



Repair Manual and Spare Parts List

ZF 63 A
ZF 63
ZF 80 A
ZF 80-1 A
ZF 85 A

FEBRUARY 2006
cod. **310.01.0054i**



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INTRODUCTION

This manual gives specific instructions for the proper repair on ZF 63 - ZF 63 A - ZF 80 A - ZF 80-1 A - ZF 85 A transmissions.

Please follow the procedures carefully to insure quality service.

ZF HURTH MARINE recommends to read the manual completely before starting with repairs, as some of the procedures described are rather complex.

Along with standard tools, ZF HURTH MARINE recommends the use of special tools, necessary to perform repairs correctly. The special tools are available through your local ZF HURTH MARINE dealer.

This manual is based on the technical information at the time of printing. The manual has been checked carefully in order to avoid errors. However ZF HURTH MARINE is not liable for any misrepresentations, errors of description or omissions.

Modifications on future manuals may be introduced without prior notice.



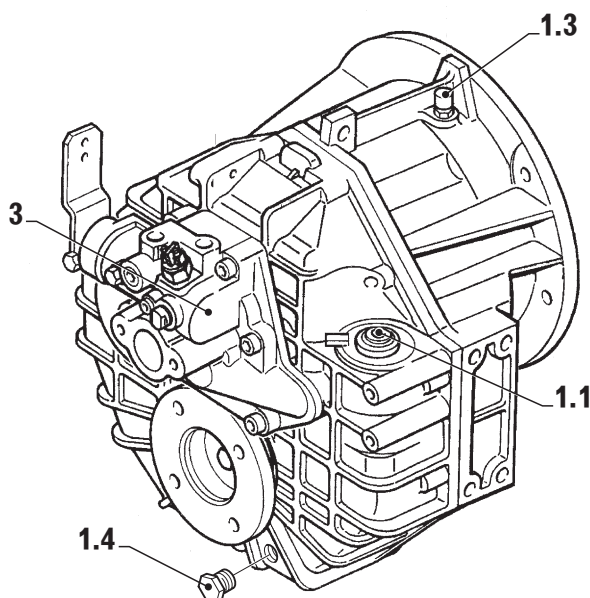
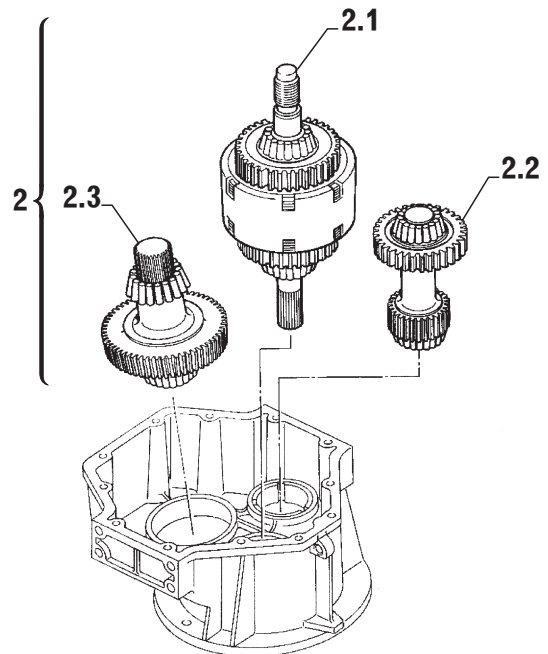
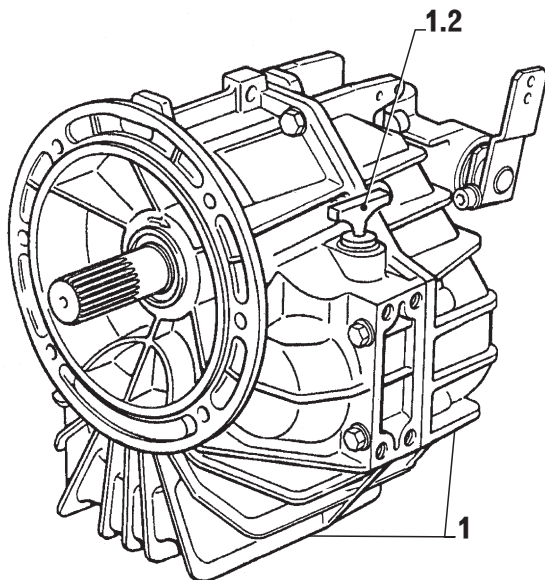
1. MAJOR COMPONENTS

1.1 TRANSMISSION SET-UP

The main components of the ZF Marine Transmissions are:

| ITEM | DESCRIPTION |
|------------|---|
| 1 | Two-piece aluminum die cast |
| 1.1 | Oil filter |
| 1.2 | Oil dipstick |
| 1.3 | Breather valve |
| 1.4 | Oil drain plug (ZF 80A, ZF 80-1A, ZF 85A) |

| ITEM | DESCRIPTION |
|------------|---|
| 2 | Gears |
| 2.1 | Input shaft with reversing clutch pack assembly |
| 2.2 | Intermediate shaft |
| 2.3 | Output shaft |
| 3 | Control block |



1.2 CLEANERS AND SEALANTS

For cleaning:

Cold cleaner such as benzene, trichloroethane or Loctite fast cleaner No. 7063.



WARNING

Keep detergents away from your skin, do not drink and do not inhale their vapors! Always wear protective gloves and safety glasses!

Note accident prevention rules!

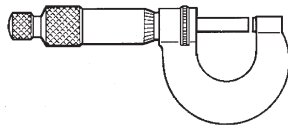
For assembly:

- Loctite 243 medium-hard for securing oil plug on ZF 80 A - ZF 80-1 A - ZF 85 A

- Loctite 245 for securing output flange on spline.
- Loctite 518 for housing surfaces.
- Loctite 574 for outer diameter sealing rings.
- Grease: Staburags NBU 30, Klueber Co. for radial shaft seals.
- ATF FLUID:
 - 3.8 litres (1.0 US.gallons) for ZF 63
 - 4.0 litres (1.05 US.gallons) for ZF 63 A
 - 5.5 litres (1.5 US.gallons) for ZF 80 A - ZF 80-1 A
 - 5.5 litres (1.5 US.gallons) for ZF 85 A

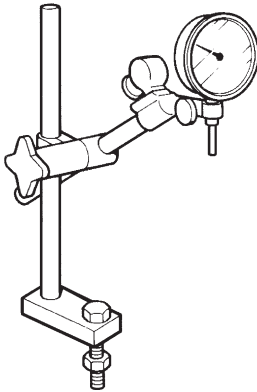
1.3. MEASURING TOOLS

MICROMETER



Measuring gauge from 0-25 mm (0-1.0 in.)
Accuracy of reading 1/100 mm (0.0004 in.)

DIAL INDICATOR GAUGE WITH ARM-TYPE SUPPORT



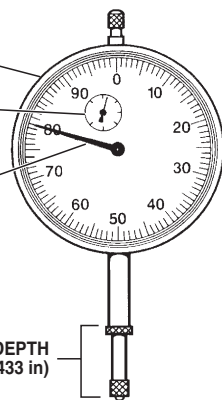
DIAL GAUGE INCREMENTS

DIAL FACE CAN BE TURNED TO ZERO POSITION

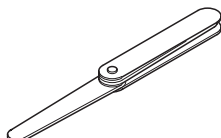
ACCURACY OF READING:
SMALL HAND 1 mm (.03937 in)

LARGE HAND
1/100 mm (.0004 in)

MEASURING DEPTH
APPROX. 11 mm (.433 in)

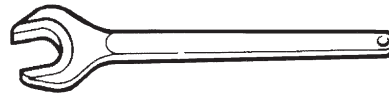


FEELER GAUGE

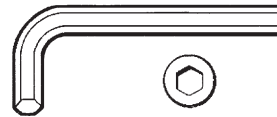


1.4. STANDARD TOOLS AND FIXTURE

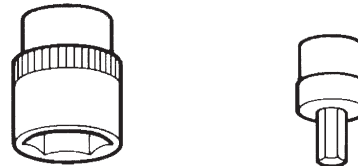
WRENCH for hexagon bolts (8-17-19-22 mm) (7/8")



ALLEN WRENCH (6 mm)



HEXAGON SOCKET WRENCH (6-8-17-19 mm)

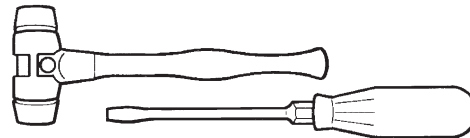


TORQUE WRENCH

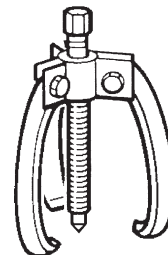
adjustable up to 180 Nm (152 ft.lb.)



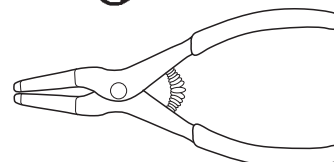
PLASTIC HAMMER (1000 g) and sturdy screwdriver



EXTRACTOR minimum diameter 130 m



PLIER





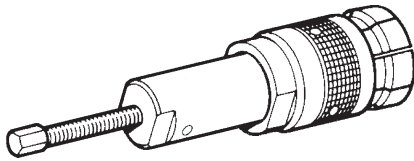
2. SPECIAL TOOLS

It is assumed that all standard tools, such as, torque wrenches, open-end wrenches, allen keys and extractors, are available.

All fixtures for pressing parts in or out should be used in conjunction with a hydraulic or manual press.

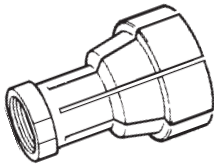
EXTRACTOR

Tapered roller bearing inner races
Basic Unit P/N 978.25.0017.0 (454421)



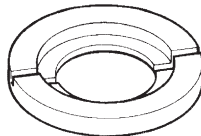
ADAPTER for basic unit 978.25.0017.0 (454421).
For bearing input shaft - spline side.

- P/N 978.25.0018.0 (469686) ZF 63 A - ZF 63
- P/N 978.35.0019.0 (500465) ZF 80 A - ZF 80-1 A - ZF 85 A

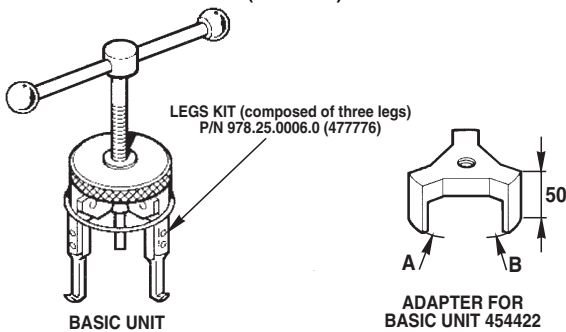


EXTRACTOR SPLIT RING

Input shaft. Taper roller bearing inner race - control block side. P/N 224.836.009 (456170)



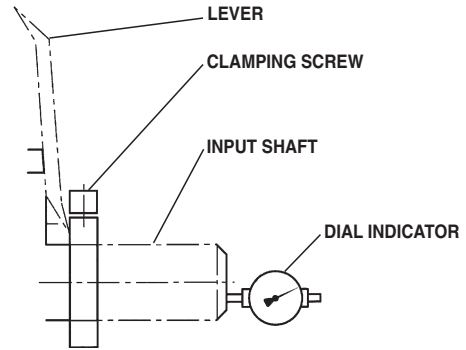
EXTRACTOR Tapered roller bearing outer races basic unit P/N 978.25.0021.0 (454422)



| Part number | ZF 63 ZF 63 A | ZF 80 A ZF 80-1 A | ZF 85 A ZF 80 A* |
|------------------------|------------------|----------------------|---------------------|
| 978.25.0009.0 (477853) | ● | | ● |
| 978.25.0011.0 (477854) | ● | ● | ● |
| 978.25.0012.0 (477856) | ● | | |
| 978.25.0013.0 (477857) | ● | | |
| 978.35.0016.0 (477895) | | ● | ● |

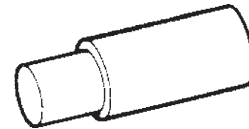
* (ZF 85 A DERIVATE VERSION)

CLAMPING RING for measuring the bearing clearance input shaft P/N 219.354.3 (618582)

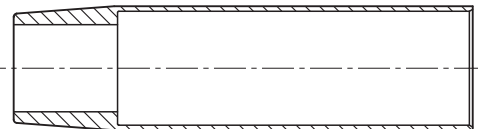


MANDREL

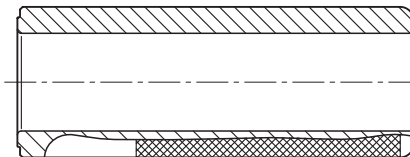
For disassembly and assembly
Shaft seal - input side : P/N 224.836.005 (454425)
Shaft seal - output side:
- P/N 224.836.006 (454426) ZF 63 A - ZF 63
- P/N 978.35.0005.0 (500449) ZF 80 A - ZF 80-1 A - ZF 85 A



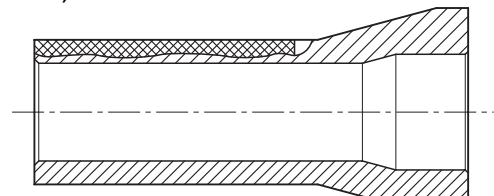
For assembling input shaft seal on the input spline side
Bushing P/N 20.0012.01 to insert input shaft seal
Only for models: ZF 63 A - ZF 63 - ZF 80 A - ZF 80-1 A



Mandrel P/N 20.0012.02 to assemble input shaft seal
Only for models: ZF 63 A - ZF 63 - ZF 80 A - ZF 80-1 A



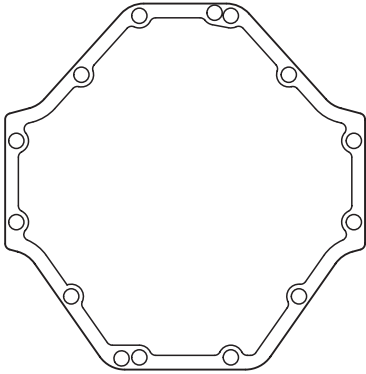
Mandrel P/N 20.1072.01 to assemble input shaft seal
Only for model: ZF 85 A - ZF 80 A (ZF 85 A DERIVATE VERSION)



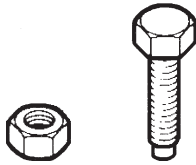
SHIM

To determinate the correct preload of the tapered roller bearings.

- P/N 20.1005.00 ZF 63 A
- P/N 20.1018.00 ZF 63
- P/N 20.1016.00 - ZF80 A - ZF 80-1 A - ZF 85 A

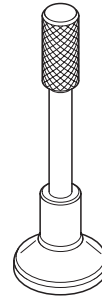
**SPECIAL HEX HEAD BOLT WITH BEARING**

for measuring the bearing clearance intermediate shaft
P/N. 224.836.008 (458105)

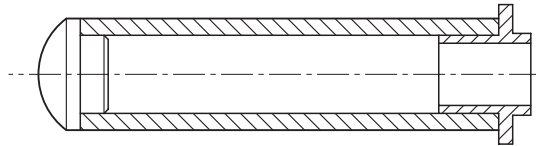
**PUNCH**

for assembly Seal - suction pipe

- P/N 20.1021.00 ZF 80 A - ZF 80-1 A - ZF 85 A
- P/N 20.1029.00 ZF 63 A - ZF 63



CENTRE SQUARE PUNCH To position the oil suction pipe into housing P/N 20.1041.00





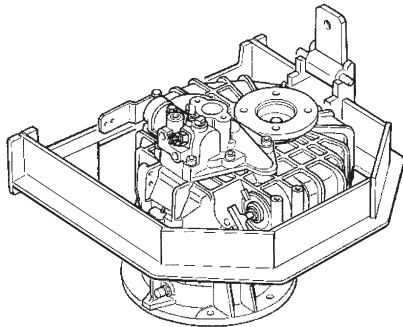
3. DISASSEMBLY

INTRODUCTION

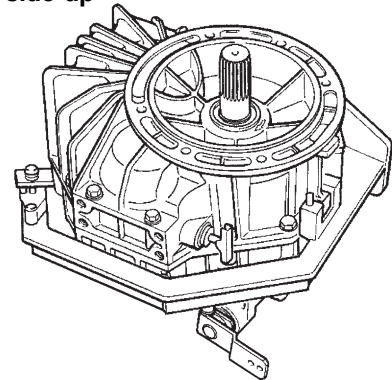
Clean the transmission thoroughly on the outside before disassembly.

The repair area should be clean and well lighted. ZF HURTH MARINE recommends using a swiveling stand for aiding in assembly and disassembly.

**Swiveling stand ZF
Output - half side up**



**Swiveling stand ZF
Input - half side up**



3.1 FLUID FILTER

3.1.1 Remove fluid filter

Turn the screw that fixes the oil filter cover in a counter-clockwise direction and remove the filter from its housing (item 1, fig. 1-1). Use a 6 mm Allen wrench.

Pull filter element off (item 2, fig.1-1).

Check O-rings (item 3 and 4, fig. 1-1) for wear, replace if necessary.

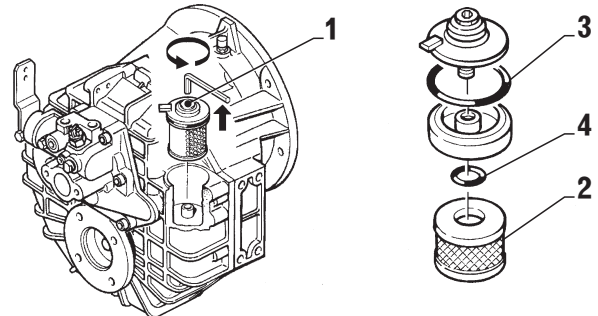


FIG. 1 - 1

3.1.2 Suction of transmission fluid

Push hose of suction pump (item 1, Fig. 1-2) through the suction pipe (item 2, Fig. 1-2) down to the bottom of the housing and suck the fluid off.

3.1.3 Suction of transmission fluid on ZF 80 A, ZF 80-1 A and ZF 85 A

Remove the plug (item 3, Fig. 1-2) and let the oil flow from the proper hole.

IMPORTANT

The used oil and the oil filter are to be handled as special waste that pollute the environment. For the safe disposal of used oil and filter, take all the measures required by the relevant local rules and legislation.

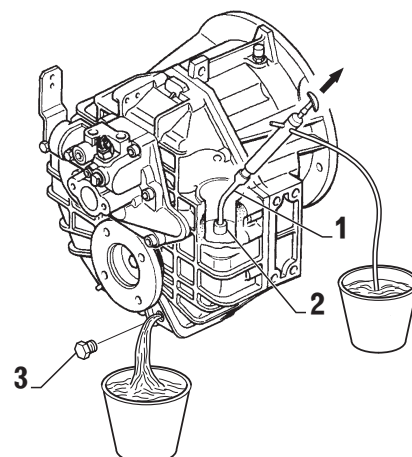


FIG. 1 - 2

3.2 DIPSTICK

Unscrew dipstick (item 1, Fig. 2-1) (counterclockwise) and pull out of housing. Replace O-Ring if present (check parts list section 11).

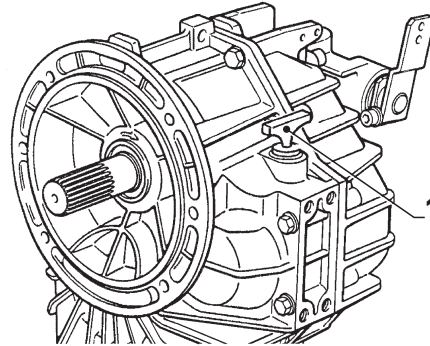


FIG. 2 - 1

3.3 BREATHER VALVE

Unscrew breather valve (item 1, Fig. 3-1). Wash valve in a detergent, let dry and dip in oil, then let oil drip off.

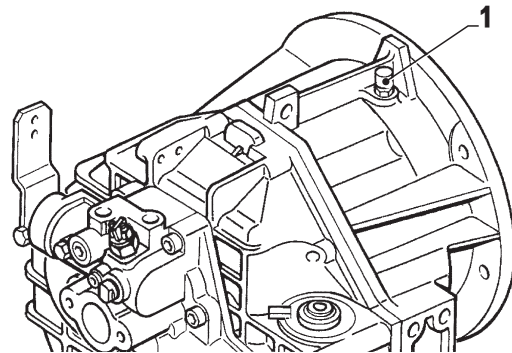


FIG. 3 - 1

3.4 OUTPUT FLANGE

Lock output flange in swivel frame.

Unscrew hex head bolt (item 1, Fig. 4-1).

Remove disc (item 2, Fig. 4-1) and O-ring (item 3, Fig. 4-1).

Screw hex bolt (item 1, Fig. 4-1) in again.

Place extractor on the transmission and pull output flange (item 1, Fig. 4-2) off.

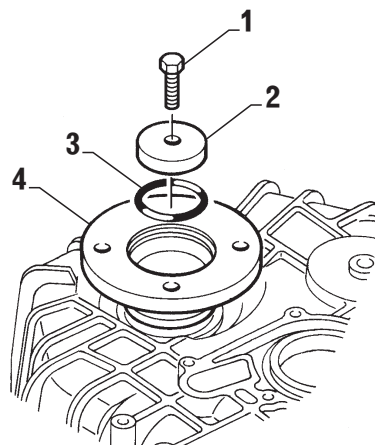


FIG. 4 - 1

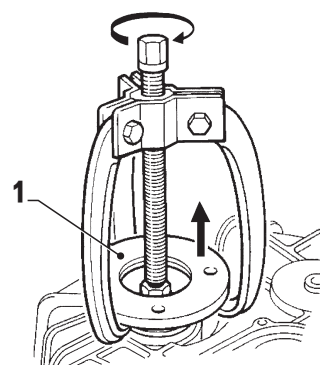


FIG. 4 - 2



3.5 CONTROL BLOCK

Unscrew allen head bolts (item 1, Fig. 5-1)
 Pull control block (item 2, Fig. 5-1) together with seal (item 3, Fig. 5-1) off the input shaft.
 Remove key (item 4, Fig. 5-1) from input shaft (item 5, Fig. 5-1).

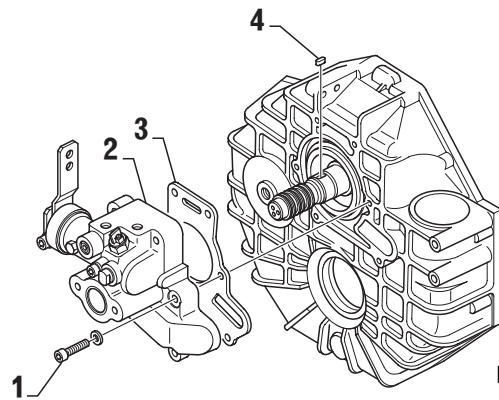


FIG. 5 - 1

3.5.1 Neutral Safety Switch

Unscrew neutral safety switch (item 1, Fig. 5-2).
 Note: Use 7/8 inch wrench for hex bolts.
 To reassemble switch:
 tightening torque: 25 Nm (18.5 ft.lb.)

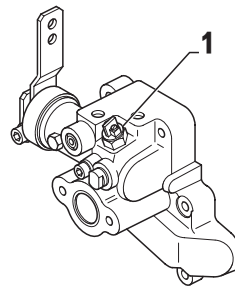


FIG. 5 - 2

3.5.2 Neutral Safety Switch Check

To check for proper operation of the switch perform one of the following tests:

A: Ohm meter

Connect the ohm meter leads to the terminal connection of the switch.

With the pin (item 1a Fig. 5-3) extended you should get a reading, indicating a good switch.

Compressing the pin (item 1b Fig. 5-3) you should have «O» reading,

B: 12 volt light

Connect the neutral safety switch with a light in series to a 12 volt battery. The switch is good when the light goes out when the center pin (item 1b Fig. 5-3) is compressed.

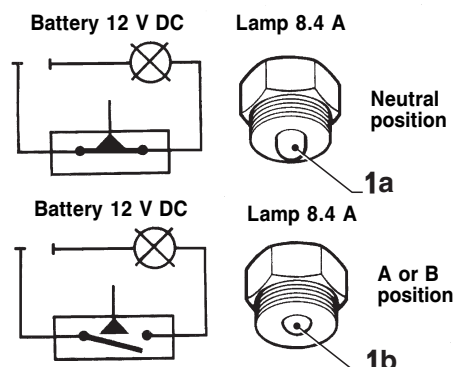


FIG. 5 - 3

3.6 HOUSING

3.6.1 Transmission housing halves

Using an adequate drift punch, top the locating pins (item 1, Fig. 6-1a and 6-1b) out of the housing.

Loosen and remove all hex head bolts and lock washers (item 2 and 3, Fig. 6-1b). Using a plastic hammer slightly top the split line of the case halves to break the seal. Then remove the input side of the housing.

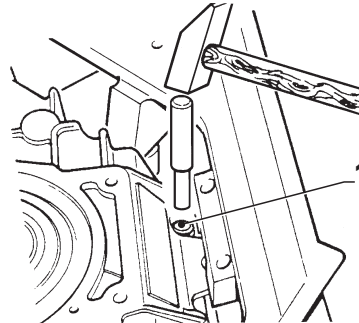


FIG. 6 - 1a

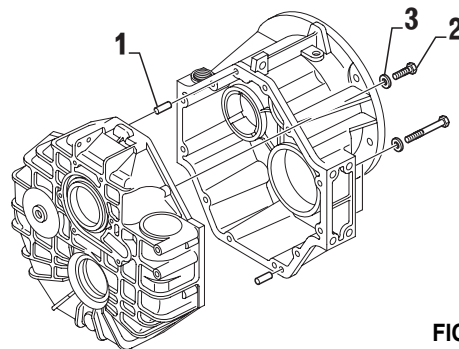


FIG. 6 - 1b

3.6.2 Shafts and gears

Take the gear set out of the housing

- Intermediate shaft (item 2, Fig. 6-2).
- Input shaft (item 1, Fig. 6-2).
- Output shaft (item 3, Fig. 6-2).

Check all gears, bearings and three piston rings on the input shaft (item 4, Fig. 6-2) for signs of wear or failure. If any of the gears are damaged or showing signs of excessive wear ZF HURTH MARINE recommends replacing the complete gear set.

When tapered roller bearings on the input shaft need to be replaced, the butting rings and needle bearings should also be replaced. To check for correct clutch operation, rotate the gears on the input shaft. If it is hard to turn the gears, the clutch is probably damaged.

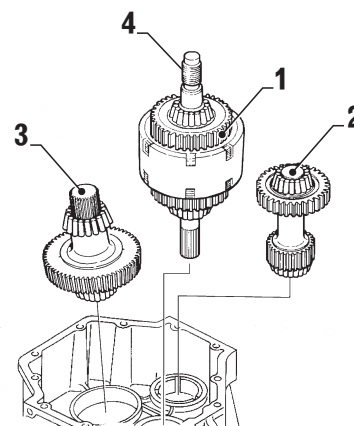


FIG. 6 - 2

3.6.3 Radial shaft seals

Input shaft seal

Using a seal mandrel inside the housing top the input shaft seal out.

Discard seal and replace with a new one. (Fig. 6-3a).

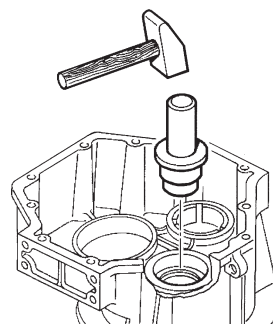


FIG. 6 - 3a



Output shaft seal

Using a mandrel punch top the output flange seal out from the other side of the housing. Discard seal and replace with a new one. (Fig. 6-3b).

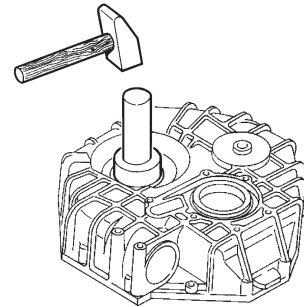


FIG. 6 - 3b

3.6.4 Fluid inlet pipe

Replacing the seal:

ZF 63 A - ZF 63 (Fig. 6-4a)

- Remove baffle plate (item 2).
- Remove suction pipe (item 3).
- Drive out seal (item 1).

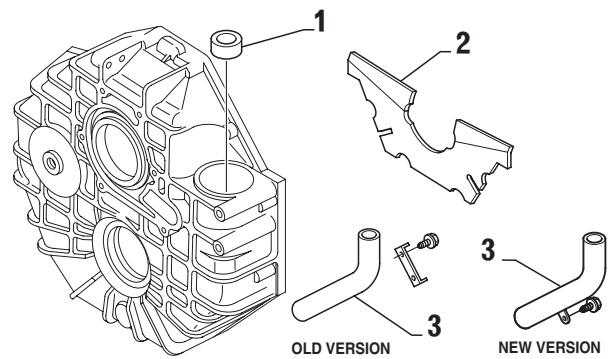


FIG. 6 - 4a

ZF 80 A - ZF 80-1 A - ZF 85 A (Fig. 6-4b)

- Remove suction pipe (item 2).
- Drive out seal (item 1).

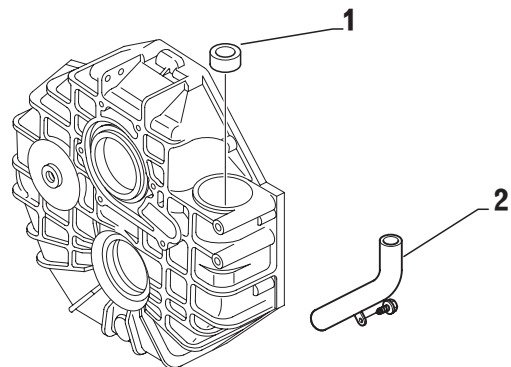


FIG. 6 - 4b

3.7 TAPERED ROLLER BEARINGS

Check for failed bearings or excessive bearing wear.

3.7.1 Outer races of tapered roller bearing

Remove the outer races out of the housing halves by means of the special tool (Fig. 7-1) or by heating the housing halves in an oven to approx. 120 °C (248 F):

Put the housing in the oven upside down, so the outer races will fall down.

⚠ WARNING

Use protective gloves when handling the heated housing and outer races.

👉 IMPORTANT

Regard location of shims under each outer race for correct position during reassembling.

Shims are located under outer races of the cover only.

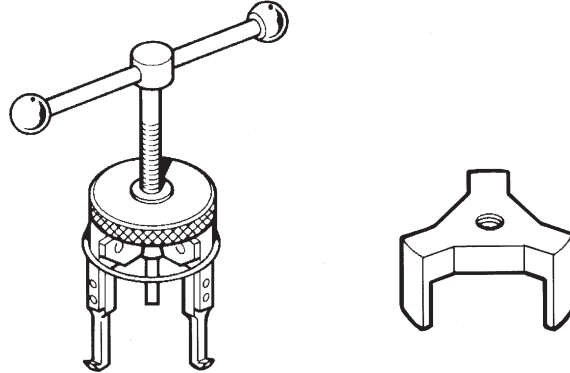


FIG. 7 - 1

3.7.2 Inner races of tapered roller bearings

NOTE

- Input shaft - spline side
- The extractor (Fig. 7-2a) is required for pulling the inner races off.

For extracting the inner races proceed as follows:

- Screw in adapter onto the puller (item 1).
- Place adapter onto the roller cage.
- Tighten collar to rollers by means of cap nut (item 2).
- Screw spindle (item 3) against shaft and pull bearing evenly and carefully off.

⚠ WARNING

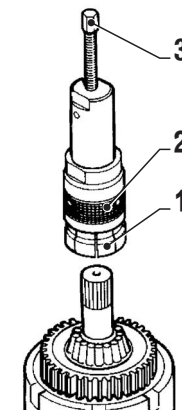
Improper use of the extractor when removing the races, could cause damage to the race or slip off.

Input shaft - Control block side

The inner race and the gear on the control block side can be removed by using the split ring and a standard hydraulic press (fig. 7-2b).

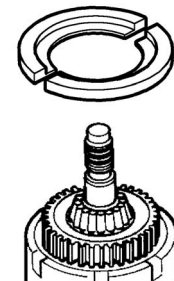
Input shaft - Control block side ZF 85 A - ZF 80 A (ZF 85 A DERIVATE VERSION)

- Remove the retaining ring (item 1, Fig. 7-2c) using a plier.
- Scrap the retaining ring.
- Remove the washer (item 2, Fig. 7-2c).
- Remove the shims (item 3, Fig. 7-2c).



INPUT SPLINE SIDE

FIG. 7 - 2a



CONTROL BLOCK SIDE

FIG. 7 - 2b

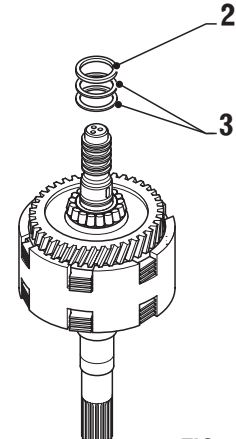
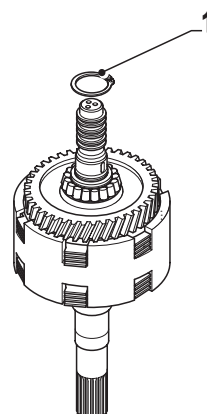


FIG. 7 - 2c



3.8 CLUTCH PACK

3.8.1 Removal of the clutch discs

Control block side (Fig. 8-1a)

ZF 63 A - ZF 63

- Remove thrust washer (1) off using two screwdrivers.
- Take off gear (2) and, needle bearings (3).
- Removal of pressure plate.
Press snap ring (5) against periphery of pressure plate (4) by means of screwdrivers. Extract them together. The discs (6) can now be removed from the clutch housing.

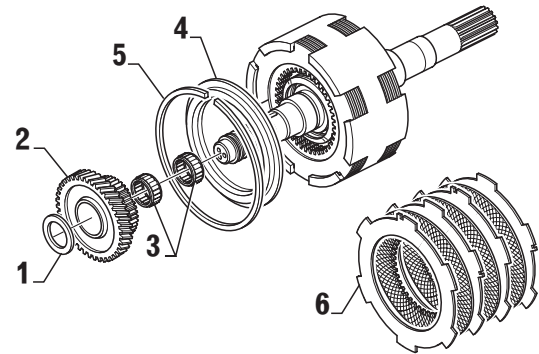


FIG. 8 - 1a

Control block side (Fig. 8-1b)

ZF 80 A - ZF 80-1 A

- Remove thrust washer (1) off using screwdrivers.
- Take off gear (2), needle bearings (3), and spacer (7).
- Removal of pressure plate.
Press snap ring (5) against periphery of pressure plate (4) by means of screwdrivers. Extract them together. The discs (6) can now be removed from clutch housing.

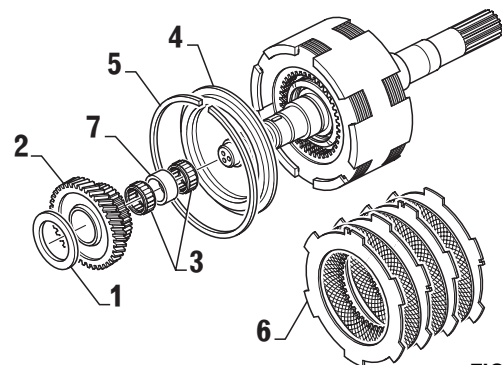


FIG. 8 - 1b

Control block side (Fig. 8-1c)

ZF 85 A - ZF 80 A (ZF 85 A DERIVATE VERSION)

- Remove thrust washer (1) off using two screwdrivers.
- Take off gear (2) and needle bearing (3).
- Removal of pressure plate.
Press snap ring (5) against periphery of pressure plate (4) by means of screwdrivers. Extract them together. The discs (6) can now be removed from the clutch housing.

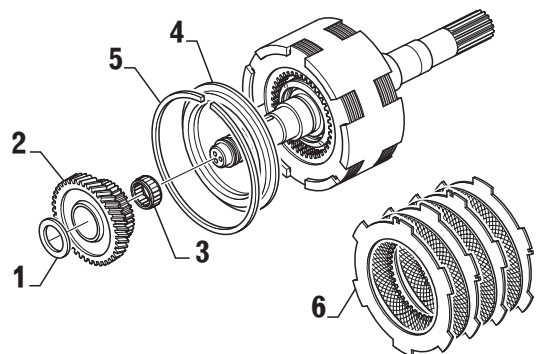


FIG. 8 - 1c

Input spline side (fig. 8-2a)
ZF 63 A (no ratio 2.7) - ZF 63

- Remove thrust washer (1) off using two screwdrivers.
- Take off gear (2) and needle bearings (3).
- Remove pressure plate (5). Press snap ring (4) against periphery of pressure plate by means of screwdrivers. Extract them together. The discs (6) can now be removed from the clutch housing.

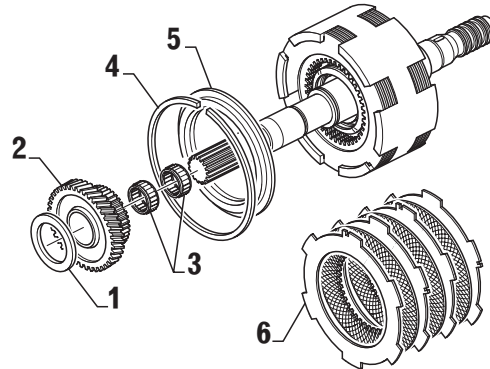


FIG. 8 - 2a

Input spline side (fig. 8-2b)
ZF 80 A - ZF 80-1 A
ZF 63 A (only ratio 2.7)
ZF 85 A

- Remove thrust washer (1) off using two screwdrivers.
- Take off gear (2), needle bearings (3) and spacer (4).
- Remove pressure plate (6). Press snap ring (5) against periphery of pressure plate by means of screwdrivers. Extract them together. The discs (7) can now be removed from the clutch housing.

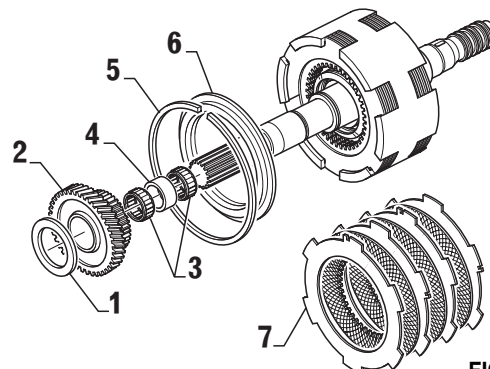


FIG. 8 - 2b



4. ASSEMBLY

INTRODUCTION

A well-lighted work area that is free from dirt and chips, will facilitate the work considerably.

ZF HURTH MARINE recommends to use a swiveling stand, described in the disassembly section to aid in the assembly.

Thoroughly clean all mating surfaces from any Loctite or gasket material.



Cleaners and solvents can be toxic and potentially harmful without proper ventilation.

Use caution when using such cleaners. Always wear protective gloves and glasses!

The next assembly procedure requires the following:

- An electric oven or heating lamp for heating the housing halves will be required when mounting the bearings.
- A hydraulic or mechanical press

4.1 INPUT SHAFT

4.1.1 Mount discs into reversing clutch

Equip both sides coupling with new outer disc (item 1, Fig. 1-1a) and new inner disc (item 2, Fig. 1-1a).

NOTE

- For exact quantity of inner (item 2, Fig. 1-1a) and outer discs (item 1, Fig. 1-1a), please refer to the spare parts list at the end of this manual.
- Stagger the position of the notches on the outer discs as shown in Fig. 1-1b.

Starting with one of the outer discs, build up the clutch. The lugs on the outer discs have to be positioned in line with each other as shown in Fig. 1-1b.

