disposed of in domestic refuse. Place these materials in an acid-resistant box and return them as you would do with any other or undamaged battery.
 - * The electrolyte and diluted sulphuric acid should never be emptied [by someone] without specific technical knowledge. Never allow the electrolyte to get into the sewer system, the soil or the water table.

Q - Can the batteries be recycled?

A - Yes. Simply take your old battery back to your local battery stockist for disposal.

Q - How is the battery recycled?

- A -**
- * The acid of the battery is recycled by neutralising it in water or by converting it into sodium-sulphate or powdered detergent, or by using it in glass and textile production.
 - * The plastic is recycled by cleaning up the battery container, melting it down and transforming it into plastic pellets which will be used once again for manufacturing batteries.
 - * The lead, which accounts for 50% of battery, is melted down into bars and refined. The lead retains all its characteristics after having been refined and can be used for the production of new batteries.

Materials Safety Data



Independent Battery Distributors

FORKLIFT - SEALED - STATIONARY - SOLAR BATTERIES - CAR - TRUCK - DEEP CYCLE - MARINE

Material Safety-

Sulphuric Acid.

Classified as hazardous according to the criteria of worksafe Australia.

IDENTIFICATION

Product name	Sulphuric Acid					
Other Names	Sulfuric Acid, Oil of Vitriol, Hydrogen Sulphate, Fertilizer Acid					
Manufacturer's Product Code	0313557	0313700	0312755	0312556	0311020	0311010
	0311755	0311556	0311452	0306755	0306557	9505300
	0305755	0305020	0305557	9505255	0505257	9505358
	9505155	9505598	9505500	9505555	9505557	9505400
UN No.	1830 (>51%)		2796 (<51%)			
Hazchem Code	2P		2R			
Dangerous Goods Class	8					
Packing Group	II					
Subsidiary Risk	None assigned					
Poisons Schedule	6					
Use	Fertiliser, Electroplating, Pickling and Anodising Metals, General chemical					

Physical Description/Properties

Appearance	Colourless oily dense liquid with slight acidic odour
Boiling Point	Not Available
Melting point	Not Available
Vapour Pressure	<.0001 kPa @ 20 C
Specific Gravity	Up to 1.840
Relative Vapour Density	Not Applicable
Flaspoint	Not Applicable
Flammability Limits	Not Applicable
Solubility in Water	Soluble

Ingredients

Ingredient	CAS No	Proportion
Sulphuric Acid	7664-93-9	32% - 98% w/v
Water	7732-18-5	Balance

Battery Charges, Charging Batteries



Independent Battery Distributors

FORKLIFT - SEALED - STATIONARY - SOLAR BATTERIES - CAR - TRUCK - DEEP CYCLE - MARINE



Independent Battery Distributors

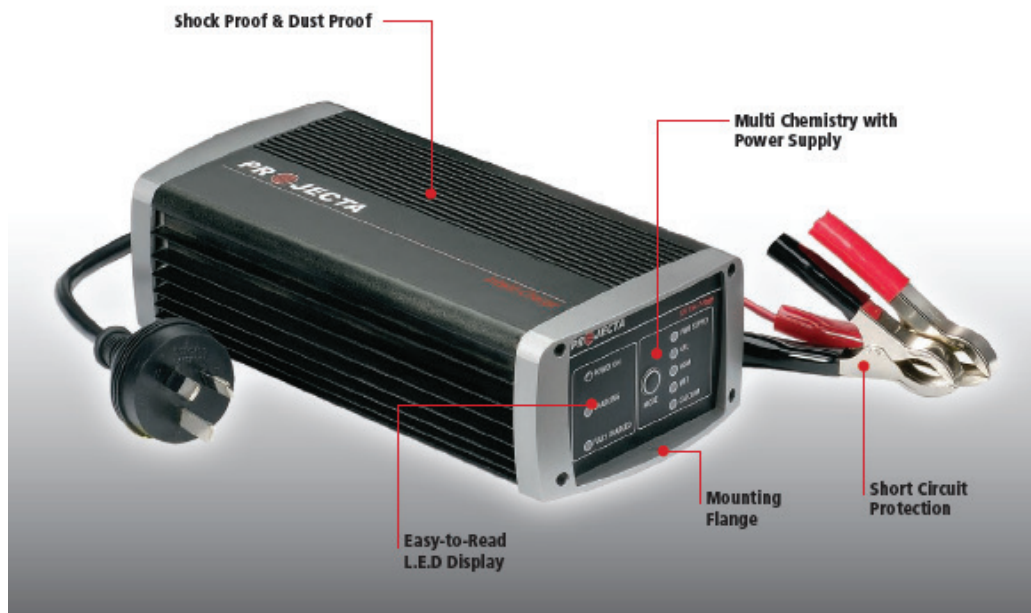
FORKLIFT - SEALED - STATIONARY - SOLAR BATTERIES - CAR - TRUCK - DEEP CYCLE - MARINE

