

"Better than the Best"



GM 90

Diesel Engines

Instruction Manual and Parts List

This Booklet is prepared to assist you in selecting correct part number and description of the parts.

Continuous efforts are put in to improve performance of the "IMEX GM-90" Diesel engine and in the process specifications, diagrams and part number are likely to change without notice. The description in this spares can not therefore, be final and binding on us.

While ordering spares please ensure that the part number and description are correctly mentioned so that the order can be processed faster.

YOUR "IMEX" ENGINE NEEDS :

- 1) Clean High Speed Diesel oil.
- 2) Lub. Oil of correct grade.
- 3) Clear Air.
- 4) "IMEX" Genuine spare parts for it's maintenance.
- 5) Clean Piece of cloth for cleaning.
- 6) Tightening of all Nuts & Bolts after an initial run of 20 Hrs.
- 7) Avoid over loading the engine.

[I] FOREWORD

Dear owner of "IMEX GM-90" Model Engine/Engines.

We congratulate for buying our "IMEX GM-90" Model Engine/Engines.

This **Hand Book** is designed to help you to know & understand your engine in order to operate it to the best advantage.

All the instruction incorporated in this manual can easily be carried out by your self.

Always deal immediately with any signs of defective running, Minor irregularities always become worse & in the end your engine falls out of service.

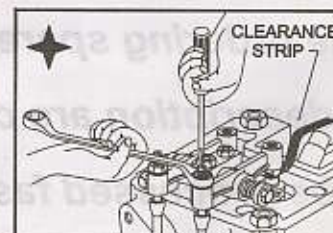
In case of any difficulty, **please** contact our Authorized Distributors / Dealers.

[II] TECHNICAL DATA :

1) Valve Tapped Clearance (When engine is cool)

Inlet :- **0.250mm**

Exhaust :- **0.350mm**

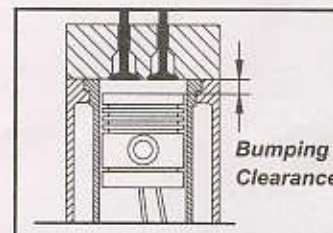


2) Tightening Torque :

- a) Cylinder Head Nut :- **23kgm**
- b) Balance Weight Bolt :- **12kgm**
- c) Connecting Rod Bolt :- **8kgm**

3) Bumping Clearance :

- | | |
|----------------|---------------------------|
| 8 HP GM-90 :- | } 1.650 to 1.800mm |
| 10 HP GM-90 :- | |
| 12 HP GM-90 :- | |



4) Selection of Pulley

When the engine is used to drive other equipment such as Alternator, Air compressor, Construction Machinery, Water Pumps etc. through belt (Flat or V-belt), selection of proper sizes of pulley will directly effect the operating condition of the engine & driven equipment. Selection of the pulleys can be determined by following fomulas.

$$D1 = \frac{D2 \times n2}{n1} \quad \text{or} \quad D2 = \frac{D1 \times n1}{n2}$$

Where D1 = Dia of the pulley on the engine shaft

D2 = Dia of the pulley on the shaft of the driven equipment.

n1 = Rated speed of engine.

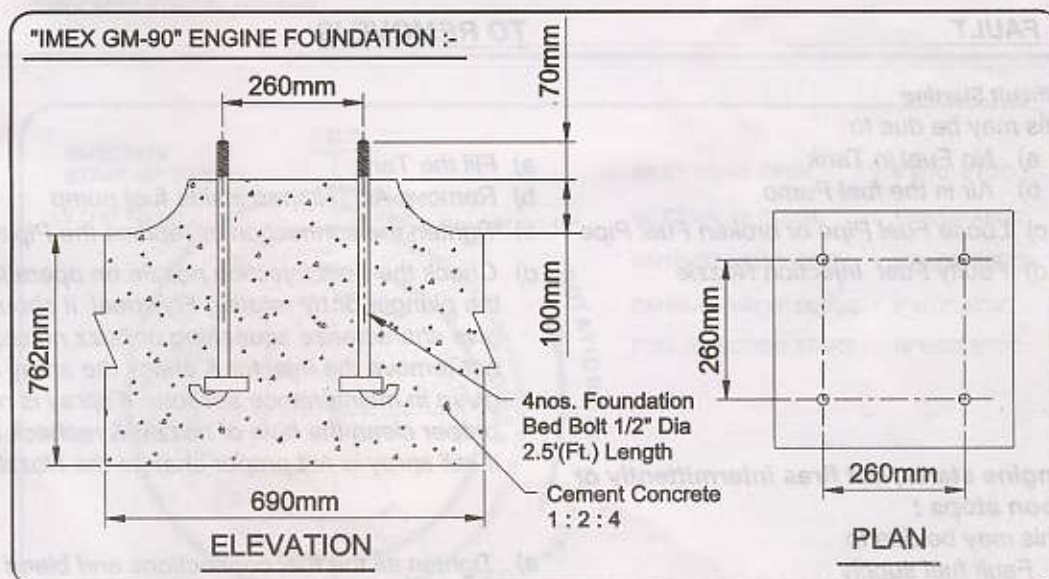
n2 = Rated speed of the driven equipment.

Note. - We can supply both the Flat pulley & V-belt pulley on demand.

[III] INSTALLATION

1) Foundation :-

The Engine should always be installed on a good cement concrete Foundation. The composition for concrete is, one part of cement, two parts of clean, sharp sand and four to five parts of washed ballast. After pouring, the concrete should be allowed to set for at least 72 hours before Engine is bolted down. In very hot and dry climate the block should be moistened with water during this period. For foundation detail Ref. Fig.



2) Erection :-

The Engine should be levelled up on the Foundation Block. Where the Engine is mounted on superstructures, these should be rigid construction and levelled before the Engine is bolted down.

3) Exhaust System :-

A standard engine is fitted with a "Pepper pot" type Exhaust Silencer. If the exhaust piping should be extended, for instance up to 3 Mt. , to the outside of a building, the Exhaust Silencer can be fitted on the end of an iron pipe, screwed 1 1/2" B.S.P Thd.

If Exhaust system is longer following pipe size is recommended:

Sr No.	Length of Exhaust System	Recommended Exhaust Pipe Dia
1)	up to 3 Mt.	1 1/2" Inch (38.1mm)
2)	3 to 6 Mt.	2" Inch (50.8mm)
3)	6 to 10 Mt.	2 1/2" Inch (63.5mm)

However, the Exhaust system should be as short as possible with a minimum number of bends.

Note. :- A faulty Exhaust system can seriously reduce the power of an Engine

Carbon deposits inside the exhaust pipe should be cleaned as and when required. Generally if engine is being used properly, it should be cleaned after 500 Hrs. of running.

[IV] STARTING & RUNNING FAULTS

FAULT

TO REMOVE IS

1) Difficult Starting

This may be due to

- No Fuel in Tank
- Air in the fuel Pump
- Loose Fuel Pipe or broken Fuel Pipe
- Faulty Fuel Injection Nozzle

- Fill the Tank
- Remove Air Trapped inside fuel pump
- Tighten the connection or replace the Pipe
- Check the Fuel Injection nozzle on operating the plunger or by rotating Flywheel, it should give characterize squeaking or buzz noise. If not remove the Injector & check the spray as given in maintenance section. If spray is not proper clean the hole of nozzle & recheck it. If still spray is not proper change the Nozzle.

2) Engine starts, but fires intermittently or soon stops :

This may be due to

- Fault fuel supply
- Water in fuel.
- Fuel filter choked.
- Faulty injector nozzle.

- Tighten all the fuel connections and bleed the system.
- Drain the fuel tank and fill up with clean fuel oil.
- Clean element or replace the element.
- Check the injection nozzle as before.

3) Engine lacks power with dirty Exhaust :

This may be due to

- | | |
|-----------------------------|--|
| a) Faulty fuel supply. | a) Tighten all the fuel connection and bleed the system. |
| b) Unsuitable fuel. | b) Drain the system and re-fill with suitable fuel. |
| c) Choked air cleaner | c) Clean the element or replace the same. |
| d) Choked exhaust silencer. | d) Clean the exhaust silencer. |

4) Over-heating

This may be due to

- | | |
|--|--|
| a) Over-Loading the engine. | a) Avoid overloading. |
| b) Water supply (For cooling engine) failure | b) Renew the supply and check for leaks. |
| c) Lubricating oil failure. | c) Check up oil level in the sump. |

5) Leakages from Breather bend & tappet set.

This may be due to

- a) Failure of splash guard of big door plate
b) Steel ball of non-return valve det jammad due to dust & oil.
c) Not-return valve on breather pipe connected in wrong direction.
d) Flash guard of tappet sets broken or dislocated from its position.