Install snap ring into groove of clutch housing securing the pressure plate.

Place end disc (item 1, Fig. 1-1c) and snap ring (item 2, Fig. 1-1c) engaging it into clutch housing groove.

Check correct position of end disc (item 1, Fig. 1-1c).

Repeat same procedure on opposite side of clutch (Fig. 1-1d).

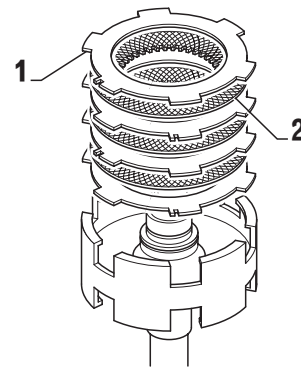


FIG. 1 - 1a

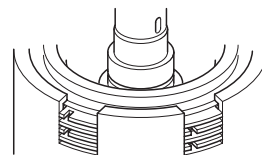


FIG. 1 - 1b

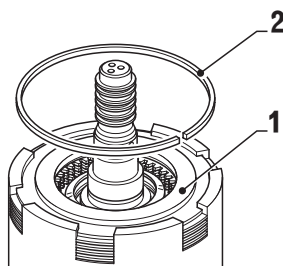


FIG. 1 - 1c

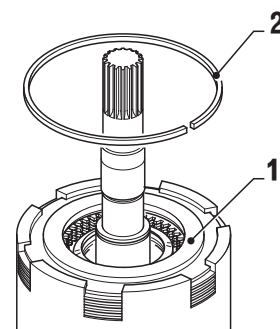


FIG. 1 - 1d

4.1.2 Install needle bearings and gear

Input spline side

- Install needle bearing (item 1, fig. 1-2) onto shaft.
- Slide spacer (item 3, fig. 1-2) where required.
- Align splines on clutch discs previously installed and install gear (item 2, fig. 1-2).

Make sure clutch gear is fully installed, engaging all clutch discs.

Control block side

- Repeat same procedure of input spline. Spacer is only in ZF 80 A and ZF 80-1 A.

4.1.3 Assemble butting rings

NOTE

- Make sure thrust washer is fully pressed on and gear is free to rotate.
- Thrust washer must not be bent.

Position shaft assembly on suitable holding fixture. Using a tube with a bore dia. of 35 mm (1.38 inch) in and a plastic hammer gently drive thrust washer in position. (item 1, Fig. 1-3). Repeat same procedure on opposite side.

4.1.4 Mounting inner races of tapered roller bearings

Heat inner race of tapered roller bearing (item 1, Fig. 1-4) to approx. 120 °(248 °F) and push onto input shaft. After cooling down, press bearing carefully against button ring (item 2, Fig. 1-4) by means of a sleeve and a manual press or a copper brass punch.

CAUTION

Handle heated tapered roller bearing inner race only with special gloves!

NOTE

For pressing, apply sleeve to inner race but not to rollers.

4.1.5 Assemble shims, support shims and retaining ring ZF 85 A - ZF 80 A (ZF 85 A DERIVATE VERSION)

- Place the shims (item 1, Fig. 1-5).
- Install the washer (item 2, Fig. 1-5).
- Put the retaining ring (item 3, Fig. 1-5) in the groove of the input shaft using a plier.

WARNING!

- Correct the shim thickness: check that there is no slack between washer and the retaining ring.
- Maximum permissible clearance should be 0.05 mm. Use a feeler gauge to check it.

ZF 63 A (Ratio = 2.7 only)
ZF 80 A - ZF 80-1 A - ZF 85 A

ZF 63 A (no Ratio = 2.7)
ZF 63

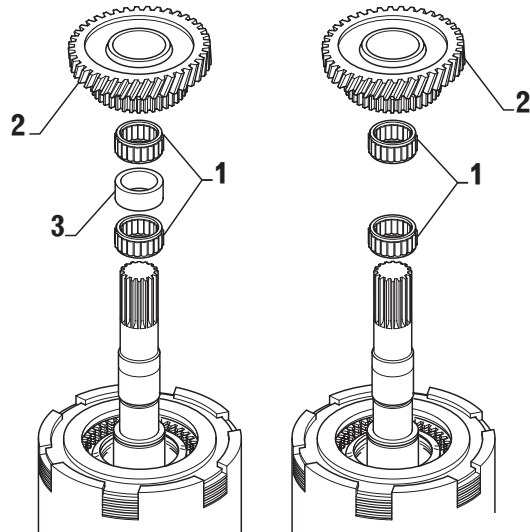


FIG. 1 - 2

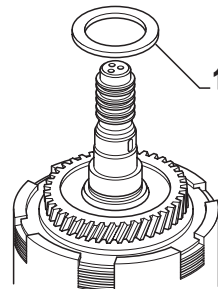


FIG. 1 - 3

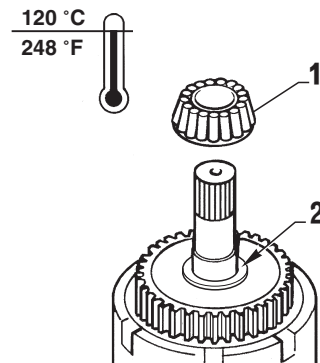


FIG. 1 - 4

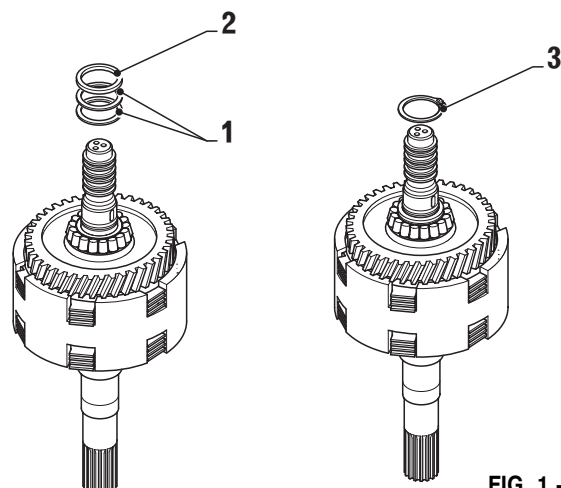


FIG. 1 - 5



4.1.6 Assemble piston rings

Mount piston ring seals (item 1, Fig. 1-6) onto input shaft.

IMPORTANT

Make sure the interlocking position of the piston rings are staggered on the shaft.

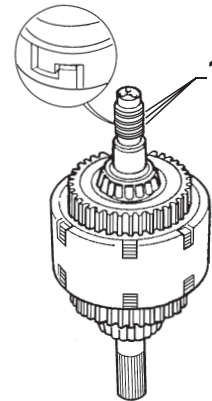


FIG. 1 - 6

4.2 INTERMEDIATE SHAFT

4.2.1 Mounting inner races of tapered roller bearings

Heat inner races of tapered roller bearings (item 1 and 2, Fig. 2-1) to approx. 120 °C (248 °F) and push them onto the intermediate shaft up against the shaft collar.

WARNING

Handle heated taper roller bearing inner races only with protective gloves!

When the inner races have cooled down, drive them carefully against the collar using a copper/brass punch.

NOTE

Apply copper/brass punch on inner race and not on the rollers.

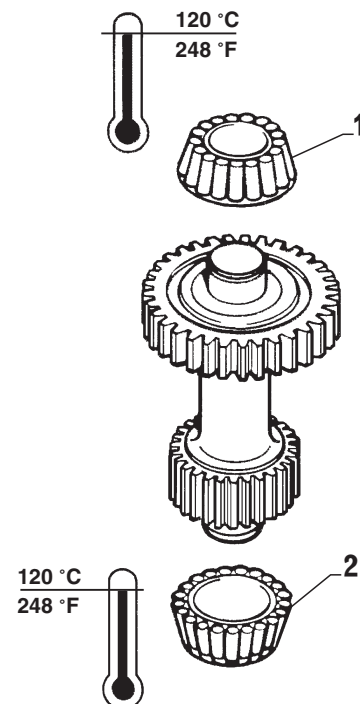


FIG. 2 - 1

4.3 OUTPUT SHAFT

4.3.1 Mounting inner race of tapered roller bearing

Heat inner races of taper roller bearings (item 1 and 2, Fig. 3-1) to approx. 120 °C (248°F) and push them onto output shaft up against shaft collar.

CAUTION

Handle heated tapered roller bearing inner races only with protective gloves!

When the inner races have cooled down, drive them carefully against the collar using a copper/brass punch.

NOTE

Apply copper/brass punch on inner race and not on the rollers.

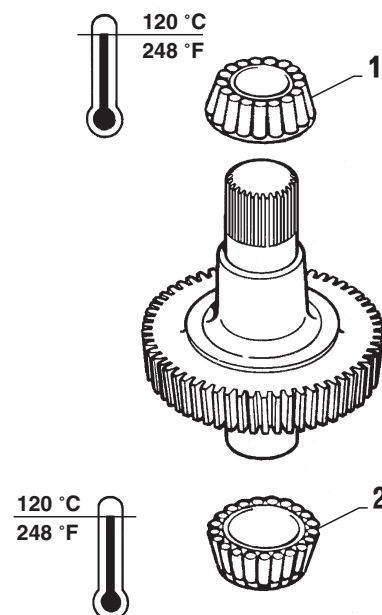


FIG. 3 - 1

4.4 PREASSEMBLY OF HOUSING

4.4.1 Assembly of outer races (tapered roller bearings)

Heat output half of the housing (item 1, Fig. 4-1) in an oven to approx. 120 °C (248 °F).

Insert outer races (item 2, Fig.4-1) into housing.

WARNING

Handle heated tapered roller bearings outer races on with protective gloves.

When housing has cooled down to ambient temperature, with a copper/brass punch seat outer races carefully into housing.

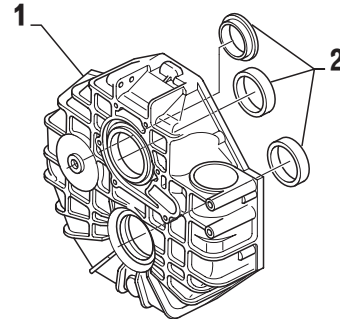


FIG. 4 - 1

4.4.2 Installation of fluid suction pipe and baffle

4.4.2.1 Installation of fluid suction pipe

- Position oil suction pipe (item 1, Fig. 4-2a) in the housing.
- Put one drop of Loctite 243 into screw threaded hole.
- Lightly tighten the screw (item 3, Fig. 4-2a).
- Insert centre square punch and tighten definitely the screw.
- Adjust oil suction pipe to measure "A" (A = 26 mm) (Fig. 4-2b).
- Put some ATF fluid on the seal seat and on the oil suction pipe using a brush.
- Press into housing over the oil suction pipe the seal (item 2, fig. 4-2c) using the appropriate punch (Fig. 4-2c).

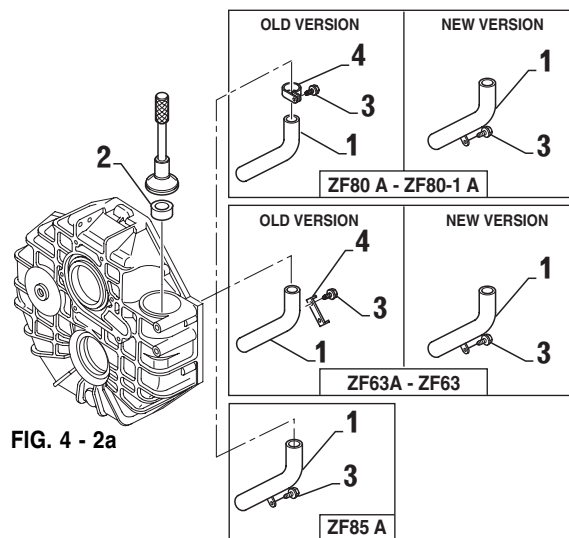


FIG. 4 - 2a

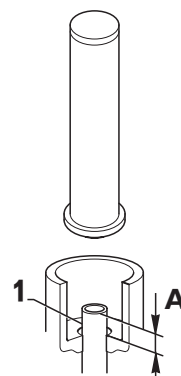


FIG. 4 - 2b

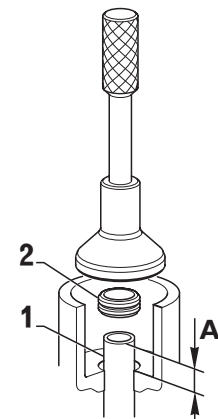


FIG. 4 - 2c

4.4.2.2 Installation of baffle (Fig. 4-2d) (ZF 63 A - ZF 63)

Put one drop of Loctite 243 on the screw thread (item 1) and screw baffle plate (item 2) into the housing. After tightening the screws bend plate lugs when present over the hexagon of screws (see fig. 4-2d).

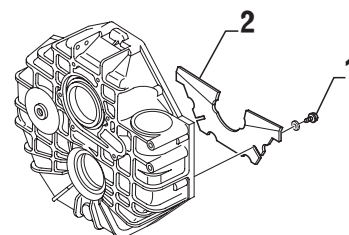


FIG. 4 - 2d



4.4.3 Assembling input shaft seal

Apply thin coat of Loctite 574 on periphery of new radial shaft seal rings (item 1, Fig. 4-3a and Fig. 4-3b) and grease lips with KLUEBER STABURAGS NBU 30.

Put it onto the mounting mandrel.

Drive shaft seal uniformly into the housing by tapping slightly onto the mounting mandrel.

NOTE

The sealing lip (A) on the shaft seal should point into the inside of the housing. The radial shaft seal must be adjusted so that the sealing lip runs on the grounded surface of the shaft.

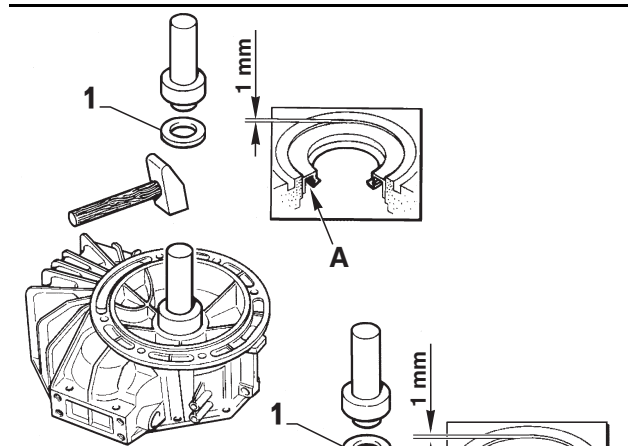


FIG. 4 - 3a

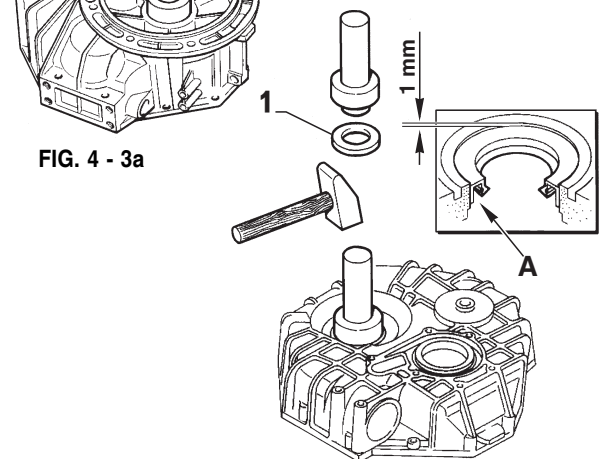


FIG. 4 - 3b

ALTERNATIVELY (Fig. 4-3c):

For models ZF 63 A - ZF 63 - ZF 80 A - ZF 80-1 A

- Smear loctite 574 on the outside diameter of the input shaft seal using a roller.
- Lubricate the inside lip with Kluber Staburags NBU30 grease.
- Insert the input shaft seal (item 2) into input shaft using the appropriate bushing p/n 20.0012.01 (item 1).
- Use mandrel p/n 20.0012.02 (item 3) to position the input shaft seal in the correct way.

For model ZF 85 A - ZF 80 A (ZF 85 A DERIVATE VERSION)

- Smear loctite 574 on the outside diameter of the input shaft seal using a roller.
- Lubricate the inside lip with Kluber Staburags NBU30 grease.
- Insert the input shaft seal (item 2) into input shaft using the appropriate mandrel p/n 20.1072.01 (item 1).
- Position the input shaft seal in the correct way.

ZF 63 - ZF 63 A
ZF 80 A - ZF 80-1 A

ZF 85 A
ZF 80 A (ZF 85 A DERIVATE VERSION)

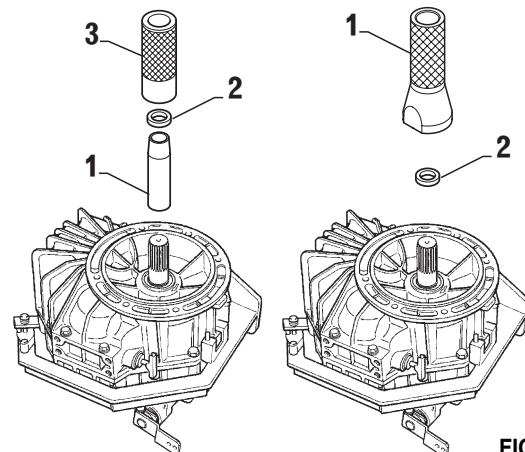


FIG. 4 - 3c

4.4.4 Mounting the breather filter

Due to the taper thread, the breather (item 1, Fig. 4-4) need not to be coated with Loctite 243.

Apply thin coat of Loctite 574 to the oil breather (item 1, Fig. 4-4).

Tighten carefully during assembly (hand-tight).

Cheek leakage during a later test run. Retighten slightly if it leaks.

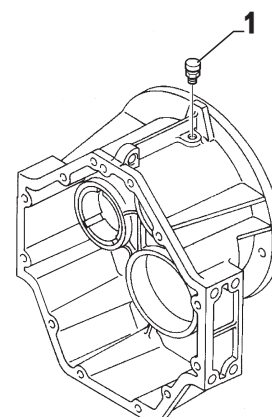


FIG. 4 - 4

4.5 MEASURING THE BEARING CLEARANCE/ADJUSTING THE PRETENSION OF BEARINGS

4.5.1 General

The required pretension/play of bearings of the individual shafts in the housing is obtained by using shims of different thickness under the outer races of the taper roller bearings. Shims which have been removed during disassembly may be reused.

First adjustment must refer to bearing clearance.

Take out from the front cover (Fig. 5-1) at least shims of 0.2 mm (0.0079 in.) thickness from the shims packages which were removed during disassembly.

Adjustment values

Pretension (mm)

| Shaft | Input | Intermediate | Output |
|---------------------|-----------|--------------|-----------|
| ZF 80 A - ZF 80-1 A | 0.02-0.12 | 0.00-0.12 | 0.00-0.12 |
| ZF 85 A - ZF 80 A * | 0.02-0.12 | 0.00-0.12 | 0.1-0.15 |
| ZF 63 A - ZF 63 | 0.02-0.12 | 0.00-0.12 | 0.05-0.15 |

Pretension (inches)

| Shaft | Input | Intermediate | Output |
|---------------------|-------------|--------------|-------------|
| ZF 80 A - ZF 80-1 A | 0.001-0.005 | 0.000-0.005 | 0.000-0.005 |
| ZF 85 A - ZF 80 A * | 0.001-0.005 | 0.000-0.005 | 0.004-0.006 |
| ZF 63 A - ZF 63 | 0.001-0.005 | 0.000-0.005 | 0.002-0.006 |

* (ZF 85 A DERIVATE VERSION)

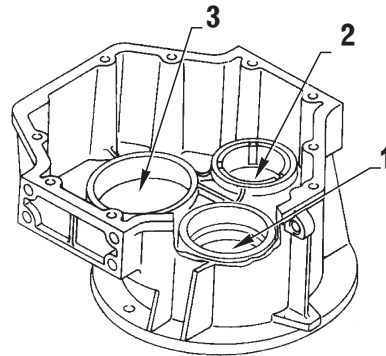


FIG. 5 - 1

4.5.2 Mounting outer races of tapered roller bearings into housing

Heat input half housing (item 1, Fig. 5-2) in an oven to approx. 120 °C (248 °F) and insert shims (item 2) and outer races (item 3) of bearings into it.

WARNING

Handle heated housing half only with protective gloves!

When half housing has cooled down to ambient temperature, press outer races carefully down using a copper/brass punch.

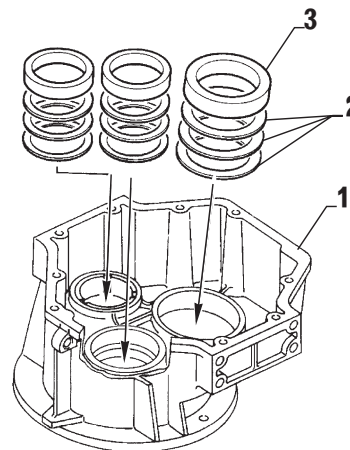


FIG. 5 - 2

4.5.3 Inserting gear set into housing

Finish housing mating face halves with an oilstone.

CAUTION

Make sure to keep any dirt out of housing.

- Holding the half housing on a swiveling stand, insert gears into it.
- Mount input housing half (item 1, Fig. 5-3) with all bolts, lock washers (item 2 and 3, Fig. 5-3) and parallel pins (item 4, Fig. 5-3).
- Tightening torque of bolts: 40 Nm (30 ft.lb.).

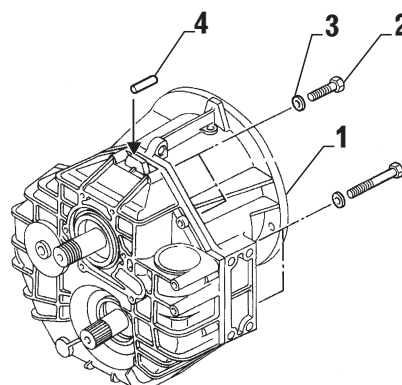


FIG. 5 - 3



4.5.4 Measuring bearing clearance on input shaft

- a) Turn input shaft several times to permit bearings to seat.
- b) Fit clamping ring (tool p/n 219.354.3 (618582)) to the spline of the input shaft (item 1, Fig. 5-4).
- c) Adjust to «0», dial indicator to obtain accurate reading.
- d) With two levers carefully pry on the clamping ring and record end play of shaft.

NOTE

This step must be done very carefully to obtain the actual bearing clearance.

- e) Carry out steps, a) and d) several times.
- f) The bearing clearance measured plus the pretension required in section 5.1 determine the required thickness of shims.

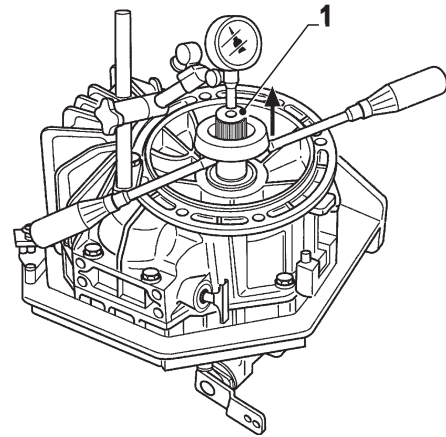


FIG. 5 - 4

4.5.5 Measuring bearing clearance at intermediate shaft

- a) Unscrew plug (item 1, Fig. 5-5a) from the housing.
- b) Screw in special tool (p/n 224.836.008 (458105)) (item 2, Fig. 5-5a) into intermediate shaft hole.
- c) Mount dial gauge support securely onto housing.
- d) Turn intermediate shaft several times to permit bearings to seat.
- e) Adjust the dial indicator needle on top of the bolt head and «0» to dial indicator (Fig. 5-5b).
- f) Screw hexagon nut carefully against housing (intermediate shaft moves up) until bearing clearance is overcome (Fig. 5-5b).

NOTE

This step should be done very carefully to obtain the actual bearing clearance.

- g) Carry out steps d) and f) several times.
- h) The clearance measured plus the pretension required in section 5.1 determine the required thickness of shims.

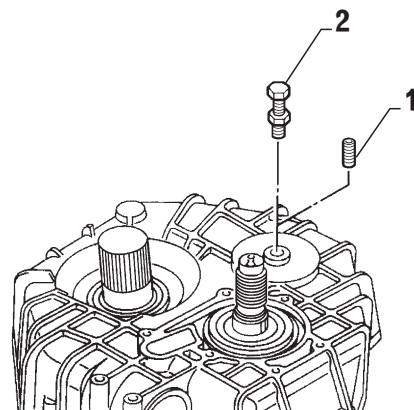


FIG. 5 - 5a

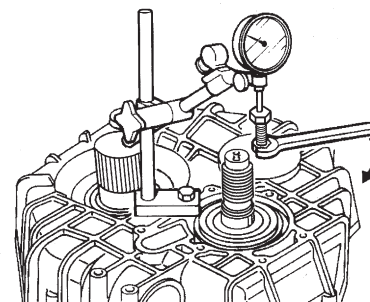


FIG. 5 - 5b

4.5.6 Measuring the bearing clearance on the output shaft

- a) Insert output flange onto the output shaft and screw in nut ring.
- b) Install bolt and spacer on input shaft.
- c) Turn output shaft repeatedly to permit bearings to seat.
- d) Mount dial gauge support securely onto housing.
- e) Place dial gauge onto top of the output shaft and adjust it to «0» reading.
- f) Lift output shaft carefully, using two screwdrivers, and record measurement (Fig. 5-6).

NOTE

This step should be done very carefully to obtain the actual bearing clearance.

- g) Carry out steps c) and f) for several times.
- h) The bearing clearance measured plus the pretension required in section 5.1 will determine the required thickness of shims.

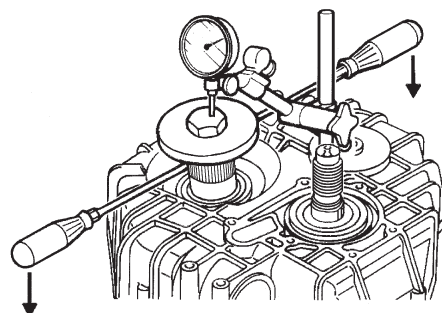


FIG. 5 - 6

4.5.7 Adjusting the pretension/clearance of bearings

When the thickness of shims has been determined, the transmission must be disassembled again.

- Using a adequate drift punch, drive the parallel pins (item 1, Fig. 5-7a) with slight blows, out of the housing.
- Loosen hex bolts (item 2 and 3, Fig. 5-7a) with lock-washers (item 4, Fig. 5-7a) and remove input side of housing (item 5, Fig. 5-7a).
- Pull outer races of bearings out of the input side of the housing using the extracting unit (Fig. 5-7b) or heating the half housing in an oven to approx. 120°C (248°F) and remove the outer races of bearings together with shims.

⚠ WARNING

Handle heated housing half and outer race only with protective gloves!

NOTE

Make sure to keep the shims with each outer race and not mix them together.

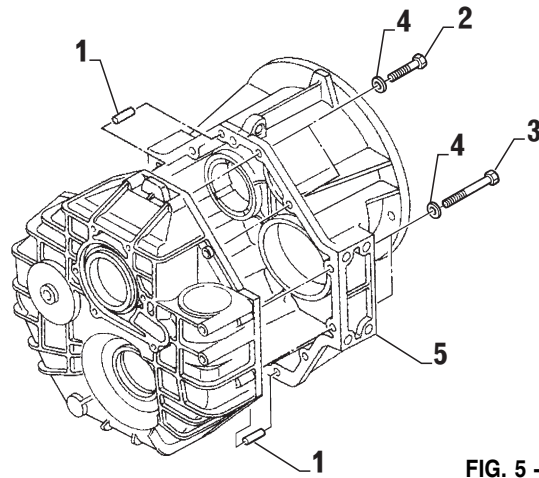


FIG. 5 - 7a

4.5.8 Final assembly of the housing

- Heat input side of the housing in an oven to approx. 120°C (248 °F).

⚠ WARNING

Handle heated housing only with protective gloves!

- Insert the required shims for proper pretension into bearings bore under bearing outer race.
- Insert outer races of bearings. When the housing has reached ambient temperature, drive outer races of bearings down to the stop, using a copper punch.
- Insert shafts.
- Fill space between seal and dust lips of shaft seal rings with a high quality bearing grease (Staburags Kluber NBU 30).
- Apply a thin coat of Loctite 518 on mating surface of input side of the housing and join both housing halves together.
- Drive parallel pins into housing to align housing halves, before tightening.
- Install mounting bolts (item 2 and 3, Fig. 5-7a) and torque them to 40 Nm (30 ft.lb.).

NOTE

There must be not measurable bearing clearance.

⚠ WARNING

The necessary time for a complete polymerization is 5 hours: we recommend therefore to clean carefully the mating surfaces with Loctite 7063 cleaner before applying the Loctite 518 and wait the requested time before the spin test.

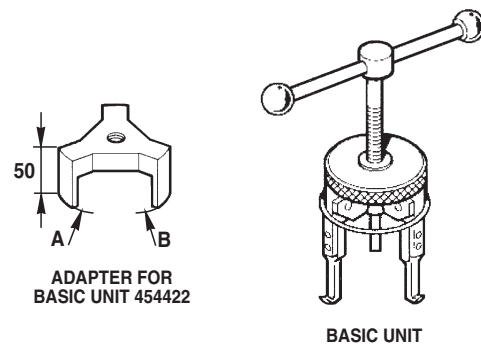


FIG. 5 - 7b



4.6 CONTROL BLOCK

4.6.1 Mounting the control block

NOTE

Piston rings (item 1, Fig. 6-1) have to be replaced, if thickness is less than 2.39 mm (0.094in).

- Insert key (item 2, Fig. 6-1) into groove of shaft.
- Place new seal (item 3, Fig. 6-1) onto control block.
- Align key and slot in rotor pump.
- Slide control block carefully on input shaft.
- Insert lock washers (item 4, Fig. 6-1) on socket head bolts (item 5, Fig. 6-1) and provide screw threads each with a drop of Loctite 243.
- Tight control block bolts. Tightening torque: 18 Nm (14 ft.lb.).

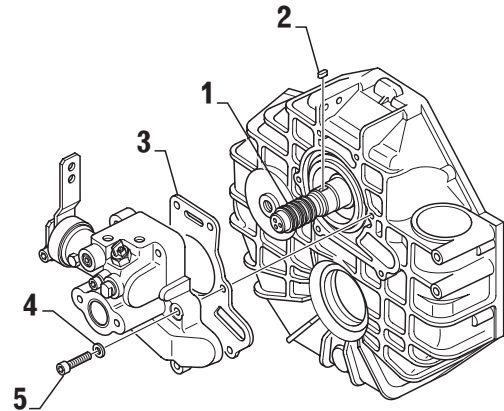


FIG. 6 - 1

4.7 FLUID FILTER

4.7.1 Mounting the fluid filter

- Wet O-rings (item 1 and 2, Fig. 7-1) with some ATF fluid and mount them.
- Install filter element (item 3, Fig. 7-1) into the transmission.
- Lock cover (item 4 Fig. 7-1) to the transmission using an allen wrench. Tightening torque: min. 5 Nm - max 8 Nm (min. 4 ft.lb. - max 6 ft.lb.)

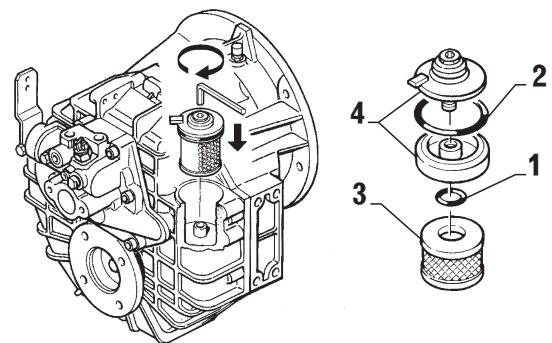


FIG. 7 - 1

4.8 OUTPUT FLANGE

Provide spline (X) of output shaft with a thin coat of Loctite 245 and sealing lip (Z) of shaft seal with a thin coat of ATF fluid. (Fig. 8-1)

Fit output flange (item 1, Fig. 8-1).

Provide O-ring (item 2, Fig. 8-1) with ATF fluid and insert into output flange.

Tight output flange down on output shaft with bolt (item 3, Fig 8-1) and washer (4).

Tightening torque:

| | |
|---------------------|----------------------|
| ZF 63 A - ZF 63 | : 100 Nm (74 ft.lb.) |
| ZF 80 A - ZF 80-1 A | : 100 Nm (74 ft.lb.) |
| ZF 85 A | : 100 Nm (74 ft.lb.) |

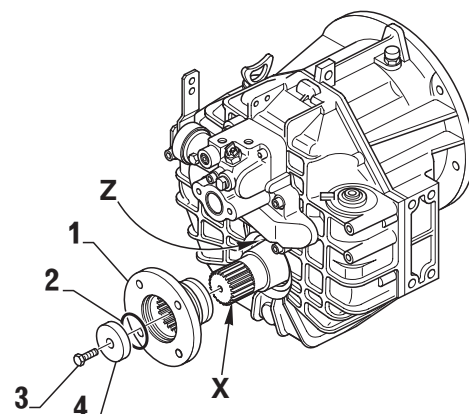


FIG. 8 - 1

4.9 MAKING THE TRANSMISSION READY FOR OPERATION

4.9.1 Filling up with transmission Fluid

Filling with ATF fluid into the fluid filter opening. (Fig. 9-1)

Quantity:

| | |
|---------------------|---------------------------|
| ZF 63 | : 4.0 US-qts (3.8 liters) |
| ZF 63 A | : 4.2 US-qts (4.0 liters) |
| ZF 80 A - ZF 80-1 A | : 5.8 US-qts (5.5 liters) |
| ZF 85 A | : 5.8 US-qts (5.5 liters) |

ATF (Automatic Transmission Fluid) such as, per list on section IX.

Fit filter element as specified in section 4.7.1.

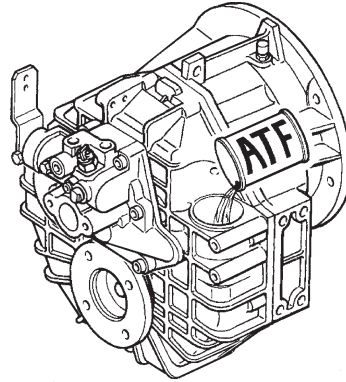


FIG. 9 - 1

4.9.2 Check fluid level

Carry out a trial run after oil filling.

Set shifting lever to neutral position (N). Start engine and let it run idle for a short time to fill the cooler and pipelines with transmission oil. Stop the engine and check oil level again. If necessary, top up with oil. Excessive oil should be removed. The fluid level on the dipstick (item 1, figure 9-2) should be between the min. and max. marks. The fluid level should be checked again after a short driving period.

NOTE

Some transmissions may have different oil dipsticks, depending on the version:

A) When inserted into the housing hole, it expands by turning the handle in clockwise direction. (Fig. 9-2 item A)

B) It is threaded (Fig. 9-2 item B).

IMPORTANT

Oil check with threaded dipstick (B) must be done in a different way compared with the one not threaded (A):

A) Oil dipstick and housing hole not threaded: dipstick completely inserted into hole.

B) Oil dipstick and housing hole threaded: dipstick not inserted into the housing hole (not screw in).