Battery Chargers

7 Stage Automatic Charging

Intelli-Charge battery charges are fully automatic and protect your battery from being overcharged allowing you to leave the charger connected indefinitely. They are also safe to use on batteries still connected to the vehicle without damaging sensitive vehicle electronics.

Using intelligent electronic control, intelli-charge battery charges deliver a very comprehensive and accurate charging technique known as 7-stage charging. The 7 charge stages are illustrated and explained below and have been specially engineered for optimum performance on all types of batteries.



Desulphation

The desulphation stage is designed to break down sulphation occurring in batteries that have been left flat for extended periods of time, returning them back to full charge. Sulphation occurs when lead-sulphate hardens and clogs up the battery cells.

Soft Start

This is preliminary charge process that gently introduces power to the battery, protecting the battery and increasing battery life.

Bulk(constant current)

This Bulk stage reduces charging time by charging the battery at the maximum rate (constant current) to a set voltage, at which point the battery is approximately 80% charge.

Absorption(constant voltage)

The Absorption stage charges the battery to 100% by adjusting the charge rate allowing the battery to absorb more power.

Equalisation(calcium mode only)

Designed especially for calcium batteries, this stage returns calcium batteries to full service by removing acid stratification of the electrolyte.

Analysis

The Analysis stage tests the battery to ensure that it has taken the charge; if the battery passes the test the charger will proceed to the float stage, but if the battery fails the test, the charger will apply a recondition charge to try to return the battery to full charge.

Recondition

If after charging, the battery is unable to hold the charge the battery reconditioning function is initiated automatically. This is more likely to take place on batteries that have been deeply discharged, prior to charging. The recondition stage will run for 4 hours and at the end will re-test the battery. the intelli-Charge battery charger will perform the recondition charge up to 3 times before switching the charging cycle to Float with an error indication.

Float

The Float stage maintains the battery at 100% charge without overcharging or damaging the battery. This means the charger can be left connected to the battery indefinitely.

Multi Chemistry

There are many battery types available on the market to suit different applications but did you know that they all require different types of charging? More batteries are damaged by incorrect charging techniques than all other causes combined.

Projecta Intelli-Charge battery charges are designed for use on all types of batteries including Gel, AGM, Wet, and Calcium. This allows you to have one battery charger for all your battery charging needs. Upon selecting the battery chemistry types, Intelli-Charge adjusts the charge to precisely match the battery type, extending battery life and improving battery performance.

POWER SUPPLY(constant voltage of 13.8 volts)

This sets the charger in power supply mode giving a constant voltage of 13.8VDC. This mode is best used where appliances are drawing power from the battery, for example like a fridge. Although the charger is designed to work with a battery connected, the 7, 10, and 15A models can work without a battery.

GEL(max voltage of 14.1 volts)

This charge mode is designed for GEL batteries and has a maximum charge voltage of 14.1V. Note that some GEL Batteries require a higher charge voltage such as 14.4V. The AGM mode can be used if this is required.

AGM(max voltage of 14.4 volts)

This charge mode is designed for AGM batteries and has a maximum charge voltage of 14.4V.