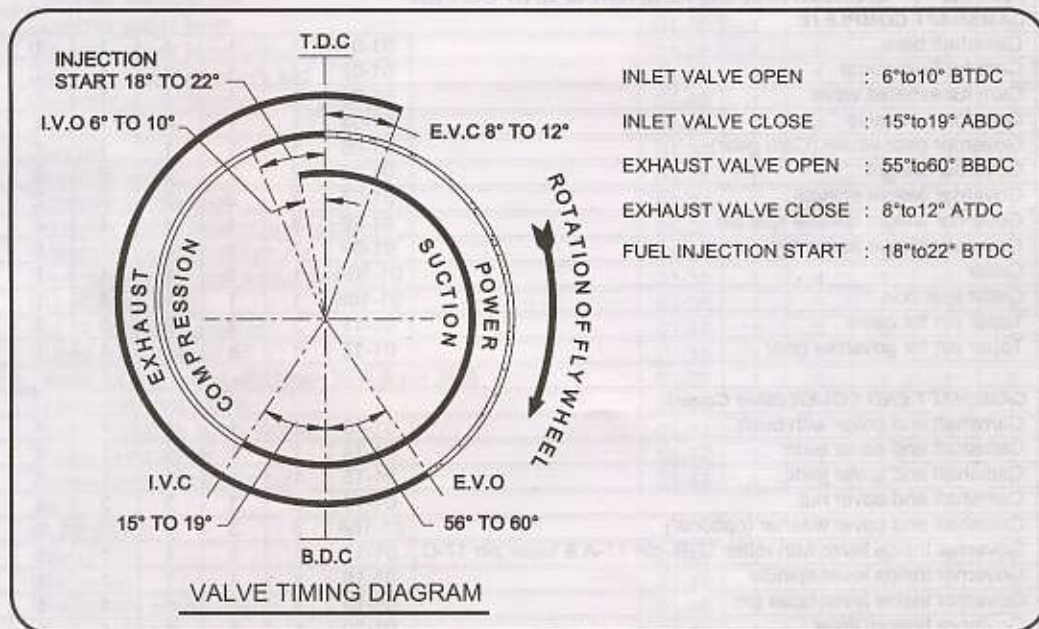
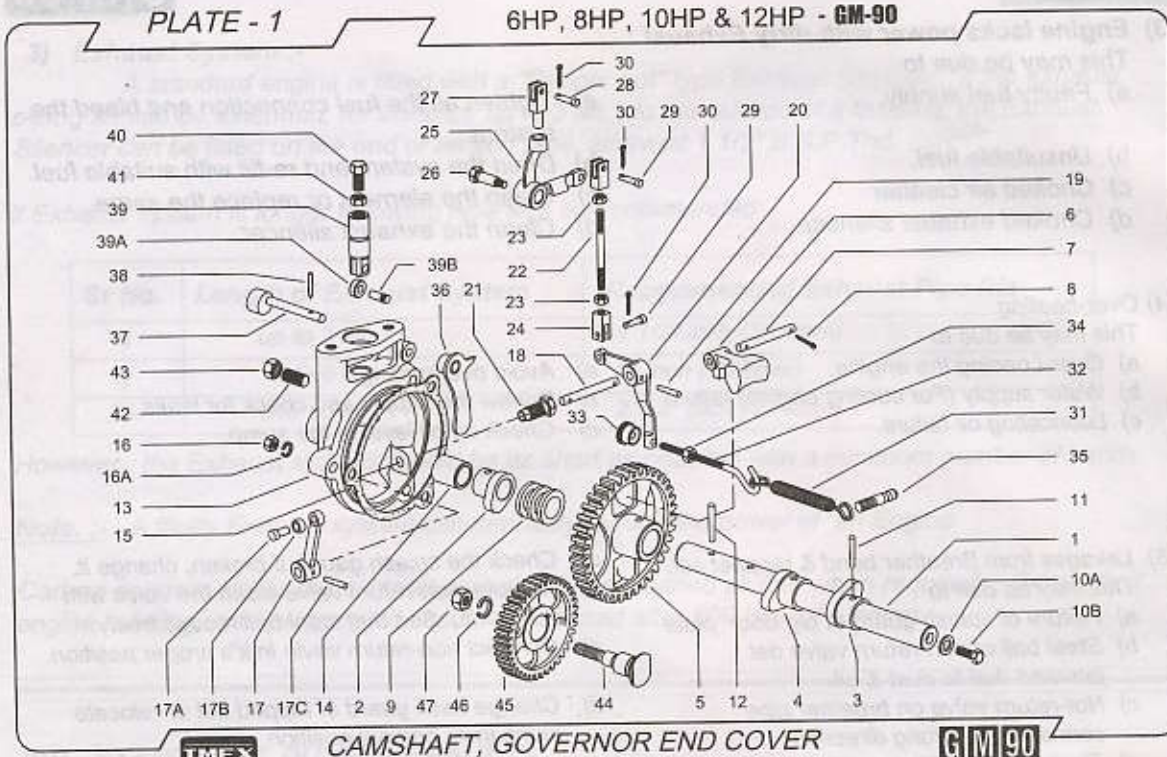
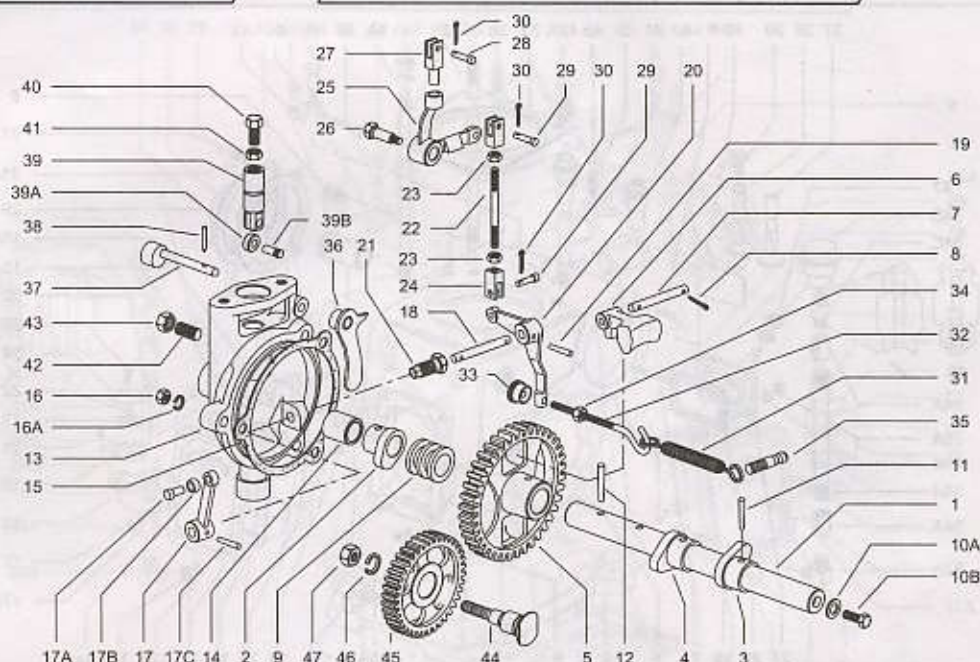
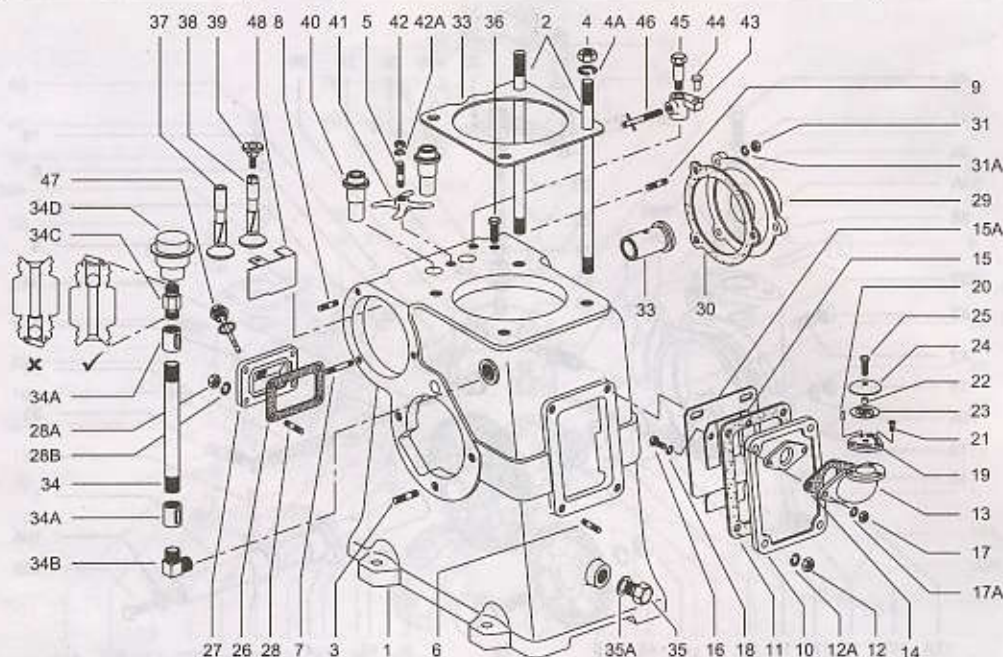


PLATE - 1
6HP, 8HP, 10HP & 12HP - GM-90

CAMSHAFT, GOVERNOR END COVER
GM 90
GM - 90 ENGINES PARTS LIST

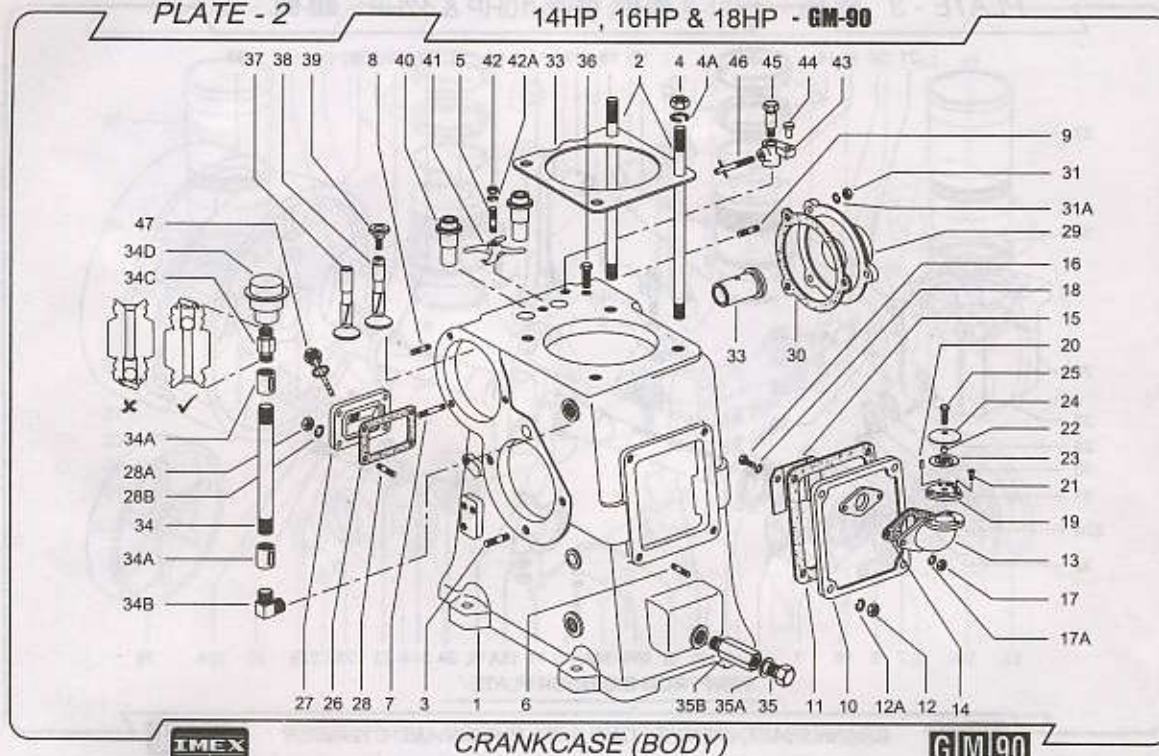
IIIUS. No.	Description of Part	Part No.	Required Per Engine					
			6-8hp	10hp	12hp	14hp	16hp	18hp
A	PLATE - 1 CAMSHAFT, GOVERNOR & END COVER							
	CAMSHAFT COMPLETE							
1	Camshaft bare	01-01	1	1	1	1	1	1
2	Cam for Fuel pump	01-02	1	1	1	1	1	1
3	Cam for exhaust valve	01-03	1	1	1	1	1	1
4	Cam for inlet valve	01-04	1	1	1	1	1	1
5	Governor gear wheel (Cam gear)	01-05	1	1	1	1	1	1
6	Governor weight	01-06	2	2	2	2	2	2
7	Governor weight spindle	01-07	2	2	2	2	2	2
8	Governor weight spindle split pin	01-08	4	4	4	4	4	4
9	Governor sleeve assembly	01-09	1	1	1	1	1	1
10A	Collar	01-10A	1	1	1	1	1	1
10B	Collar lock bolt	01-10B	1	1	1	1	1	1
11	Taper pin for cams	01-11	3	3	3	3	3	3
12	Taper pin for governor gear	01-12	1	1	1	1	1	1
	CAMSHAFT END COVER (Side Cover)							
13	Camshaft end cover with bush	01-13	1	1	1	1	1	1
14	Camshaft end cover bush	01-14	1	1	1	1	1	1
15	Camshaft end cover joint	01-15	1	1	1	1	1	1
16	Camshaft end cover nut	01-16	3	3	3	3	3	3
16A	Camshaft end cover washer (optional)	01-16A	3	3	3	3	3	3
17	Governor inside lever with roller 17-B, pin 17-A & taper pin 17-C	01-17	1	1	1	1	1	1
18	Governor inside lever spindle	01-18	1	1	1	1	1	1
19	Governor inside lever taper pin	01-19	1	1	1	1	1	1
20	Governor bottom lever	01-20	1	1	1	1	1	1
21	Governor bottom lever bush	01-21	1	1	1	1	1	1
22	Governor link road	01-22	1	1	1	1	1	1
23	Governor link road lock nut	01-23	2	2	2	2	2	2