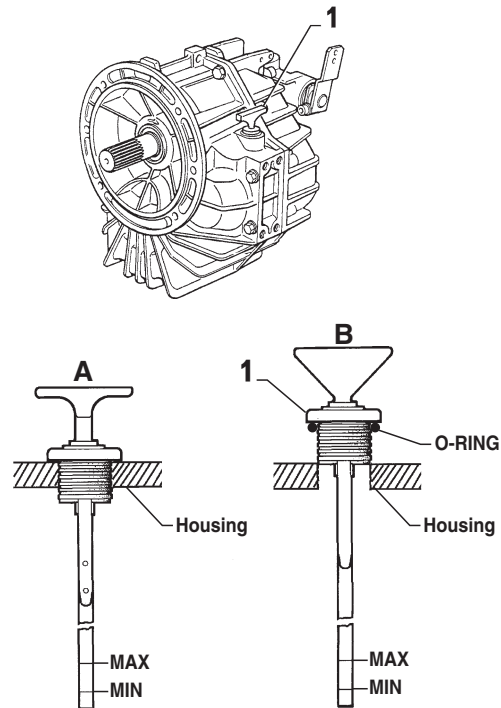
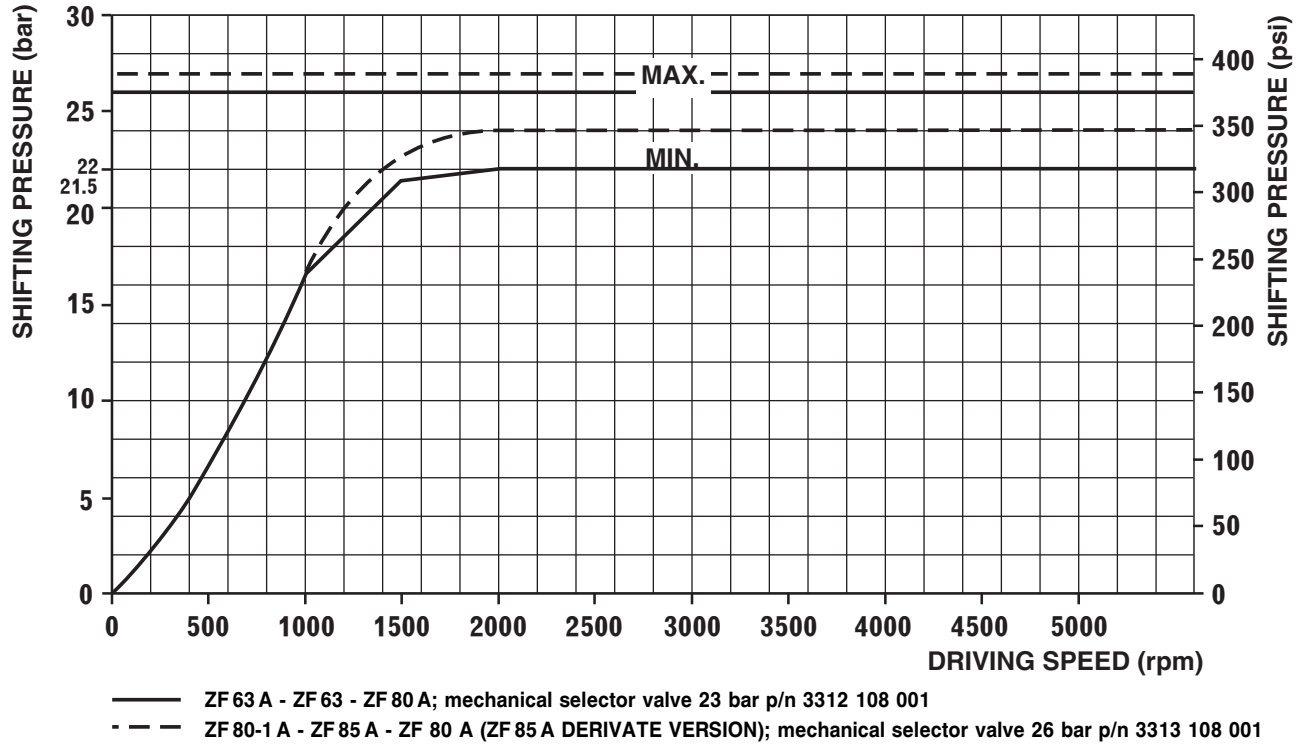


FIG. 9 - 2

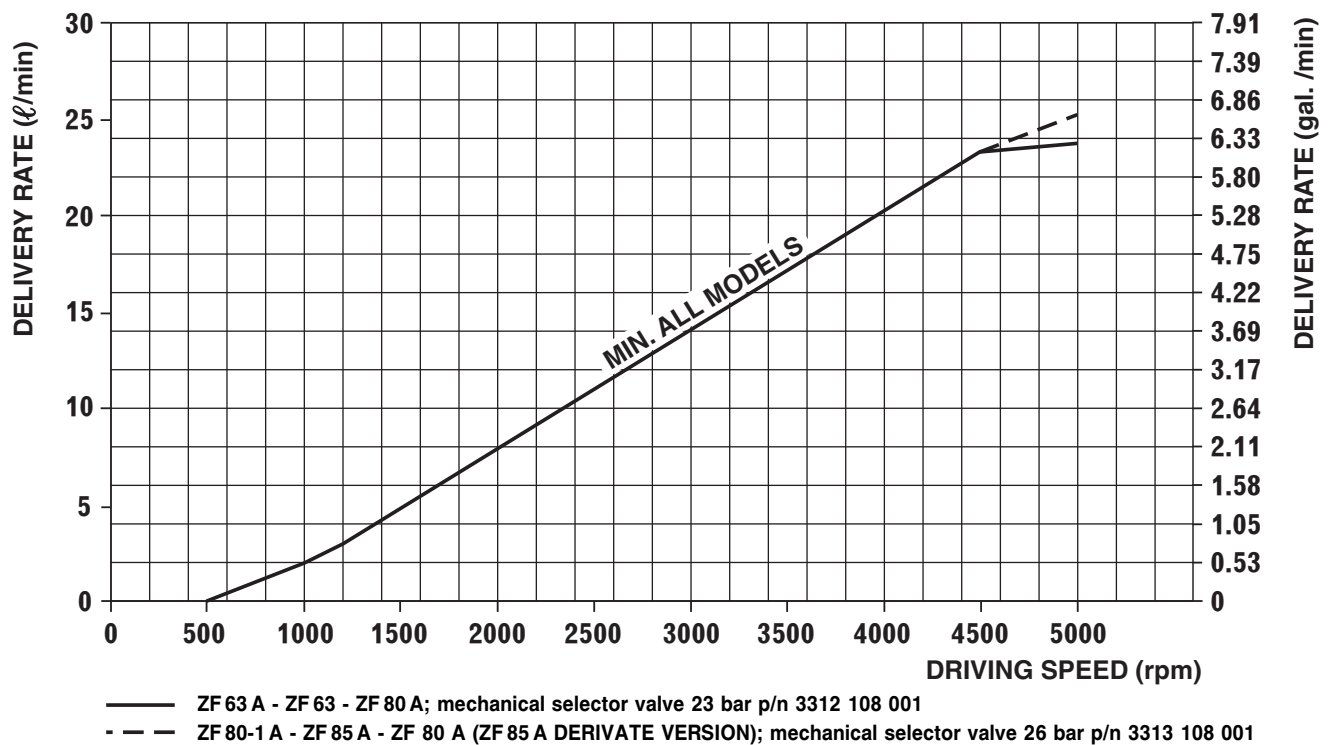


5. ADJUSTMENT DATA

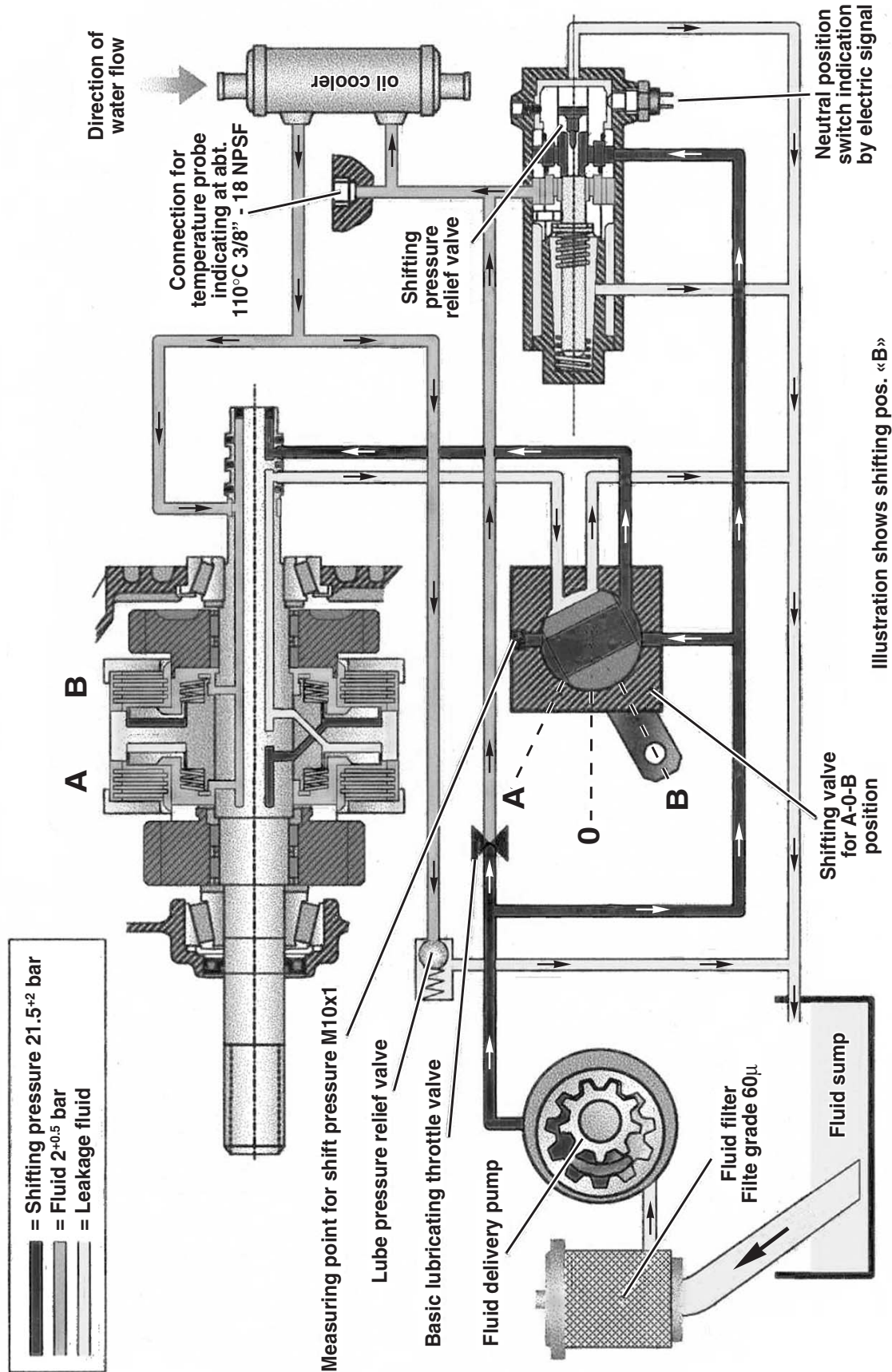
5.1 SHIFTING PRESSURE



5.2 LUBE OIL DELIVERY RATE



6. HYDRAULIC DIAGRAM





7. TIGHTENING TORQUES

| PART | SIZE | TORQUE IN lb.ft. | TORQUE IN Nm | LOCTITE |
|--|------|---------------------|-----------------|---------|
| Mounting brackets bolts ZF 63 A - ZF 63 | M12 | min 55.5 - max 57 | min 75 - max 77 | - |
| Mounting brackets bolts ZF 80 A - ZF 80-1 A - ZF 85 A | M12 | min 55.5 - max 57 | min 75 - max 77 | - |
| Output flange bolt ZF 63 A - ZF 63 | M16 | 74 | 100 | 243 |
| Housing bolts | M10 | 30 | 40 | - |
| Control block bolts | M8 | 13 | 18 | 243 |
| Shifting lever bolt | M8 | 17 | 23 | - |
| Output flange bolt ZF 80 A - ZF 80-1 A - ZF 85 A | M16 | 74 | 100 | 243 |
| Fluid filter bolt | M8 | min 4 - max 6 | min 5 - max 8 | - |
| Oil breather | - | Hand tight | Hand tight | 574 |
| Fluid dipstick | - | Hand tight | Hand tight | - |
| Oil drain plug | - | 30 | 40 | 243 |
| Stud bolt | M16 | 26 | 35 | 243 |
| Control block stop screw | - | 9 | 12 | - |
| Control block pressure screw | M10 | 9 | 12 | - |
| Screw ZF 63 A | M5 | 4 | 5 | 243 |
| Screw ZF 80 A - ZF 80-1 A - ZF 85 A | M6 | 7 | 9 | 243 |
| Neutral safety switch | - | 18.5 | 25 | - |
| Control block guide bolt | - | 9 | 12 | - |
| Control block temperature plug | - | 26 | 35 | - |

8. FUNCTION TEST

When the transmission has been completely assembled and filled up with transmission fluid, it would be convenient to make a function test.

This test can be carried out on a bench test rig, or in a boat. If no fluid cooler can be connected, a hydraulic hose must be connected between the inlet and outlet of the hydraulic pump.

Measuring instruments required:

- Pressure gauge 0-40 bar (0-580 psi), with connecting thread M10x1.
- Temperature gauge 0-120°C (0-250°F) connecting thread 3/8«-18NPSF.
- Flow meter 0-35 liters/min (0-10 gals/min).

Tests to be carried out:

1. Fluid leaks
2. Noise emission
3. Output direction of rotation, LH/RH
4. Lube oil temperature
5. Shifting pressure
6. Lube oil flow rate

The function test should be carried out follows:

| Motor speed rpm | Shift lever position | Temperature | Durat. minutes | Test |
|---------------------------|--------------------------------|---------------|----------------|--------------|
| 800-1000 | neutral | 40°C/104 °F | 5 | 1, 2 |
| 600-800 (idling speed) | A <-> B position repeatedly | 40°C/104 °F | - | 1, 2, 3 |
| 1500-2500 | B position | 80°C / 176 °F | - | 1, 2, 4 |
| 600-800 (idling speed) | A <-> B position repeatedly | 80°C/176 °F | - | 1, 2, 3 |
| idling - max. speed | A position | 80°C/176 °F | - | 1, 2, 5*, 6* |
| 600-800 (idling speed) | A-> B position 80°C/176 °F | - | - | 1, 2 |
| idling - max. speed | B position | 80°C/176 °F | - | 1, 2, 5*, 6* |
| | | 80°C/176 °F | - | |

* At different speeds.



9. TROUBLESHOOTING

In case of trouble, check first whether all items of the mounting and operating instructions have been completed with. The subsequent tables will assist you in troubleshooting.

| Symptom | Possible cause | Remedy |
|--|--|---|
| 1. Transmission cannot be shifted. | 1.1 Shifting lever is loose. 1.2 Remote control does not permit lever travel required. 1.3 Remote control faulty. 1.4 No shifting pressure available. | 1.1 Tighten clamping bolt on shifting lever. 1.2 Lift remote control off, if gears can be shifted by hand, adjust remote control 1.3 Repair remote control. 1.4 Refer to 7. |
| 2. Delayed shift time. | 2.1 Shift linkage misadjust not allowing full engagement. | 2.1 Lift remote control off, if gear can be shifted by hand, adjust remote control. If the transmission cannot be shifted correctly by hand, replace the control block. |
| 3. Clutch is slipping, i.e. propeller speed too low as compared to engine speed. | 3.1 Inadmissible fluid used. 3.2 Fluid contains water. 3.3 Shifting pressure too low. 3.4 Wear on clutch discs. 3.5 Piston rings are damaged. | 3.1 Drain fluid, refill with prescribed fluid, flush transmission while engine runs in neutral position drain fluid, refill transmission. 3.2 Refer to 9. 3.3 Refer to 6. 3.4 Disassemble transmission, replace clutch discs. 3.5 Disassemble transmission, replace piston rings. |
| 4. Transmission locked in gear. | 4.1 Medium piston ring in input shaft in control block is faulty. 4.2 Warped discs due to overheating of slipping clutch. 4.3 Needle bearings on input shaft are worn out. | 4.1 Remove control block, replace piston ring, if control block is worn, replace likewise. 4.2 Refer to 3. 4.3 Disassemble transmission, replace needle bearing and check for damage input shaft and gears. |
| 5. Output shaft turns in neutral position. | 5.1 Rotary slide valve in control block is worn. 5.2 Faulty needle bearing on input shaft. 5.3 Warped discs due to overheating of slipping clutch. | 5.1 Replace control block. 5.2 Disassemble transmission and input shaft, replace bearing concerned and other damaged parts. 5.3 Refer to 3. |
| 6. Shifting pressure too low. | 6.1 Fluid filter clogged. 6.2 Fluid level in transmission too low. 6.3 Fluid pump is worn out. 6.4 Spring in shifting pressure relief valve is broken. 6.5 Piston rings on input shaft are faulty. 6.6 Piston rings in clutch are faulty. | 6.1 Replace fine filter. 6.2 Top-up with fluid; in case of fluid loss check transmission, cooler and pipelines for leakage also refer to 10 through 13. 6.3 Replace control block containing fluid pump. 6.4 Replace control block. 6.5 Remove control block and replace piston rings. In case of wear in control block due to faulty piston rings replace block as well. 6.6 Disassemble transmission, replace piston rings.. |



| Symptom | Possible cause | Remedy |
|---|--|--|
| 7. No shifting pressure available. | <p>7.1 Direction of engine rotation does not agree with arrow on transmission front cover.</p> <p>7.2 No fluid in the transmission.</p> <p>7.3 Fine filter is dirty.</p> <p>7.4 Fluid level in transmission is too low.</p> <p>7.5 Fluid pump worn out.</p> <p>7.6 Pump key in input shaft for fluid pump drive is broken.</p> <p>7.7 Spring of shifting pressure relief valve is broken.</p> | <p>7.1 Replace with suitable rotation engine.</p> <p>7.2 Refill with fluid.</p> <p>7.3 Replace fine filter.</p> <p>7.4 Top-up with fluid. In case of loss of fluid check transmission, cooler and pipelines for leakage, also refer to 10 through 13.</p> <p>7.5 Replace control block.</p> <p>7.6 Remove control block. Replace pump key, and any other faulty parts.</p> <p>7.7 Replace control block.</p> |
| 8. Excessive fluid temperature. | <p>8.1 Fluid cooler is too small.</p> <p>8.2 Excessive fluid in transmission.</p> <p>8.3 Fluid cooler is dirty on water side.</p> <p>8.4 Worn fluid pump in control block.</p> <p>8.5 Faulty piston rings in control block.</p> <p>8.6 Clutch is slipping.</p> <p>8.7 Clutch does not open completely due to worn disc support.</p> <p>8.8 Clutch does not open completely due to broken cup springs.</p> <p>8.9 With fluid cooler in bypass and unfavorable arrangement of pipelines too little coolant water flows through bypass to cooler.</p> | <p>8.1 Use a larger fluid cooler.</p> <p>8.2 Remove excessive fluid with commercial suction pump.</p> <p>8.3 Detach coolant water lines and clean fluid cooler on water side.</p> <p>8.4 Replace control block containing fluid pump.</p> <p>8.5 Remove control block, replace piston rings. In case of wear in the control block due to faulty piston rings replace control block as well.</p> <p>8.6 Refer to 3.</p> <p>8.7 Dismount transmission and clutch, replace all faulty parts.</p> <p>8.8 Dismount transmission and clutch, replace all faulty parts.</p> <p>8.9 Correct bypass pipeline.</p> |
| 9. Water in the fluid, fluid looks milky. | <p>9.1 Fluid cooler faulty.</p> <p>9.2 High water level in engine compartment, water entering at output shaft seal.</p> | <p>9.1 Repair leakage at cooler or replace cooler. Change transmission fluid.</p> <p>9.2 Remedy cause for water level in engine compartment. Change transmission fluid.</p> |
| 10. Fluid leakage at input or output shaft | <p>10.1 Breather clogged with paint or dirt</p> <p>10.2 Shaft seal faulty</p> <p>10.3 Excessive fluid in transmission</p> | <p>10.1 Remove paint or dirt from breather Replace seal. If seal location on shaft is worn, regrind.</p> <p>10.3 Remove excessive fluid with commercial suction pump.</p> |
| 11. Fluid leakage at breather. | <p>11.1 Excessive fluid in transmission.</p> | <p>11.1 Pump excessive fluid out with commercial hand pump.</p> |
| 12. Fluid leakage at joints or screw connections. | <p>12.1 Bolts are not tight at the prescribed torque.</p> <p>12.2 Loctite not properly spread onto sealing surface.</p> <p>12.3 Gasket has been used several times.</p> | <p>12.1 Tighten bolts to prescribed torque.</p> <p>12.2 Reseal after removing old Loctite and cleaning. Finish mating faces with oilstone.</p> <p>12.3 Replace gasket.</p> |



| Symptom | Possible cause | Remedy |
|---|---|--|
| 13. Transmission noise becomes louder. | 13.1 Fluid level too low so that pump sucks in air. 13.2 Damage starting on flexible coupling due to wear or fatigue probably due to misalignment between engine and transmission. 13.3 Beginning damage of bearings in transmission, e.g. due to torsional vibration, running without fluid, overload, wrong alignment of transmission. 13.4 Beginning damage of gearing, e.g. due to torsional vibrations, running without fluid, overload. 13.5 Fluid suction pipe in transmission has come loose. | 13.1 Top up with fluid to marking on dipstick. 13.2 Replace flexible coupling. Check alignment between engine and transmission. 13.3 Disassemble transmission, replace bearings concerned and other faulty parts. Find causes and remedy. 13.4 Disassemble transmission, replace faulty parts. 13.5 Disassemble transmission fix fluid suction pipe. |
| 14. Chattering transmission noise mainly at low engine speed. | 14.1 The engine or propeller generates torsional vibrations in the drive unit which produces a hammering noise in the transmission. 14.2 Misaligned cardan shafts on input or output. | 14.1 Mount a flexible coupling with a different stiffness factor between engine and transmission; a coupling with a higher stiffness factor might be sufficient. Otherwise analyze the torsional vibrations to find out the required stiffness for the coupling. 14.2 Mount and align cardan shaft strictly according to instructions issued by cardan shaft manufacturer. |
| 15. Low pressure. | 15.1 Fine filter is dirty. 15.2 Fluid level in transmission is low. 15.3 Control block is broken. 15.4 Problem at control valve. 15.5 Piston rings on input shaft are faulty. 15.6 Piston rings inside the clutch are faulty. 15.7 Defective cover filter : air suction. 15.8 Oil suction hose not properly adjusted. 15.9 Fitting key in input shaft for fluid pump drive is broken. 15.10 Possible wear of the piston ring grooves. | 15.1 Replace fine filter. 15.2 Refill with fluid. 15.3 Replace control block. 15.4 Replace control block. 15.5 Remove control block and replace piston rings. 15.6 Disassemble transmission, replace piston rings. 15.7 Replace cover filter. 15.8 Replace the seal and adjust correctly the suction hose. 15.9 Remove control block replace fitting key, replace any other faulty parts. 15.10 Replace the input shaft. |
| 16. Oil leakage. | 16.1 Porosity. 16.2 Seals. 16.3 Joints. 16.4 Bracket with flatness error. 16.5 Bolts are not tight. 16.6 Fittings loosen. 16.7 Dipstick is not tight. 16.8 Filter is not tight. 16.9 Excessive fluid in transmission. 16.10 Breather clogged with paint or dirt (fluid leakage at output shaft). 16.11 Aluminium washers used more times. | 16.1 Replace faulty parts. 16.2 Replace seals. 16.3 Check if bolts are tighten with the correct torque. Clean the surface and reseal with Loctite 518. 16.4 Replace bracket. 16.5 Reseal and tighten bolts with prescribed torque. 16.6 Tighten or replace. 16.7 Tighten dipstick or replace o-ring dipstick. 16.8 Tighten filter or replace o-ring filter 16.9 Remove excessive fluid with commercial suction pump. 16.10 Remove paint or dirty from breather. 16.11 Replace aluminium washers. |



| Symptom | Possible cause | Remedy |
|------------------------------|--|--|
| 17. High oil temperature. | 17.1 Excessive fluid in transmission. 17.2 Oil cooler is dirty. 17.3 No water in circuit. 17.4 Undersized cooler. 17.5 Clutch is slipping. 17.6 Excessive friction of the reverse clutch. 17.7 Possible bypass in the cooling circuit. | 17.1 Remove excessive fluid with commercial suction pump. 17.2 Replace the cooler and check the water circuit. 17.3 Check the cooling circuit. 17.4 Replace the cooler with a proper one. 17.5 Refer to 18. 17.6 Check the clutch play and the correct position of the piston. 17.7 Reduce the bypass. |
| 18. Slipping clutch | 18.1 Low pressure. 18.2 Fluid level in transmission is low. 18.3 Shift lever not properly adjusted. 18.4 Trolling lever not in the detent position. 18.5 Wear on clutch discs. 18.6 Piston rings in clutch are faulty. 18.7 Inadmissible fluid used. 18.8 Water in the fluid. 18.9 Piston rings on input shaft are faulty. | 18.1 Refer to 15. 18.2 Refill with fluid. 18.3 Regulate at the end of the way. 18.4 Adjust the lever at the detent position. 18.5 Disassemble transmission, replace clutch discs. 18.6 Disassemble transmission, replace piston rings. 18.7 Drain fluid, refill with prescribed fluid. 18.8 Repair leakage at cooler or replace cooler. Change transmission fluid. 18.9 Remove control block and replace piston rings. |
| 19. Noise. | - hydraulic 19.1 Oil filter is dirty. 19.2 Fluid level in transmission is low. 19.3 Oil suction hose not properly adjusted. 19.4 Defective cover filter : air suction. - at idle speed 19.5 Coupling. - under load 19.6 Wrong shimming. 19.7 Defective gears. | 19.1 Replace oil filter. 19.2 Refill with fluid. 19.3 Replace the seal and adjust correctly the suction hose. 19.4 Replace cover filter. 19.5 Replace. 19.6 Re-shim. 19.7 Replace defective gears. |
| 20. Engagement not possible. | 20.1 Fluid level in transmission is low. 20.2 Fine filter is dirty. 20.3 Incorrect shift lever position. 20.4 Coupling is damaged. 20.5 Control block. 20.6 Shifting lever is loose. 20.7 Low pressure. | 20.1 Refill with fluid. 20.2 Replace fine filter. 20.3 Regulate at the end of the way. 20.4 Replace coupling. 20.5 Replace control block. 20.6 Tighten clamping bolt on shifting lever. 20.7 Refer to 15. |
| 21. Slow engagement. | 21.1 Fluid level in transmission is low. 21.2 Shift lever. 21.3 Regulate. | 21.1 Refill with fluid. 21.2 Low pressure. 21.3 Refer to 15. |
| 22. Hard shifting. | 22.1 Shift lever. 22.2 Control block is dirty. | 22.1 Regulate. 22.2 Disassemble the control valve and clean. |



| Symptom | Possible cause | Remedy |
|--|---|--|
| 23. Transmission is dragging in neutral. | 23.1 Warped discs due to overheating. 23.2 Needle bearings on input shaft are faulty. 23.3 Intermediate gear moved from the shaft and touching the clutch drum. 23.4 Discs of the reverse clutch radially broken due to torsional vibration. | 23.1 Replace discs, replace any other faulty parts. 23.2 Disassemble transmission, replace needle bearings. 23.3 Replace the intermediate gear. 23.4 Replace the discs and change the damper with a proper one. |
| 24. Water in the oil. | 24.1 Fluid cooler faulty. 24.2 Water in bilge. | 24.1 Repair leakage at cooler or replace cooler. 24.2 Remove water from the bilge and check the oil seal. |

10. AUTOMATIC TRANSMISSION FLUID

| MANUFACTURER | PRODUCT | MANUFACTURER | PRODUCT |
|------------------------------------|--|-------------------------------------|--|
| ADDINOL MINERALÖL GMBH, KRUMPA/D | <ul style="list-style-type: none"> • ADDINOL ATF D IID • ADDINOL ATF D III | ENGEN PETROLEUM, CAPE TOWN/ZA | <ul style="list-style-type: none"> • ENGEN ATF 22D |
| AGIP PETROLI SPA, ROM/I | <ul style="list-style-type: none"> • AGIP ATF II D • AGIP ATF D 309 • AGIP ATF PLUS • AGIP DEXRON III | ERTOIL SA, MADRID/E | <ul style="list-style-type: none"> • TRANSMISIONES AUTOMATICAS D2 |
| AGIP SCHMIERTECHNIK, WÜRZBURG/D | <ul style="list-style-type: none"> • AUTOL GETRIEBEÖL ATF-D • AUTOL GETRIEBEÖL ATF III D | ESSO AG, HAMBURG/D | <ul style="list-style-type: none"> • ESSO ATF D (21611) • ESSO ATF F-30320 • ESSO ATF D (21065) |
| ARAL LUBRICANTS GMBH, BOCHUM/D | <ul style="list-style-type: none"> • ARAL GETRIEBEÖL ATF 22 • ARAL GETR.ÖL ATF 55 F-30589 | FIAT LUBRIFICANTI, VILLASTELLONE/I | <ul style="list-style-type: none"> • TUTELA GI/A |
| AVIA MINERALÖL-AG, MÜNCHEN/D | <ul style="list-style-type: none"> • AVIA FLUID ATF 86 | FINA EUROPE SA, BRÜSSEL/B | <ul style="list-style-type: none"> • FINAMATIC II-D |
| BLASER SWISSLUBE, HASLE-RÜEGSAU/CH | <ul style="list-style-type: none"> • BLASOL 229 | FUCHS LUBRICANTS (UK), DERBY/GB | <ul style="list-style-type: none"> • SILKTRAN MP-ATF • SILKTRAN PSV ATF |
| BP OIL DEUTSCHLAND, HAMBURG/D | <ul style="list-style-type: none"> • FRONTOL UNIVERSAL-ATF 100 | FUCHS MINERALÖLWERKE, MANNHEIM/D | <ul style="list-style-type: none"> • TITAN ATF 4000 |
| BP OIL INTERNATIONAL, LONDON/GB | <ul style="list-style-type: none"> • AUTRAN DX II • AUTRAN MBX • AUTRAN DX III (F-30370) • AUTRAN DX III (F-30381) | GINOUVES GEORGES SA, LA FARLEDE/F | <ul style="list-style-type: none"> • YORK LT 785 |
| BUCHER + CIE AG, LANGENTHAL/CH | <ul style="list-style-type: none"> • MOTOREX ATF SUPER D-22656 • MOTOREX ATF DEXRON III MC | GULF OIL (GB) LTD, CHELTENHAM/GB | <ul style="list-style-type: none"> • UNIFLUID • ATF 2 |
| CALPAM GMBH, ASCHAFFENBURG/D | <ul style="list-style-type: none"> • PAMATIC FLUID 289 • CALPAMATIC FLUID III F | HANDELSMIJ NOVIOL B.V., NIJMEGEN/NL | <ul style="list-style-type: none"> • KENDALL ATF DEXRON IID |
| CALTEX PETROLEUM CORP., LONDON/GB | <ul style="list-style-type: none"> • CALTEX ATF-HDA • CALTEX ATF-HDM • CALTEX TEXAMATIC 1278 • CALTEX TEXAMATIC 7045 • CALTEX TEXAMATIC 1205A | HOMBERG GMBH + CO KG, WUPPERTAL/D | <ul style="list-style-type: none"> • HOMBERG-GETRIEBE-FLUID D |
| CASTROL LTD, SWINDON/GB | <ul style="list-style-type: none"> • CASTROL TQ-D (22765) • CASTROL TQ DEXRON III F-30520 • CASTROL TRANSMAX S (F-30319) • CASTROL TRANSMAX T (F-30359) • CASTROL TQ-D (21289) • CASTROL ATF 21293 | IGOL FRANCE, PARIS/F | <ul style="list-style-type: none"> • IGOL ATF 420 |
| CEPSA, MADRID/E | <ul style="list-style-type: none"> • CEPSA ATF-70 | INA RAFINERIJA ZAGREB/CROATIA | <ul style="list-style-type: none"> • INA-ATF SUPER |
| CHEVRON PRODUCTS CO., RICHMOND/USA | <ul style="list-style-type: none"> • CHEVRON ATF F-30108 | ITALIANA PETROLI, GENOVA/I | <ul style="list-style-type: none"> • TRANSMISSION FLUID DX |
| CITGO PETROLEUM CORP., TULSA/USA | <ul style="list-style-type: none"> • CITGO ATF DEXRON III F-30167 | JAPAN ENERGY CORP., TOKYO/JAPAN | <ul style="list-style-type: none"> • JOMO ATF K |
| C.J.DIEDERICH SÖHNE, WUPPERTAL/D | <ul style="list-style-type: none"> • CIDISOL-HYDR.-FLUID DEXRON IID | KÄPPLER K., STUTTGART/D | <ul style="list-style-type: none"> • SELECTOL FLUID GETR.ÖL IID 23 |
| DE OLIEBRON B.V., ZWIJNDRECHT/NL | <ul style="list-style-type: none"> • ATF DMM • ATF 289 | KLÖCKNER ENERGIEHANDEL GMBH, KÖLN/D | <ul style="list-style-type: none"> • DEUTZ OEL ATF-D |
| DEA MINERALÖL AG, HAMBURG/D | <ul style="list-style-type: none"> • DEAMATIC • DEAFLLUID 4011 • DEAFLLUID 3003 | KROON OIL BV, ALMELO/NL | <ul style="list-style-type: none"> • ATF DEXRON IID • ALMIROL ATF |
| DEUTSCHE SHELL AG, HAMBURG/D | <ul style="list-style-type: none"> • MAC ATF D-21666 | KUWAIT PETROLEUM, HOOGVLIET/NL | <ul style="list-style-type: none"> • Q8 AUTO 15 • Q8 AUTO 14 (IID-21677) • Q8 AUTO 14 (IID) • Q8 AUTO 14 (IID-21883) |
| DUCKHAMS OIL, BROMLEY/GB | <ul style="list-style-type: none"> • UNIMATIC | LEPRINCE + SIVEKE GMBH, HERFORD/D | <ul style="list-style-type: none"> • LEPRINXOL FLUID CN |
| ELF LUBRIFIANTS, PARIS/F | <ul style="list-style-type: none"> • TRANSANTAR DF2 • ANTAR 22329 • ELFMATIC G2 22329 • HUILE RENAULT DIESEL • STARMATIC | LIQUI MOLY / MEGUIN, ULM/D | <ul style="list-style-type: none"> • ATF IIE • MEGOL ATF IID |
| ELFMATIC G3 | <ul style="list-style-type: none"> • TRANSANTAR DF3 | LUBRICATION ENGIN., FORT WORTH/USA | <ul style="list-style-type: none"> • AUTOMATIC TRANSMISSION FLUID |
| ELLER-MONTAN-COMP., DUISBURG/D | <ul style="list-style-type: none"> • ELLMO-AUTOMATIK-FLUID 22233 | MAURAN SA, ODARS/F | <ul style="list-style-type: none"> • INTER OIL INTER MATIC ATF D2 |
| | | MIN.ÖL-RAFFIN. DOLLBERGEN, UETZE/D | <ul style="list-style-type: none"> • PENNASOL FLUID-GETR.ÖL TYP PCN |
| | | MOBIL OIL, WEDEL/D | <ul style="list-style-type: none"> • MOBIL ATF 220 D20104 / D21685 • MOBIL ATF F-30107 • MOBIL ATF 220 D21412 / D22187 |
| | | MOBIL SEKIYU KABUS. KAISHA, TOKYO/J | <ul style="list-style-type: none"> • MOBIL ATF 220Y (D-21412) |
| | | MOL HUNGARIAN OIL, KOMARON/H | <ul style="list-style-type: none"> • CARRIER ATF |
| | | MORRIS LUBRICANTS, SHREWSBURY/GB | <ul style="list-style-type: none"> • LIQUIMATIC DII |
| | | NAFTEC, ALGIER/DZ | <ul style="list-style-type: none"> • TASSILIA |



| MANUFACTURER | PRODUCT |
|--------------------------------------|--|
| NANHAI SUPERIOR LUB-OIL, CHINA | • NANHAI ATF (D2) |
| NIS-RAFINERIJA NAFTE BEOGRAD/YU | • GALAX MATIC DAC |
| OEST G. MIN.ÖLWERK, FREUDENSTADT/D | • ATF T 4011 |
| OMEX PETROLEUM PTY, BELLEVUE/AUS | • OMEX ATF DEXRON II |
| OMV AG, SCHWECHAT/A | • OMV ATF D II (D22427) • OMV ATF III (F-30580) |
| OPTIMOL ÖLWERKE, HAMBURG/D | • OPTIMOL ATF T 4011 |
| OSWALD KLUTH, BARGFELD-STEGEN/D | • UNIVERSAL ATF-D |
| PAKELO MOTOR OIL, SAN BONIFACIO/I | • MULTIPURPOSE TRANSM. FLUID IID |
| PANOLIN AG, MADETSWIL/CH | • PANOLIN ATF MULTI 21996 • PANOLIN ATF DEXRON III |
| PARS OIL CO., TEHRAN/IR | • PARS ENTEGHAL-E AUTOMATIC OIL |
| PAZ LUBRICANTS & CHEMICALS, HAIFA/IL | • PAZBO EZF |
| PENNZOIL PRODUCT COMP., HOUSTON/USA | • PENNZOIL ATF F-30110 |
| PETRO-CANADA, MISSISSAUGA/CDN | • DEXRON III/MERC.ATF (F-30395) |
| PETROL OFISI A.S., BAKANLIKAR/TR | • PETROL OFISI ATF II |
| PETROLEX, KWIDZYN/PL | • VECO MATIC IID |
| PRINZ-SCHULTE, FRECHEN/D | • AERO-LINE ATF-2 • AERO-LINE ATF-D |
| REPSOL DISTRIBUCION SA, MADRID/E | • REPSOL MATIC ATF |
| S.A.E.L, ALCOBENDAS/E | • GULF ATF DII D-22233 |
| SASOL OIL, RANDBURG/ZA | • SASOL ATF DXII |
| SCHMIERSTOFFRAFFINERIE SALZBERGEN/D | • WINTERSHALL ATF D |
| SHELL ASEOL AG, BERN/CH | • ASEOL ATF DB UNIVERSAL |
| SHELL INTERNATIONAL, LONDON/GB | • SHELL DONAX TA (D-21666) • SHELL DONAX TG (F-30358) |
| SLOVNAFT JS CO, BRATISLAVA/SLO | • MADIT AUTOMATIC |
| SONOL ISRAEL LTD, HAIFA/IL | • DEXRON 2 D |

| MANUFACTURER | PRODUCT |
|--------------------------------------|--|
| SOPROGRASA SA, MADRID/E | • SOPRAL 164 |
| STATOIL STAVANGER/N | • TRANSWAY DX III (F-30373) • TRANSWAY DX II |
| STL TECNOL, ESCALQUENS/F | • TECNOL TECMATIC D2 |
| SUN OIL COMPANY, AARTSELAAR/B | • SUNAMATIC 149 • SUNAMATIC 153 |
| SUOMEN PETROOLI OY, HAMINA/SF | • TEBOIL FLUID E (F-30301) • TEBOIL FLUID D |
| SVENSKA STATOIL AB, NYNÄSHAMN/S | • TRANSWAY DX III (F-30373) |
| TAMOIL LUBES, GENEVA/CH | • TAMOIL ATF II D |
| TEXACO LUBRICANTS COMP., BEACON/USA | • ATF MERCON / DEXRON III • TEXAMATIC 7045 • TEXAMATIC 4261 • TEXAMATIC 7080 • TEXTRAN PSM • TEXAMATIC 4011 • TEXAMATIC 4291 • TEXAMATIC 9226 |
| TEXACO SERVICES LTD, BRÜSSEL/B | |
| TOTAL RAFFINAGE DISTR., PARIS/F | • TOTAL FLUIDE ATX • TOTAL FLUIDE IID • TOTAL FLUIDE AT 42 |
| TOTAL SOUTH AFRICA, JOHANNESBURG/ZA | • TOTAL FLUIDE ATD |
| TURBOTANK BÖSCHE BÖDEKER, BREMEN/D | • TURBO UNIV. ATF MERCON 4011 |
| UFANEFTECHIM REFINERY, UFA/RUS | • UFALUB ATF |
| UNIL DEUTSCHLAND GMBH, BREMEN/D | • UNIL MATIC CN T 4011 |
| VALVOLINE INC., LEXINGTON/USA | • VALVOLINE MULTI-PURPOSE ATF |
| VALVOLINE INTERNAT., DORDRECHT/NL | • VALVOLINE ATF TYPE D |
| VEBA OEL AG, GELSENKIRCHEN/D | • MOVARA ATF-GETRIEBEÖL DIID |
| VEEDOL INTERNATIONAL, SWINDON/GB | • VEEDOL ATF-M (22764) • VEEDOL ATF DEXRON III F-30521 • VEEDOL UNITRANS S PLUS |
| YACCO SA, ST PIERRE-LES-ELBEUF/F | • YACCO ATF D |
| ZELLER + GMELIN GMBH&CO, EISLINGEN/D | • DIVINOL FLUID 666 |



11. SPARE PARTS LIST ZF 63 A - ZF 63 - ZF 80 A - ZF 80-1 A

Preface

The spare parts list is only valid for the type and versions of transmission, as shown below.

You will find the transmission type and version on your transmission name plate.

If the type and version indicated differs from that printed in this Manual, the relative Spare Parts List should be ordered from ZF HURTH MARINE.

The indicated dimensions and standards are as such not enough for ordering parts.

When ordering parts, please state:

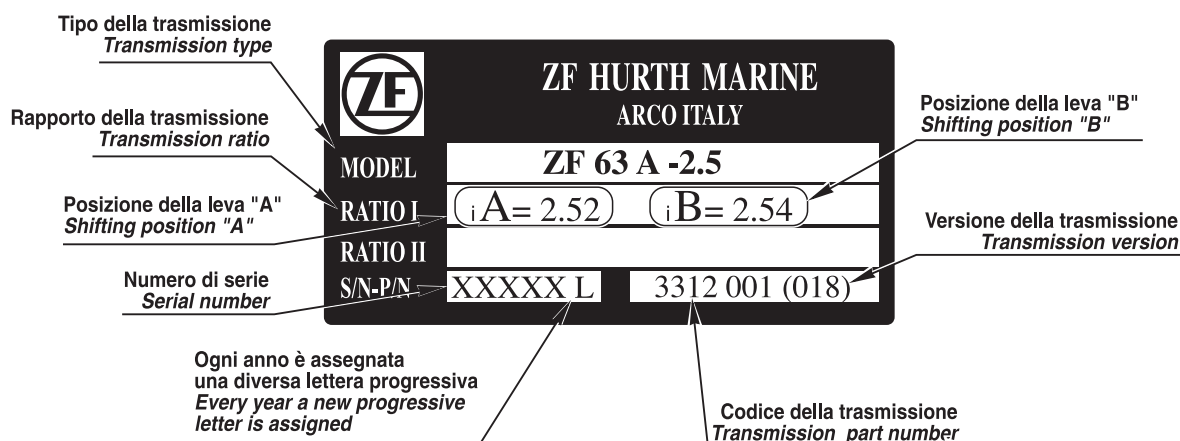
- Transmission type
- Serial number
- Item no.
- Part name
- Identification no.
- quantity of parts required.