WET(bulk and absorption 14.7 volts recondition up to 16 volts)

This charge mode is designed for Wet batteries and has a maximum charge voltage of 14.7V during Bulk and Absorption stages and 16.0V during the Recondition stage

CALCIUM(bulk and absorption 14.7 volts, equalisation and recondition up to 16 volts)

This charge mode is best suited for Calcium batteries that have been deeply discharged and require an equalisation charge to restore a full electrolyte reading. If the battery requires a simple 'top-up', the WET charge mode can be used.

Product Features

7-Stage Charging

Intelli-Charge chargers use intelligent electronics to monitor the charging process and deliver an advanced 7-stage charge to your battery. 7-stage charging is a very comprehensive and accurate charging techniques that gives your battery longer life and better performance compared to using traditional chargers.

Multi Chemistry

The multi chemistry function allows you to set the charging profile to suit the batteries chemistry type(GEL, AGM, WET and CALCIUM). This ensures correct and thorough charging and maximises battery performance and battery life.

Adjustable Current*

Intelli-Charge allows you to adjust and select the charge rate from as low as 2 Amps to best suit the size of your batteries.

Power Supply

The smaller models (7, 10, 15A) can be used as a power supply which is great as a memory saver when changing your vehicle battery so you don't lose important radio and computer information. You can also run 12V appliances direct from the battery clamps up to the rated output current, ideal for use around the house.

In the larger models (25, 35, 50A, 8A/24V), power supply operates as a float charge (constant voltage) and is ideal for maintaining a battery while running an appliance or load from the battery without risk of overcharging the battery.

User Friendly Controls

All Intelli-Charge chargers feature user-friendly displays so you can quickly customise the charge settings and monitor the charge's performance. What's more, the chargers remember the last settings used even when the power has been turned off.

LCD Display & Remote Control*

Control and monitor the charger's performance from a remote control display, allowing the charger to be mounted out of the way and out of sight. the battery charger and remote are synchronised for operation either locally or by remote.

Temperature Compensation*

The temperature sensor monitors the battery temperature and adjusts (compensates) the charger's output to prevent overcharging. This is ideal for batteries used in warmer climates or environments.

Short Circuit protection

Intelli-charge battery chargers features short circuit protection, even in Power Supply mode.

Designed to prevent the output leads from sparking during charging from accidental reverse connection or short circuit, This gives you the peace of mind that the charger will remain safe at all times.

Shock Proof & Dust Proof

Constructed from extruded aluminium, Intelli-Charge battery chargers are shock proof, dust-proof and have been rigorously vibration tested and passed both for military and caravan standards.

In addition, the circuit boards have been conformal coated to protect against moisture and dust and other elements so they are suitable for use in a range of locations.

Charging Batteries

A 12V battery charger will charge a battery to 16V, and leave the battery in a 100% charged state. The alternator/regulator will stop charging a flat battery around 14V. This can mean that the battery may only be approximately 85% in state of charge.

A calcium maintenance - free battery may take a little longer to recharge than a lead - acid type battery. Some chargers are not suitable to recharge a flat calcium maintenance - free battery. A good workshop charger (10A and above) is the ideal charger.

Should a battery be below 11V in a discharged flat condition, it may be difficult to recharge. In this instance consult your battery specialist technician for advice and a check up.

AGM batteries (Absorbed Glass Matt) and Gel Batteries will require a charger designed specifically for AGM-Gel charging. Using other types of charges can cause damage to these batteries

Disclaimer

This catalogue has been compiled from a variety of sources including automotive vehicle and component manufacturers as well as unpublished Australian and overseas data. While it is believed that these sources are reliable. It has not been possible to confirm all the information due to it being most impractical to obtain. Independent Battery Distributors believes the data is submitted as a guide to assist in the selection of their product and generally accurate for that purpose.

I.B.D. do not consider themselves liable for the loss or damage, either expressed or implied, to have risen as a result of the use of this catalogue. Specifications shown in this catalogue are subject to change without prior notice.

Recyclable

Independent Battery Distributors batteries are recyclable products. Over 85% of a battery can be recycled, which helps save our environment.

IBD has a management program in place of collection and recycle of spent batteries in Australia and is committed to saving the environment.



E & OE may apply