PLATE - 1
14HP, 16HP & 18HP - GM-90

CAMSHAFT, GOVERNOR END COVER
GM 90
GM - 90 ENGINES PARTS LIST

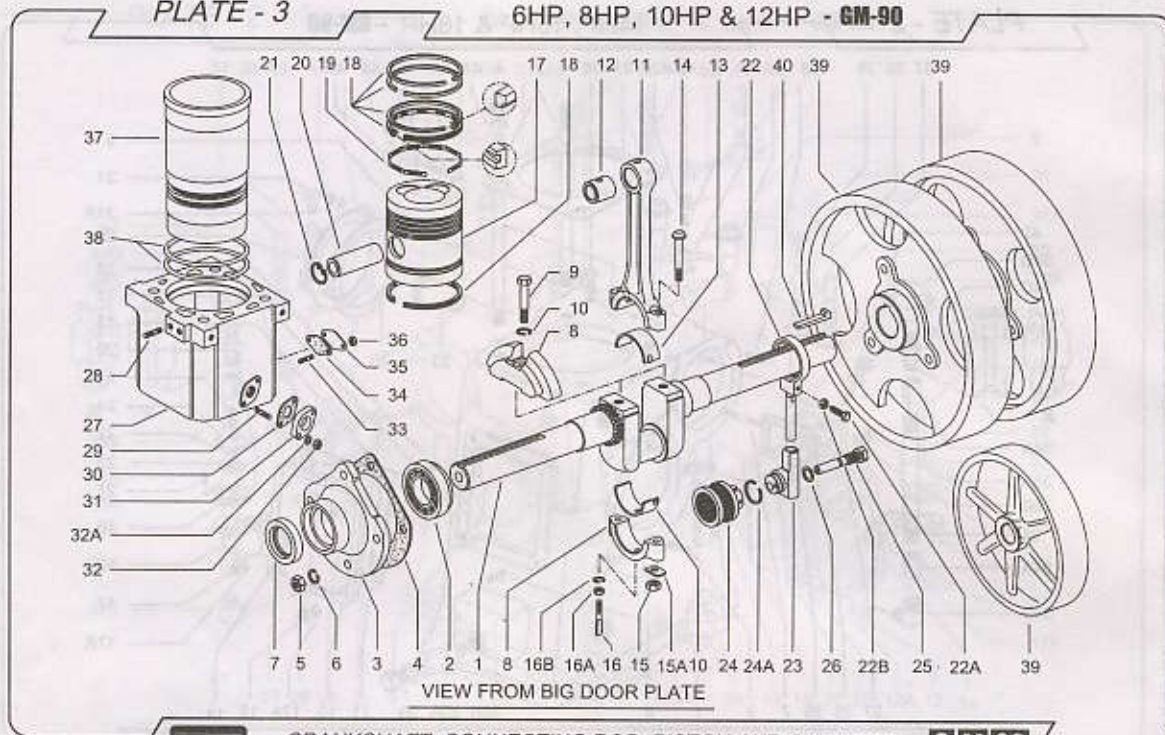
IIIUS. No.	Description of Part	Part No.	Required Per Engine					
			6-8hp	10hp	12hp	14hp	16hp	18hp
24	Governor link road fork	01-24	2	2	2	2	2	2
25	Governor upper lever	01-25	1	1	1	1	1	1
26	Governor upper lever fulcrum pin	01-26	1	1	1	1	1	1
27	Governor upper lever eye end	01-27	1	1	1	1	1	1
28	Governor upper lever eye end joint pin	01-28	1	1	1	1	1	1
29	Joint pin for fork	01-29	2	2	2	2	2	2
30	Split pin	01-30	3	3	3	3	3	3
31	Governor spring	01-31	1	1	1	1	1	1
32	Governor spring hook	01-32	1	1	1	1	1	1
33	Governor spring hook adjusting nut	01-33	1	1	1	1	1	1
34	Governor spring hook lock nut	01-34	1	1	1	1	1	1
35	Governor spring hook anchor pin	01-35	1	1	1	1	1	1
36	Cut off hand lever	01-36	1	1	1	1	1	1
37	Cut off spindle & eccentric	01-37	1	1	1	1	1	1
38	Cut off spindle taper pin	01-38	1	1	1	1	1	1
39	Tappet for fuel pump with roller 39-A & pin 39-B	01-39	1	1	1	1	1	1
40	Tappet adjusting screw	01-40	1	1	1	1	1	1
41	Tappet adjusting screw lock nut	01-41	1	1	1	1	1	1
42	Tappet fixing screw	01-42	1	1	1	1	1	1
43	Tappet fixing screw lock nut	01-43	1	1	1	1	1	1
IDLER GEAR								
44	Idler spindle	01-44	1	1	1	1	1	1
45	Idler pinion	01-45	1	1	1	1	1	1
46	Idler spindle spring washer	01-46	1	1	1	1	1	1
47	Idler spindle nut	01-47	1	1	1	1	1	1

PLATE - 2
6HP, 8HP, 10HP & 12HP - GM-90

CRANKCASE (BODY)
GM 90
GM - 90 ENGINES PARTS LIST

IIIUS. No.	Description of Part	Part No.	Required Per Engine					
			6-8hp	10hp	12hp	14hp	16hp	18hp
B	PLATE - 2 CRANK CASE (BODY)							
1	Crank case (Body)	02-01	1	1	1	1	1	1
2	Stud for cylinder & cylinder head	02-02	4	4	4	4	4	4
3	Stud for main bearing housing	02-03	7	7	7	7	7	7
4	Nut for cylinder head with spring washer 4-A	02-04	4	4	4	4	4	4
5	Stud for tappet guide clamp	02-05	1	1	1	1	1	1
6	Stud for crank case door (big)	02-06	4	4	4	4	4	4
7	Stud for camshaft end cover gear end	02-07	2	2	2	2	2	2
8	Stud for camshaft end cover gear end	02-08	1	1	1	1	1	1
9	Stud for camshaft end cover drive end	02-09	3	3	3	3	3	3
10	Crank case door big	02-10	1	1	1	1	1	1
11	Crank case door (Big) joint	02-11	1	1	1	1	1	1
12	Nut for crank case door (Big) with spring washer 12-A (Optional)	02-12	4	4	4	4	4	4
13	Crank case breather body (Bend)	02-13	1	1	1	1	1	1
14	Crank case breather body joint	02-14	1	1	1	1	1	1
15	Splash guard for door	02-15	1	1	1	1	1	1
15A	Splash guard for door	02-15A	1	1	1	-	-	-
16	Bolt for breather body guard & splash guard	02-16	2	2	2	2	2	2
17	Nut for breather body bolt with washer 17A	02-17	2	2	2	2	2	2
18	Washer for breather bolt	02-18	2	2	2	2	2	2
19	Breather plate	02-19	1	1	1	1	1	1
20	Dowel for breather plate	02-20	1	1	1	1	1	1
21	Screw for breather plate	02-21	3	3	3	3	3	3
22	Spacing washer	02-22	1	1	1	1	1	1
23	Breather disc	02-23	1	1	1	1	1	1
24	Breather cover	02-24	1	1	1	1	1	1
25	Bolt for breather cover	02-25	1	1	1	1	1	1
26	Crank case door (small) joint	02-26	1	1	1	1	1	1
27	Crank case door small	02-27	1	1	1	1	1	1

PLATE - 2
14HP, 16HP & 18HP - GM-90

CRANKCASE (BODY)
GM 90
GM - 90 ENGINES PARTS LIST

IIIUS. No.	Description of Part	Part No.	Required Per Engine					
			6-8hp	10hp	12hp	14hp	16hp	18hp
28	Stud for crank case door (small)	02-28	4	4	4	4	4	4
28A	Nut for crank case door (small) with spring washer 28-B (Optional)	02-28A	4	4	4	4	4	4
29	Cover for camshaft end	02-29	1	1	1	1	1	1
30	Joint for cover	02-30	1	1	1	1	1	1
31	Nut for camshaft end cover	02-31	3	3	3	3	3	3
32	End bearing for camshaft (Body bush)	02-32	1	1	1	1	1	1
33	Joint-crank case to cylinder block	02-33	3	3	3	3	3	3
34	Breather air pipe with coupling 34-A, elbow 34-B, non return valve 34-C & breather cap 34-D (Set)	02-34	1	1	1	1	1	1
35	Drain plug for crank case with washer 35A	02-35	1	1	1	1	1	1
35B	Drain plug pipe	02-35B	-	-	-	1	1	1
36	Plug for camshaft oiling hole	02-36	1	1	1	1	1	1
37	Valve tappet inlet	02-37	1	1	1	1	1	1
38	Valve tappet exhaust	02-38	1	1	1	1	1	1
39	Valve tappet head	02-39	1	1	1	1	1	1
40	Valve tappet guide with joint	02-40	2	2	2	2	2	2
41	Valve tappet guide clamp	02-41	1	1	1	1	1	1
42	Nut for valve tappet guide clamp with spring washer 42-A	02-42	1	1	1	1	1	1
VALVE LIFTER COMPLETE								
43	Valve lifter	02-43	1	1	1	1	1	1
44	Valve lifter pin	02-44	1	1	1	1	1	1
45	Valve lifter swivel pin	02-45	1	1	1	1	1	1
46	Valve lifter operating handle	02-46	1	1	1	1	1	1
47	Oil gauge	02-47	1	1	1	1	1	1
48	Splash guard for tappet	02-48	1	1	1	-	-	-