The spare parts list is referring to the following versions:

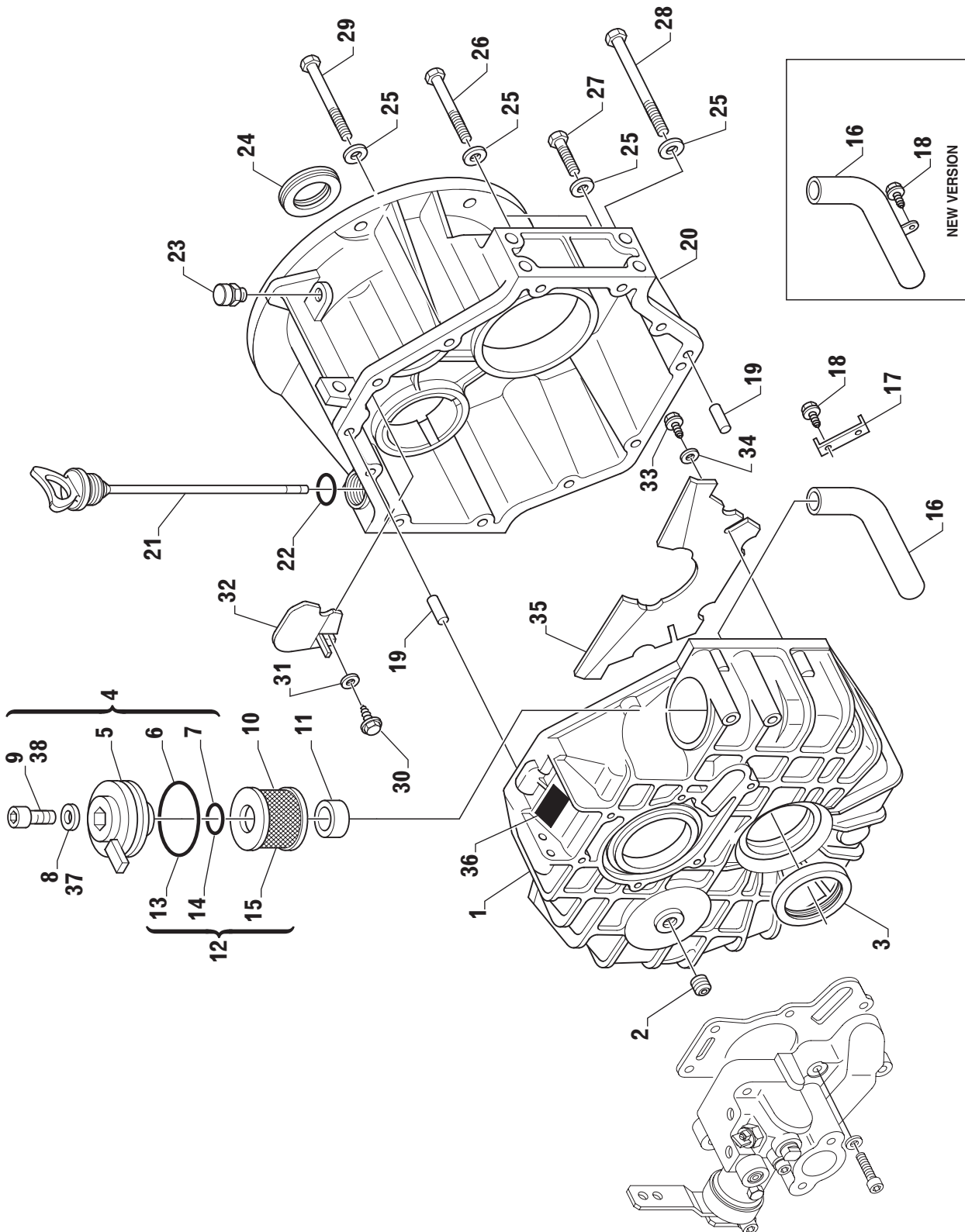
| | |
|------------------|---|
| ZF 63 A | versions 21 (1.22 R); 22 (1.56 R); 24 (2.04 R); 25 (2.52 R); 30 (2.70 R); versions 001 (1.22 R); 002 (1.56 R); 003 (2.04 R); 004 (2.52 R); 012 (2.52 R uprated); 005 (2.70 R); versions 015 (1.22 R); 016 (1.56 R); 017 (2.04 R); 018 (2.52 R); 035 (2.52 R); 020 (2.52 R uprated); 021 (2.70 R); 034 (2.70 R); |
| ZF 63 | versions 01 (1.51 R); 02 (1.93 R); 03 (2.48 R); 04 (2.78 R); versions 009 (1.25 R); 001 (1.51 R); 002 (1.93 R); 003 (2.48 R); 004 (2.78 R); versions 010 (1.25 R); 011 (1.51 R); 013 (1.93 R); 014 (2.48 R); 015 (2.78 R); |
| ZF 80 A | versions 15 (1.20 R); 16 (1.41 R); 17 (1.57 R); 18 (1.96 R); 19 (2.50 R); 20 (2.85 R); versions 001 (1.20 R); 002 (1.41 R); 003 (1.57 R); 004 (1.96 R); 005 (2.50 R); 006 (2.85 R); |
| ZF 80-1 A | versions 009 (1.21 R); 010 (1.41 R); 007 (1.57 R); 008 (1.96 R); 011 (2.50 R); 012 (2.85 R); |

Name plate

The name plate is mounted to the transmission



ZF 63 A





| Pos. | Part number | Old P/N | Descrizione | Description | Q.tà Q.ty | Note |
|------|---------------|---------|---|-----------------------------|--------------|-------------------------|
| 1 | 3312 301 004 | 451892 | Scatola | Housing | 1 | |
| 2 | 0636 301 041 | 442373 | Tappo | Plug | 1 | |
| 3 | 0634 319 132 | 442135 | Paraolio uscita | Output shaft seal | 1 | |
| 4 | 3312 101 003 | 500484 | Coperchio filtro completo | Filter cover, assy. | 1 | |
| 5 | ☆ | | . Coperchio filtro | . Filter cover | 1 | |
| 6 | 0634 304 688 | 442731 | . Guarnizione OR | . O-Ring | 1 | |
| 7 | 0634 306 204 | 105542 | Guarnizione OR | O-Ring | 1 | |
| 8 | 0630 001 085 | 167010 | . Rosetta | . Washer | 1 | |
| 9 | 0636 101 475 | 320202 | . Vite M8x30 | . Screw M8x30 | 1 | |
| 10 | 3312 301 007 | 438637 | Filtro olio | Oil filter | 1 | (2) old part number |
| 11 | 3312 301 008 | 439653 | Guarnizione | Sealing washer | 1 | |
| 12 | 3312 199 031 | 463772 | Filtro olio completo | Oil filter, assy | 1 | |
| 13 | 0634 304 688 | 442731 | . Guarnizione OR | . O-Ring | 1 | |
| 14 | 0634 306 204 | 105542 | . Guarnizione OR | . O-Ring | 1 | |
| 15 | 3312 301 037 | | . Filtro olio | . Oil filter | 1 | (2) new part number |
| 16 | 3312 301 005 | 438948 | Tubo aspirazione | Suction pipe | 1 | |
| | 3312 301 033 | | Tubo aspirazione con supporto | Suction pipe with support | 1 | |
| 17 | 3312 301 013 | 439223 | Piastra ritegno | Retaining plate | 1 | |
| 18 | 0636 113 006 | 455079 | Vite T.E. | Hex head screw | 2 | |
| | | | (ritegno tubo aspirazione) | (suction pipe retainer) | | |
| | 0636 015 020 | | Vite T.E. | Hex head screw | 2 | |
| | | | (tubo aspirazione con supporto) | (suction pipe with support) | | |
| 19 | 0631 315 520 | 335817 | Spina | Locator pin | 2 | |
| 20 | 3312 301 002 | 451889 | Coperchio | Cover (housing) | 1 | |
| | 3312 301 003 | 501352 | Coperchio | Cover (housing) | 1 | (1) |
| ▼21 | 978.36.701.02 | 454913 | Asta livello olio | Oil dipstick | 1 | |
| △ | 3312 201 002 | 500989 | Asta livello olio + OR | Oil dipstick + OR | 1 | |
| 22 | 0634 304 405 | 501211 | . Guarnizione OR (Asta livello olio) | . O-Ring (Oil dipstick) | 1 | |
| 23 | 3311 301 002 | 442369 | Valvola di sfiato | Breather valve | 1 | |
| 24 | 3312 301 030 | 413883 | Paraolio entrata | Input shaft seal | 1 | |
| 25 | 0630 302 091 | 442371 | Rosetta | Washer | 12 | |
| 26 | 0636 010 550 | 442374 | Vite T.E. | Hex head screw | 4 | |
| 27 | 0636 015 227 | 442375 | Vite T.E. | Hex head screw | 5 | |
| 28 | 0636 010 572 | 442376 | Vite T.E. | Hex head screw | 2 | |
| 29 | 0636 015 386 | 452512 | Vite T.E. | Hex head screw | 1 | |
| 30 | 0636 113 006 | 455079 | Vite T.E. | Hex head screw | 1 | |
| | 0636 015 020 | | Vite T.E. | Hex head screw | 1 | |
| 31 | 0630 001 046 | | Rosetta | Washer | 1 | |
| 32 | 3312 301 011 | 455053 | Piastra | Baffle plate | 1 | Ratio I = 1.2; 1.6; 2.0 |
| | 3312 301 012 | 458290 | Piastra | Baffle plate | 1 | Ratio I = 2.5; 2.7 |
| 33 | 0636 113 006 | 455079 | Vite T.E. | Hex head screw | 2 | |
| | 0636 015 020 | | Vite T.E. | Hex head screw | 2 | |
| 34 | 0630 001 046 | | Rosetta | Washer | 2 | |
| 35 | 3312 301 006 | 438963 | Piastra | Baffle plate | 1 | |
| 36 | 3312 301 001 | | Targhetta di identificazione | Name plate | 1 | |
| 37 | 0630 001 085 | 167010 | Rosetta | Washer | 1 | |
| 38 | 0636 101 475 | 320202 | Vite M8x30 | Screw M8x30 | 1 | |

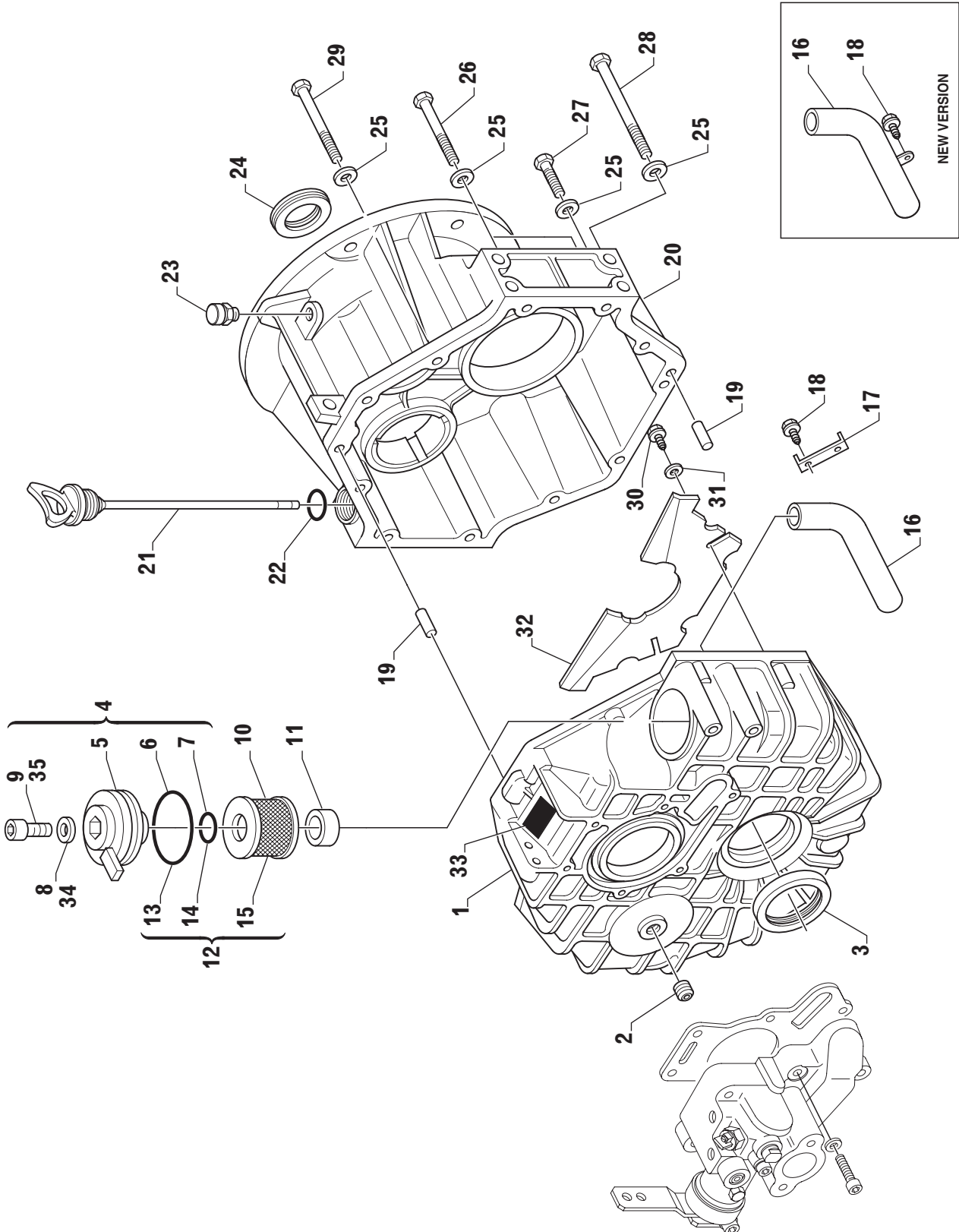
▼ Fino a matricola 10730G - Up to serial number 10730G

△ Da matricola 10731G - From serial number 10731G

(1) Only Ratio I = 2.7 (also PCM) ; Ratio I = 2.52 uprated version & ratio I = 2.52 (for PCM only)

(2) Fornito solo incluso nel kit filtro olio p/n 3312 199 031
Supplied only included in the oil filter kit p/n 3312 199 031

ZF 63





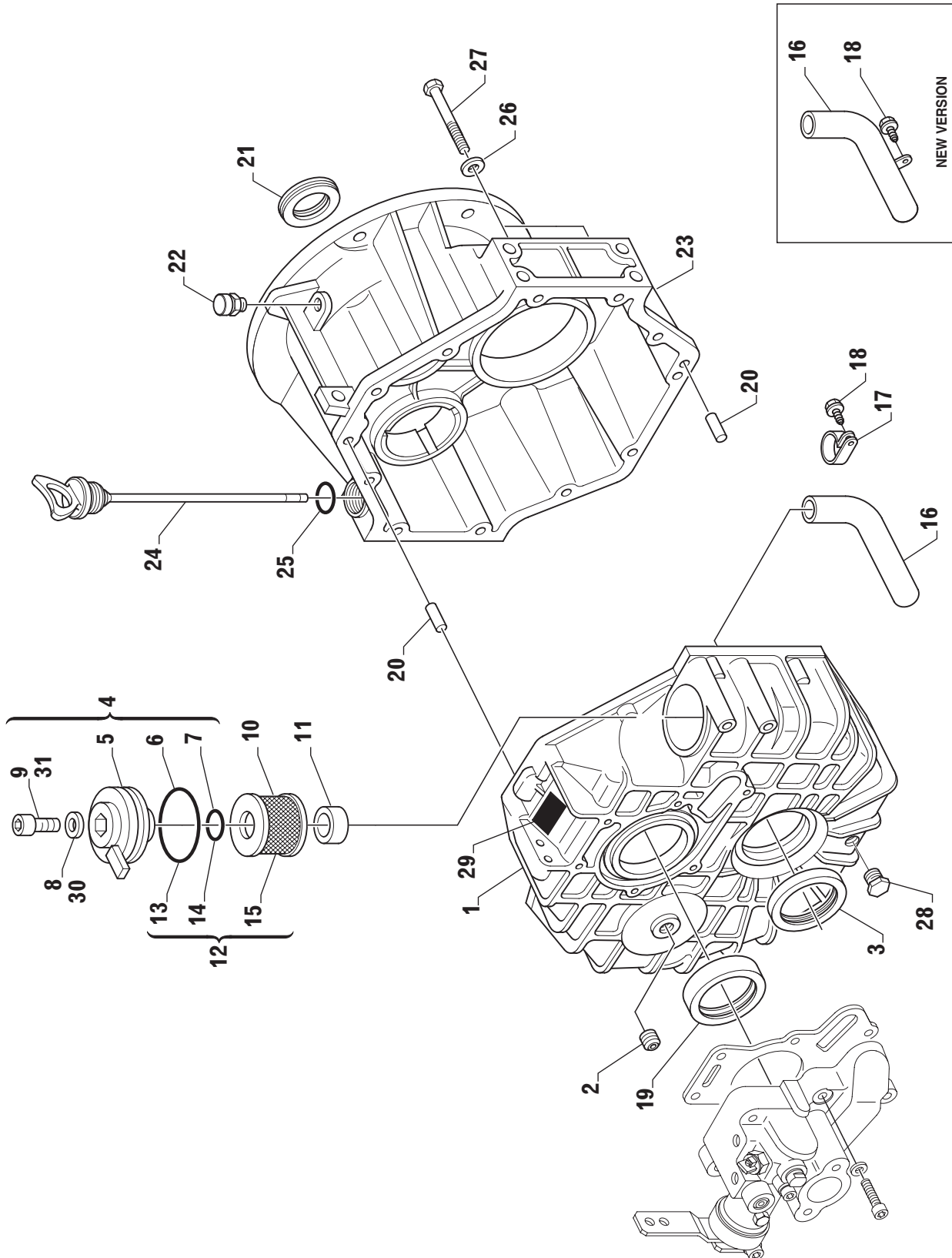
| Pos. | Part number | Old P/N | Descrizione | Description | Q.tà Q.ty | Note |
|------|---------------|---------|---|--|--------------|---------------------|
| 1 | 3312 301 020 | 455502 | Scatola | Housing | 1 | |
| 2 | 0636 301 041 | 442373 | Tappo | Plug | 1 | |
| 3 | 0634 319 132 | 442135 | Paraolio uscita | Output shaft seal | 1 | |
| 4 | 3312 101 003 | 500484 | Coperchio filtro completo | Filter cover, assy. | 1 | |
| 5 | ☆ | | . Coperchio filtro | . Filter cover | 1 | |
| 6 | 0634 304 688 | 442731 | . Guarnizione OR | . O-Ring | 1 | |
| 7 | 0634 306 204 | 105542 | . Guarnizione OR | . O-Ring | 1 | |
| 8 | 0630 001 085 | 167010 | . Rosetta | . Washer | 1 | |
| 9 | 0636 101 475 | 320202 | . Vite M8x30 | . Screw M8x30 | 1 | |
| 10 | 3312 301 007 | 438637 | Filtro olio | Oil filter | 1 | (1) old part number |
| 11 | 3312 301 008 | 439653 | Guarnizione | Gasket | 1 | |
| 12 | 3312 199 031 | 463772 | Filtro olio completo | Oil filter, assy | 1 | |
| 13 | 0634 304 688 | 442731 | . Guarnizione OR | . O-Ring | 1 | |
| 14 | 0634 306 204 | 105542 | . Guarnizione OR | . O-Ring | 1 | |
| 15 | 3312 301 037 | | . Filtro olio | . Oil filter | 1 | (1) new part number |
| 16 | 3312 301 022 | 455499 | Tubo aspirazione | Suction pipe | 1 | |
| | 3312 301 032 | | Tubo aspirazione con supporto | Suction pipe with support | 1 | |
| 17 | 3312 301 013 | 439223 | Piastra ritegno | Retaining plate | 1 | |
| 18 | 0636 113 006 | 455079 | Vite T.E. | Hex head screw | 2 | |
| | | | (ritegno tubo aspirazione) | (suction pipe retainer) | | |
| | 0636 015 020 | | Vite T.E. (tubo aspirazione con supporto) | Hex head screw (suction pipe with support) | 2 | |
| 19 | 0631 315 520 | 335817 | Spina | Locator pin | 2 | |
| 20 | 3312 301 018 | 455501 | Coperchio | Cover (housing) | 1 | |
| | 3312 301 019 | 501861 | Coperchio | Cover | 1 | Only Ratio I = 1.25 |
| ▼21 | 978.21.701.01 | 468239 | Asta livello olio | Oil dipstick | 1 | |
| △ | 3312 201 001 | 500992 | Asta livello olio + OR | Oil dipstick + OR | 1 | |
| 22 | 0634 304 405 | 501211 | . Guarnizione OR (Asta livello olio) | . O-Ring (Oil dipstick) | 1 | |
| 23 | 3311 301 002 | 442369 | Valvola di sfiato | Breather valve | 1 | |
| 24 | 3312 301 030 | 413883 | Paraolio entrata | Input shaft seal | 1 | |
| 25 | 0630 302 091 | 442371 | Rosetta | Washer | 12 | |
| 26 | 0636 010 550 | 442374 | Vite T.E. | Hex head screw | 4 | |
| 27 | 0636 015 227 | 442375 | Vite T.E. | Hex head screw | 5 | |
| 28 | 0636 010 569 | 455443 | Vite T.E. | Hex head screw | 2 | |
| 29 | 0636 015 386 | 452512 | Vite T.E. | Hex head screw | 1 | |
| 30 | 0636 113 006 | 455079 | Vite T.E. | Hex head screw | 2 | |
| | 0636 015 020 | | Vite T.E. | Hex head screw | 2 | |
| 31 | 0630 001 046 | 442371 | Rosetta | Washer | 2 | |
| 32 | 3312 301 023 | 455500 | Piastra | Baffle plate | 1 | |
| 33 | 3312 301 001 | | Targhetta di identificazione | Name plate | 1 | |
| 34 | 0630 001 085 | 167010 | Rosetta | Washer | 1 | |
| 35 | 0636 101 475 | 320202 | Vite M8x30 | Screw M8x30 | 1 | |

▼ Fino a matricola 18672F - Up to serial number 18672F

△ Da matricola 18673F - From serial number 18673F

(1) Fornito solo incluso nel kit filtro olio p/n 3312 199 031
Supplied only included in the oil filter kit p/n 3312 199 031

ZF 80 A - ZF 80-1 A





| Pos. | Part number | Old P/N | Descrizione | Description | Q.tà Q.ty | Note |
|------|---------------|---------|--|--|--------------|--|
| 1 | 3313 301 013 | 489412 | Scatola | Housing | 1 | Not available any more From s/n 21410 L (1) |
| | 3313 301 009 | | Scatola | Housing | 1 | |
| 2 | 0636 301 041 | 442373 | Tappo | Plug | 1 | |
| 3 | 0634 319 104 | 448160 | Paraolio uscita | Output shaft seal | 1 | |
| 4 | 3312 101 003 | 500484 | Coperchio filtro completo | Filter cover, assy. | 1 | |
| 5 | | | . Coperchio filtro | . Filter cover | 1 | |
| 6 | 0634 304 688 | 442731 | . Guarnizione OR | . O-Ring | 1 | |
| 7 | 0634 306 204 | 105542 | . Guarnizione OR | . O-Ring | 1 | |
| 8 | 0630 001 085 | 167010 | . Rosetta | . Washer | 1 | |
| 9 | 0636 101 475 | 320202 | . Vite M8x30 | . Screw M8x30 | 1 | |
| 10 | 3312 301 007 | 438637 | Filtro olio | Oil filter | 1 | (4) old part number |
| 11 | 3312 301 008 | 439653 | Guarnizione | Gasket | 1 | |
| 12 | 3312 199 031 | 463772 | Filtro olio completo | Oil filter, assy | 1 | |
| 13 | 0634 304 688 | 442731 | . Guarnizione OR | . O-Ring | 1 | |
| 14 | 0634 306 204 | 105542 | . Guarnizione OR | . O-Ring | 1 | |
| 15 | 3312 301 037 | | . Filtro olio | . Oil filter | 1 | (4) new part number |
| 16 | 3313 301 015 | 439522 | Tubo aspirazione | Suction pipe | 1 | |
| | 3313 301 011 | | Tubo aspirazione | Suction pipe | 1 | (3) |
| | 3313 301 022 | | Tubo aspirazione con supporto | Suction pipe with support | 1 | |
| 17 | 0632 311 398 | 479439 | Fascetta | Suction pipe clamp | 1 | |
| 18 | 0636 101 411 | 102879 | Vite T.E. (fascetta tubo aspirazione) | Hex head screw (suction pipe clamp) | 1 | |
| 19 | 3313 301 014 | 462997 | Anello centratore | Centering ring | 1 | |
| 20 | 0631 315 520 | 335817 | Spina | Locator pin | 2 | |
| 21 | 3312 301 030 | 413883 | Paraolio entrata | Input shaft seal | 1 | |
| 22 | 3311 301 002 | 442369 | Valvola di sfiato | Breather valve | 1 | |
| 23 | 3313 301 012 | 489414 | Coperchio | Cover (housing) | 1 | Not available any more From s/n 21410 L (2) |
| | 3313 301 010 | | Coperchio | Cover (housing) | 1 | |
| ▼24 | 978.36.701.01 | 439520 | Asta livello olio | Oil dipstick | 1 | |
| △ | 3313 201 001 | 500993 | Asta livello olio + OR | Oil dipstick + OR | 1 | |
| 25 | 0634 304 405 | 501211 | . Guarnizione OR (Asta livello olio) | . O-Ring (Oil dipstick) | 1 | |
| 26 | 0630 302 091 | 442371 | Rosetta | Washer | 14 | |
| 27 | 0636 015 227 | 442375 | Vite T.E. | Hex head screw | 14 | |
| 28 | 3312 301 017 | 469691 | Tappo | Plug | 1 | |
| 29 | 3312 301 001 | | Targhetta di identificazione | Name plate | 1 | |
| 30 | 0630 001 085 | 167010 | Rosetta | Washer | 1 | |
| 31 | 0636 101 475 | 320202 | Vite M8x30 | Screw M8x30 | 1 | |

(1) Scatola non fornibile con coperchio cod. 3310 301 012. Fornibile solo con coperchio codice 3313 301 010
This housing is not suitable with cover p/n 3310 301 012. But only with the new cover p/n 3313 301 010

(2) Coperchio non fornibile con scatola cod. 3310 301 013. Fornibile solo con scatola codice 3313 301 009
This cover is not suitable with housing p/n 3310 301 013. But only with the new housing p/n 3313 301 009

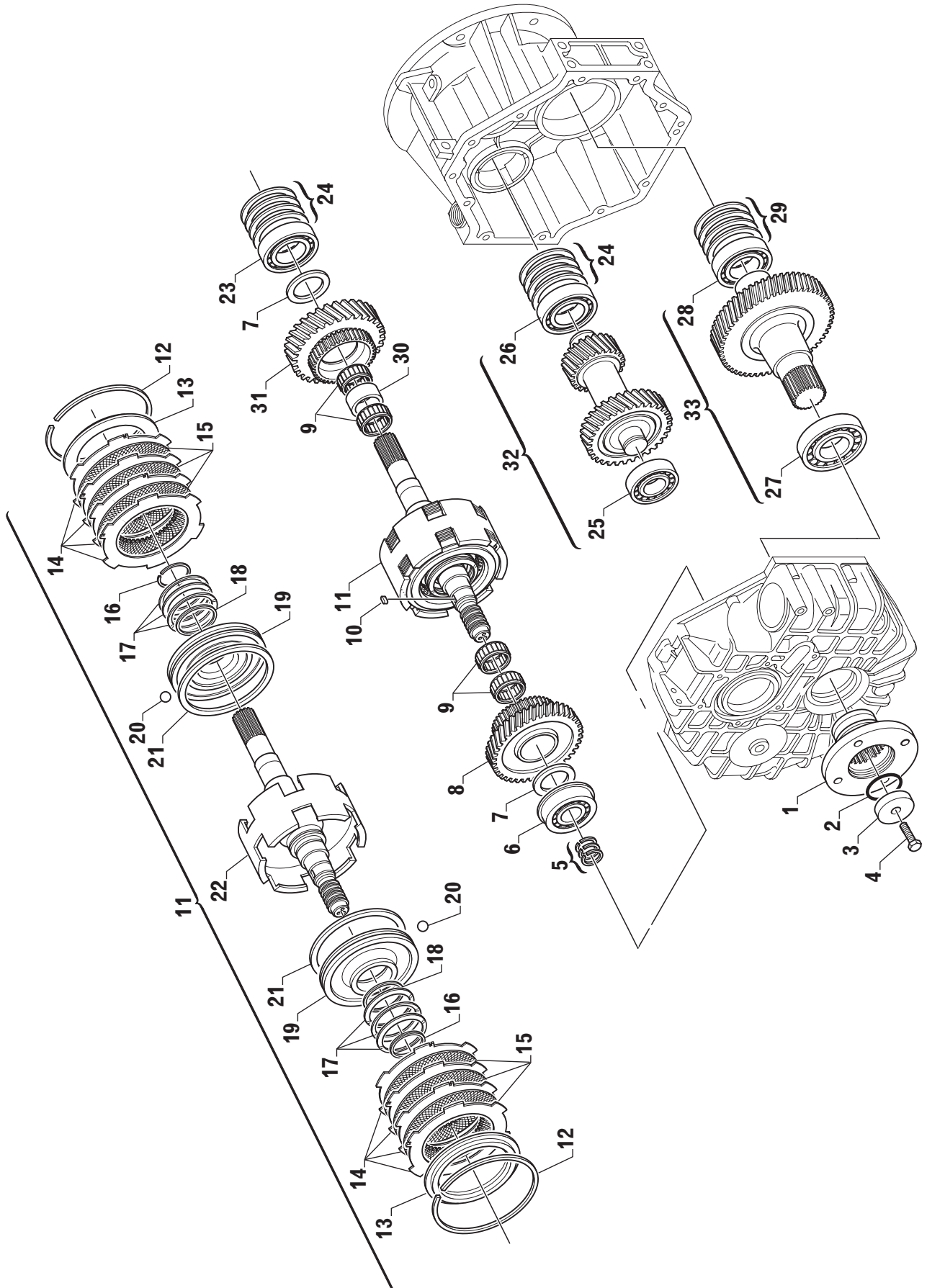
(3) Adatto solo alla nuova scatola p/n 3313 301 009
Suitable only to new housing p/n 3313 301 009

(4) Fornito solo incluso nel kit filtro olio p/n 3312 199 031
Supplied only included in the oil filter kit p/n 3312 199 031

▼ Fino a matricola 35909E - Up to serial number 35909E

△ Da matricola 35910E - From serial number 35910E

ZF 63 A





| Pos. | Part number | Old P/N | Descrizione | Description | Q.tà Q.ty | Note |
|------|--------------|---------|---|-----------------------------------|--------------|---------------------|
| 1 | 3312 304 009 | 439489 | Flangia uscita | Output flange | 1 | |
| 2 | 0634 306 328 | 105571 | Guarnizione OR | O-Ring | 1 | |
| 3 | 3313 304 017 | 475710 | Rondella | Washer | 1 | |
| 4 | 0636 016 111 | 348826 | Vite T.E. | Hex head screw | 1 | |
| 5 | 3312 302 041 | 447038 | Anello di tenuta | Piston ring | 3 | |
| 6 | 0635 501 940 | | Cuscinetto a rulli conici | Tapered roller bearing | 1 | |
| 7 | 3312 302 004 | 454406 | Rasamento | Butting ring | 2 | |
| 8 | 3312 302 006 | 488955 | Ingranaggio Z3 = 49 | Reverse gear Z3 = 49 | 1 | |
| | 3312 302 007 | 501462 | Ingranaggio Z3 = 50 | Reverse gear Z3 = 50 | 1 | Only Ratio I = 2.04 |
| 9 | 3312 302 040 | 441438 | Cuscinetto a rullini | Needle bearing | 4 | |
| 10 | 0631 501 062 | 437956 | Chiavetta | Key | 1 | |
| 11 | 3312 199 051 | | Albero di ingresso completo | Input shaft, assy. | 1 | |
| | 3312 199 052 | | Albero di ingresso completo | Input shaft, assy. | 1 | (1) |
| 12 | 0630 513 066 | 455788 | . Anello elastico | . Snap ring | 2 | |
| 13 | 3312 302 012 | 455789 | . Disco finale | . End disc | 2 | |
| | 3312 302 013 | 501345 | . Disco finale | . End disc | 2 | (1) |
| 14 | 3312 302 008 | 455787 | . Disco frizione esterno | . Outer clutch disc | 10 | |
| 15 | 3312 302 009 | 455786 | . Disco frizione interno | . Inner clutch disc | 8 | |
| 16 | 0630 501 038 | 500076 | . Anello di ritegno | . Retainer ring | 2 | |
| 17 | 3312 302 015 | 500148 | . Molla a tazza | . Cup spring | 6 | |
| | 3312 302 038 | | . Molla a tazza | . Cup spring | 6 | From s/n 18674 L |
| 18 | 0634 402 178 | 500066 | . Anello interno | . Inner clutch piston ring | 2 | |
| 19 | 3312 302 014 | 500147 | . Pistone | . Clutch piston | 2 | |
| 20 | 0635 460 006 | 106690 | . Sfera | . Ball | 2 | |
| 21 | 0634 402 176 | 500069 | . Anello esterno | . Outer clutch piston ring | 2 | |
| 22 | 3312 199 032 | | . Albero di ingresso + cilindro frizione | . Input shaft & clutch housing | 1 | |
| | 3312 199 033 | | . Albero di ingresso + cilindro frizione | . Input shaft & clutch housing | 1 | (1) |
| 23 | 0635 501 937 | 447754 | Cuscinetto a rulli conici | Tapered roller bearing | 1 | |
| | 0635 501 941 | | Cuscinetto a rulli conici | Tapered roller bearing | 1 | (1) |
| 24 | 3312 302 023 | 277213 | Spessore 0,1 mm | Shim 0.1 mm | 2 | |
| | 3312 302 024 | 277214 | Spessore 0,15 mm | Shim 0.15 mm | 2 | |
| | 3312 302 025 | 277215 | Spessore 0,2 mm | Shim 0.2 mm | 2 | |
| 25 | 0635 501 942 | | Cuscinetto a rulli conici | Tapered roller bearing | 1 | |
| 26 | 0635 501 941 | | Cuscinetto a rulli conici | Tapered roller bearing | 1 | |
| | 0735 370 229 | 501332 | Cuscinetto a rulli conici | Tapered roller bearing | 1 | (1) |
| 27 | 0635 501 938 | 333859 | Cuscinetto a rulli conici | Tapered roller bearing | 1 | |
| 28 | 0635 501 922 | | Cuscinetto a rulli conici | Tapered roller bearing | 1 | |
| 29 | 3312 304 027 | 166807 | Spessore 0,1 mm | Shim 0.1 mm | 2 | |
| | 3312 304 028 | 442340 | Spessore 0,15 mm | Shim 0.15 mm | 2 | |
| | 3312 304 029 | 154102 | Spessore 0,3 mm | Shim 0.3 mm | 2 | |
| | 3312 304 030 | 154101 | Spessore 0,5 mm | Shim 0.5 mm | 2 | |
| 30 | 3312 302 016 | 501341 | Distanziale | Spacer | 1 | (1) |

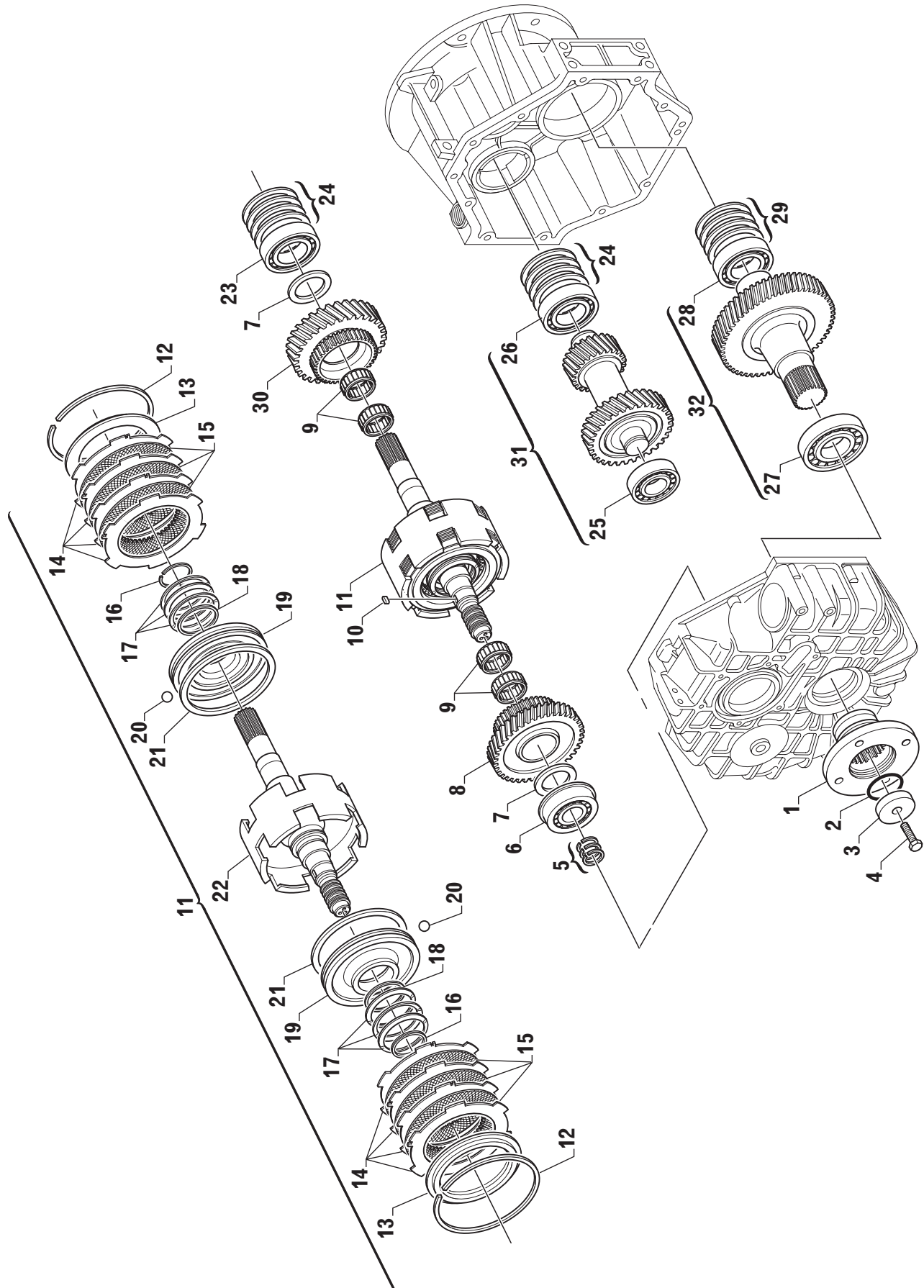
(1) Only Ratio I = 2.7 (also PCM) ; Ratio I = 2.52 uprated version & ratio I = 2.52 (for PCM only)



| Pos. | Part number | Old P/N | Descrizione | Description | Q.tà Q.ty | Note |
|---|--------------|---------|------------------------------------|--|--------------|------|
| Vers. 21,001,015 (Rapporto I = 1,22) | | | | Vers. 21,001,015 (Ratio I = 1.22) | | |
| 31 | 3312 302 005 | 500860 | Ingranaggio Z1 = 37 | Forward gear Z1 = 37 | 1 | |
| 32 | 3312 199 023 | 455731 | Albero intermedio Z4 = 45, Z5 = 34 | Intermediate shaft Z4 = 45, Z5 = 34 | 1 | * |
| 33 | 3312 199 024 | 455732 | Albero di uscita Z2 = 45 | Output shaft Z2 = 45 | 1 | * |
| Vers. 22,002,016 (Rapporto I = 1,56) | | | | Vers. 22,002,016 (Ratio I = 1.56) | | |
| 31 | 3312 202 003 | 451950 | Ingranaggio Z1 = 32 | Forward gear Z1 = 32 | 1 | |
| 32 | 3312 199 025 | 455733 | Albero intermedio Z4 = 45, Z5 = 29 | Intermediate shaft Z4 = 45, Z5 = 29 | 1 | * |
| 33 | 3312 199 026 | 455734 | Albero di uscita Z2 = 50 | Output shaft Z2 = 50 | 1 | * |
| Vers. 24,003,017 (Rapporto I = 2,04) | | | | Vers. 24,003,017 (Ratio I = 2.04) | | |
| 31 | 3312 202 004 | 452128 | Ingranaggio Z1 = 27 | Forward gear Z1 = 27 | 1 | |
| 32 | 3312 199 027 | | Albero intermedio Z4 = 44, Z5 = 24 | Intermediate shaft Z4 = 44, Z5 = 24 | 1 | * |
| 33 | 3312 199 028 | 455736 | Albero di uscita Z2 = 55 | Output shaft Z2 = 55 | 1 | * |
| Vers. 25,004,018 (Rapporto I = 2,52) | | | | Vers. 25,004,018 (Ratio I = 2.52) | | |
| 31 | 3312 202 005 | 452148 | Ingranaggio Z1 = 23 | Forward gear Z1 = 23 | 1 | |
| 32 | 3312 199 029 | 455737 | Albero intermedio Z4 = 45, Z5 = 21 | Intermediate shaft Z4 = 45, Z5 = 21 | 1 | * |
| 33 | 3312 199 030 | 455738 | Albero di uscita Z2 = 58 | Output shaft Z2 = 58 | 1 | * |
| Vers. 012,20,035 (Rapporto I = 2,52 uprated) | | | | Vers. 012,20,035 (uprated version I = 2,52) | | |
| 31 | 3312 202 007 | 501797 | Ingranaggio Z1 = 23 | Forward gear Z1 = 23 | 1 | |
| 32 | 3312 199 073 | | Albero intermedio Z4 = 45, Z5 = 21 | Intermediate shaft Z4 = 45, Z5 = 21 | 1 | * |
| 33 | 3312 199 074 | | Albero di uscita Z2 = 58 | Output shaft Z2 = 58 | 1 | * |
| Vers. 30,005,021,034 (Rapporto I = 2,7) | | | | Vers. 30,005,021,034 (Ratio I = 2.7) | | |
| 31 | 3312 202 006 | 501340 | Ingranaggio Z1 = 22 | Forward gear Z1 = 22 | 1 | |
| 32 | 3312 199 003 | | Albero intermedio Z4 = 45, Z5 = 20 | Intermediate shaft Z4 = 45, Z5 = 20 | 1 | * |
| 33 | 3312 199 056 | | Albero di uscita Z2 = 59 | Output shaft Z2 = 59 | 1 | * |