PLATE - 3
6HP, 8HP, 10HP & 12HP - GM-90


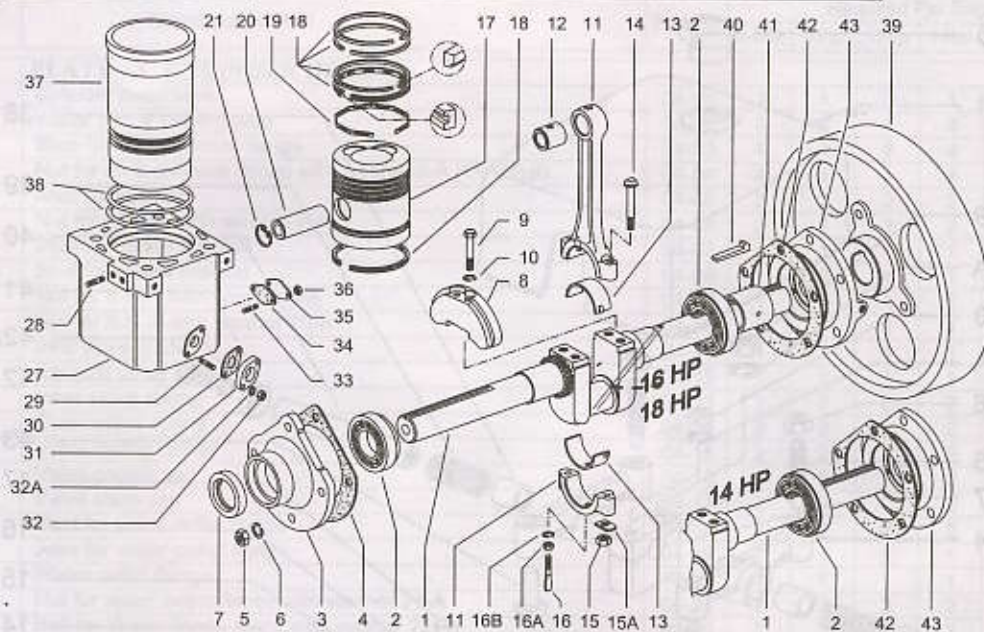
VIEW FROM BIG DOOR PLATE



CRANKSHAFT, CONNECTING ROD, PISTON AND CYLINDER


GM - 90 ENGINES PARTS LIST

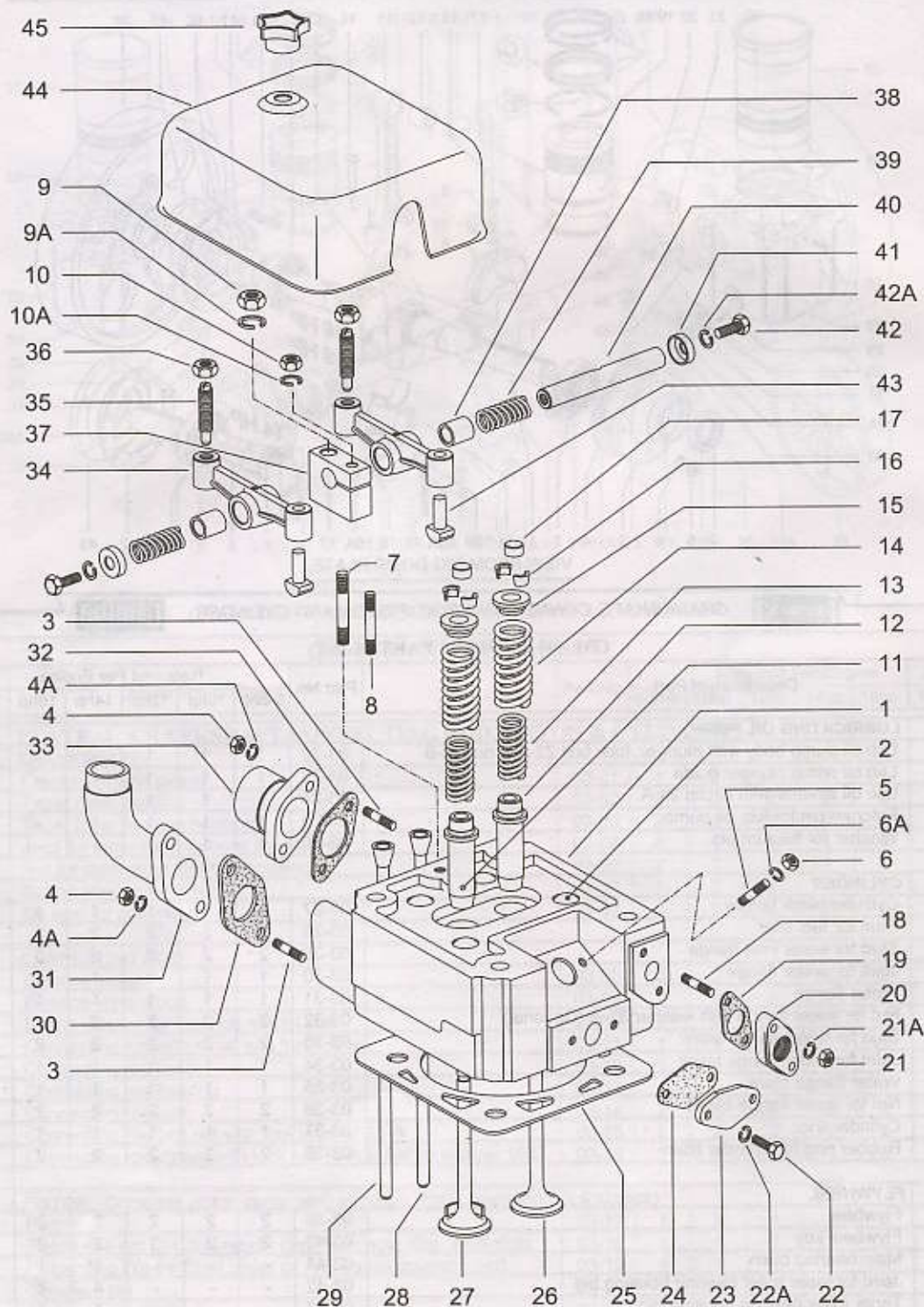
IIIUS. No.	Description of Part	Part No.	Required Per Engine					
			6-8hp	10hp	12hp	14hp	16hp	18hp
C	PLATE -3 CRANKSHAFT CONNECTING ROD, PISTON & CYLINDER							
	CRANKSHAFT							
1	Crankshaft with pinion	03-01	1	1	1	1	1	1
2	Taper roller bearing	03-02	2	2	2	2	2	2
3	Taper roller bearing housing	03-03	2	2	2	2	2	2
4	Joint for taper roller bearing housing	03-04	4	4	4	4	4	4
5	Nut for taper roller bearing housing	03-05	7	7	7	7	7	7
6	Spring washer for S.N-5	03-06	7	7	7	7	7	7
7	Oil seal for crankshaft	03-07	2	2	2	2	2	2
	CONNECTING ROD							
8	Balance weight	03-08	2	2	2	2	2	2
9	Balance weight bolt	03-09	2	2	2	2	2	2
10	Spring washer for balance weight bolt	03-10	2	2	2	2	2	2
11	Connecting rod with small end bush , cap	03-11	1	1	1	1	1	1
12	Connecting rod bush	03-12	1	1	1	1	1	1
13	Connecting rod bearing	03-13	1	1	1	1	1	1
14	Connecting rod bolt	03-14	2	2	2	2	2	2
15	Connecting rod bolt nut with lock washer 15-A	03-15	2	2	2	2	2	2
16	Connecting rod dipper with lock nut 16-A & spring washer 16-B	03-16	1	1	1	1	1	1
	PISTON (Complete piston comprising of piston, rings, gudgeon pin & circlips)							
17	Piston	03-17	1	1	1	1	1	1
18	Piston ring set (2-Compressor ring, 1-Scraper ring, 2-Oil ring)	03-18	1	1	1	1	1	1
19	Helper ring (To be fitted under oil ring above gudgeon pin)	03-19	1	1	1	1	1	1
20	Gudgeon pin	03-20	1	1	1	1	1	1
21	Gudgeon pin circlip	03-21	2	2	2	2	2	2

PLATE - 3
14HP, 16HP & 18HP - GM-90

VIEW FROM BIG DOOR PLATE
CRANKSHAFT, CONNECTING ROD, PISTON AND CYLINDER
GM - 90 ENGINES PARTS LIST

Illus. No.	Description of Part	Part No.	Required Per Engine					
			6-8hp	10hp	12hp	14hp	16hp	18hp
LUBRICATING OIL PUMP								
22	Lub oil pump body with plunger, lock bolt 22-A & nut 22-B	03-22	1	1	1	-	-	-
23	Lub oil pump plunger guide	03-23	1	1	1	-	-	-
24	Lub oil strainer with circlip 24-A	03-24	1	1	1	-	-	-
25	Fulcrum pin for lub. oil pump	03-25	1	1	1	-	-	-
26	Washer for fulcrum pin	03-26	1	1	1	-	-	-
CYLINDER								
27	Cylinder block hollow	03-27	1	1	1	1	1	1
28	Stud for fuel filter	03-28	2	2	2	2	2	2
29	Stud for water inlet flange	03-29	2	2	2	2	2	2
30	Joint for water flange	03-30	1	1	1	1	1	1
31	Water flange	03-31	1	1	1	1	1	1
32	Nut for water flange with washer 32-A (Optional)	03-32	2	2	2	2	2	2
33	Stud for water flange blank	03-33	2	2	2	2	2	2
34	Joint for water flange blank	03-34	1	1	1	1	1	1
35	Water flange blank	03-35	1	1	1	1	1	1
36	Nut for water flange blank	03-36	2	2	2	2	2	2
37	Cylinder liner	03-37	1	1	1	1	1	1
38	Rubber ring for cylinder liner	03-38	2	2	2	2	2	2
FLYWHEEL								
39	Flywheel	03-39	2	2	2	2	2	2
40	Flywheel key	03-40	2	2	2	2	2	2
41	Main bearing bush	03-41	-	-	-	1*	1	1
42	Joint for taper roller bearing housing big	03-42	-	-	-	4	4	4
43	Taper roller bearing housing big	03-43	-	-	-	1	1	1
Note.- * Optional								