* Cuscinetti a rulli conici già assemblati - *Tapered roller bearings already assembled*

ZF 63

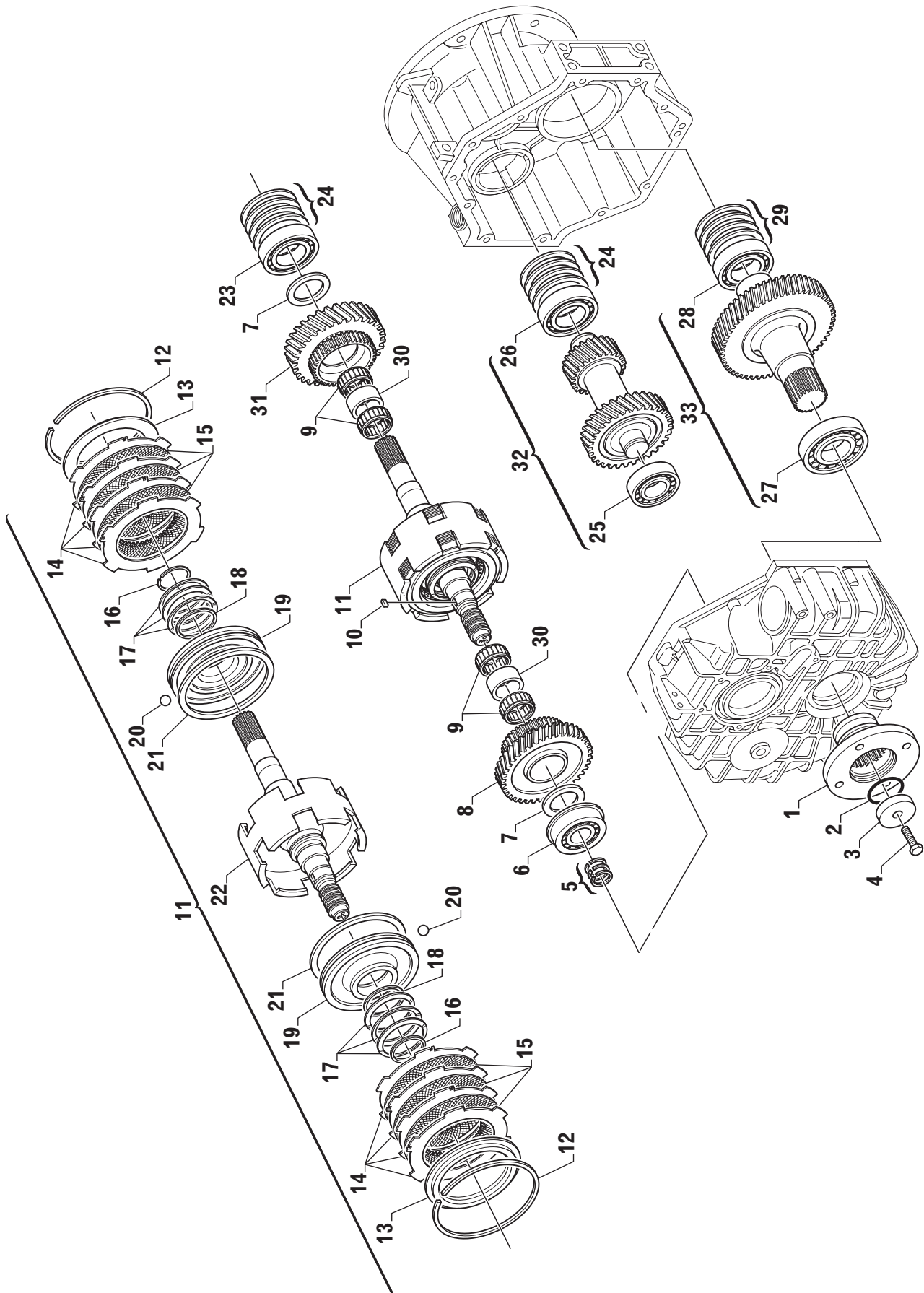




| Pos. | Part number | Old P/N | Descrizione | Description | Q.tà Q.ty | Note |
|---|--------------|---------|--|--|--------------|------------------|
| 1 | 3312 304 009 | 439489 | Flangia uscita | Output flange | 1 | |
| 2 | 0634 306 328 | 105571 | Guarnizione OR | O-Ring | 1 | |
| 3 | 3313 304 017 | 475710 | Rondella | Washer | 1 | |
| 4 | 0636 016 111 | 348826 | Vite T.E. | Hex head screw | 1 | |
| 5 | 3312 302 041 | 447038 | Anello di tenuta | Piston ring | 3 | |
| 6 | 0635 501 940 | | Cuscinetto a rulli conici | Tapered roller bearing | 1 | |
| 7 | 3312 302 004 | 454406 | Rasamento | Butting ring | 2 | |
| 8 | 3312 302 006 | 488955 | Ingranaggio Z3 = 49 | Reverse gear Z3 = 49 | 1 | |
| 9 | 3312 302 040 | 441438 | Cuscinetto a rullini | Needle bearing | 4 | |
| 10 | 0631 501 062 | 437956 | Chiavetta | Key | 1 | |
| 11 | 3312 199 051 | | Albero di ingresso completo | Input shaft, assy. | 1 | |
| 12 | 0630 513 066 | 455788 | . Anello elastico | . Snap ring | 2 | |
| 13 | 3312 302 012 | 455789 | . Disco finale | . End disc | 2 | |
| 14 | 3312 302 008 | 455787 | . Disco frizione esterno | . Outer clutch disc | 10 | |
| 15 | 3312 302 009 | 455786 | . Disco frizione interno | . Inner clutch disc | 8 | |
| 16 | 0630 501 038 | 500076 | . Anello di ritegno | . Retainer ring | 2 | |
| 17 | 3312 302 015 | 500148 | . Molla a tazza | . Cup spring | 6 | |
| | 3312 302 038 | | . Molla a tazza | . Cup spring | 6 | From s/n 18854 L |
| 18 | 0634 402 178 | 500066 | . Anello interno | . Inner clutch piston ring | 2 | |
| 19 | 3312 302 014 | 500147 | . Pistone | . Clutch piston | 2 | |
| 20 | 0635 460 006 | 106690 | . Sfera | . Ball | 2 | |
| 21 | 0634 402 176 | 500069 | . Anello esterno | . Outer clutch piston ring | 2 | |
| 22 | 3312 199 032 | | . Albero di ingresso + cilindro frizione | . Input shaft and clutch housing | 1 | |
| 23 | 0635 501 937 | 447754 | Cuscinetto a rulli conici | Tapered roller bearing | 1 | |
| 24 | 3312 302 023 | 277213 | Spessore 0,1 mm | Shim 0.1 mm | 2 | |
| | 3312 302 024 | 277214 | Spessore 0,15 mm | Shim 0.15 mm | 2 | |
| | 3312 302 025 | 277215 | Spessore 0,2 mm | Shim 0.2 mm | 2 | |
| 25 | 0635 501 942 | | Cuscinetto a rulli conici | Tapered roller bearing | 1 | |
| 26 | 0635 501 941 | | Cuscinetto a rulli conici | Tapered roller bearing | 1 | |
| 27 | 0635 501 938 | 333859 | Cuscinetto a rulli conici | Tapered roller bearing | 1 | |
| 28 | 0635 501 922 | | Cuscinetto a rulli conici | Tapered roller bearing | 1 | |
| 29 | 3312 304 027 | 166807 | Spessore 0,1 mm | Shim 0.1 mm | 2 | |
| | 3312 304 028 | 442340 | Spessore 0,15 mm | Shim 0.15 mm | 2 | |
| | 3312 304 029 | 154102 | Spessore 0,3 mm | Shim 0.3 mm | 2 | |
| | 3312 304 030 | 154101 | Spessore 0,5 mm | Shim 0.5 mm | 2 | |
| Vers. 009,010 (Rapporto I = 1,25) | | | | Vers. 009,010 (Ratio I = 1.25) | | |
| 30 | 3312 302 019 | 500856 | Ingranaggio Z1 = 39 | Forward gear Z1 = 39 | 1 | |
| 31 | 3312 199 048 | | Albero intermedio Z4 = 45, Z5 = 36 | Intermediate shaft Z4 = 45, Z5 = 36 | 1 | * |
| 32 | 3312 199 049 | | Albero di uscita Z2 = 49 | Output shaft Z2 = 49 | 1 | * |
| Vers. 01,001,011 (Rapporto I = 1,51) | | | | Vers. 01,001,011 (Ratio I = 1.51) | | |
| 30 | 3312 202 008 | 439253 | Ingranaggio Z1 = 35 | Forward gear Z1 = 35 | 1 | |
| 31 | 3312 199 040 | 470065 | Albero intermedio Z4 = 45, Z5 = 32 | Intermediate shaft Z4 = 45, Z5 = 32 | 1 | * |
| 32 | 3312 199 011 | | Albero di uscita Z2 = 53 | Output shaft Z2 = 53 | 1 | * |
| Vers. 02,002,013 (Rapporto I = 1,93) | | | | Vers. 02,002,013 (Ratio I = 1.93) | | |
| 30 | 3312 202 009 | 439254 | Ingranaggio Z1 = 30 | Forward gear Z1 = 30 | 1 | |
| 31 | 3312 199 042 | 470068 | Albero intermedio Z4 = 45, Z5 = 27 | Intermediate shaft Z4 = 45, Z5 = 27 | 1 | * |
| 32 | 3312 199 034 | | Albero di uscita Z2 = 58 | Output shaft Z2 = 58 | 1 | * |
| Vers. 03,003,014 (Rapporto I = 2,48) | | | | Vers. 03,003,014 (Ratio I = 2.48) | | |
| 30 | 3312 202 010 | 455504 | Ingranaggio Z1 = 25 | Forward gear Z1 = 25 | 1 | |
| 31 | 3312 199 035 | 479681 | Albero intermedio Z4 = 45, Z5 = 23 | Intermediate shaft Z4 = 45, Z5 = 23 | 1 | * |
| 32 | 3312 199 036 | 479685 | Albero di uscita Z2 = 62 | Output shaft Z2 = 62 | 1 | * |
| Vers. 04,004,015 (Rapporto I = 2,78) | | | | Vers. 04,004,015 (Ratio I = 2.78) | | |
| 30 | 3312 202 011 | 455510 | Ingranaggio Z1 = 23 | Forward gear Z1 = 23 | 1 | |
| 31 | 3312 199 012 | | Albero intermedio Z4 = 45, Z5 = 21 | Intermediate shaft Z4 = 45, Z5 = 21 | 1 | * |
| 32 | 3312 199 013 | | Albero di uscita Z2 = 64 | Output shaft Z2 = 64 | 1 | * |

* Cuscinetti a rulli conici già assemblati - *Tapered roller bearings already assembled*

ZF 80 A - ZF 80-1 A





| Pos. | Part number | Old P/N | Descrizione | Description | Q.tà Q.ty | Note |
|------|--------------|---------|---|----------------------------------|--------------|--------------------|
| 1 | 3313 304 007 | 439581 | Flangia | Flange | 1 | |
| 2 | 0634 303 505 | 384176 | Guarnizione OR | O-Ring | 1 | |
| 3 | 3313 304 026 | 387841 | Rondella | Washer | 1 | |
| 4 | 0636 016 085 | 102823 | Vite T.E. | Hex head screw | 1 | |
| 5 | 3312 302 041 | 447038 | Anello di tenuta | Piston ring | 3 | |
| 6 | 0635 501 937 | 447754 | Cuscinetto a rulli conici | Tapered roller bearing | 1 | |
| 7 | 3313 302 023 | 457823 | Rasamento | Butting ring | 2 | |
| 8 | 3313 302 024 | 500819 | Ingranaggio Z3 = 44 | Reverse gear Z3 = 44 | 1 | |
| 9 | 3312 302 040 | 441438 | Cuscinetto a rullini | Needle bearing | 4 | |
| 10 | 0631 501 062 | 437956 | Chiavetta | Key | 1 | |
| 11 | 3313 199 026 | 486633 | Albero di ingresso completo | Input shaft, assy. | 1 | |
| 12 | 0630 513 066 | 455788 | . Anello elastico | . Snap ring | 2 | |
| 13 | 3312 302 012 | 455789 | . Disco finale | . End disc | 2 | |
| 14 | 3312 302 008 | 455787 | . Disco frizione esterno | . Outer clutch disc | 12 | |
| 15 | 3312 302 009 | 455786 | . Disco frizione interno | . Inner clutch disc | 10 | |
| 16 | 0630 501 038 | 500076 | . Anello di ritegno | . Retainer ring | 2 | |
| 17 | 3312 302 015 | 500148 | . Molla a tazza | . Cup spring | 6 | |
| △ | 3312 302 038 | 500148 | . Molla a tazza | . Cup spring | 6 | |
| 18 | 0634 402 178 | 500066 | . Anello interno | . Inner clutch piston ring | 2 | |
| 19 | 3312 302 014 | 500147 | . Pistone | . Clutch piston | 2 | |
| 20 | 0635 460 006 | 106690 | . Sfera | . Ball | 2 | |
| 21 | 0634 402 176 | 500069 | . Anello esterno | . Outer clutch piston ring | 2 | |
| 22 | 3313 199 027 | 500237 | . Albero di ingresso + cilindro frizione | . Input shaft and clutch housing | 1 | |
| 23 | 0635 501 939 | | Cuscinetto a rulli conici | Tapered roller bearing | 1 | |
| 24 | 3313 302 042 | 439630 | Spessore 0,1 mm | Shim 0.1 mm | 2 | |
| | 3313 302 043 | 439631 | Spessore 0,15 mm | Shim 0.15 mm | 2 | |
| | 3313 302 044 | 439632 | Spessore 0,2 mm | Shim 0.2 mm | 2 | |
| | 3313 302 045 | 439633 | Spessore 0,5 mm | Shim 0.5 mm | 2 | |
| | 3313 302 046 | 439634 | Spessore 1,0 mm | Shim 1.0 mm | 2 | Intermediate shaft |
| 25 | 0635 501 937 | 447754 | Cuscinetto a rulli conici | Tapered roller bearing | 1 | |
| 26 | 0635 501 938 | 333859 | Cuscinetto a rulli conici | Tapered roller bearing | 1 | |
| 27 | 0635 373 008 | 384182 | Cuscinetto a rulli conici | Tapered roller bearing | 1 | |
| 28 | 0635 501 914 | | Cuscinetto a rulli conici | Tapered roller bearing | 1 | |
| 29 | 3208 304 023 | 449125 | Spessore 0,15 mm | Shim 0.15 mm | 2 | |
| | 3208 304 024 | 449126 | Spessore 0,20 mm | Shim 0.20 mm | 2 | |
| | 3208 304 027 | 449127 | Spessore 0,50 mm | Shim 0.50 mm | 2 | |
| 30 | 3313 302 030 | 439533 | Distanziale | Spacer | 2 | |

△ Da matricola 43448L (ZF 80 A) e 43463L (ZF 80-1 A)
From serial number 43448L (ZF 80 A) and 43463L (ZF 80-1 A)

SOLO PER ZF 80 A

Vers. 15,001 (Rapporto I = 1,2)

| | | | |
|----|--------------|--------|------------------------------------|
| 31 | 3313 302 021 | | Ingranaggio Z1 = 35 |
| 32 | 3313 199 030 | 500392 | Albero intermedio Z4 = 44, Z5 = 35 |
| 33 | 3313 199 031 | 500398 | Albero di uscita Z2 = 42 |

Vers. 16,002 (Rapporto I = 1,41)

| | | | |
|----|--------------|--------|------------------------------------|
| 31 | 3313 302 026 | 500850 | Ingranaggio Z1 = 32 |
| 32 | 3313 199 032 | 500393 | Albero intermedio Z4 = 44, Z5 = 32 |
| 33 | 3313 199 033 | 500399 | Albero di uscita Z2 = 45 |

Vers. 17,003 (Rapporto I = 1,57)

| | | | |
|----|--------------|--------|------------------------------------|
| 31 | 3313 302 025 | 500849 | Ingranaggio Z1 = 30 |
| 32 | 3313 199 034 | 500394 | Albero intermedio Z4 = 44, Z5 = 30 |
| 33 | 3313 199 035 | 500400 | Albero di uscita Z2 = 47 |

Vers. 18,004 (Rapporto I = 1,96)

| | | | |
|----|--------------|--------|------------------------------------|
| 31 | 3313 202 004 | 459589 | Ingranaggio Z1 = 26 |
| 32 | 3313 199 036 | 500395 | Albero intermedio Z4 = 44, Z5 = 26 |
| 33 | 3313 199 016 | 500401 | Albero di uscita Z2 = 51 |

ONLY FOR ZF 80 A

Vers. 15,001 (Ratio I = 1.2)

| | | | | | |
|--|--|--|-------------------------------------|---|---|
| | | | Forward gear Z1 = 35 | 1 | |
| | | | Intermediate shaft Z4 = 44, Z5 = 35 | 1 | * |
| | | | Output shaft Z2 = 42 | 1 | * |

Vers. 16,002 (Ratio I = 1.41)

| | | | | | |
|--|--|--|-------------------------------------|---|---|
| | | | Forward gear Z1 = 32 | 1 | |
| | | | Intermediate shaft Z4 = 44, Z5 = 32 | 1 | * |
| | | | Output shaft Z2 = 45 | 1 | * |

Vers. 17,003 (Ratio I = 1.57)

| | | | | | |
|--|--|--|-------------------------------------|---|---|
| | | | Forward gear Z1 = 30 | 1 | |
| | | | Intermediate shaft Z4 = 44, Z5 = 30 | 1 | * |
| | | | Output shaft Z2 = 47 | 1 | * |

Vers. 18,004 (Ratio I = 1.96)

| | | | | | |
|--|--|--|-------------------------------------|---|---|
| | | | Forward gear Z1 = 26 | 1 | |
| | | | Intermediate shaft Z4 = 44, Z5 = 26 | 1 | * |
| | | | Output shaft Z2 = 51 | 1 | * |

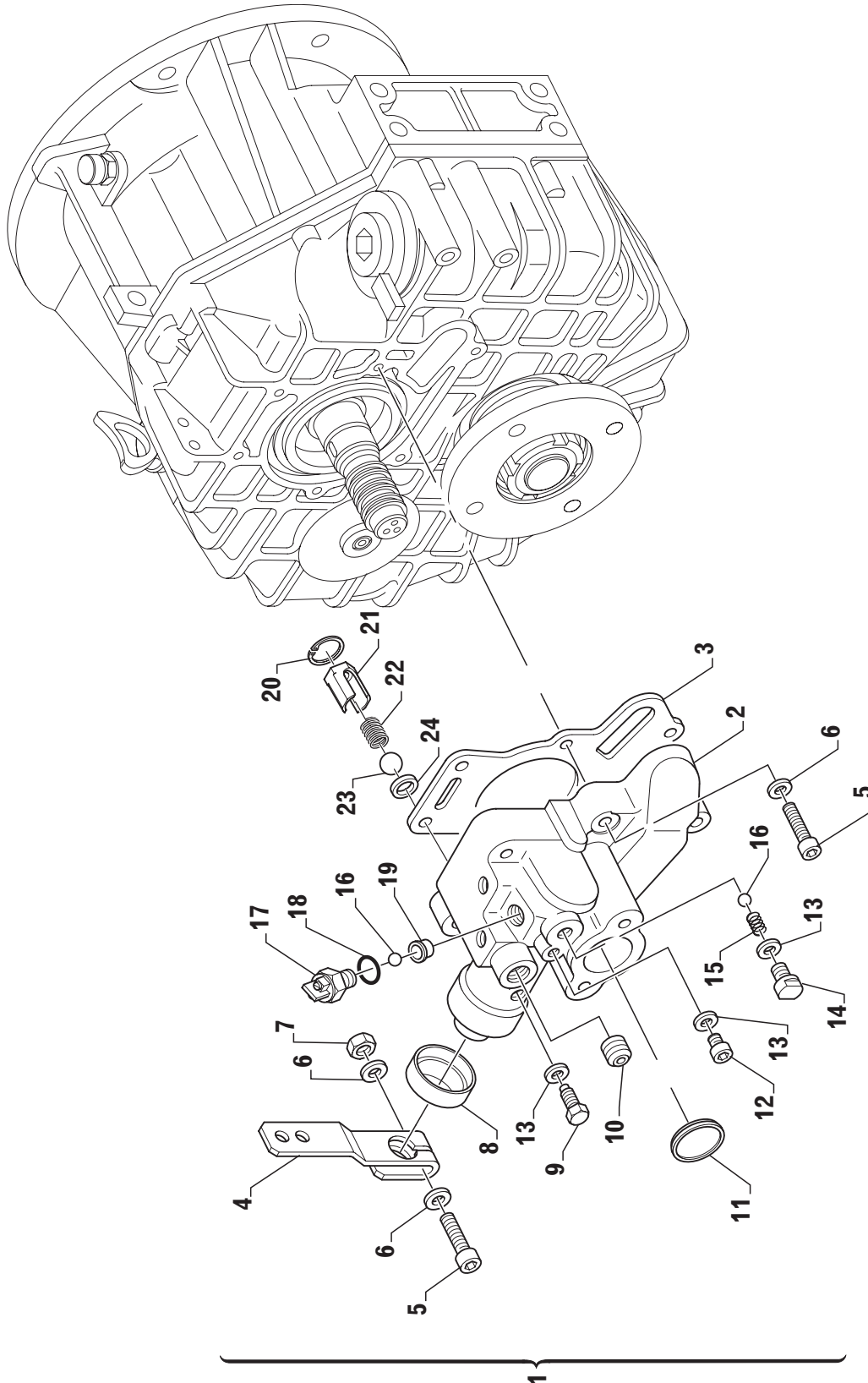


| Pos. | Part number | Old P/N | Descrizione | Description | Q.tà Q.ty | Note |
|---|--------------|---------|------------------------------------|--------------------------------------|--------------|------|
| Vers. 19,005 (Rapporto I = 2,5) | | | | Vers. 19,005 (Ratio I = 2.5) | | |
| 31 | 3313 202 005 | 462133 | Ingranaggio Z1 = 22 | Forward gear Z1 = 22 | 1 | |
| 32 | 3313 199 037 | 500396 | Albero intermedio Z4 = 44, Z5 = 22 | Intermediate shaft Z4 = 44, Z5 = 22 | 1 | * |
| 33 | 3313 199 038 | 500402 | Albero di uscita Z2 = 55 | Output shaft Z2 = 55 | 1 | * |
| Vers. 20,006 (Rapporto I = 2,85) | | | | Vers. 20,006 (Ratio I = 2.85) | | |
| 31 | 3313 202 006 | 462134 | Ingranaggio Z1 = 20 | Forward gear Z1 = 20 | 1 | |
| 32 | 3313 199 039 | 500397 | Albero intermedio Z4 = 44, Z5 = 20 | Intermediate shaft Z4 = 44, Z5 = 20 | 1 | * |
| 33 | 3313 199 040 | 500403 | Albero di uscita Z2 = 57 | Output shaft Z2 = 57 | 1 | * |
| SOLO PER ZF 80-1 A | | | | ONLY FOR ZF 80-1 A | | |
| Vers. 007 (Rapporto I = 1,57) | | | | Vers. 007 (Ratio I = 1.57) | | |
| 31 | 3313 302 025 | 500849 | Ingranaggio Z1 = 30 | Forward gear Z1 = 30 | 1 | |
| 32 | 3313 199 034 | 500394 | Albero intermedio Z4 = 44, Z5 = 30 | Intermediate shaft Z4 = 44, Z5 = 30 | 1 | * |
| 33 | 3313 199 035 | 500400 | Albero di uscita Z2 = 47 | Output shaft Z2 = 47 | 1 | * |
| Vers. 008 (Rapporto I = 1,96) | | | | Vers. 008 (Ratio I = 1.96) | | |
| 31 | 3313 202 004 | 459589 | Ingranaggio Z1 = 26 | Forward gear Z1 = 26 | 1 | |
| 32 | 3313 199 036 | 500395 | Albero intermedio Z4 = 44, Z5 = 26 | Intermediate shaft Z4 = 44, Z5 = 26 | 1 | * |
| 33 | 3313 199 003 | | Albero di uscita Z2 = 51 | Output shaft Z2 = 51 | 1 | * |
| Vers. 009 (Rapporto I = 1,21) | | | | Vers. 009 (Ratio I = 1.21) | | |
| 31 | 3313 302 021 | | Ingranaggio Z1 = 35 | Forward gear Z1 = 35 | 1 | |
| 32 | 3313 199 030 | 500392 | Albero intermedio Z4 = 44, Z5 = 35 | Intermediate shaft Z4 = 44, Z5 = 35 | 1 | * |
| 33 | 3313 199 031 | 500398 | Albero di uscita Z2 = 42 | Output shaft Z2 = 42 | 1 | * |
| Vers. 010 (Rapporto I = 1,41) | | | | Vers. 010 (Ratio I = 1.41) | | |
| 31 | 3313 302 026 | 500850 | Ingranaggio Z1 = 32 | Forward gear Z1 = 32 | 1 | |
| 32 | 3313 199 032 | 500393 | Albero intermedio Z4 = 44, Z5 = 32 | Intermediate shaft Z4 = 44, Z5 = 32 | 1 | * |
| 33 | 3313 199 033 | 500399 | Albero di uscita Z2 = 45 | Output shaft Z2 = 45 | 1 | * |
| Vers. 011 (Rapporto I = 2,5) | | | | Vers. 011 (Ratio I = 2.5) | | |
| 31 | 3313 202 005 | 462133 | Ingranaggio Z1 = 22 | Forward gear Z1 = 22 | 1 | |
| 32 | 3313 199 001 | | Albero intermedio Z4 = 44, Z5 = 22 | Intermediate shaft Z4 = 44, Z5 = 22 | 1 | * |
| 33 | 3313 199 004 | | Albero di uscita Z2 = 55 | Output shaft Z2 = 55 | 1 | * |
| Vers. 012 (Rapporto I = 2,85) | | | | Vers. 012 (Ratio I = 2.85) | | |
| 31 | 3313 202 007 | 501739 | Ingranaggio Z1 = 20 | Forward gear Z1 = 20 | 1 | |
| 32 | 3313 199 002 | | Albero intermedio Z4 = 44, Z5 = 20 | Intermediate shaft Z4 = 44, Z5 = 20 | 1 | * |
| 33 | 3313 199 005 | | Albero di uscita Z2 = 57 | Output shaft Z2 = 57 | 1 | * |

* Cuscinetti a rulli conici già assemblati - *Tapered roller bearings already assembled*

ZF 63 A - ZF 63 - ZF 80 A - ZF 80-1 A

MECHANICAL SELECTOR VALVE

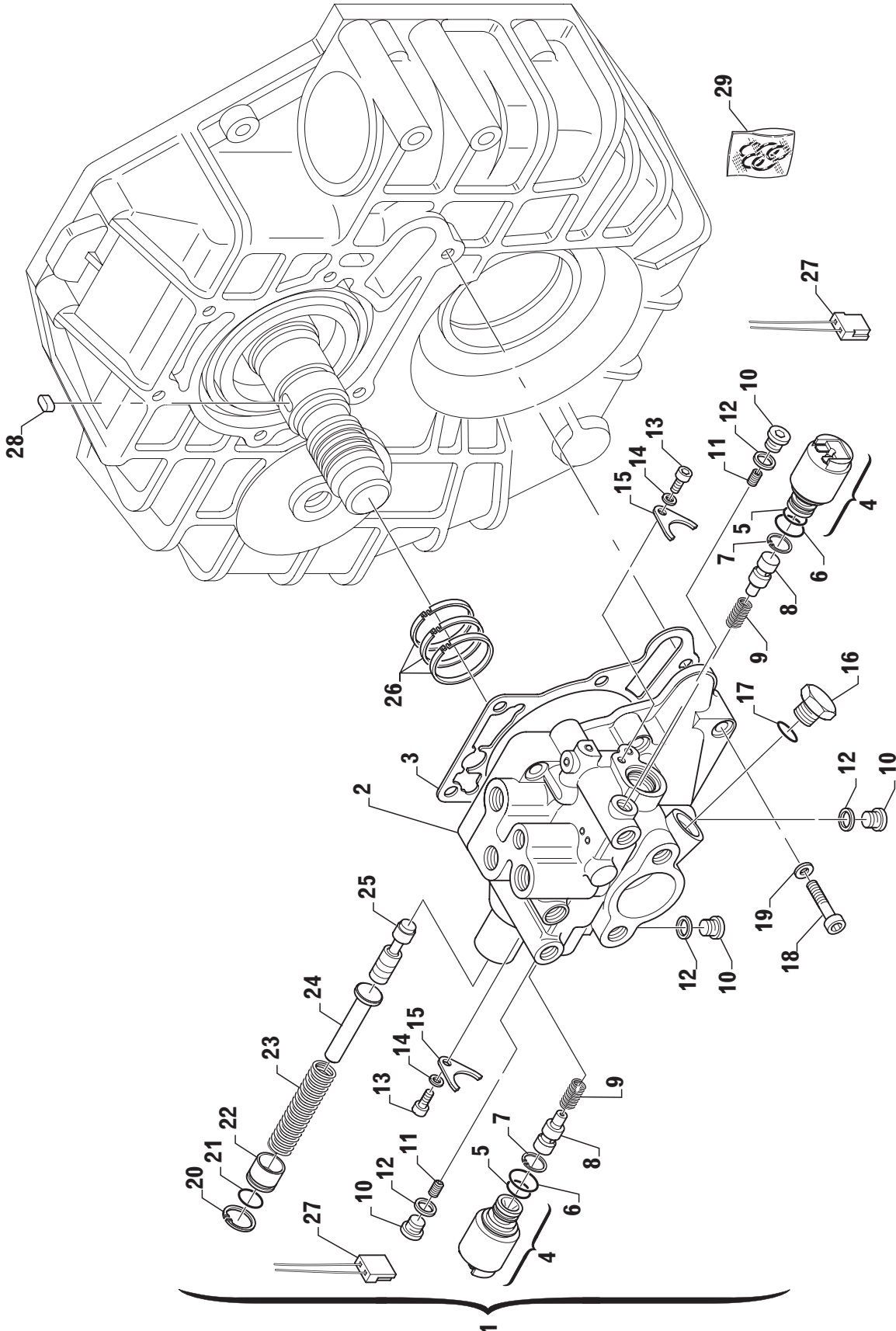




| Pos. | Part number | Old P/N | Descrizione | Description | Q.tà Q.ty | Note |
|------|--------------|---------|--|--|--------------|-------------------|
| 1 | 3312 108 001 | | Valvola di comando completo 23 bar | Control valve assy. 23 bar | 1 | |
| | 3313 108 001 | | Valvola di comando alta velocità 26 bar | High speed control valve assy. 26 bar | 1 | Only for ZF 80-1A |
| 2 | ☆ | | . Valvola di comando | . Control valve | 1 | |
| 3 | 3312 308 020 | 408388 | . Guarnizione | . Gasket | 1 | |
| 4 | 3312 308 025 | 452963 | . Leva | . Lever | 1 | |
| 5 | 0636 101 727 | 442377 | . Vite T.E. | . Hex head screw | 7 | |
| 6 | 0630 302 090 | 442372 | . Rosetta | . Washer | 8 | |
| 7 | 0637 006 157 | 455785 | . Dado | . Nut | 1 | |
| 8 | 0634 309 621 | 500065 | . Guarnizione | . Gasket | 1 | |
| 9 | 3312 308 034 | 500026 | . Vite di fermo | . Stop screw | 1 | |
| 10 | 0636 309 007 | 455756 | . Tappo | . Plug | 1 | |
| 11 | 0631 405 061 | 500107 | . Tappo | . Plug | 1 | |
| 12 | 0636 302 053 | 103465 | . Tappo | . Plug | 1 | |
| 13 | 0634 801 302 | 107410 | . Rosetta | . Washer | 3 | |
| 14 | 3312 308 037 | 500028 | . Vite di guida | . Guide bolt | 1 | |
| 15 | 3312 308 047 | 500044 | . Molla | . Spring | 1 | |
| 16 | 0635 460 014 | 106695 | . Sfera | . Ball | 2 | |
| 17 | 3312 308 029 | 455764 | . Interruttore completo | . Neutral safety switch assy. | 1 | |
| 18 | 001.105.0158 | 105527 | . Guarnizione OR | . O-Ring | 1 | |
| 19 | 3312 308 039 | 500030 | . Boccia | . Bushing | 1 | |
| 20 | 0630 502 005 | 500083 | . Anello elastico | . Snap ring | 1 | |
| 21 | 3312 308 038 | 500029 | . Boccia | . Bushing | 1 | |
| 22 | 3312 308 042 | 500032 | . Molla per lubrificazione | . Spring | 1 | |
| 23 | 0635 460 023 | 500097 | . Sfera | . Ball | 1 | |
| 24 | 3312 308 036 | 500027 | . Distanziale | . Spacer | 1 | |

ZF 63 A - ZF 63 - ZF 80 A - ZF 80-1 A

OLD ELECTRIC SELECTOR VALVE WITH PROPORTIONAL VALVES





| Pos. | Part number | Old P/N | Descrizione | Description | Q.tà Q.ty | Note |
|------|---------------|---------|----------------------------|-------------------------|--------------|------------------------|
| 1 | 3312 199 004 | | Distributore elettrico | Electric selector valve | 1 | (1) |
| | 3312 199 005 | | Distributore elettrico | Electric selector valve | 1 | (2) |
| | 3313 108 003 | | Distributore elettrico | Electric selector valve | 1 | (3) Only for ZF 80-1 A |
| | 3313 108 004 | | Distributore elettrico | Electric selector valve | 1 | (4) Only for ZF 80-1 A |
| 2 | ☆ | | . Valvola di comando | . Control valve | 1 | |
| 3 | 3312 308 020 | 408388 | Guarnizione | Gasket | 1 | |
| 4 | 3312 308 064 | 501634 | Valvola proporzionale 12 V | Electric valve 12 V | 2 | |
| | 3312 308 065 | 501635 | Valvola proporzionale 24 V | Electric valve 24 V | 2 | |
| 5 | 0634 304 651 | 501724 | Guarnizione OR | O-Ring | 2 | |
| 6 | 0634 304 391 | 501524 | Anello di tenuta | Piston ring | 2 | |
| 7 | 0630 502 078 | 501528 | Anello elastico | Snap ring | 2 | |
| 8 | 3312 308 054 | 501502 | Pistoncino valvola 2/3 vie | Valve piston | 2 | |
| 9 | 3312 308 062 | 501533 | Molla per pistone | Piston spring | 2 | |
| 10 | 0636 302 053 | 103465 | Tappo | Plug | 4 | |
| 11 | 3312 308 059 | 501516 | Grano | Drilled plug | 2 | |
| 12 | 0634 801 302 | 107410 | Rosetta | Washer | 4 | |
| 13 | 0636 101 651 | 501525 | Vite | Screw | 2 | |
| 14 | 0630 001 096 | 501527 | Rondella | Washer | 2 | |
| 15 | 1043 326 045 | | Fermo valvola | Valve lock | 2 | |
| 16 | 3312 308 063 | 501562 | Tappo | Plug | 1 | |
| 17 | 0634 306 524 | | Anello OR | O-Ring | 1 | |
| 18 | 0636 101 727 | 442377 | Vite T.E. | Hex head screw | 6 | |
| 19 | 0630 302 090 | 442372 | Rosetta | Washer | 6 | |
| 20 | 0630 532 004 | 501529 | Anello elastico | Snap ring | 1 | |
| 21 | 0634 304 309 | 501523 | Anello di tenuta OR | O-Ring | 1 | |
| 22 | 3312 308 058 | 501515 | Tappo | Plug | 1 | |
| 23 | 3312 308 040 | 500031 | Molla | Spring | 1 | |
| 24 | 3312 308 043 | 500038 | Perno guida molla | Spring guide pin | 1 | |
| 25 | 3312 308 017 | 500040 | Pistoncino estraibile | Valve piston | 1 | |
| 26 | 3312 302 041 | 447038 | Anello di tenuta | Piston ring | 3 | |
| 27 | 3312 117 001 | | Kit connettori | Connectors kit | 1 | |
| 28 | 0631 501 062 | 437956 | Chiavetta | Key | 1 | |
| 29 | 978.28.641.01 | 501751 | Kit guarnizioni | Seal kit | 1 | |