Note.- * Optional

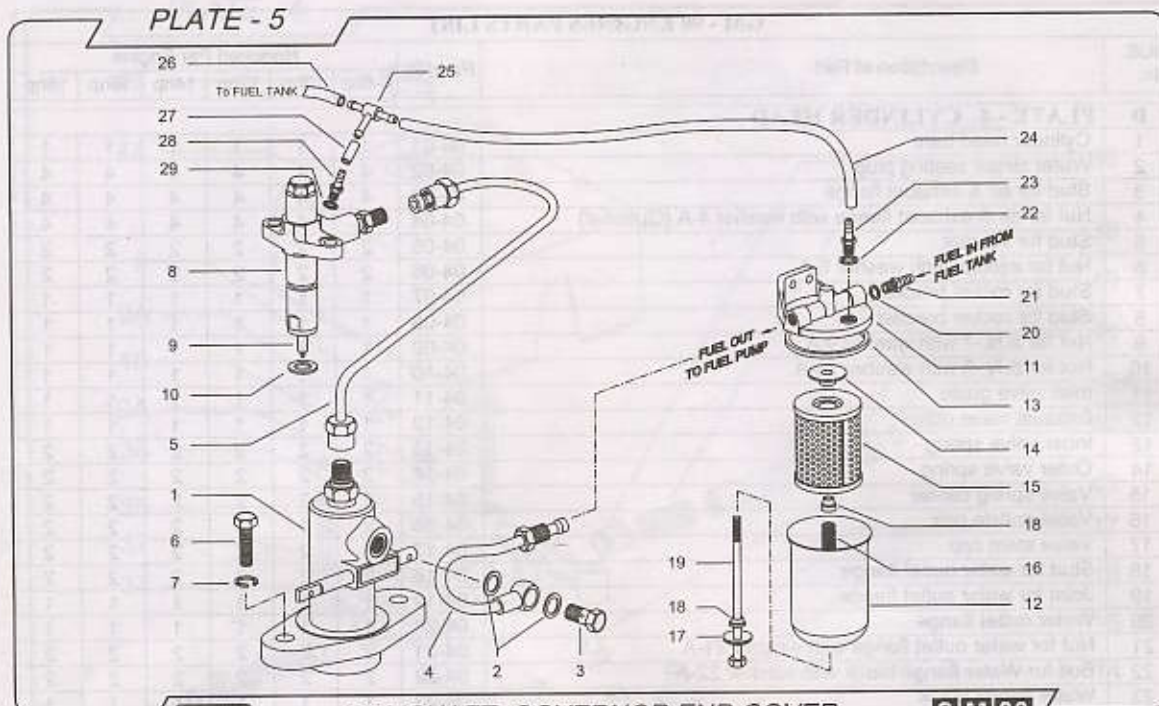
PLATE - 4



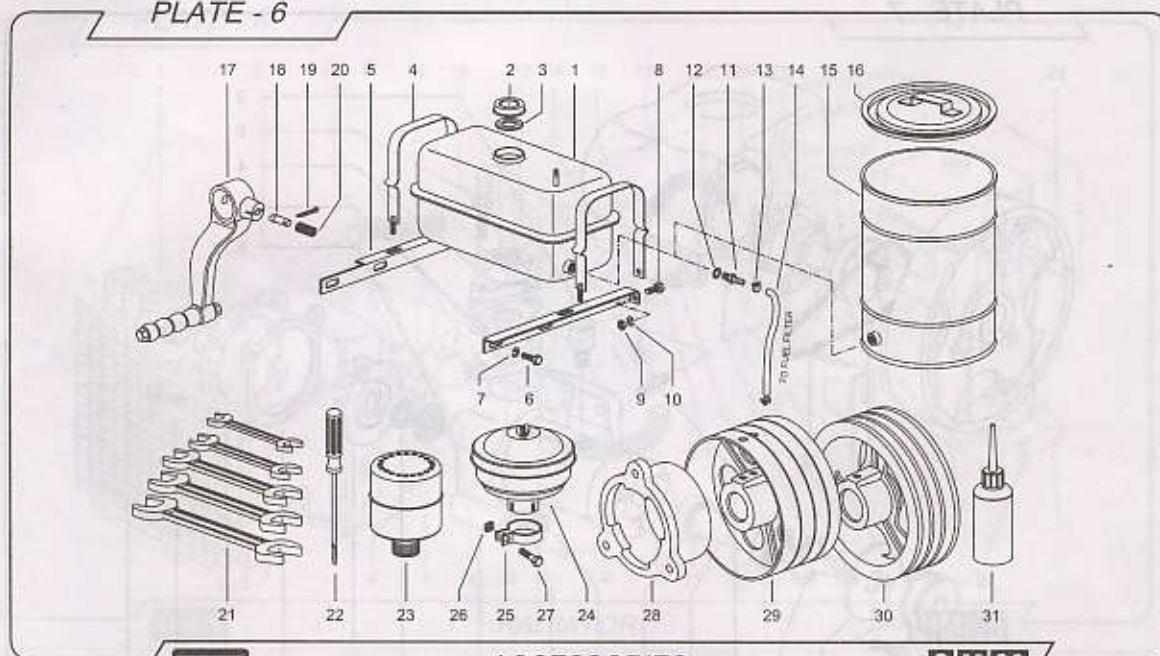
CYLINDER HEAD

GM - 90 ENGINES PARTS LIST

IIIUS. No.	Description of Part	Part No.	Required Per Engine					
			6-8hp	10hp	12hp	14hp	16hp	18hp
D	PLATE - 4 CYLINDER HEAD							
1	Cylinder head bare	04-01	1	1	1	1	1	1
2	Water circuit sealing plug	04-02	4	4	4	4	4	4
3	Stud for air & exhaust flange	04-03	4	4	4	4	4	4
4	Nut for air & exhaust flange with washer 4-A (Optional)	04-04	4	4	4	4	4	4
5	Stud for injector	04-05	2	2	2	2	2	2
6	Nut for injector with washer 6-A	04-06	2	2	2	2	2	2
7	Stud for rocker bracket	04-07	1	1	1	1	1	1
8	Stud for rocker bracket	04-08	1	1	1	1	1	1
9	Nut for S.N.-7 with washer 9-A	04-09	1	1	1	1	1	1
10	Nut for S.N.-8 with washer 10-A	04-10	1	1	1	1	1	1
11	Inlet valve guide	04-11	1	1	1	1	1	1
12	Exhaust valve guide	04-12	1	1	1	1	1	1
13	Inner valve spring	04-13	2	2	2	2	2	2
14	Outer valve spring	04-14	2	2	2	2	2	2
15	Valve spring carrier	04-15	2	2	2	2	2	2
16	Valve collate pair	04-16	2	2	2	2	2	2
17	Valve stem cap	04-17	2	2	2	2	2	2
18	Stud for water outlet flange	04-18	2	2	2	2	2	2
19	Joint for water outlet flange	04-19	1	1	1	1	1	1
20	Water outlet flange	04-20	1	1	1	1	1	1
21	Nut for water outlet flange with washer 21-A	04-21	2	2	2	2	2	2
22	Bolt for Water flange blank with washer 22-A	04-22	2	2	2	2	2	2
23	Water flange blank	04-23	1	1	1	1	1	1
24	Joint for water flange blank	04-24	1	1	1	1	1	1
25	Gasket	04-25	1	1	1	1	1	1
26	Exhaust valve	04-26	1	1	1	1	1	1
27	Inlet valve with deflector	04-27	1	1	1	1	1	1
28	Exhaust valve push rod	04-28	1	1	1	1	1	1
29	Air valve push rod	04-29	1	1	1	1	1	1
30	Joint for air inlet band	04-30	1	1	1	1	1	1
31	Air inlet band (Air inlet manifold)	04-31	1	1	1	1	1	1
32	Joint for exhaust flange	04-32	1	1	1	1	1	1
33	Exhaust flange (Exhaust manifold)	04-33	1	1	1	1	1	1
34	Valve rocker with bush	04-34	2	2	2	2	2	2
35	Rocker adjusting screw	04-35	2	2	2	2	2	2
36	Rocker adjusting screw lock nut	04-36	2	2	2	2	2	2
37	Rocker bracket	04-37	1	1	1	1	1	1
38	Rocker bush	04-38	2	2	2	2	2	2
39	Rocker shaft spring	04-39	2	2	2	2	2	2
40	Rocker shaft	04-40	1	1	1	1	1	1
41	Rocker shaft washer	04-41	2	2	2	2	2	2
42	Rocker shaft lock bolt with spring washer 42-A	04-42	2	2	2	2	2	2
43	Rocker striking pin	04-43	2	2	2	2	2	2
44	Head cover	04-44	1	1	1	1	1	1
45	Head cover nut	04-45	1	1	1	1	1	1

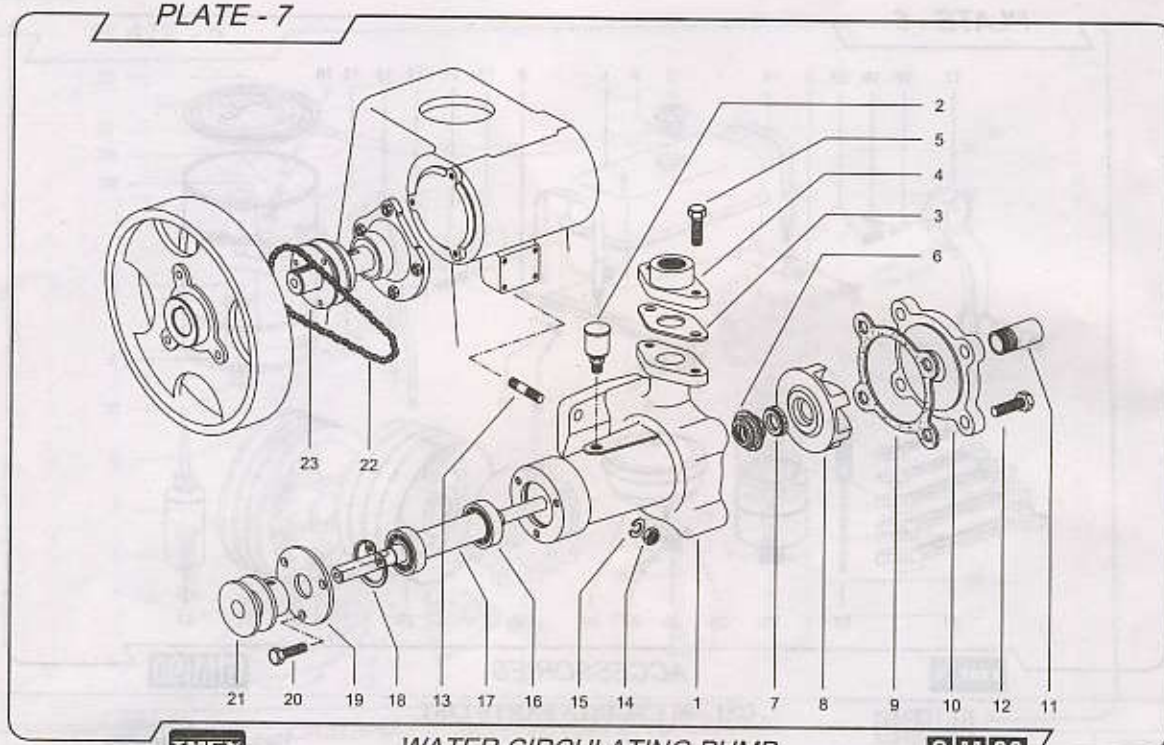
PLATE - 5

IMEX
CAMSHAFT, GOVERNOR END COVER
GM 90
GM - 90 ENGINES PARTS LIST

IIIUS. No.	Description of Part	Part No.	Required Per Engine					
			6-8hp	10hp	12hp	14hp	16hp	18hp
E	PLATE - 5 FUEL INJECTION SYSTEM							
1	Fuel pump	05-01	1	1	1	1	1	1
2	Fuel pipe fixing plug joint (Banjo washer)	05-02	2	2	2	2	2	2
3	Fuel pipe fixing plug (Banjo bolt)	05-03	1	1	1	1	1	1
4	Fuel pipe (Filter to fuel pump)	05-04	1	1	1	1	1	1
5	High pressure pipe	05-05	1	1	1	1	1	1
6	Fuel pump bolt	05-06	1	1	1	1	1	1
7	Spring washer for fuel pump bolt	05-07	2	2	2	2	2	2
8	Nozzle holder	05-08	1	1	1	1	1	1
9	Injector nozzle	05-09	1	1	1	1	1	1
10	Injector nozzle washer	05-10	1	1	1	1	1	1
11	Fuel filter cap	05-11	1	1	1	1	1	1
12	Fuel filter body	05-12	1	1	1	1	1	1
13	O-ring for fuel filter cap	05-13	1	1	1	1	1	1
14	Rubber seal for filter element	05-14	1	1	1	1	1	1
15	Fuel filter element	05-15	1	1	1	1	1	1
16	Spring for fuel filter	05-16	1	1	1	1	1	1
17	Metal washer for fuel filter	05-17	1	1	1	1	1	1
18	Rubber seal bottom / top	05-18	2	2	2	2	2	2
19	Stud for fuel filter	05-19	1	1	1	1	1	1
20	Washer for fuel nipple	05-20	1	1	1	1	1	1
21	Nipple for fuel inlet pipe	05-21	1	1	1	1	1	1
22	Washer for overflow nipple S.N.-21	05-22	1	1	1	1	1	1
23	Nipple for overflow pipe	05-23	1	1	1	1	1	1
24	Overflow pipe (Fuel filter to T-joint)	05-24	1	1	1	1	1	1
25	T-Joint (Three way)	05-25	1	1	1	1	1	1
26	Overflow pipe 'T' to Fuel tank	05-26	1	1	1	1	1	1
27	Overflow pipe 'T' to Fuel injector	05-27	1	1	1	1	1	1
28	Overflow nipple for injector	05-28	1	1	1	1	1	1
29	Washer for overflow nipple S.N.-28	05-29	1	1	1	1	1	1

PLATE - 6

ACCESSORIES
GM 90
GM - 90 ENGINES PARTS LIST

IIIUS. No.	Description of Part	Part No.	Required Per Engine					
			6-8hp	10hp	12hp	14hp	16hp	18hp
F	PLATE - 6 ACCESSORIES							
1	Fuel tank (Square)	06-01	1	1	1	1	1	1
2	Cap for fuel tank	06-02	1	1	1	1	1	1
3	Joint for cap of fuel tank	06-03	1	1	1	1	1	1
4	Fuel tank fixing strips	06-04	2	2	2	2	2	2
5	Fuel tank fixing angle	06-05	2	2	2	2	2	2
6	Bolt for fixing angle	06-06	4	4	4	4	4	4
7	Washer for bolt S.N.-6	06-07	4	4	4	4	4	4
8	Bolt for fixing strip S.N.-9	06-08	2	2	2	2	2	2
9	Nut for fixing strip S.N.-4	06-09	4	4	4	4	4	4
10	Washer for nut S.N.-9	06-10	4	4	4	4	4	4
11	Nipple for fuel outlet	06-11	1	1	1	1	1	1
12	Washer for nipple S.N.-11	06-12	1	1	1	1	1	1
13	Clamp for fuel pipe (Fuel tank to fuel filter)	06-13	2	2	2	2	2	2
14	Fuel tank to filter pipe	06-14	1	1	1	1	1	1
15	Fuel tank round (Optional)	06-15	1	1	1	1	1	1
16	Fuel tank cover (Cap) for S.N.-15 (Optional)	06-16	1	1	1	1	1	1
17	Starting handle	06-17	1	1	1	1	1	1
18	Pin for starting handle	06-18	1	1	1	1	1	1
19	Split pin	06-19	1	1	1	1	1	1
20	Spring	06-20	1	1	1	1	1	1
21	Spanner set	06-21	1	1	1	1	1	1
22	Screw driver	06-22	1	1	1	1	1	1
23	Silencer	06-23	1	1	1	1	1	1
24	Air cleaner (Air filter)	06-24	1	1	1	1	1	1
25	Clamp for air filter	06-25	1	1	1	1	1	1
26	Bolt for clamp	06-26	1	1	1	1	1	1
27	Nut for clamp	06-27	1	1	1	1	1	1
28	Water circulating pulley 6 inch dia (Optional)	06-28	1	1	1	-	-	-
29	Flat pulley	06-29	1	1	1	1	1	1
30	V-Groove pulley (Optional)	06-30	1	1	1	1	1	1
31	Oil can	06-31	1	1	1	1	1	1

PLATE - 7

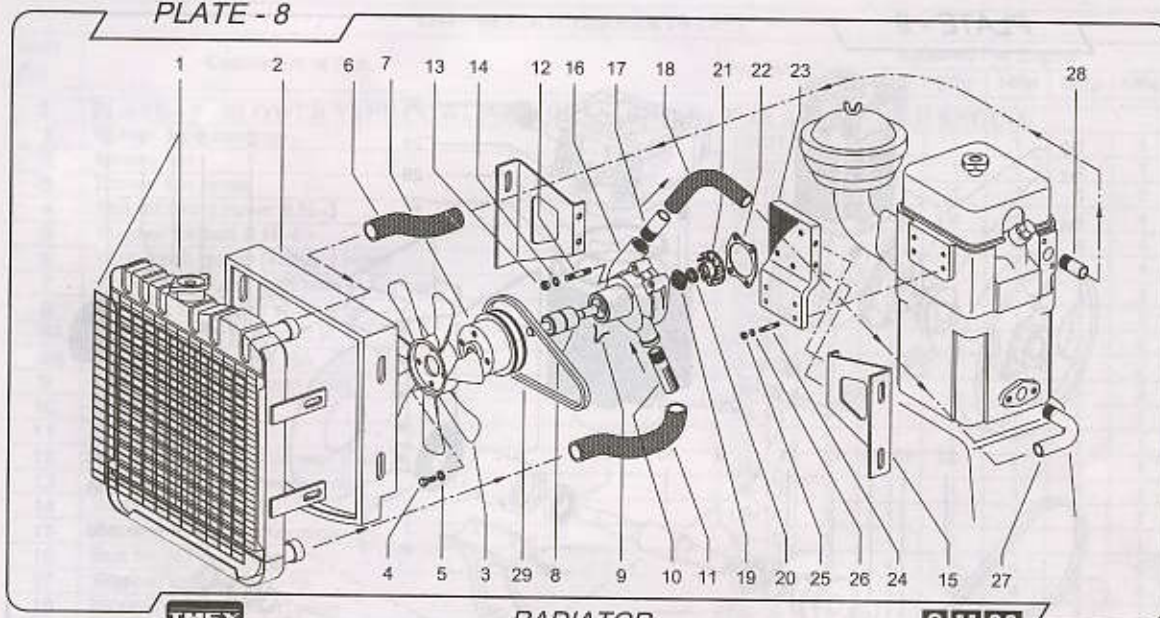


WATER CIRCULATING PUMP

GM 90

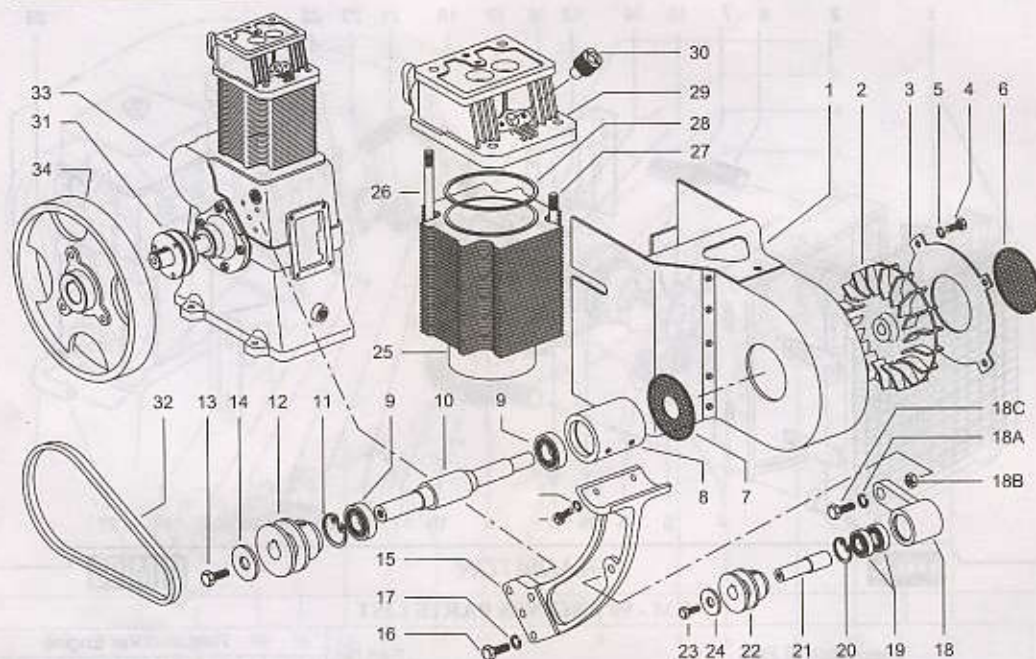
GM - 90 ENGINES PARTS LIST

GM - 90 ENGINES PARTS LIST								
IIIUS. No.	Description of Part	Part No.	Required Per Engine					
			6-8hp	10hp	12hp	14hp	16hp	18hp
G	PLATE - 7 WATER CIRCULATING PUMP (Optional)							
1	Water circulating pump body	07-01	1	1	1	1	1	1
2	Grease nipple	07-02	1	1	1	1	1	1
3	Rubber seal of delivery flange	07-03	1	1	1	1	1	1
4	Delivery flange	07-04	1	1	1	1	1	1
5	Bolt to fix delivery flange	07-05	2	2	2	2	2	2
6	Mechanical seal	07-06	1	1	1	1	1	1
7	Ceramic collar	07-07	1	1	1	1	1	1
8	Impeller	07-08	1	1	1	1	1	1
9	Joint for impeller cover	07-09	1	1	1	1	1	1
10	Impeller cover with suction hole	07-10	1	1	1	1	1	1
11	Suction nipple for impeller cover S.N.-10	07-11	1	1	1	1	1	1
12	Bolt for impeller cover	07-12	4	4	4	4	4	4
13	Stud for fixing water circulating pump	07-13	4	4	4	4	4	4
14	Nut for S.N.-13	07-14	4	4	4	4	4	4
15	Washer for S.N.-14	07-15	4	4	4	4	4	4
16	Ball bearing	07-16	2	2	2	2	2	2
17	Pump shaft	07-17	1	1	1	1	1	1
18	Circlip for bearing	07-18	1	1	1	1	1	1
19	Bearing cover	07-19	1	1	1	1	1	1
20	Bolt for bearing cover	07-20	3	3	3	3	3	3
21	V-Groover pulley for water pump	07-21	1	1	1	1	1	1
22	Link belt	07-22	1	1	1	1	1	1
23	V-Groove pulley fixed on inner side of flywheel	07-23	1	1	1	1	1	1

PLATE - 8

RADIATOR
GM 90
GM - 90 ENGINES PARTS LIST

IIIUS. No.	Description of Part	Part No.	Required Per Engine					
			6-8hp	10hp	12hp	14hp	16hp	18hp
H	PLATE - 8 RADIATOR (Optional)							
1	Radiator with guard	08-01	1	1	1	1	1	1
2	Radiator fan guard	08-02	1	1	1	1	1	1
3	Radiator fan	08-03	1	1	1	1	1	1
4	Bolt for radiator fan	08-04	4	4	4	4	4	4
5	Washer for S.N.-4	08-05	4	4	4	4	4	4
6	Rubber pipe connecting between top of radiator to water outlet flange of cylinder head	08-06	1	1	1	1	1	1
7	V-Groove pulley of water circulating pump	08-07	1	1	1	1	1	1
8	Water circulating pump shaft bearing (It is itself a shaft of water circulating pump)	08-08	1	1	1	1	1	1
9	Circlip	08-09	1	1	1	1	1	1
10	Suction nipple for water circulating pump	08-10	1	1	1	1	1	1
11	Rubber pipe connection between bottom of radiator to the suction nipple of water circulating	08-11	1	1	1	1	1	1
12	Stud for fixing water circulating pump	08-12	4	4	4	4	4	4
13	Nut for S.N.-12	08-13	4	4	4	4	4	4
14	Washer for S.N.-13	08-14	4	4	4	4	4	4
15	Radiator clamp	08-15	2	2	2	2	2	2
16	Water circulating pump body	08-16	1	1	1	1	1	1
17	Delivery nipple for water circulating pump	08-17	1	1	1	1	1	1
18	Rubber pipe connection between water inlet flange of cylinder block & delivery nipple of water circulating pump	08-18	1	1	1	1	1	1
19	Mechanical seal	08-19	1	1	1	1	1	1
20	Ceramic collar	08-20	1	1	1	1	1	1
21	Impeller of water circulating pump	08-21	1	1	1	1	1	1
22	Joint of water circulating pump	08-22	1	1	1	1	1	1
23	Bracket for fixing water circulating pump	08-23	1	1	1	1	1	1
24	Stud for fixing bracket on cylinder head	08-24	4	4	4	4	4	4
25	Nut for S.N.-24	08-25	4	4	4	4	4	4
26	Washer S.N.-25	08-26	4	4	4	4	4	4
27	Water inlet bend	08-27	1	1	1	1	1	1
28	Water outlet nipple	08-28	1	1	1	1	1	1
29	Link bolt	08-29	1	1	1	1	1	1