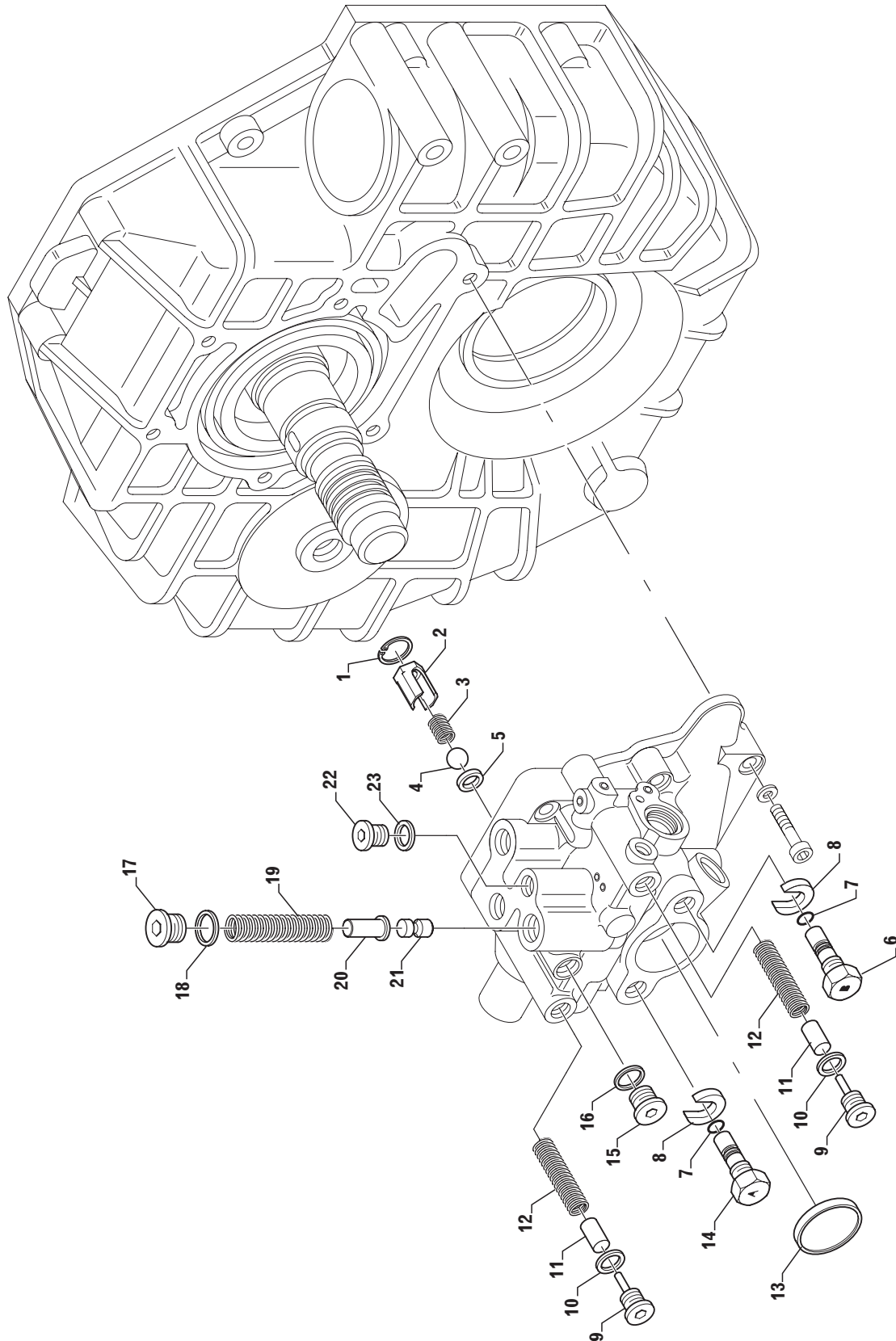
(1) Installare con 12 V - *to be installed with 12 V power supply*

(2) Installare con 24 V - *to be installed with 24 V power supply*

(3) Installare con 24 V - 26 bar - *to be installed with 24 V power supply - 26 bar*

(4) Installare con 12 V - 26 bar - *to be installed with 12 V power supply - 26 bar*

ZF 63 A - ZF 63 - ZF 80 A - ZF 80-1 A

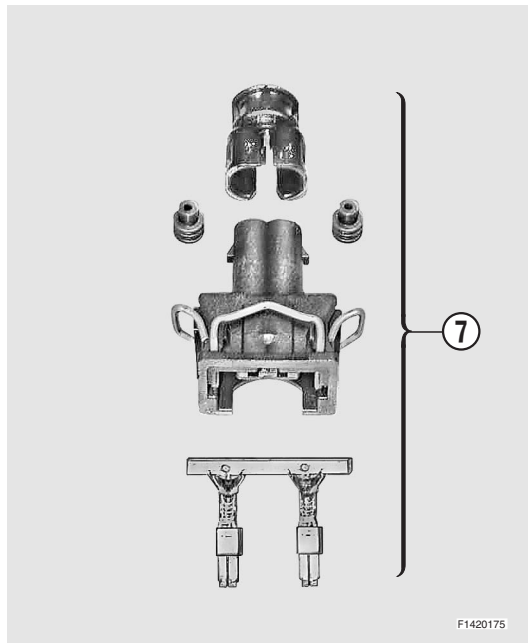
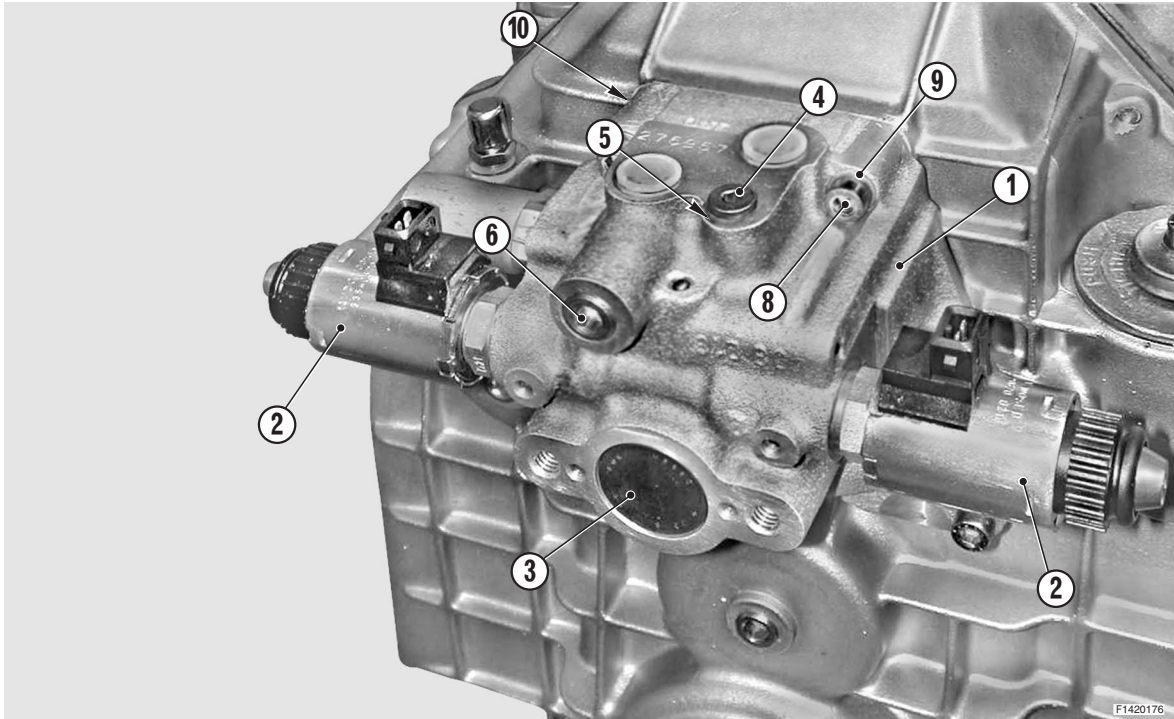




| Pos. | Part number | Old P/N | Descrizione | Description | Q.tà Q.ty | Note |
|------|--------------|---------|------------------------------|---------------------|--------------|------|
| 1 | 0630 502 005 | 500083 | Anello elastico | Snap ring | 1 | |
| 2 | 3312 308 038 | 500029 | Boccola | Bushing | 1 | |
| 3 | 3312 308 042 | 500032 | Molla per lubrificazione | Spring | 1 | |
| 4 | 0635 460 023 | 500097 | Sfera | Ball | 1 | |
| 5 | 3312 308 036 | 500027 | Distanziale | Spacer | 1 | |
| 6 | 3312 308 052 | 501497 | Vite torna a casa "B" | Come home screw "B" | 1 | |
| 7 | 0634 304 690 | 501522 | Anello di tenuta OR | O-Ring | 2 | |
| 8 | 3312 308 050 | 501495 | Rondella | Washer | 2 | |
| 9 | 3312 308 056 | 501513 | Vite | Screw | 2 | |
| 10 | 0634 801 298 | 500095 | Rosetta | Washer | 2 | |
| 11 | 4656 306 013 | | Pistoncino ammortizzatore | Piston | 2 | |
| 12 | 0732 042 539 | | Molla ammortizzatore | Spring | 2 | |
| 13 | 0631 405 062 | 501530 | Tappo | Plug | 1 | |
| 14 | 3312 308 051 | 501496 | Vite torna a casa "A" | Come home screw "A" | 1 | |
| 15 | 0636 302 068 | 500744 | Tappo | Plug | 1 | |
| 16 | 0634 801 260 | 500897 | Rosetta | Washer | 1 | |
| 17 | 0636 302 065 | 501520 | Vite | Screw | 1 | |
| 18 | 0634 801 281 | 227851 | Rosetta | Washer | 1 | |
| 19 | 3312 308 061 | 501532 | Molla | Spring | 1 | |
| 20 | 3312 308 057 | 501514 | Perno guida molla | Spring guide pin | 1 | |
| 21 | 3312 308 053 | 501498 | Pistoncino valvola riduzione | Valve piston | 1 | |
| 22 | 0636 302 053 | 103465 | Tappo | Plug | 1 | |
| 23 | 0634 801 302 | 107410 | Rosetta | Washer | 1 | |

ZF 63 A - ZF 63 - ZF 80 A - ZF 80-1 A

OLD ELECTRIC SELECTOR VALVE ON/OFF 12V, 26 BAR





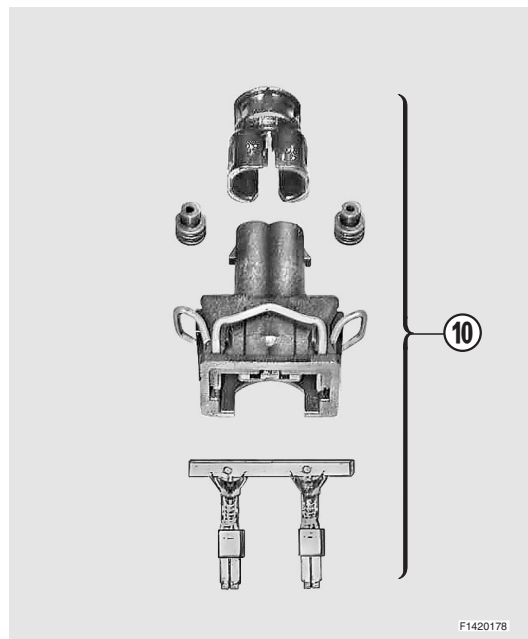
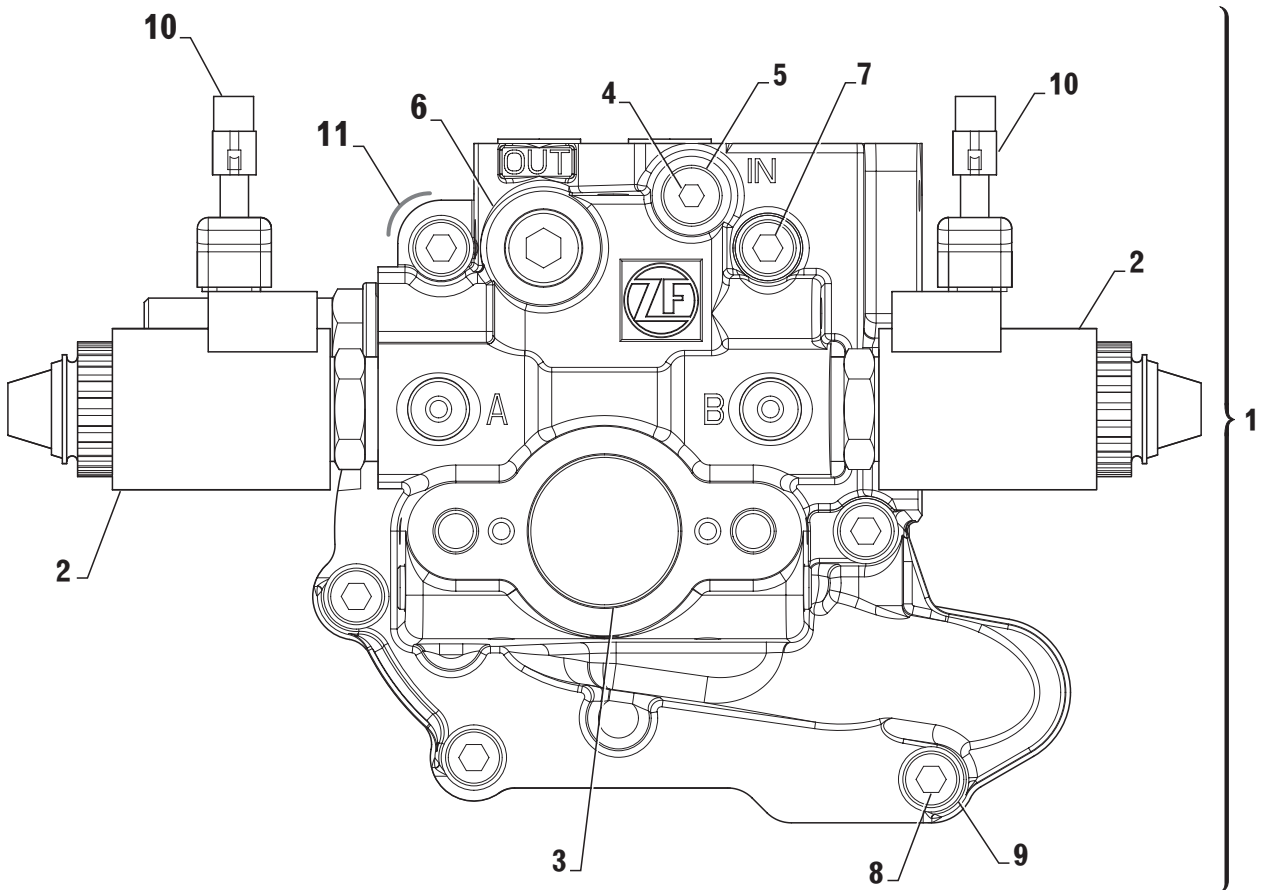
| Pos. | Part number | Old P/N | Descrizione | Description | Q.tà Q.ty | Note |
|------|--------------|---------|---|--|--------------|------------|
| 1 | 3312 199 015 | | Distributore elettrico 26 bar ON/OFF | Electric selector valve 26 bar ON/OFF | 1 | * |
| 2 | 3312 308 069 | | Elettrovalvola ON/OFF 12V | Solenoid valve ON/OFF 12V | 2 | |
| 3 | 0631 405 061 | | Tappo | Dummy plug | 1 | |
| 4 | 0636 302 053 | | Tappo M10x1 | Screw plug M10x1 | 1 | Ma = 12 Nm |
| 5 | 0634 801 302 | | Rosetta | Washer | 1 | |
| 6 | 0636 309 007 | | Tappo | Screw plug | 1 | Ma = 30 Nm |
| 7 | 3316 117 001 | | Assieme connettore | Connector kit | 2 | |
| 8 | 0636 101 727 | | Vite T.E. M8x40 | Cap screw M8x40 | 6 | |
| 9 | 0630 302 090 | | Rosetta | Washer | 6 | |
| 10 | 3312 308 020 | | Guarnizione | Gasket | 1 | |

* Installare con 12 V - *To be installed with 12 V power supply*

ZF 63 A - ZF 63 - ZF 80 A - ZF 80-1 A

NEW ELECTRIC SELECTOR VALVE ON/OFF 12V - 26 BAR

NEW ELECTRIC SELECTOR VALVE ON/OFF 24V - 26 BAR



F1420178



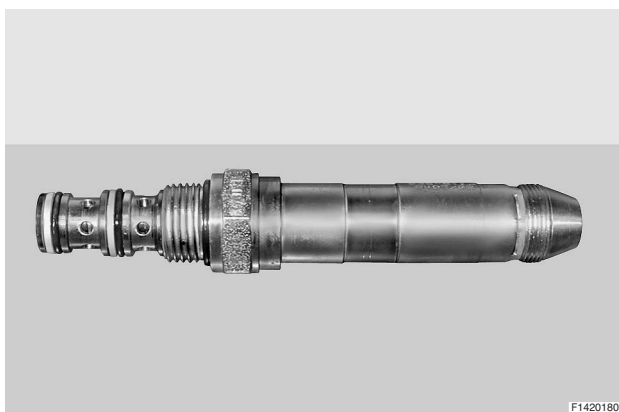
| Pos. | Part number | Old P/N | Descrizione | Description | Q.tà Q.ty | Note |
|------|--------------|---------|---|--|--------------|------------|
| 1 | 3312 199 063 | | Distributore elettrico ON/OFF 12V - 26 bar | Electric selector valve ON/OFF 12V - 26 bar | 1 | * |
| | 3312 199 064 | | Distributore elettrico ON/OFF 24V - 26 bar | Electric selector valve ON/OFF 24V - 26 bar | 1 | * * |
| 2 | 3312 308 069 | | Elettrovalvola ON/OFF 12V | Solenoid valve ON/OFF 12V | 2 | Ma = 20 Nm |
| | 3312 308 106 | | Elettrovalvola ON/OFF 24V | Solenoid valve ON/OFF 24V | 2 | Ma = 20 Nm |
| 3 | 0631 405 061 | | Tappo | Dummy plug | 1 | |
| 4 | 0636 302 053 | | Tappo M10x1 | Screw plug M10x1 | 1 | Ma = 12 Nm |
| 5 | 0634 801 302 | | Rosetta | Washer | 1 | |
| 6 | 0636 309 007 | | Tappo | Screw plug | 1 | Ma = 35 Nm |
| 7 | 0636 101 709 | | Vite T.E. M8x65 | Cap screw M8x65 | 2 | |
| 8 | 0636 101 727 | | Vite T.E. M8x40 | Cap screw M8x40 | 4 | |
| 9 | 0630 302 090 | | Rosetta elastica | Spring washer | 6 | |
| 10 | 3316 117 001 | | Assieme connettore | Connector kit | 2 | |
| 11 | 3312 308 020 | | Guarnizione | Gasket | 1 | |

* Installare con 12 V - *To be installed with 12 V power supply*

* * Installare con 24 V - *To be installed with 24 V power supply*



Per convertire la elettrovalvola da 12V a 24V sostituire solo il solenoide con il ricambio a cod. 3312 199 062.
To transform the solenoid valve from 12V to 24V it will be enough to replace only the solenoid - available loosen P/N 3312 199 062.



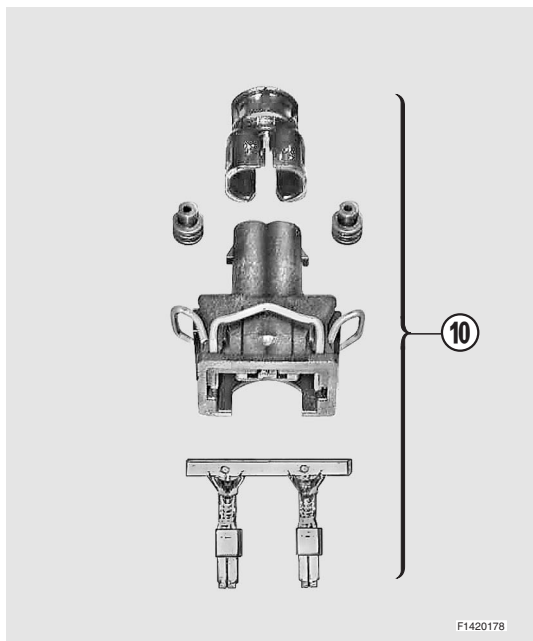
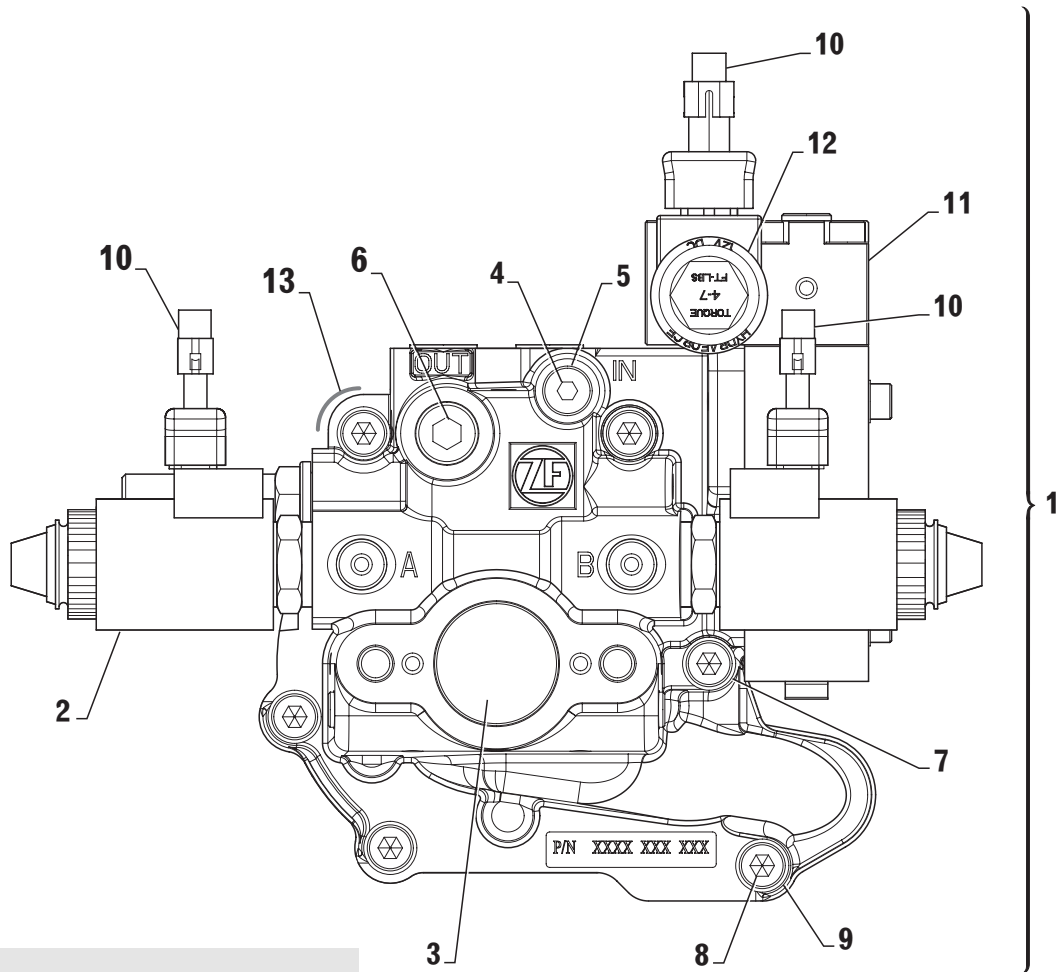
La valvola non è disponibile singolarmente ed è un componente comune alla versione 12V e 24V dell'elettrovalvola.
The valve is not available loosen and it is a common component both for 12V and 24V solenoid valve.



ZF 63 A - ZF 63 - ZF 80 A - ZF 80-1 A

**NEW ELECTRIC SELECTOR VALVE ON/OFF 12V - 26 BAR
WITH TROLLING VALVE**

**NEW ELECTRIC SELECTOR VALVE ON/OFF 24V - 26 BAR
WITH TROLLING VALVE**





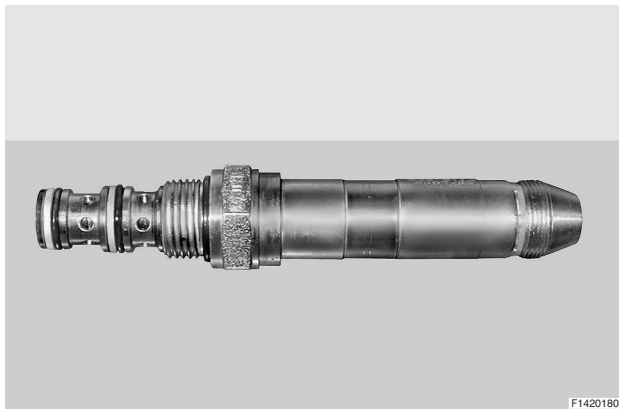
| Pos. | Part number | Old P/N | Descrizione | Description | Q.tà Q.ty | Note |
|------|--------------|---------|---|--|--------------|------------|
| 1 | 3312 199 065 | | Distributore elettrico ON/OFF 12V, 26 bar con TV | Electric selector valve ON/OFF 12V, 26 bar with Trolling valve | 1 | * |
| | 3312 199 066 | | Distributore elettrico ON/OFF 24V, 26 bar con TV | Electric selector valve ON/OFF 24V, 26 bar with Trolling valve | 1 | * * |
| 2 | 3312 308 069 | | Elettrovalvola ON/OFF 12V, 26 BAR | Solenoid valve ON/OFF 12V, 26 bar | 2 | Ma = 20 Nm |
| | 3312 308 106 | | Elettrovalvola ON/OFF 24V, 26 bar | Solenoid valve ON/OFF 24V, 26 bar | 2 | Ma = 20 Nm |
| 3 | 0631 405 061 | | Tappo | Dummy plug | 1 | |
| 4 | 0636 302 053 | | Tappo a vite M10x1 | Screw plug M10x1 | 1 | Ma = 12 Nm |
| 5 | 0634 801 302 | | Anello di tenuta | Sealing ring | 1 | |
| 6 | 0636 309 007 | | Tappo a vite | Screw plug | 1 | Ma = 35 Nm |
| 7 | 0636 101 709 | | Vite TCEI M8x65 | Cap screw M8x65 | 2 | |
| 8 | 0636 101 727 | | Vite TCEI M8x40 | Cap screw M8x40 | 4 | |
| 9 | 0630 302 090 | | Rosetta elastica | Spring washer | 6 | |
| 10 | 3316 117 001 | | Assieme connettore | Connector kit | 3 | |
| 11 | 3312 108 027 | | Trolling valve | Trolling device | 1 | |
| 12 | 3312 308 096 | | Valvola proporzionale 12V | Proportional valve 12V | 1 | Ma = 27 Nm |
| | 3312 308 124 | | Valvola proporzionale 24V | Proportional valve 24V | 1 | Ma = 27 Nm |
| 13 | 3312 308 020 | | Guarnizione | Gasket | 1 | |

* Installare con 12 V - *To be installed with 12 V power supply*

* * Installare con 24 V - *To be installed with 24 V power supply*



Per convertire la elettrovalvola da 12V a 24V sostituire solo il solenoide con il ricambio a cod. 3312 199 062.
To transform the solenoid valve from 12V to 24V it will be enough to replace only the solenoid - available loosen P/N 3312 199 062.



La valvola non è disponibile singolarmente ed è un componente comune alla versione 12V e 24V dell'elettrovalvola.
The valve is not available loosen and it is a common component both for 12V and 24V solenoid valve.

**COMPOSIZIONE KIT ZF 63 A - ZF 63 - ZF 63 A - ZF 63 KIT COMPONENTS**

| Fig. | Pos. | Part number | Old P/N | Descrizione | Description | Q.ty |
|------|------|---------------------|---------|--|------------------------------------|------|
| - | - | 3312 199 017 | 501175 | Kit guarnizioni e anelli elastici | Seal kit & piston rings | |
| 2 | 2 | 0634 306 328 | 105571 | . Anello OR | . O-ring | 1 |
| 1 | 24 | 3312 301 030 | 413883 | . Paraolio entrata | . Input shaft seal | 1 |
| 1 | 3 | 0634 319 132 | 442135 | . Paraolio uscita | . Output shaft seal | 1 |
| 3 | 3 | 3312 308 020 | 408388 | . Guarnizione | . Gasket | 1 |
| 1 | 22 | 0634 304 405 | 501211 | . Guarnizione OR | . O-Ring | 1 |
| 2 | 5 | 3312 302 041 | 447038 | . Anello elastico | . Piston ring | 3 |
| 3 | 8 | 0634 309 621 | 500065 | . Anello di tenuta | . Seal | 1 |
| 1 | 6 | 0634 304 688 | 442731 | . Guarnizione OR | . O-Ring | 1 |
| 1 | 7 | 0634 306 204 | 105542 | . Guarnizione OR | . O-Ring | 1 |
| 1 | 11 | 3312 301 008 | 439653 | . Guarnizione | . Gasket | 1 |
| - | - | 3312 199 018 | 500432 | Kit guarnizioni e frizioni | Seal kit & clutch kit | |
| - | - | 3312 199 017 | 501175 | . Kit guarnizioni e anelli elastici | . Seal kit & piston rings | 1 |
| 2 | 15 | 3312 302 009 | 455786 | . Disco frizione interno | . Inner disc | 8 |
| 2 | 14 | 3312 302 008 | 455787 | . Disco frizione esterno | . Outer disc | 10 |
| - | - | 3312 199 019 | 501216 | Kit cuscinetti | Bearing kit | |
| 2 | 9 | 3312 302 040 | 441438 | . Cuscinetto a rullini | . Needle bearing | 4 |
| 2 | 25 | 0635 501 942 | | . Cuscinetto a rullini conici | . Tapered roller bearing | 1 |
| 2 | 26 | 0635 501 941 | | . Cuscinetto a rullini conici | . Tapered roller bearing | 1 |
| 2 | 6 | 0635 501 940 | | . Cuscinetto a rullini conici | . Tapered roller bearing | 1 |
| 2 | 23 | 0635 501 937 | 447754 | . Cuscinetto a rullini conici | . Tapered roller bearing | 1 |
| 2 | 27 | 0635 501 938 | 333859 | . Cuscinetto a rullini conici | . Tapered roller bearing | 1 |
| 2 | 28 | 0635 501 922 | | . Cuscinetto a rullini conici | . Tapered roller bearing | 1 |
| 2 | 24 | 3312 302 023 | 277213 | . Spessore 0,1 mm | . Shim 0.1 mm | 2 |
| 2 | 24 | 3312 302 024 | 277214 | . Spessore 0,15 mm | . Shim 0.15 mm | 2 |
| 2 | 24 | 3312 302 025 | 277215 | . Spessore 0,2 mm | . Shim 0.2 mm | 2 |
| 2 | 29 | 3312 304 027 | 166807 | . Spessore 0,1 mm | . Shim 0.1 mm | 2 |
| 2 | 29 | 3312 304 028 | 442340 | . Spessore 0,15 mm | . Shim 0.15 mm | 2 |
| 2 | 29 | 3312 304 029 | 154102 | . Spessore 0,3 mm | . Shim 0.3 mm | 2 |
| 2 | 29 | 3312 304 030 | 154101 | . Spessore 0,5 mm | . Shim 0.5 mm | 2 |

**COMPOSIZIONE KIT CUSCINETTI ZF 63 A, R. 2,52 (uprated version), R. 2,7
ZF 63 A BEARINGS KIT, RATIO I = 2.52 (uprated version), Ratio I = 2.7**

| Fig. | Pos. | Part number | Old P/N | Descrizione | Description | Q.ty |
|------|------|---------------------|---------|-------------------------------|--------------------------|------|
| - | - | 3312 199 053 | | Kit cuscinetti | Bearing kit | |
| 2 | 9 | 3312 302 040 | 441438 | . Cuscinetto a rullini conici | . Needle bearing | 4 |
| 2 | 25 | 0635 501 942 | | . Cuscinetto a rullini conici | . Tapered roller bearing | 1 |
| 2 | 23 | 0635 501 941 | | . Cuscinetto a rullini conici | . Tapered roller bearing | 1 |
| 2 | 6 | 0635 501 940 | | . Cuscinetto a rullini conici | . Tapered roller bearing | 1 |
| 2 | 26 | 0735 370 229 | 501332 | . Cuscinetto a rullini conici | . Tapered roller bearing | 1 |
| 2 | 27 | 0635 501 938 | 333859 | . Cuscinetto a rullini conici | . Tapered roller bearing | 1 |
| 2 | 28 | 0635 501 922 | | . Cuscinetto a rullini conici | . Tapered roller bearing | 1 |
| 2 | 24 | 3312 302 023 | 277213 | . Spessore 0,1 mm | . Shim 0.1 mm | 2 |
| 2 | 24 | 3312 302 024 | 277214 | . Spessore 0,15 mm | . Shim 0.15 mm | 2 |
| 2 | 24 | 3312 302 025 | 277215 | . Spessore 0,2 mm | . Shim 0.2 mm | 2 |
| 2 | 29 | 3312 304 027 | 166807 | . Spessore 0,1 mm | . Shim 0.1 mm | 2 |
| 2 | 29 | 3312 304 028 | 442340 | . Spessore 0,15 mm | . Shim 0.15 mm | 2 |
| 2 | 29 | 3312 304 029 | 154102 | . Spessore 0,3 mm | . Shim 0.3 mm | 2 |
| 2 | 29 | 3312 304 030 | 154101 | . Spessore 0,5 mm | . Shim 0.5 mm | 2 |


COMPOSIZIONE KIT ZF 80 A - ZF 80-1 A - ZF 80 A - ZF 80-1 A KIT COMPONENTS

| Fig. | Pos. | Part number | Old P/N | Descrizione | Description | Q.ty |
|------|------|---------------------|---------|--|------------------------------------|------|
| - | - | 3313 199 020 | 501171 | Kit guarnizioni e anelli elastici | Seal kit & piston rings | |
| 2 | 2 | 0634 303 505 | 384176 | . Anello OR | . O-ring | 1 |
| 1 | 21 | 3312 301 030 | 413883 | . Paraolio entrata | . Input shaft seal | 1 |
| 1 | 3 | 0634 319 104 | 448160 | . Paraolio uscita | . Output shaft seal | 1 |
| 3 | 3 | 3312 308 020 | 408388 | . Guarnizione | . Gasket | 1 |
| 1 | 25 | 0634 304 405 | 501211 | . Guarnizione OR | . O-Ring | 1 |
| 2 | 5 | 3312 302 041 | 447038 | . Anello elastico | . Piston ring | 3 |
| 3 | 8 | 0634 309 621 | 500065 | . Anello di tenuta | . Seal | 1 |
| 1 | 6 | 0634 304 688 | 442731 | . Guarnizione OR | . O-Ring | 1 |
| 1 | 7 | 0634 306 204 | 105542 | . Guarnizione OR | . O-Ring | 1 |
| 1 | 11 | 3312 301 008 | 439653 | . Guarnizione | . Gasket | 1 |
| - | - | 3313 199 021 | 500434 | Kit guarnizioni e frizioni | Seal kit & clutch kit | |
| - | - | 3313 199 020 | 501171 | . Kit guarnizioni e anelli elastici | . Seal kit & piston rings | 1 |
| 2 | 15 | 3312 302 009 | 455786 | . Disco frizione interno | . Inner disc | 10 |
| 2 | 14 | 3312 302 008 | 455787 | . Disco frizione esterno | . Outer disc | 12 |
| - | - | 3313 199 022 | 501218 | Kit cuscinetti | Bearing kit | |
| 2 | 9 | 3312 302 040 | 441438 | . Cuscinetto a rullini | . Needle bearing | 4 |
| 2 | 23 | 0635 501 939 | | . Cuscinetto a rullini conici | . Tapered roller bearing | 1 |
| 2 | 6,25 | 0635 501 937 | 447754 | . Cuscinetto a rullini conici | . Tapered roller bearing | 2 |
| 2 | 26 | 0635 501 938 | 333859 | . Cuscinetto a rullini conici | . Tapered roller bearing | 1 |
| 2 | 27 | 0635 373 008 | 384182 | . Cuscinetto a rullini conici | . Tapered roller bearing | 1 |
| 2 | 28 | 0635 501 914 | | . Cuscinetto a rullini conici | . Tapered roller bearing | 1 |
| 2 | 24 | 3313 302 042 | 439630 | . Spessore 0,1 mm | . Shim 0.1 mm | 2 |
| 2 | 24 | 3313 302 043 | 439631 | . Spessore 0,15 mm | . Shim 0.15 mm | 2 |
| 2 | 24 | 3313 302 044 | 439632 | . Spessore 0,2 mm | . Shim 0.2 mm | 2 |
| 2 | 24 | 3313 302 045 | 439633 | . Spessore 0,5 mm | . Shim 0.5 mm | 2 |
| 2 | 24 | 3313 302 046 | 439634 | . Spessore 1,0 mm | . Shim 1.0 mm | 2 |
| 2 | 29 | 3208 304 023 | 449125 | . Spessore 0,15 mm | . Shim 0.15 mm | 2 |
| 2 | 29 | 3208 304 024 | 449126 | . Spessore 0,2 mm | . Shim 0.2 mm | 2 |
| 2 | 29 | 3208 304 027 | 449127 | . Spessore 0,5 mm | . Shim 0.5 mm | 2 |



12. SPARE PARTS LIST

ZF 80 A (016, 017, 018, 019, 020, 021 VERSION)

ZF 80-1 A (024, 025, 026, 027, 029, 030 VERSION)

Preface

The spare parts list is only valid for the type and versions of transmission, as shown below.

You will find the transmission type and version on your transmission name plate.

If the type and version indicated differs from that printed in this Manual, the relative Spare Parts List should be ordered from ZF HURTH MARINE.

The indicated dimensions and standards are as such not enough for ordering parts.

When ordering parts, please state:

- Transmission type
- Transmission version
- Serial number
- Item no.
- Part name
- Identification no.
- quantity of parts required.

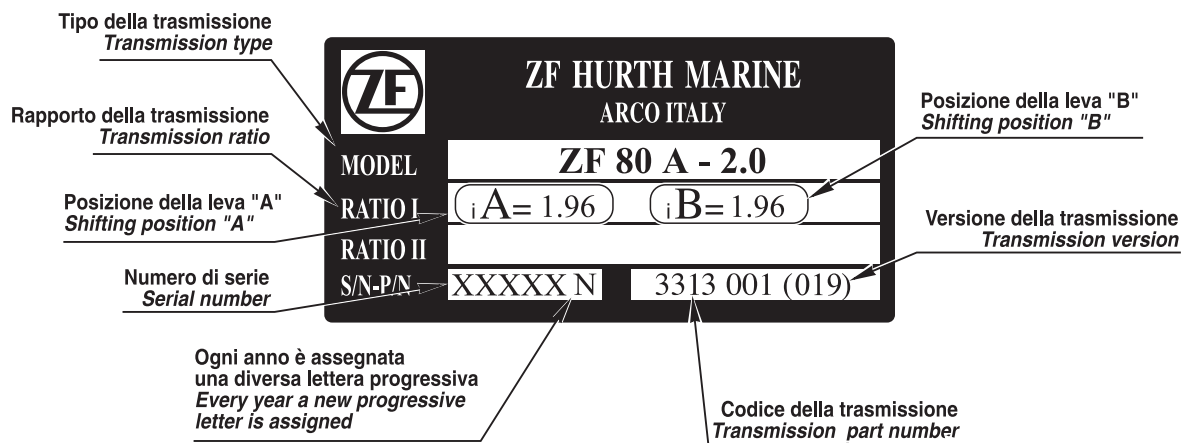
The spare parts list is referring to the following versions:

ZF 80 A **versions** 016 (1.20 R); 017 (1.41 R); 018 (1.57 R); 019 (1.96 R); 020 (2.50 R); 021 (2.85 R).