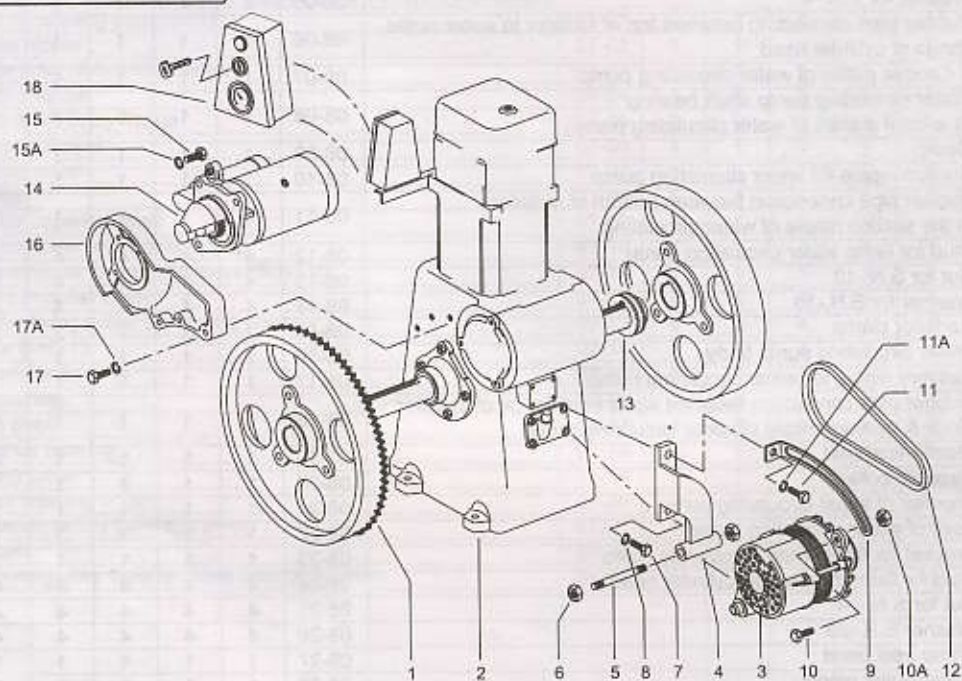
PLATE - 9



BLOWER TYPE COWLING ASSEMBLY FOR AIR COOLED ENGINE



PLATE - 10



STRATOR MOTOR AND ALTERNATOR ARRANGEMENT

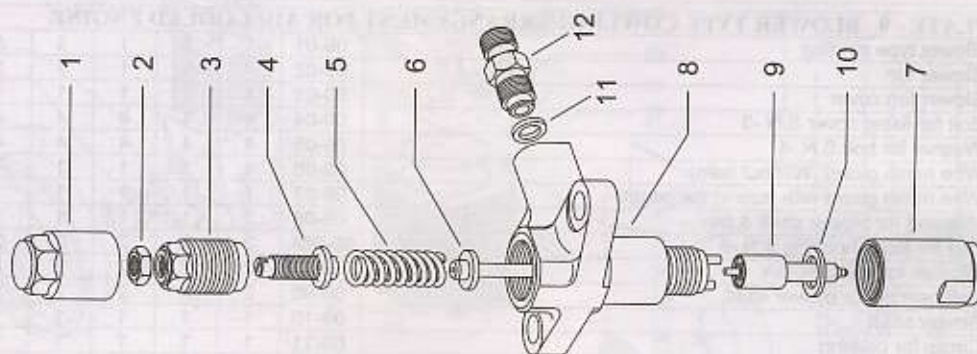


GM - 90 ENGINES PARTS LIST

GM - 90 ENGINES PARTS LIST								
IIUS. No.	Description of Part	Part No.	Required Per Engine					
			6-8hp	10hp	12hp	14hp	16hp	18hp
I	PLATE - 9 BLOWER TYPE COWLING ARRANGEMENT FOR AIR COOLED ENGINE							
1	Blower type cowling	09-01	1	1	1	1	1	1
2	Blower fan	09-02	1	1	1	1	1	1
3	Blower fan cover	09-03	1	1	1	1	1	1
4	Bolt for fixing cover S.N.-3	09-04	4	4	4	4	4	4
5	Washer for bolt S.N.-4	09-05	4	4	4	4	4	4
6	Wire mesh guard (Without hole)	09-06	1	1	1	1	1	1
7	Wire mesh guard with hole in the centre	09-07	1	1	1	1	1	1
8	Housing for blower shaft & fan	09-08	1	1	1	1	1	1
8A	Bolt for fixing housing S.N.-8	09-08A	2	2	2	2	2	2
8B	Washer for bolt S.N.-8A	09-08B	2	2	2	2	2	2
9	Ball bearing for blower shaft	09-09	2	2	2	2	2	2
10	Blower shaft	09-10	1	1	1	1	1	1
11	Circlip for bearing	09-11	1	1	1	1	1	1
12	V-Groove pulley of blower shaft	09-12	1	1	1	1	1	1
13	Bolt for fixing V-Groove pulley	09-13	1	1	1	1	1	1
14	Washer for bolt S.N-13	09-14	1	1	1	1	1	1
15	Bracket for blower housing	09-15	1	1	1	1	1	1
16	Bolt for fixing bracket	09-16	4	4	4	4	4	4
17	Washer for bolt S.N.-16	09-17	4	4	4	4	4	4
18	Mounting for tension pulley	09-18	1	1	1	1	1	1
18A	Bolt for mounting S.N.-18	09-18A	1	1	1	1	1	1
18B	Nut for bolt S.N. 18-A	09-18B	1	1	1	1	1	1
18C	Washer for nut S.N. 18-B	09-19C	1	1	1	1	1	1
19	Ball bearing for tension pulley shaft	09-19	2	2	2	2	2	2
20	Circlip for ball bearing	09-20	1	1	1	1	1	1
21	Tension pulley shaft	09-21	1	1	1	1	1	1
22	Tension pulley (V-Groove)	09-22	1	1	1	1	1	1
23	Bolt for fixing tension pulley	09-23	1	1	1	1	1	1
24	Washer for bolt S.N.-23	09-24	1	1	1	1	1	1
25	Cylinder block	09-25	1	1	1	1	1	1
26	Stud for cylinder block & head (Long)	09-26	2	2	2	2	2	2
27	Stud for cylinder block & head (Short)	09-27	2	2	2	2	2	2
28	Gasket ring	09-28	1	1	1	1	1	1
29	Cylinder head	09-29	1	1	1	1	1	1
30	Nozzle sleeve	09-30	1	1	1	1	1	1
31	V-groove pulley mounted on flywheel boss (Inside)	09-31	1	1	1	1	1	1
32	V-Belt	09-32	1	1	1	1	1	1
33	Crank case	09-33	1	1	1	1	1	1
34	Flywheel	09-34	2	2	2	2	2	2
J	PLATE - 10 STARTER MOTOR (SELF) & ALTERNATOR ARRANGEMENT (Optional)							
1	Ring gear	10-01	1	1	1	1	1	1
2	Crank case (Body)	10-02	1	1	1	1	1	1
3	Alternator	10-03	1	1	1	1	1	1
4	Mounting for alternator	10-04	1	1	1	1	1	1
5	Stud for S.N.-3	10-05	1	1	1	1	1	1
6	Nut for S.N.-5	10-06	2	2	2	2	2	2
7	Bolt for S.N.-4	10-07	2	2	2	2	2	2
8	Washer for bolt S.N.-7	10-08	2	2	2	2	2	2
9	Clamp for adjustment of alternator	10-09	1	1	1	1	1	1
10	Lock bolt with nut 10-A	10-10	1	1	1	1	1	1
11	Bolt & washer for clamp	10-11	1	1	1	1	1	1
12	Belt for alternator	10-12	1	1	1	1	1	1
13	V-Groove pulley	10-13	1	1	1	1	1	1
14	Strator motor (Self)	10-14	1	1	1	1	1	1
15	Bolt for S.N.14 with washer 15-A	10-15	3	3	3	3	3	3
16	Bracket for S.N.-14	10-16	1	1	1	1	1	1
17	Bolt for S.N. with washer 17-A	10-17	3	3	3	3	3	3
18	Penal board	10-18	1	1	1	1	1	1

PLATE - 11A

NOZZLE HOLDER

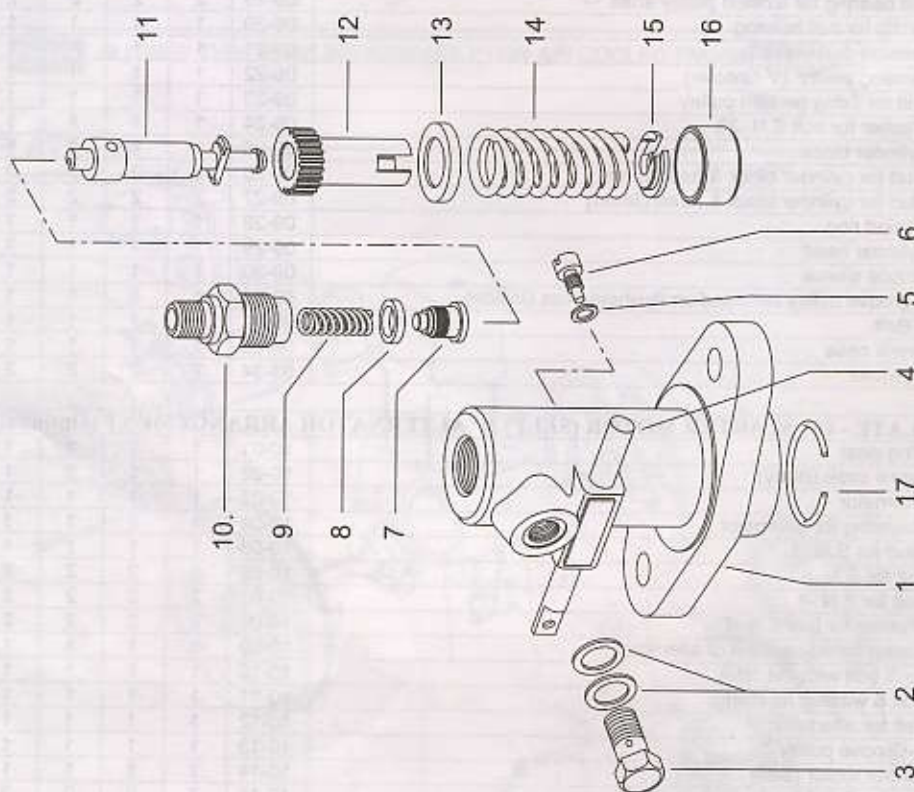


NOZZLE WITH NOZZLE HOLDER (INJECTOR)

GM 90

PLATE - 11B

FUEL INJECTION PUMP



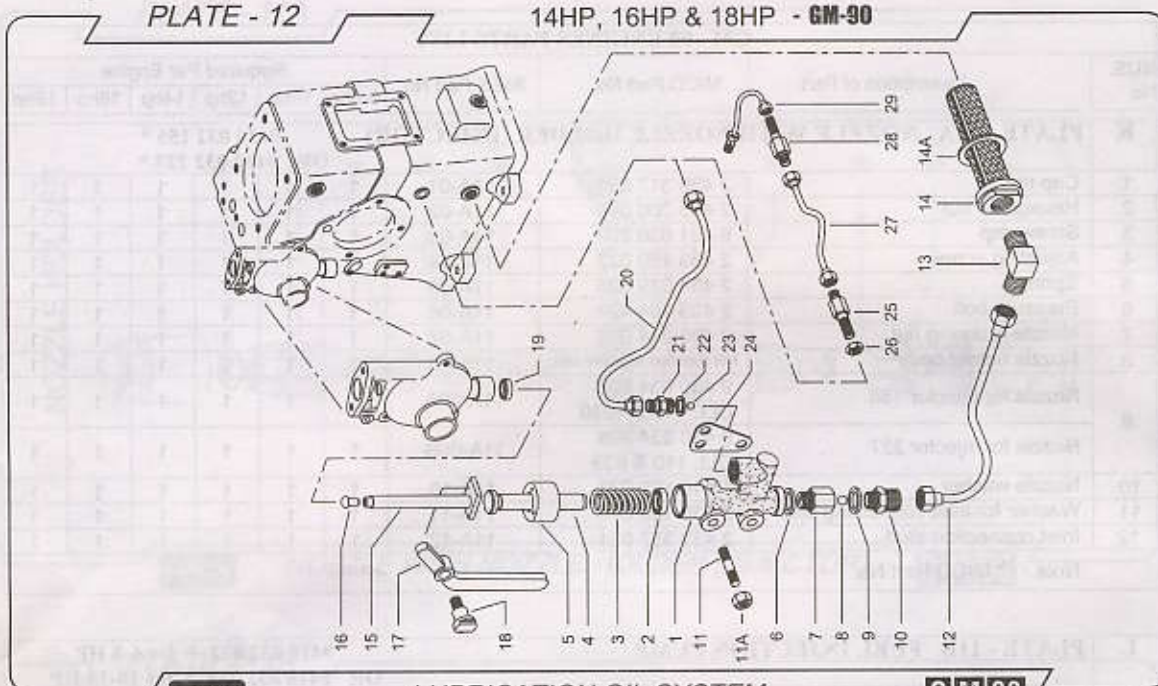
FUEL INJECTION PUMP

GM 90

GM - 90 ENGINES PARTS LIST

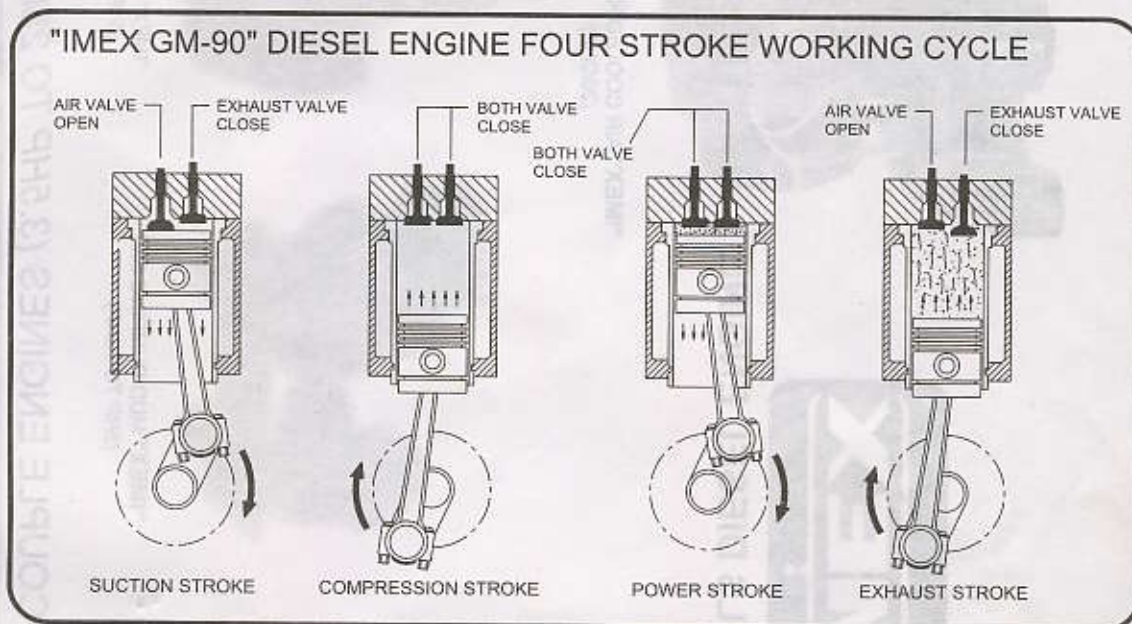
GM - 90 ENGINES PARTS LIST										
IIIUS. No.	Description of Part	MICO Part No.	IMEX Part No.	Required Per Engine						
				6-8hp	10hp	12hp	14hp	16hp	18hp	
K	PLATE - 11A NOZZLE WITH NOZZLE HOLDER (INJECTOR)			9430 032 155 * OR 9430 032 227 *						
1	Cap nut	2 433 317 021	11A-01	1	1	1	1	1	1	1
2	Hexagonal nut	2 433 300 010	11A-02	1	1	1	1	1	1	1
3	Screw cap	9 431 030 300	11A-03	1	1	1	1	1	1	1
4	Adjusting screw	2 433 460 022	11A-04	1	1	1	1	1	1	1
5	Spring	2 434 619 006	11A-05	1	1	1	1	1	1	1
6	Pressure bolt	2 433 104 424	11A-06	1	1	1	1	1	1	1
7	Nozzle retaining nut	2 433 314 066	11A-07	1	1	1	1	1	1	1
8	Nozzle holder body	Not supplied as spare part	11A-08	1	1	1	1	1	1	1
9	Nozzle for injector 155	9 430 034 205 DLL 110 S 1030	11A-09A	1	1	1	1	1	1	1
	Nozzle for injector 227	9 430 034 206 DLL 110 S 639	11A-09B	1	1	1	1	1	1	1
10	Nozzle washer	1 410 103 023	11A-10	1	1	1	1	1	1	1
11	Washer for inlet connecting stud	2 430 100 040	11A-11	1	1	1	1	1	1	1
12	Inlet connection stud	2 433 357 031	11A-12	1	1	1	1	1	1	1
Note.- * MICO Part No.										

L	PLATE - 11B FUEL INJECTION PUMP			9410 032 032 * for 6-8 HP OR 9410 032 034 * for 10-18 HP					
1	Fuel pump body (Housing)	9 411 035 248	11B-01	1	1	1	1	1	1
2	Banjo bolt washer	Not supplied as spare part	11B-02	2	2	2	2	2	2
3	Banjo bolt	Not supplied as spare part	11B-03	1	1	1	1	1	1
4	Control pack	9 411 036 021	11B-04	1	1	1	1	1	1
5	Washer for locating screw	1 410 107 005	11B-05	1	1	1	1	1	1
6	Locating screw	9 411 038 308	11B-06	1	1	1	1	1	1
7	Delivery valve (DV)	9 411 038 542	11B-07	1	1	1	1	1	1
8	Washer for DV	1 410 206 022	11B-08	1	1	1	1	1	1
9	Helical spring	1 414 612 005	11B-09	1	1	1	1	1	1
10	DV Holder	9 411 033 308	11B-10	1	1	1	1	1	1
11	Element 6 - 8 HP	9 411 038 321	11B-11A	1	-	-	-	-	-
	Element 10 to 16 HP	9 411 038 323	11B-11B	-	1	1	1	1	1
12	Control sleeve	1 410 364 000	11B-12	1	1	1	1	1	1
13	Spring plate upper	1 410 500 002	11B-13	1	1	1	1	1	1
14	Plunger spring	1 414 617 005	11B-14	1	1	1	1	1	1
15	Spring plate lower	3 410 120 010	11B-15	1	1	1	1	1	1
16	Plunger guide	9 411 030 521	11B-16	1	1	1	1	1	1
17	Spring ring	1 414 601 005	11B-17	1	1	1	1	1	1
Note.- * MICO Part No.									

PLATE - 12
14HP, 16HP & 18HP - GM-90

IMEX
LUBRICATION OIL SYSTEM
GM 90
GM - 90 ENGINES PARTS LIST

IIIUS. No.	Description of Part	Part No.	Required Per Engine					
			6-8hp	10hp	12hp	14hp	16hp	18hp
M	PLATE - 12 LUBRICATION OIL SYSTEM							
1	Lubricating oil pump body	12-01	-	-	-	1	1	1
2	Oil seal for pump	12-02	-	-	-	1	1	1
3	Spring	12-03	-	-	-	1	1	1
4	Plunger	12-04	-	-	-	1	1	1
5	Cover for spring	12-05	-	-	-	1	1	1
6	Washer	12-06	-	-	-	1	1	1
7	Inlet valve connection	12-07	-	-	-	1	1	1
8	Ball valve (Steel ball Ø5/16")	12-08	-	-	-	1	1	1
9	Washer	12-09	-	-	-	1	1	1
10	Inlet connecting	12-10	-	-	-	1	1	1
11	Stud with nut 11-A	12-11	-	-	-	2	2	2
12	Suction pipe	12-12	-	-	-	1	1	1
13	Elbow for suction pipe	12-13	-	-	-	1	1	1
14	Oil filter with washer 14-A	12-14	-	-	-	1	1	1
15	Pump tappet with foot	12-15	-	-	-	1	1	1
16	Pump tappet end pin	12-16	-	-	-	1	1	1
17	Pump hand lever	12-17	-	-	-	1	1	1
18	Swivel pin for lever	12-18	-	-	-	1	1	1
19	Oil seal for pump tappet	12-19	-	-	-	1	1	1
20	Delivery pipe	12-20	-	-	-	1	1	1
21	Pump outlet connecting	12-21	-	-	-	1	1	1
22	Washer for 21	12-22	-	-	-	1	1	1
23	Ball valve (steel ball Ø5/16")	12-23	-	-	-	1	1	1
24	Pump body joint	12-24	-	-	-	1	1	1
25	Distributor union	12-25	-	-	-	1	1	1
26	Lock nut for distributor union	12-26	-	-	-	1	1	1
27	Connecting pipe	12-27	-	-	-	1	1	1
28	Distributor union	12-28	-	-	-	1	1	1
29	Oil pipe from big housing to body	12-29	-	-	-	1*	1	1
Note.- * Optional								

The "IMEX GM-90" Diesel Engine is working on four stroke cycle principle. The complete cycle is affected in two revolution of the crankshaft. The short description of the working is illustrated below.



I Suction Stroke :-

During the downward motion of the piston, the air inlet Valve opens and the fresh air from atmosphere is sucked into cylinder through air cleaner.

II Compression Stroke :-

During compression stroke both valves remain closed and piston moves up, with the result that air inside the cylinder is compressed to a very high pressure, which develop temperature rise enough to ignite the fuel. Just before the piston reaches the top position a very small quantity of fuel is injected through nozzle. The injection pressure causes the fuel to discharge in the form of fine spray.

III Working Stroke :-

The fuel injected at the end of compression stroke mixes thoroughly with hot air and gets ignited due to high temperature. This combustion occurring inside the combustion chamber causes further rise in temperature and pressure with the effect the piston is forced down.

IV Exhaust Stroke :-

In this last stroke of the cycle exhaust valve opens when piston moves up and all burnt gases escape out through silencer,

This completes the cycle of operation and continues in the same manner and the engine goes on running.