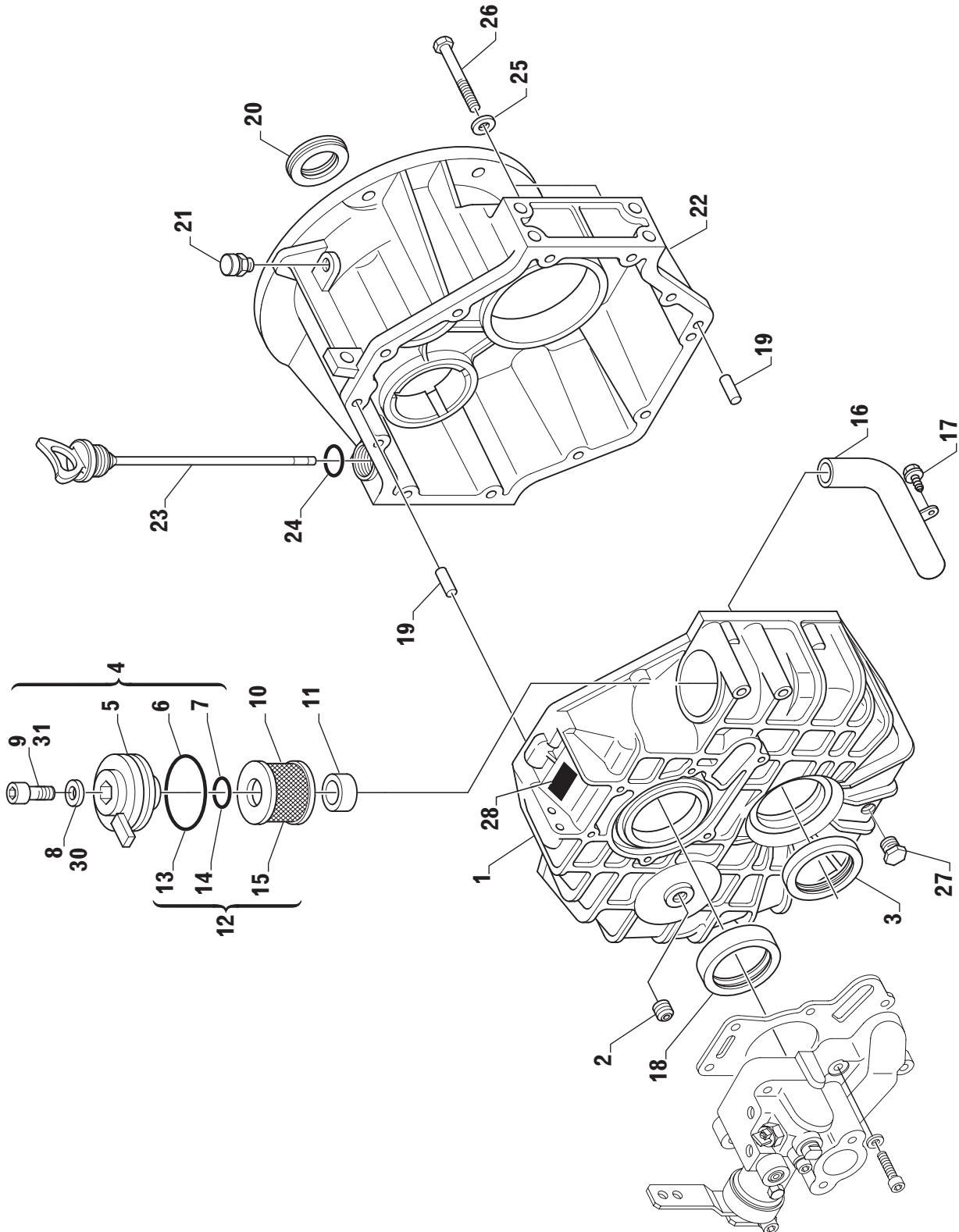
ZF 80-1 A **versions** 024 (1.21 R); 025 (1.41 R); 026 (1.57 R); 027 (1.96 R); 029 (2.50 R); 030 (2.85 R).

Name plate

The name plate is mounted to the transmission



ZF 80 A versions 016 - 017 - 018 - 019 - 020 - 021
ZF 80-1 A versions 024 - 025 - 026 - 027 - 029 - 030

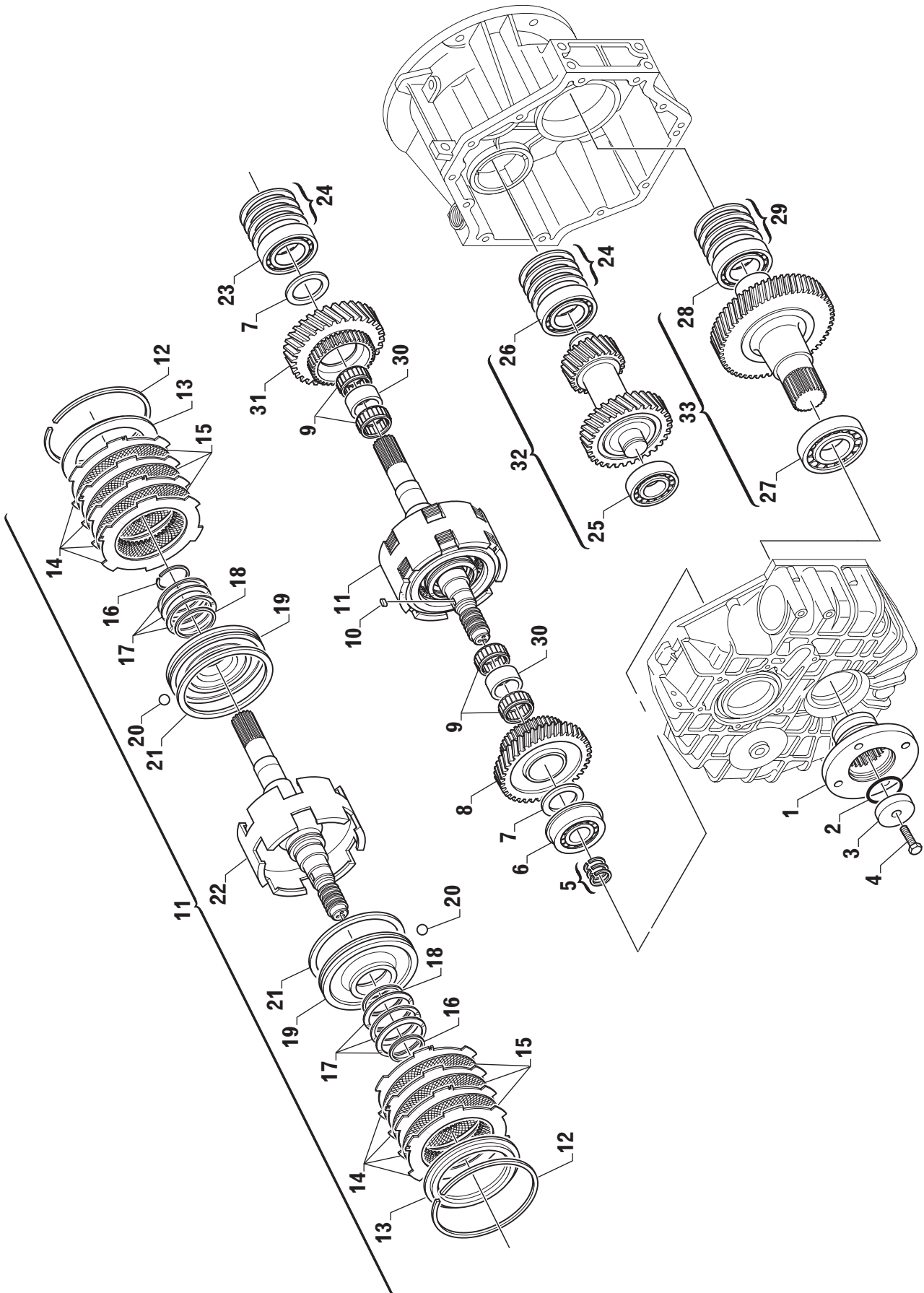




| Pos. | Part number | Old P/N | Descrizione | Description | Q.tà Q.ty | Note |
|------|--------------|---------|--|--|--------------|---------------------|
| 1 | 3313 199 078 | | Assieme scatola | Housing, assy. | 1 | up to s/n XXXXXR |
| | 3313 199 114 | | Assieme scatola | Housing, assy. | 1 | from s/n XXXXXR |
| | 3313 301 009 | | . Scatola | . Housing | 1 | up to s/n XXXXXR |
| | 3313 201 003 | | . Scatola con boccia flangiata | . Housing with flanged bushing | 1 | from s/n XXXXXR |
| | 3313 301 022 | | . Tubo aspirazione con supporto | . Suction pipe with support | 1 | |
| | 0636 101 411 | | . Vite | . Screw | 1 | |
| | 3312 301 008 | | . Guarnizione | . Gasket | 1 | |
| 2 | 0636 301 041 | 442373 | Tappo M16x1,5 | Plug M16x1.5 | 1 | |
| 3 | 0634 319 104 | 448160 | Paraolio uscita | Output shaft seal | 1 | |
| 4 | 3312 101 003 | 500484 | Coperchio filtro completo | Filter cover, assy. | 1 | |
| 5 | | | . Coperchio filtro | . Filter cover | 1 | |
| 6 | 0634 304 688 | 442731 | . Guarnizione OR | . O-Ring | 1 | |
| 7 | 0634 306 204 | 105542 | . Guarnizione OR | . O-Ring | 1 | |
| 8 | 0630 001 085 | 167010 | . Rosetta | . Washer | 1 | |
| 9 | 0636 101 475 | 320202 | . Vite M8x30 | . Screw M8x30 | 1 | |
| 10 | 3312 301 007 | 438637 | Filtro olio | Oil filter | 1 | (1) old part number |
| 11 | 3312 301 008 | 439653 | Guarnizione | Gasket | 1 | |
| 12 | 3312 199 031 | 463772 | Filtro olio completo | Oil filter, assy | 1 | |
| 13 | 0634 304 688 | 442731 | . Guarnizione OR | . O-Ring | 1 | |
| 14 | 0634 306 204 | 105542 | . Guarnizione OR | . O-Ring | 1 | |
| 15 | 3312 301 037 | | . Filtro olio | . Oil filter | 1 | (1) new part number |
| 16 | 3313 301 022 | | Tubo aspirazione con supporto | Suction pipe with support | 1 | |
| 17 | 0636 101 411 | 102879 | Vite T.E. M6x16 (fascetta tubo aspirazione) | Hex head screw M6x16 (suction pipe clamp) | 1 | |
| 18 | 3313 301 014 | 462997 | Anello centratore | Centering ring | 1 | up to s/n XXXXXR |
| 19 | 0631 315 520 | 335817 | Spina | Locator pin | 2 | |
| 20 | 3312 301 030 | 413883 | Paraolio entrata | Input shaft seal | 1 | |
| 21 | 3311 301 002 | 442369 | Valvola di sfiato | Breather valve | 1 | |
| 22 | 3313 301 010 | | Coperchio | Cover (housing) | 1 | |
| 23 | 3313 201 001 | 500993 | Asta livello olio + OR | Oil dipstick + OR | 1 | |
| 24 | 0634 304 405 | 501211 | . Guarnizione OR (Asta livello olio) | . O-Ring (Oil dipstick) | 1 | |
| 25 | 0630 302 091 | 442371 | Rosetta | Washer | 14 | |
| 26 | 0636 015 227 | 442375 | Vite T.E. M10x35 | Hex head screw M10x35 | 14 | |
| 27 | 3312 301 017 | 469691 | Tappo | Plug | 1 | |
| 28 | 3312 301 001 | | Targhetta di identificazione | Name plate | 1 | |
| 30 | 0630 001 085 | 167010 | Rosetta | Washer | 1 | |
| 31 | 0636 101 475 | 320202 | Vite M8x30 | Screw M8x30 | 1 | |

(1) Fornito solo incluso nel kit filtro olio p/n 3312 199 031
Supplied only included in the oil filter kit p/n 3312 199 031

ZF 80 A versions 016 - 017 - 018 - 019 - 020 - 021
 ZF 80-1 A versions 024 - 025 - 026 - 027 - 029 - 030





| Pos. | Part number | Old P/N | Descrizione | Description | Q.tà Q.ty | Note |
|--------------------------------------|--------------|---------|---|-------------------------------------|--------------|--------------------|
| 1 | 3313 304 007 | 439581 | Flangia | Flange | 1 | |
| 2 | 0634 303 505 | 384176 | Guarnizione OR | O-Ring | 1 | |
| 3 | 3313 304 026 | 387841 | Rondella | Washer | 1 | |
| 4 | 0636 016 085 | 102823 | Vite T.E. | Hex head screw | 1 | |
| 5 | 3312 302 041 | 447038 | Anello di tenuta | Piston ring | 3 | |
| 6 | 0635 501 937 | 447754 | Cuscinetto a rulli conici | Tapered roller bearing | 1 | |
| 7 | 3313 302 023 | 457823 | Rasamento | Butting ring | 2 | |
| 8 | 3313 302 024 | 500819 | Ingranaggio Z3 = 44 | Reverse gear Z3 = 44 | 1 | |
| 9 | 3312 302 040 | 441438 | Cuscinetto a rullini | Needle bearing | 4 | |
| 10 | 0631 501 062 | 437956 | Chiavetta | Key | 1 | |
| 11 | 3313 199 075 | | Albero di ingresso completo | Input shaft, assy. | 1 | |
| 12 | 0630 513 065 | | . Anello elastico | . Snap ring | 2 | |
| 13 | 3319 302 003 | | . Disco finale | . End disc | 2 | |
| 14 | 3319 302 001 | | . Disco frizione esterno | . Outer clutch disc | 10 | |
| 15 | 3319 302 006 | | . Disco frizione interno | . Inner clutch disc | 8 | |
| 16 | 0630 501 038 | 500076 | . Anello di ritegno | . Retainer ring | 2 | |
| 17 | 3313 302 059 | | . Molla a tazza | . Cup spring | 6 | |
| 18 | 0634 402 178 | 500066 | . Anello interno | . Inner clutch piston ring | 2 | |
| 19 | 3319 302 004 | | . Pistone | . Clutch piston | 2 | |
| 20 | 0635 460 006 | 106690 | . Sfera | . Ball | 2 | |
| 21 | 0634 402 177 | | . Anello esterno | . Outer clutch piston ring | 2 | |
| 22 | 3313 199 076 | | . Albero di ingresso + cilindro frizione. | Input shaft and clutch housing | 1 | |
| 23 | 0635 501 939 | | Cuscinetto a rulli conici | Tapered roller bearing | 1 | |
| 24 | 3313 302 042 | 439630 | Spessore 0,1 mm | Shim 0.1 mm | 2 | |
| | 3313 302 043 | 439631 | Spessore 0,15 mm | Shim 0.15 mm | 2 | |
| | 3313 302 044 | 439632 | Spessore 0,2 mm | Shim 0.2 mm | 2 | |
| | 3313 302 045 | 439633 | Spessore 0,5 mm | Shim 0.5 mm | 2 | |
| | 3313 302 046 | 439634 | Spessore 1,0 mm | Shim 1.0 mm | 2 | Intermediate shaft |
| 25 | 0635 501 937 | 447754 | Cuscinetto a rulli conici | Tapered roller bearing | 1 | |
| 26 | 0635 501 938 | 333859 | Cuscinetto a rulli conici | Tapered roller bearing | 1 | |
| 27 | 0635 373 008 | 384182 | Cuscinetto a rulli conici | Tapered roller bearing | 1 | |
| 28 | 0635 501 914 | | Cuscinetto a rulli conici | Tapered roller bearing | 1 | |
| 29 | 3208 304 023 | 449125 | Spessore 0,15 mm | Shim 0.15 mm | 2 | |
| | 3208 304 024 | 449126 | Spessore 0,2 mm | Shim 0.2 mm | 2 | |
| | 3208 304 027 | 449127 | Spessore 0,5 mm | Shim 0.5 mm | 2 | |
| 30 | 3313 302 030 | 439533 | Distanziale | Spacer | 2 | |
| SOLO PER ZF 80 A | | | | ONLY FOR ZF 80 A | | |
| Vers. 016 (Rapporto I = 1,2) | | | | Vers. 016 (Ratio I = 1.2) | | |
| 31 | 3313 302 021 | | Ingranaggio Z1 = 35 | Forward gear Z1 = 35 | 1 | |
| 32 | 3313 199 030 | 500392 | Albero intermedio Z4 = 44, Z5 = 35 | Intermediate shaft Z4 = 44, Z5 = 35 | 1 | * |
| 33 | 3313 199 031 | 500398 | Albero di uscita Z2 = 42 | Output shaft Z2 = 42 | 1 | * |
| Vers. 017 (Rapporto I = 1,41) | | | | Vers. 017 (Ratio I = 1.41) | | |
| 31 | 3313 302 026 | 500850 | Ingranaggio Z1 = 32 | Forward gear Z1 = 32 | 1 | |
| 32 | 3313 199 032 | 500393 | Albero intermedio Z4 = 44, Z5 = 32 | Intermediate shaft Z4 = 44, Z5 = 32 | 1 | * |
| 33 | 3313 199 033 | 500399 | Albero di uscita Z2 = 45 | Output shaft Z2 = 45 | 1 | * |
| Vers. 018 (Rapporto I = 1,57) | | | | Vers. 018 (Ratio I = 1.57) | | |
| 31 | 3313 302 025 | 500849 | Ingranaggio Z1 = 30 | Forward gear Z1 = 30 | 1 | |
| 32 | 3313 199 034 | 500394 | Albero intermedio Z4 = 44, Z5 = 30 | Intermediate shaft Z4 = 44, Z5 = 30 | 1 | * |
| 33 | 3313 199 035 | 500400 | Albero di uscita Z2 = 47 | Output shaft Z2 = 47 | 1 | * |
| Vers. 019 (Rapporto I = 1,96) | | | | Vers. 019 (Ratio I = 1.96) | | |
| 31 | 3313 202 004 | 459589 | Ingranaggio Z1 = 26 | Forward gear Z1 = 26 | 1 | |
| 32 | 3313 199 036 | 500395 | Albero intermedio Z4 = 44, Z5 = 26 | Intermediate shaft Z4 = 44, Z5 = 26 | 1 | * |
| 33 | 3313 199 016 | 500401 | Albero di uscita Z2 = 51 | Output shaft Z2 = 51 | 1 | * |
| Vers. 020 (Rapporto I = 2,5) | | | | Vers. 020 (Ratio I = 2.5) | | |
| 31 | 3313 202 005 | 462133 | Ingranaggio Z1 = 22 | Forward gear Z1 = 22 | 1 | |
| 32 | 3313 199 037 | 500396 | Albero intermedio Z4 = 44, Z5 = 22 | Intermediate shaft Z4 = 44, Z5 = 22 | 1 | * |
| 33 | 3313 199 038 | 500402 | Albero di uscita Z2 = 55 | Output shaft Z2 = 55 | 1 | * |

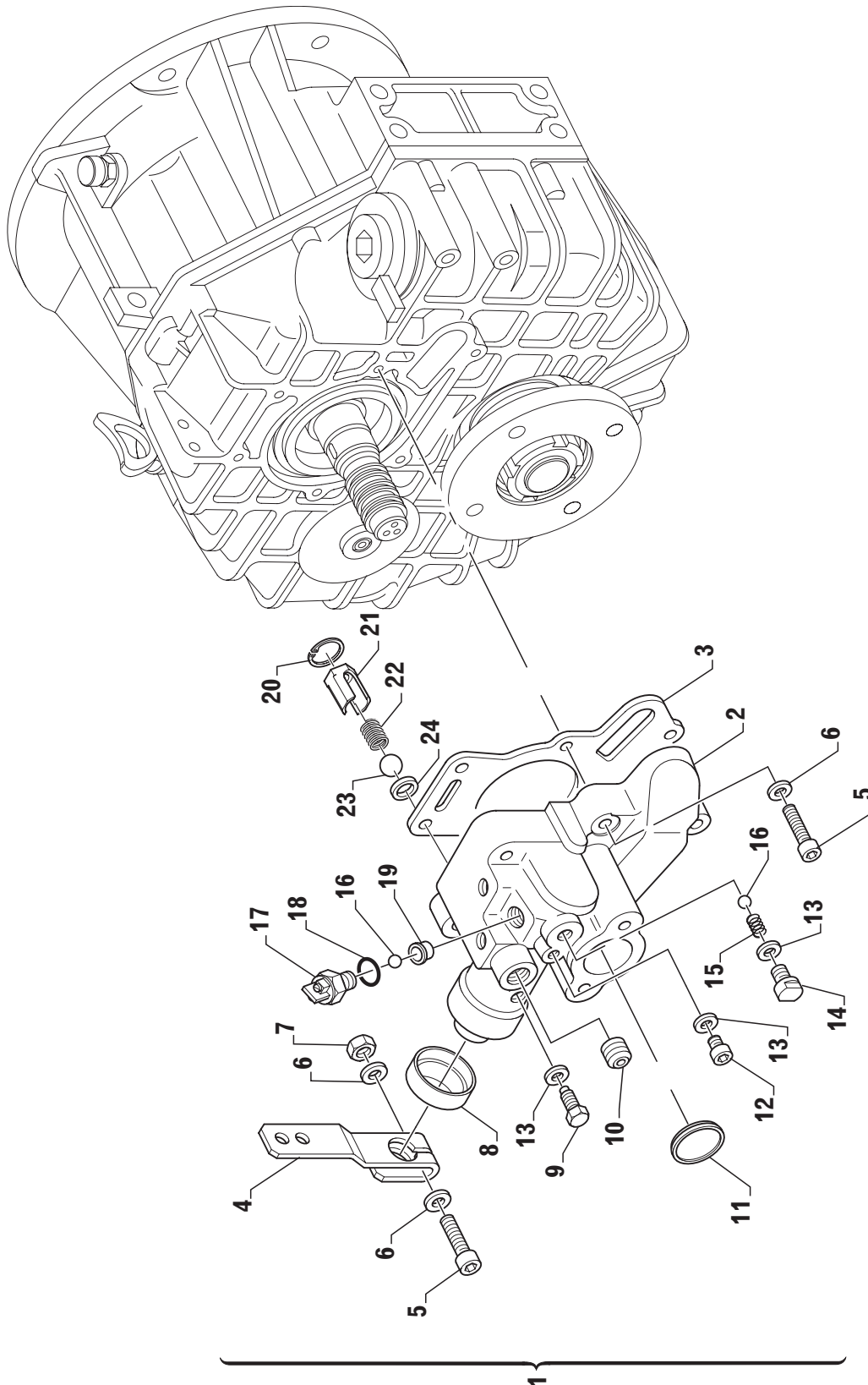


| Pos. | Part number | Old P/N | Descrizione | Description | Q.tà Q.ty | Note |
|--------------------------------------|--------------|---------|------------------------------------|-------------------------------------|--------------|------|
| Vers. 021 (Rapporto I = 2,85) | | | | Vers. 021 (Ratio I = 2.85) | | |
| 31 | 3313 202 006 | 462134 | Ingranaggio Z1 = 20 | Forward gear Z1 = 20 | 1 | |
| 32 | 3313 199 039 | 500397 | Albero intermedio Z4 = 44, Z5 = 20 | Intermediate shaft Z4 = 44, Z5 = 20 | 1 | * |
| 33 | 3313 199 040 | 500403 | Albero di uscita Z2 = 57 | Output shaft Z2 = 57 | 1 | * |
| SOLO PER ZF 80-1 A | | | | ONLY FOR ZF 80-1 A | | |
| Vers. 024 (Rapporto I = 1,21) | | | | Vers. 024 (Ratio I = 1.21) | | |
| 31 | 3313 302 021 | | Ingranaggio Z1 = 35 | Forward gear Z1 = 35 | 1 | |
| 32 | 3313 199 030 | 500392 | Albero intermedio Z4 = 44, Z5 = 35 | Intermediate shaft Z4 = 44, Z5 = 35 | 1 | * |
| 33 | 3313 199 031 | 500398 | Albero di uscita Z2 = 42 | Output shaft Z2 = 42 | 1 | * |
| Vers. 025 (Rapporto I = 1,41) | | | | Vers. 025 (Ratio I = 1.41) | | |
| 31 | 3313 302 026 | 500850 | Ingranaggio Z1 = 32 | Forward gear Z1 = 32 | 1 | |
| 32 | 3313 199 032 | 500393 | Albero intermedio Z4 = 44, Z5 = 32 | Intermediate shaft Z4 = 44, Z5 = 32 | 1 | * |
| 33 | 3313 199 033 | 500399 | Albero di uscita Z2 = 45 | Output shaft Z2 = 45 | 1 | * |
| Vers. 026 (Rapporto I = 1,57) | | | | Vers. 026 (Ratio I = 1.57) | | |
| 31 | 3313 302 025 | 500849 | Ingranaggio Z1 = 30 | Forward gear Z1 = 30 | 1 | |
| 32 | 3313 199 034 | 500394 | Albero intermedio Z4 = 44, Z5 = 30 | Intermediate shaft Z4 = 44, Z5 = 30 | 1 | * |
| 33 | 3313 199 035 | 500400 | Albero di uscita Z2 = 47 | Output shaft Z2 = 47 | 1 | * |
| Vers. 027 (Rapporto I = 1,96) | | | | Vers. 027 (Ratio I = 1.96) | | |
| 31 | 3313 202 004 | 459589 | Ingranaggio Z1 = 26 | Forward gear Z1 = 26 | 1 | |
| 32 | 3313 199 036 | 500395 | Albero intermedio Z4 = 44, Z5 = 26 | Intermediate shaft Z4 = 44, Z5 = 26 | 1 | * |
| 33 | 3313 199 003 | | Albero di uscita Z2 = 51 | Output shaft Z2 = 51 | 1 | * |
| Vers. 029 (Rapporto I = 2,5) | | | | Vers. 029 (Ratio I = 2.5) | | |
| 31 | 3313 202 005 | 462133 | Ingranaggio Z1 = 22 | Forward gear Z1 = 22 | 1 | |
| 32 | 3313 199 001 | | Albero intermedio Z4 = 44, Z5 = 22 | Intermediate shaft Z4 = 44, Z5 = 22 | 1 | * |
| 33 | 3313 199 004 | | Albero di uscita Z2 = 55 | Output shaft Z2 = 55 | 1 | * |
| Vers. 030 (Rapporto I = 2,85) | | | | Vers. 030 (Ratio I = 2.85) | | |
| 31 | 3313 202 007 | 501739 | Ingranaggio Z1 = 20 | Forward gear Z1 = 20 | 1 | |
| 32 | 3313 199 002 | | Albero intermedio Z4 = 44, Z5 = 20 | Intermediate shaft Z4 = 44, Z5 = 20 | 1 | * |
| 33 | 3313 199 005 | | Albero di uscita Z2 = 57 | Output shaft Z2 = 57 | 1 | * |

* Cuscinetti a rulli conici già assemblati - *Tapered roller bearings already assembled*

ZF 80 A versions 016 - 017 - 018 - 019 - 020 - 021
ZF 80-1 A versions 024 - 025 - 026 - 027 - 029 - 030

MECHANICAL SELECTOR VALVE

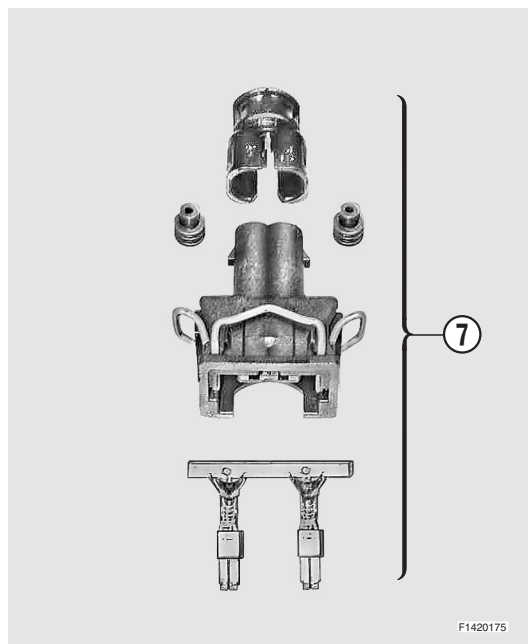
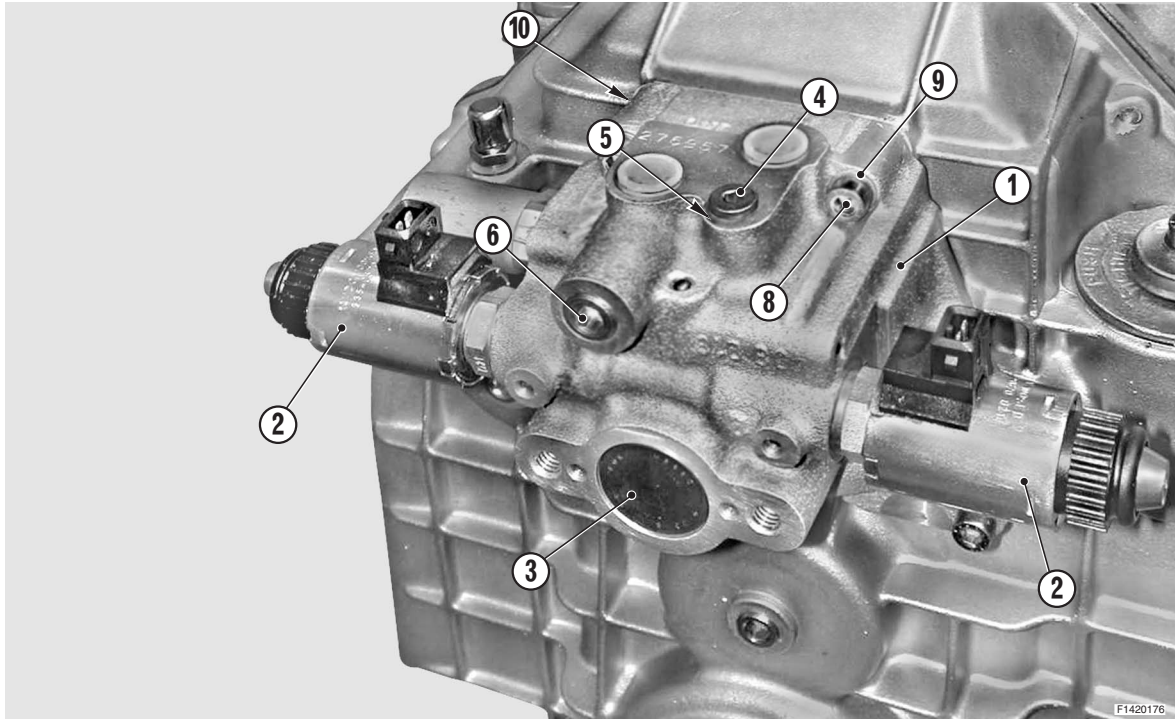




| Pos. | Part number | Old P/N | Descrizione | Description | Q.tà Q.ty | Note |
|------|--------------|---------|---|----------------------------------|--------------|-------------------|
| 1 | 3312 108 001 | | Valvola di comando completo 23 bar | Mechanical selector valve 23 bar | 1 | |
| 1 | 3313 108 001 | | Valvola di comando alta velocità 26 bar | Mechanical selector valve 26 bar | 1 | Only for ZF 80-1A |
| 2 | ☆ | | . Valvola di comando | . Control valve | 1 | |
| 3 | 3312 308 020 | 408388 | . Guarnizione | . Gasket | 1 | |
| 4 | 3312 308 025 | 452963 | . Leva | . Lever | 1 | |
| 5 | 0636 101 727 | 442377 | . Vite T.E. | . Hex head screw | 7 | |
| 6 | 0630 302 090 | 442372 | . Rosetta | . Washer | 8 | |
| 7 | 0637 006 157 | 455785 | . Dado | . Nut | 1 | |
| 8 | 0634 309 621 | 500065 | . Guarnizione | . Gasket | 1 | |
| 9 | 3312 308 034 | 500026 | . Vite di fermo | . Stop screw | 1 | |
| 10 | 0636 309 007 | 455756 | . Tappo | . Plug | 1 | |
| 11 | 0631 405 061 | 500107 | . Tappo | . Plug | 1 | |
| 12 | 0636 302 053 | 103465 | . Tappo | . Plug | 1 | |
| 13 | 0634 801 302 | 107410 | . Rosetta | . Washer | 3 | |
| 14 | 3312 308 037 | 500028 | . Vite di guida | . Guide bolt | 1 | |
| 15 | 3312 308 047 | 500044 | . Molla | . Spring | 1 | |
| 16 | 0635 460 014 | 106695 | . Sfera | . Ball | 2 | |
| 17 | 3312 308 029 | 455764 | . Interruttore completo | . Neutral safety switch assy. | 1 | |
| 18 | 001.105.0158 | 105527 | . Guarnizione OR | . O-Ring | 1 | |
| 19 | 3312 308 039 | 500030 | . Boccia | . Bushing | 1 | |
| 20 | 0630 502 005 | 500083 | . Anello elastico | . Snap ring | 1 | |
| 21 | 3312 308 038 | 500029 | . Boccia | . Bushing | 1 | |
| 22 | 3312 308 042 | 500032 | . Molla per lubrificazione | . Spring | 1 | |
| 23 | 0635 460 023 | 500097 | . Sfera | . Ball | 1 | |
| 24 | 3312 308 036 | 500027 | . Distanziale | . Spacer | 1 | |

ZF 80 A versions 016 - 017 - 018 - 019 - 020 - 021
ZF 80-1 A versions 024 - 025 - 026 - 027 - 029 - 030

OLD ELECTRIC SELECTOR VALVE ON/OFF 12V, 26 BAR



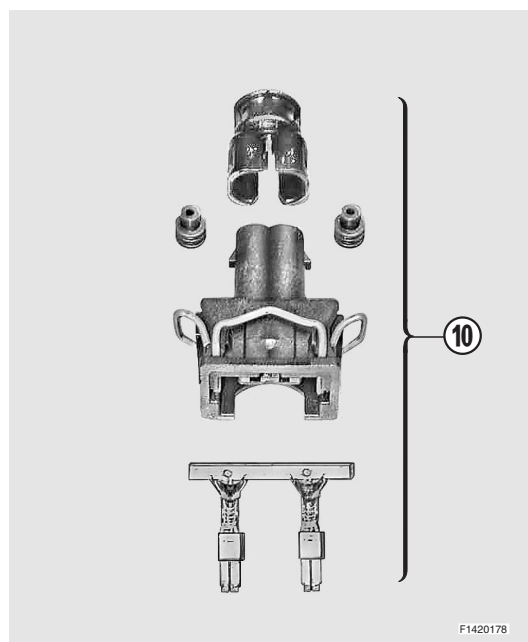
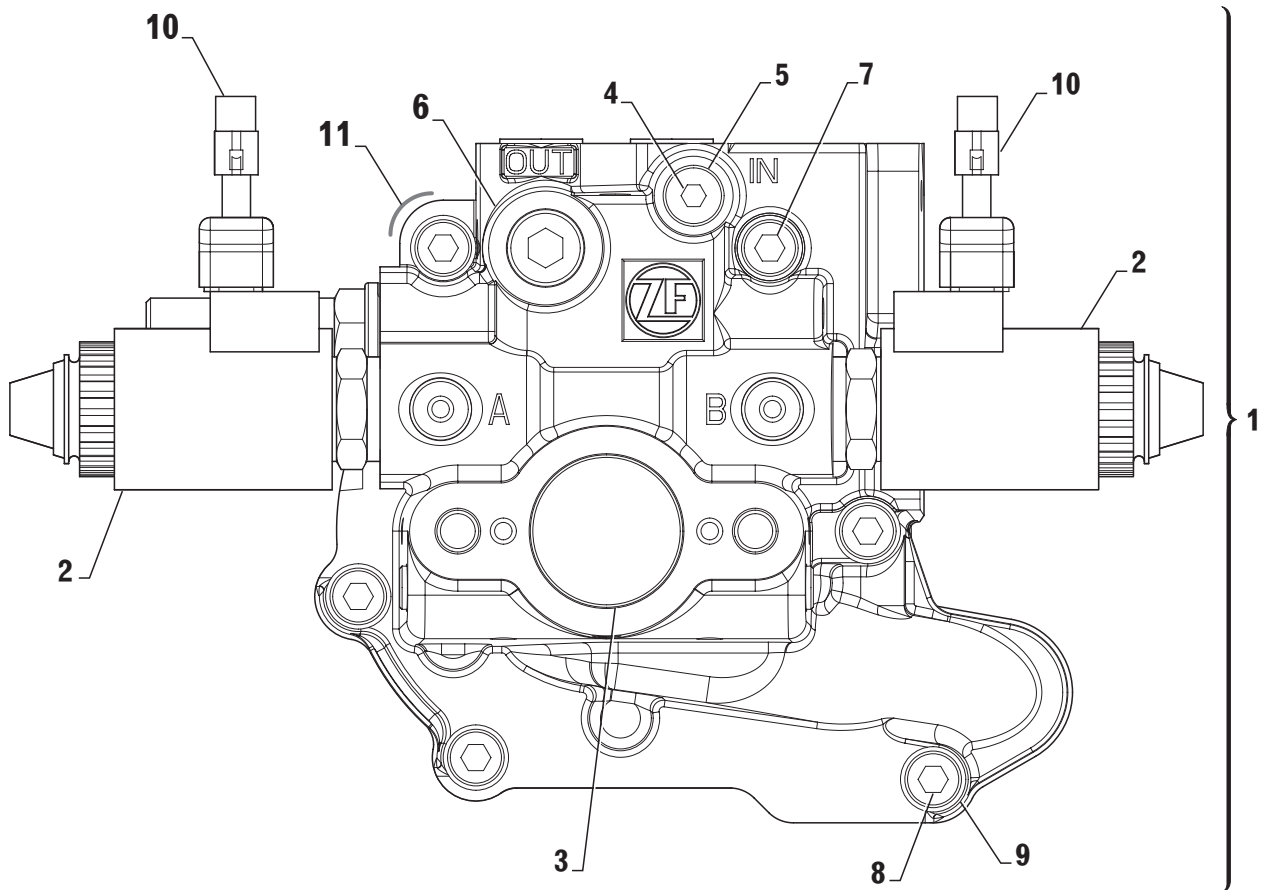


| Pos. | Part number | Old P/N | Descrizione | Description | Q.tà Q.ty | Note |
|------|--------------|---------|---|--|--------------|------------|
| 1 | 3312 199 015 | | Distributore elettrico 26 bar ON/OFF | Electric selector valve 26 bar ON/OFF | 1 | * |
| 2 | 3312 308 069 | | Elettrovalvola ON/OFF 12V | Solenoid valve ON/OFF 12V | 2 | |
| 3 | 0631 405 061 | | Tappo | Dummy plug | 1 | |
| 4 | 0636 302 053 | | Tappo M10x1 | Screw plug M10x1 | 1 | Ma = 12 Nm |
| 5 | 0634 801 302 | | Rosetta | Washer | 1 | |
| 6 | 0636 309 007 | | Tappo | Screw plug | 1 | Ma = 30 Nm |
| 7 | 3316 117 001 | | Assieme connettore | Connector kit | 2 | |
| 8 | 0636 101 727 | | Vite T.E. M8x40 | Cap screw M8x40 | 6 | |
| 9 | 0630 302 090 | | Rosetta | Spring washer | 6 | |
| 10 | 3312 308 020 | | Guarnizione | Gasket | 1 | |

* Installare con 12 V - *To be installed with 12 V power supply*

ZF 80 A versions 016 - 017 - 018 - 019 - 020 - 021
ZF 80-1 A versions 024 - 025 - 026 - 027 - 029 - 030

NEW ELECTRIC SELECTOR VALVE ON/OFF 12V - 26 BAR
NEW ELECTRIC SELECTOR VALVE ON/OFF 24V - 26 BAR





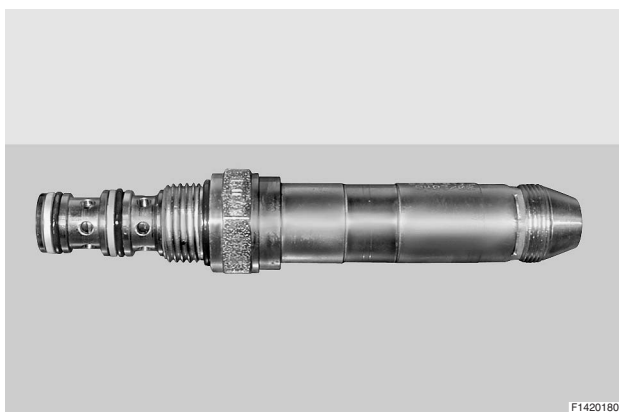
| Pos. | Part number | Old P/N | Descrizione | Description | Q.tà Q.ty | Note |
|------|--------------|---------|---|--|--------------|------------|
| 1 | 3312 199 063 | | Distributore elettrico ON/OFF 12V - 26 bar | Electric selector valve ON/OFF 12V - 26 bar | 1 | * |
| | 3312 199 064 | | Distributore elettrico ON/OFF 24V - 26 bar | Electric selector valve ON/OFF 24V - 26 bar | 1 | * * |
| 2 | 3312 308 069 | | Elettrovalvola ON/OFF 12V | Solenoid valve ON/OFF 12V | 2 | Ma = 20 Nm |
| | 3312 308 106 | | Elettrovalvola ON/OFF 24V | Solenoid valve ON/OFF 24V | 2 | Ma = 20 Nm |
| 3 | 0631 405 061 | | Tappo | Dummy plug | 1 | |
| 4 | 0636 302 053 | | Tappo M10x1 | Screw plug M10x1 | 1 | Ma = 12 Nm |
| 5 | 0634 801 302 | | Rosetta | Washer | 1 | |
| 6 | 0636 309 007 | | Tappo | Screw plug | 1 | Ma = 35 Nm |
| 7 | 0636 101 709 | | Vite T.E. M8x65 | Cap screw M8x65 | 2 | |
| 8 | 0636 101 727 | | Vite T.E. M8x40 | Cap screw M8x40 | 4 | |
| 9 | 0630 302 090 | | Rosetta elastica | Spring washer | 6 | |
| 10 | 3316 117 001 | | Assieme connettore | Connector kit | 2 | |
| 11 | 3312 308 020 | | Guarnizione | Gasket | 1 | |

* Installare con 12 V - *To be installed with 12 V power supply*

* * Installare con 24 V - *To be installed with 24 V power supply*



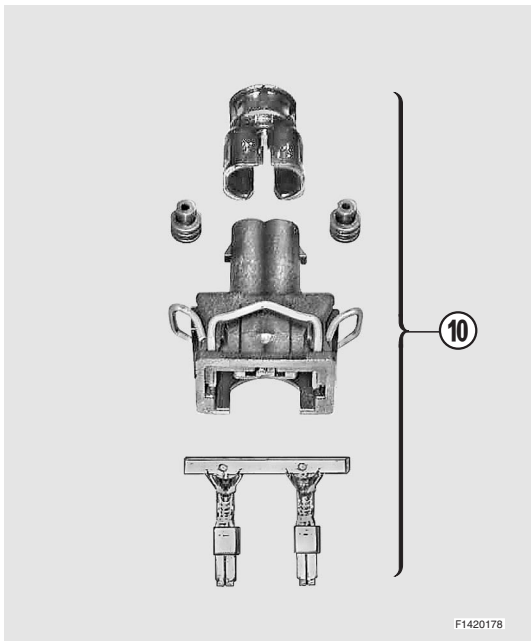
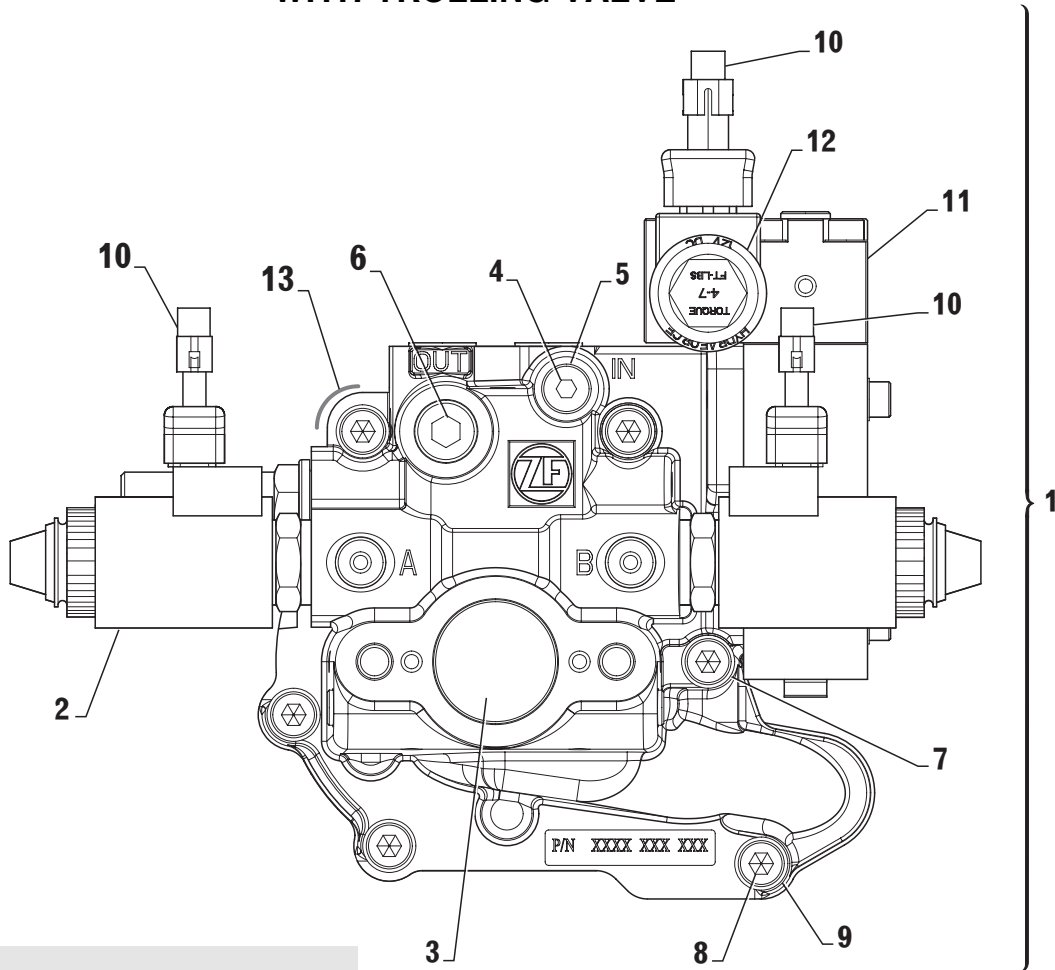
Per convertire la elettrovalvola da 12V a 24V sostituire solo il solenoide con il ricambio a cod. 3312 199 062.
To transform the solenoid valve from 12V to 24V it will be enough to replace only the solenoid - available loosen P/N 3312 199 062.



La valvola non è disponibile singolarmente ed è un componente comune alla versione 12V e 24V dell'elettrovalvola.
The valve is not available loosen and it is a common component both for 12V and 24V solenoid valve.

ZF 80 A versions 016 - 017 - 018 - 019 - 020 - 021
 ZF 80-1 A versions 024 - 025 - 026 - 027 - 029 - 030

**NEW ELECTRIC SELECTOR VALVE ON/OFF 12V - 26 BAR
 WITH TROLLING VALVE**
**NEW ELECTRIC SELECTOR VALVE ON/OFF 24V - 26 BAR
 WITH TROLLING VALVE**





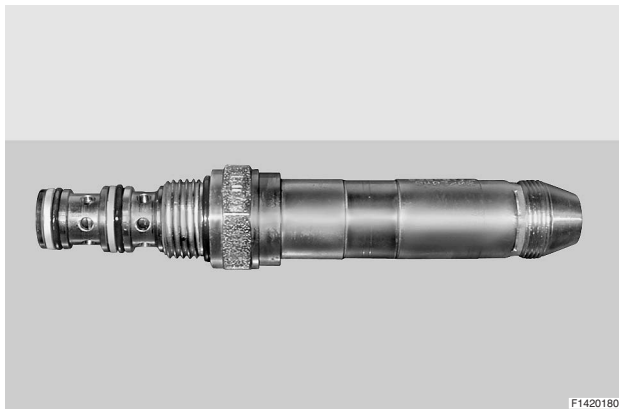
| Pos. | Part number | Old P/N | Descrizione | Description | Q.tà Q.ty | Note |
|------|--------------|---------|---|--|--------------|------------|
| 1 | 3312 199 065 | | Distributore elettrico ON/OFF 12V, 26 bar con TV | Electric selector valve ON/OFF 12V, 26 bar with Trolling valve | 1 | * |
| | 3312 199 066 | | Distributore elettrico ON/OFF 24V, 26 bar con TV | Electric selector valve ON/OFF 24V, 26 bar with Trolling valve | 1 | * * |
| 2 | 3312 308 069 | | Elettrovalvola ON/OFF 12V, 26 BAR | Solenoid valve ON/OFF 12V, 26 bar | 2 | Ma = 20 Nm |
| | 3312 308 106 | | Elettrovalvola ON/OFF 24V, 26 bar | Solenoid valve ON/OFF 24V, 26 bar | 2 | Ma = 20 Nm |
| 3 | 0631 405 061 | | Tappo | Dummy plug | 1 | |
| 4 | 0636 302 053 | | Tappo a vite M10x1 | Screw plug M10x1 | 1 | Ma = 12 Nm |
| 5 | 0634 801 302 | | Anello di tenuta | Sealing ring | 1 | |
| 6 | 0636 309 007 | | Tappo a vite | Screw plug | 1 | Ma = 35 Nm |
| 7 | 0636 101 709 | | Vite TCEI M8x65 | Cap screw M8x65 | 2 | |
| 8 | 0636 101 727 | | Vite TCEI M8x40 | Cap screw M8x40 | 4 | |
| 9 | 0630 302 090 | | Rosetta elastica | Spring washer | 6 | |
| 10 | 3316 117 001 | | Assieme connettore | Connector kit | 3 | |
| 11 | 3312 108 027 | | Trolling valve | Trolling device | 1 | |
| 12 | 3312 308 096 | | Valvola proporzionale 12V | Proportional valve 12V | 1 | Ma = 27 Nm |
| | 3312 308 124 | | Valvola proporzionale 24V | Proportional valve 24V | 1 | Ma = 27 Nm |
| 13 | 3312 308 020 | | Guarnizione | Gasket | 1 | |

* Installare con 12 V - *To be installed with 12 V power supply*

* * Installare con 24 V - *To be installed with 24 V power supply*



Per convertire la elettrovalvola da 12V a 24V sostituire solo il solenoide con il ricambio a cod. 3312 199 062.
To transform the solenoid valve from 12V to 24V it will be enough to replace only the solenoid - available loosen P/N 3312 199 062.



La valvola non è disponibile singolarmente ed è un componente comune alla versione 12V e 24V dell'elettrovalvola.
The valve is not available loosen and it is a common component both for 12V and 24V solenoid valve.

**COMPOSIZIONE KIT - KIT COMPONENTS****ZF 80 A versions 016 - 017 - 018 - 019 - 020 - 021****ZF 80-1 A versions 024 - 025 - 026 - 027 - 029 - 030**

| Fig. | Pos. | Part number | Old P/N | Descrizione | Description | Q.ty |
|------|------|---------------------|---------|--|------------------------------------|------|
| - | - | 3313 199 020 | 501171 | Kit guarnizioni e anelli elastici | Seal kit & piston rings | |
| 2 | 2 | 0634 303 505 | 384176 | . Anello OR | . O-ring | 1 |
| 1 | 20 | 3312 301 030 | 413883 | . Paraolio entrata | . Input shaft seal | 1 |
| 1 | 3 | 0634 319 104 | 448160 | . Paraolio uscita | . Output shaft seal | 1 |
| 3 | 3 | 3312 308 020 | 408388 | . Guarnizione | . Gasket | 1 |
| 1 | 24 | 0634 304 405 | 501211 | . Guarnizione OR | . O-Ring | 1 |
| 2 | 5 | 3312 302 041 | 447038 | . Anello elastico | . Piston ring | 3 |
| 3 | 8 | 0634 309 621 | 500065 | . Anello di tenuta | . Seal | 1 |
| 1 | 6 | 0634 304 688 | 442731 | . Guarnizione OR | . O-Ring | 1 |
| 1 | 7 | 0634 306 204 | 105542 | . Guarnizione OR | . O-Ring | 1 |
| 1 | 11 | 3312 301 008 | 439653 | . Guarnizione | . Gasket | 1 |
| - | - | 3313 199 077 | | Kit guarnizioni e frizioni | Seal kit & clutch kit | |
| - | - | 3313 199 020 | 501171 | . Kit guarnizioni e anelli elastici | . Seal kit & piston rings | 1 |
| 2 | 15 | 3319 302 006 | | . Disco frizione interno | . Inner disc | 8 |
| 2 | 14 | 3319 302 001 | | . Disco frizione esterno | . Outer disc | 10 |
| - | - | 3313 199 022 | 501218 | Kit cuscinetti | Bearing kit | |
| 2 | 9 | 3312 302 040 | 441438 | . Cuscinetto a rullini | . Needle bearing | 4 |
| 2 | 23 | 0635 501 939 | | . Cuscinetto a rullini conici | . Tapered roller bearing | 1 |
| 2 | 6,25 | 0635 501 937 | 447754 | . Cuscinetto a rullini conici | . Tapered roller bearing | 2 |
| 2 | 26 | 0635 501 938 | 333859 | . Cuscinetto a rullini conici | . Tapered roller bearing | 1 |
| 2 | 27 | 0635 373 008 | 384182 | . Cuscinetto a rullini conici | . Tapered roller bearing | 1 |
| 2 | 28 | 0635 501 914 | | . Cuscinetto a rullini conici | . Tapered roller bearing | 1 |
| 2 | 24 | 3313 302 042 | 439630 | . Spessore 0,1 mm | . Shim 0.1 mm | 2 |
| 2 | 24 | 3313 302 043 | 439631 | . Spessore 0,15 mm | . Shim 0.15 mm | 2 |
| 2 | 24 | 3313 302 044 | 439632 | . Spessore 0,2 mm | . Shim 0.2 mm | 2 |
| 2 | 24 | 3313 302 045 | 439633 | . Spessore 0,5 mm | . Shim 0.5 mm | 2 |
| 2 | 24 | 3313 302 046 | 439634 | . Spessore 1,0 mm | . Shim 1.0 mm | 2 |
| 2 | 29 | 3208 304 023 | 449125 | . Spessore 0,15 mm | . Shim 0.15 mm | 2 |
| 2 | 29 | 3208 304 024 | 449126 | . Spessore 0,2 mm | . Shim 0.2 mm | 2 |
| 2 | 29 | 3208 304 027 | 449127 | . Spessore 0,5 mm | . Shim 0.5 mm | 2 |



13. SPARE PARTS LIST ZF 85 A

Preface

The spare parts list is only valid for the type and versions of transmission, as shown below.

You will find the transmission type and version on your transmission name plate.

If the type and version indicated differs from that printed in this Manual, the relative Spare Parts List should be ordered from ZF HURTH MARINE.

The indicated dimensions and standards are as such not enough for ordering parts.

When ordering parts, please state:

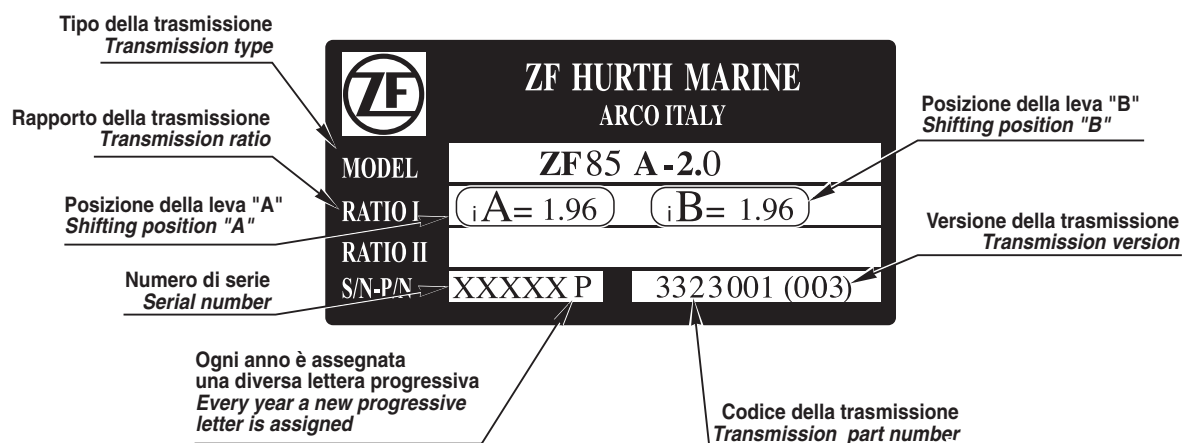
- Transmission type
- Transmission version
- Serial number
- Item no.
- Part name
- Identification no.
- quantity of parts required.

The spare parts list is referring to the following versions:

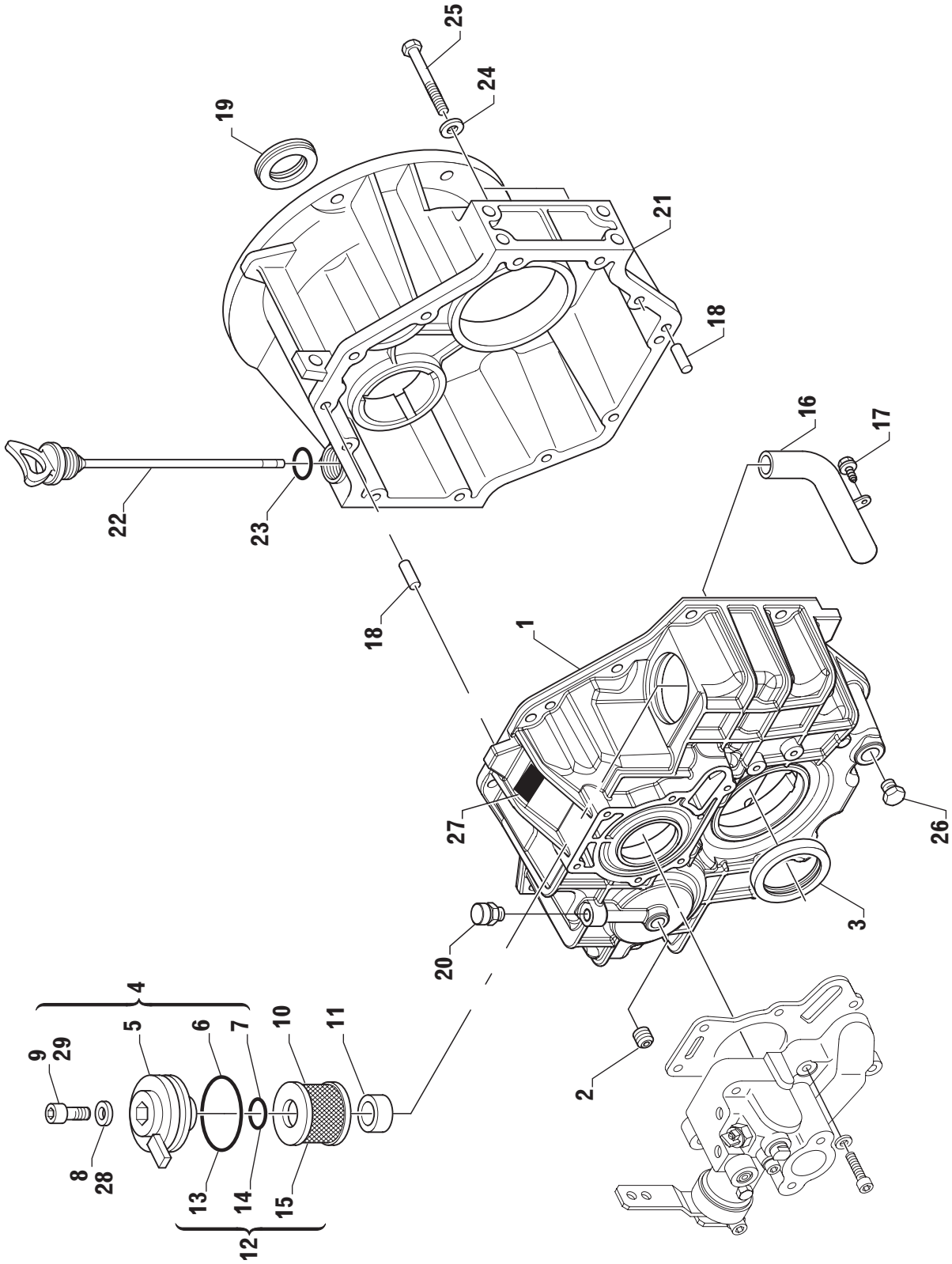
ZF 85 A **versions** 004 (1.57 R); 007 (1.75 R); 003 (1.96 R); 002 (2.50 R)

Name plate

The name plate is mounted to the transmission



ZF 85 A versions 004 - 007 - 003 - 002

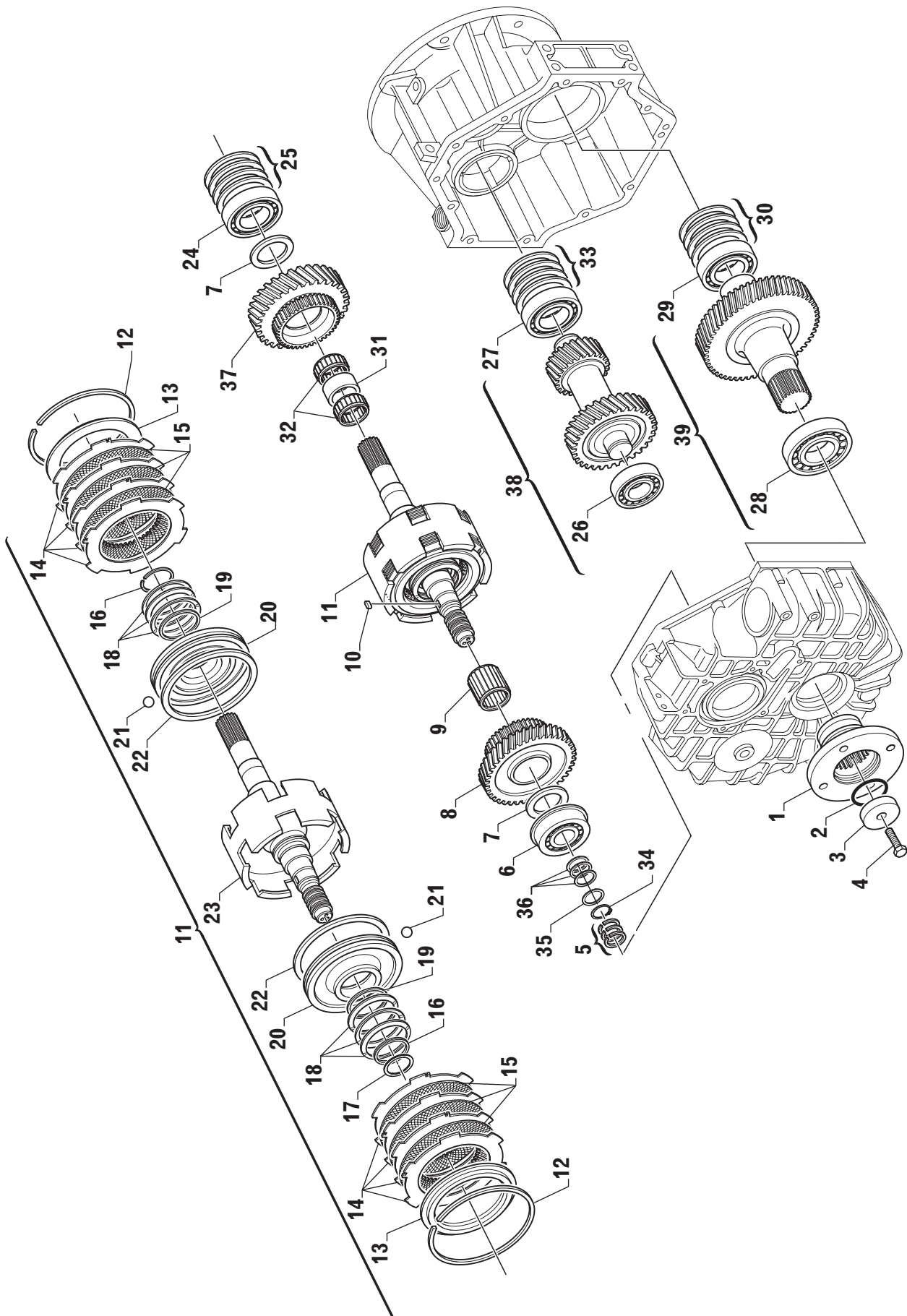




| Pos. | Part number | Old P/N | Descrizione | Description | Q.tà Q.ty | Note |
|------|--------------|---------|--|--|--------------|---------------------|
| 1 | 3323 199 001 | | Assieme scatola | Housing, assy. | 1 | |
| | 3323 301 002 | | . Scatola | . Housing | 1 | |
| | 3313 301 022 | | . Tubo aspirazione con supporto | . Suction pipe with support | 1 | |
| | 0636 101 411 | | . Vite TCEI M6x16 | . Cap screw M6x16 | 1 | |
| | 3312 301 008 | | . Guarnizione | . Gasket | 1 | |
| 2 | 0636 301 041 | 442373 | Tappo M16x1,5 | Plug M16x1.5 | 1 | |
| 3 | 0634 319 104 | 448160 | Paraolio uscita | Output shaft seal | 1 | |
| 4 | 3312 101 003 | 500484 | Coperchio filtro completo | Filter cover, assy. | 1 | |
| 5 | | | . Coperchio filtro | . Filter cover | 1 | |
| 6 | 0634 304 688 | 442731 | . Guarnizione OR | . O-Ring | 1 | |
| 7 | 0634 306 204 | 105542 | . Guarnizione OR | . O-Ring | 1 | |
| 8 | 0630 001 085 | 167010 | . Rosetta | . Washer | 1 | |
| 9 | 0636 101 475 | 320202 | . Vite M8x30 | . Screw M8x30 | 1 | |
| 10 | 3312 301 007 | 438637 | Filtro olio | Oil filter | 1 | (1) old part number |
| 11 | 3312 301 008 | 439653 | Guarnizione | Gasket | 1 | |
| 12 | 3312 199 031 | 463772 | Filtro olio completo | Oil filter, assy | 1 | |
| 13 | 0634 304 688 | 442731 | . Guarnizione OR | . O-Ring | 1 | |
| 14 | 0634 306 204 | 105542 | . Guarnizione OR | . O-Ring | 1 | |
| 15 | 3312 301 037 | 438637 | . Filtro olio | . Oil filter | 1 | (1) new part number |
| 16 | 3313 301 022 | | Tubo aspirazione con supporto | Suction pipe with support | 1 | |
| 17 | 0636 101 411 | 102879 | Vite T.E. M6x16 (fascetta tubo aspirazione) | Hex head screw M6x16 (suction pipe clamp) | 1 | |
| 18 | 0631 315 520 | 335817 | Spina | Locator pin | 2 | |
| 19 | 0634 301 846 | | Paraolio entrata | Input shaft seal | 1 | |
| 20 | 3311 301 002 | 442369 | Valvola di sfiato | Breather valve | 1 | |
| 21 | 3323 301 001 | | Coperchio | Cover (housing) | 1 | |
| 22 | 3313 201 001 | 500993 | Asta livello olio + OR | Oil dipstick + OR | 1 | |
| 23 | 0634 304 405 | 501211 | . Guarnizione OR (Asta livello olio) | . O-Ring (Oil dipstick) | 1 | |
| 24 | 0630 302 091 | 442371 | Rosetta | Washer | 14 | |
| 25 | 0636 015 227 | 442375 | Vite T.E. M10x35 | Hex head screw M10x35 | 14 | |
| 26 | 3312 301 017 | 469691 | Tappo scarico olio | Oil drain plug | 1 | |
| 27 | 3312 301 001 | | Targhetta di identificazione | Name plate | 1 | |
| 28 | 0630 001 085 | 167010 | Rosetta | Washer | 1 | |
| 29 | 0636 101 475 | 320202 | Vite M8x30 | Screw M8x30 | 1 | |

(1) Fornito solo incluso nel kit filtro olio p/n 3312 199 031
Supplied only included in the oil filter kit p/n 3312 199 031

ZF 85 A versions 004 - 007 - 003 - 002



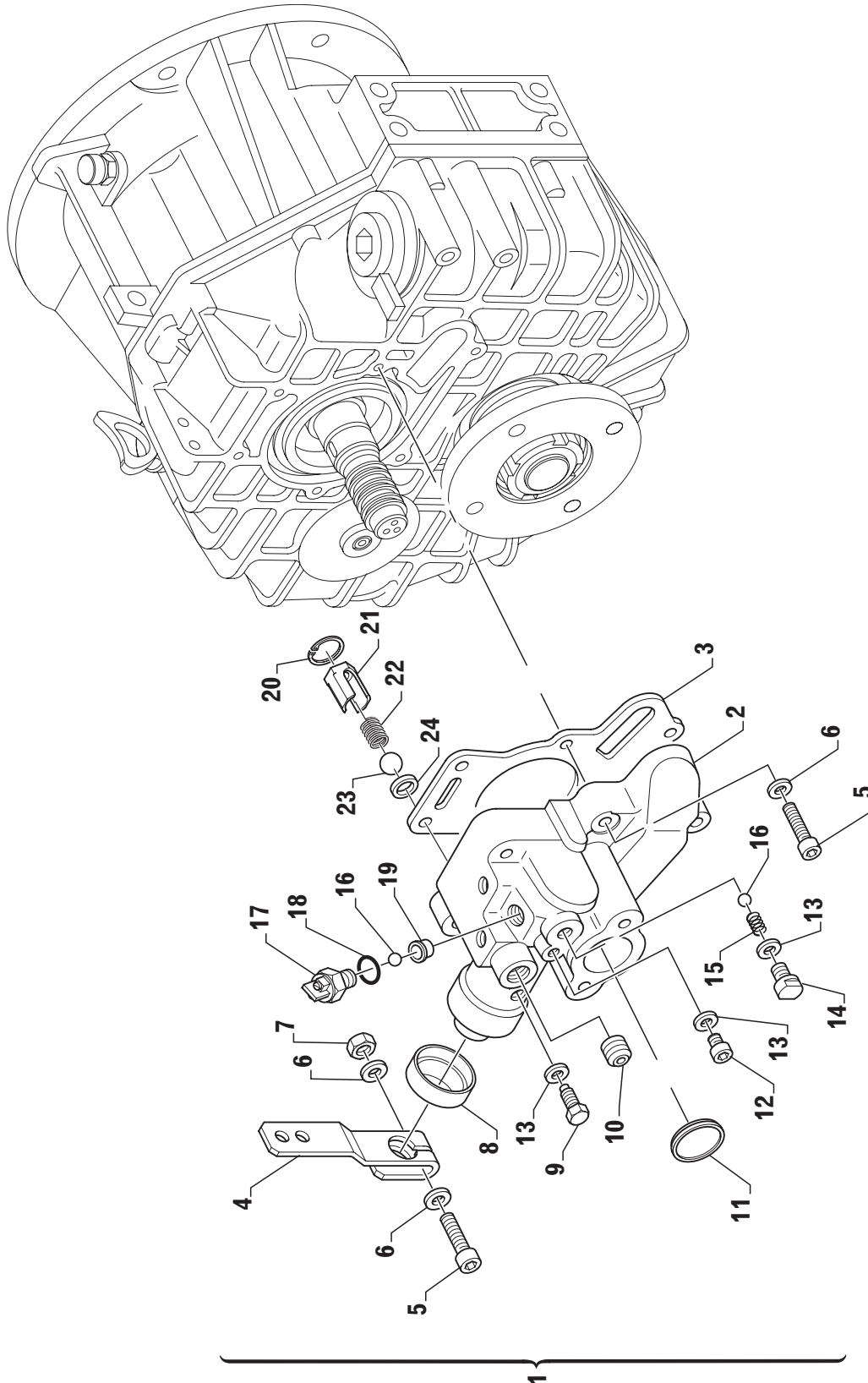


| Pos. | Part number | Old P/N | Descrizione | Description | Q.tà Q.ty | Note |
|--------------------------------------|--------------|---------|---|-------------------------------------|--------------|------|
| 1 | 3313 304 007 | 439581 | Flangia | Flange | 1 | |
| 2 | 0634 303 505 | 384176 | Guarnizione OR | O-Ring | 1 | |
| 3 | 3313 304 026 | 387841 | Rondella | Washer | 1 | |
| 4 | 0636 016 085 | 102823 | Vite T.E. M16x45 | Hex head screw M16x45 | 1 | |
| 5 | 3312 302 041 | 447038 | Anello di tenuta | Piston ring | 3 | |
| 6 | 0635 501 952 | | Cuscinetto a rulli conici | Tapered roller bearing | 1 | |
| 7 | 3323 302 008 | | Rasamento | Butting ring | 2 | |
| 8 | 3323 302 004 | | Ingranaggio Z3 = 44 | Reverse gear Z3 = 44 | 1 | |
| 9 | 0735 321 606 | | Cuscinetto a rullini | Needle bearing | 1 | |
| 10 | 0631 501 062 | 437956 | Chiavetta | Key | 1 | |
| 11 | 3323 199 004 | | Albero di ingresso completo | Input shaft, assy. | 1 | |
| 12 | 0630 513 065 | | . Anello elastico | . Snap ring | 2 | |
| 13 | 3323 302 017 | | . Disco finale | . End disc | 2 | |
| 14 | 3323 302 012 | | . Disco frizione esterno | . Outer clutch disc | 10 | |
| 15 | 3323 302 011 | | . Disco frizione interno | . Inner clutch disc | 8 | |
| 16 | 3323 302 009 | | . Anello di ritegno | . Retainer ring | 2 | |
| 17 | 3323 302 030 | | . Ralla | . Thrust washer | 1 | |
| 18 | 3323 302 018 | | . Molla a tazza | . Cup spring | 6 | |
| 19 | 0634 402 178 | 500066 | . Anello interno | . Inner clutch piston ring | 2 | |
| 20 | 3323 302 006 | | . Pistone | . Clutch piston | 2 | |
| 21 | 0635 460 006 | 106690 | . Sfera | . Ball | 2 | |
| 22 | 0634 402 177 | | . Anello esterno | . Outer clutch piston ring | 2 | |
| 23 | 3323 199 003 | | . Albero di ingresso + cilindro frizione | . Input shaft and clutch housing | 1 | |
| 24 | 0635 501 951 | | Cuscinetto a rulli conici | Tapered roller bearing | 1 | |
| 25 | 3313 302 042 | 439630 | Spessore 0,1 mm | Shim 0.1 mm | 2 | |
| | 3313 302 043 | 439631 | Spessore 0,15 mm | Shim 0.15 mm | 2 | |
| | 3313 302 044 | 439632 | Spessore 0,2 mm | Shim 0.2 mm | 2 | |
| | 3313 302 045 | 439633 | Spessore 0,5 mm | Shim 0.5 mm | 2 | |
| | 3313 302 046 | 439634 | Spessore 1,0 mm | Shim 1.0 mm | 2 | |
| 26 | 0635 501 937 | 447754 | Cuscinetto a rulli conici | Tapered roller bearing | 1 | |
| 27 | 0635 372 018 | | Cuscinetto a rulli conici | Tapered roller bearing | 1 | |
| 28 | 0635 373 008 | 384182 | Cuscinetto a rulli conici | Tapered roller bearing | 1 | |
| 29 | 0635 501 914 | | Cuscinetto a rulli conici | Tapered roller bearing | 1 | |
| 30 | 3208 304 023 | 449125 | Spessore 0,15 mm | Shim 0.15 mm | 2 | |
| | 3208 304 024 | 449126 | Spessore 0,20 mm | Shim 0.20 mm | 2 | |
| | 3208 304 025 | | Spessore 0,25 mm | Shim 0.25 mm | 2 | |
| | 3208 304 026 | | Spessore 0,30 mm | Shim 0.30 mm | 2 | |
| | 3208 304 027 | 449127 | Spessore 0,50 mm | Shim 0.50 mm | 2 | |
| 31 | 3323 302 013 | | Distanziale | Spacer | 1 | |
| 32 | 0735 321 607 | | Cuscinetto a rullini | Needle bearing | 2 | |
| 33 | 3323 303 008 | | Spessore 0,10 mm | Shim 0.10 mm | 2 | |
| | 3323 303 009 | | Spessore 0,15 mm | Shim 0.15 mm | 2 | |
| | 3323 303 010 | | Spessore 0,20 mm | Shim 0.20 mm | 2 | |
| | 3323 303 011 | | Spessore 0,50 mm | Shim 0.50 mm | 2 | |
| 34 | 0630 501 031 | | Anello di sicurezza | Retaining ring | 1 | |
| 35 | 0630 100 010 | | Disco appoggio | Support shim | 1 | |
| 36 | 0630 000 193 | | Spessore 40x50x0,10 | Shim 40x50x0.10 | 1 | |
| | 0630 000 298 | | Spessore 40x50x0,15 | Shim 40x50x0.15 | 1 | |
| | 0630 000 274 | | Spessore 40x50x0,20 | Shim 40x50x0.20 | 1 | |
| Vers. 004 (Rapporto I = 1,57) | | | | Vers. 004 (Ratio I = 1.57) | | |
| 37 | 3323 302 038 | | Ingranaggio Z1 = 30 | Forward gear Z1 = 30 | 1 | |
| 38 | 3323 199 005 | | Albero intermedio Z4 = 44, Z5 = 30 | Intermediate shaft Z4 = 44, Z5 = 30 | 1 | * |
| 39 | 3323 199 009 | | Albero di uscita Z2 = 47 | Output shaft Z2 = 47 | 1 | * |
| Vers. 007 (Rapporto I = 1,75) | | | | Vers. 007 (Ratio I = 1.75) | | |
| 37 | 3323 202 009 | | Ingranaggio Z1 = 28 | Forward gear Z1 = 28 | 1 | |
| 38 | 3323 199 006 | | Albero intermedio Z4 = 44, Z5 = 28 | Intermediate shaft Z4 = 44, Z5 = 28 | 1 | * |
| 39 | 3323 199 010 | | Albero di uscita Z2 = 49 | Output shaft Z2 = 49 | 1 | * |
| Vers. 003 (Rapporto I = 1,96) | | | | Vers. 003 (Ratio I = 1.96) | | |
| 37 | 3323 202 003 | | Ingranaggio Z1 = 26 | Forward gear Z1 = 26 | 1 | |
| 38 | 3323 199 007 | | Albero intermedio Z4 = 44, Z5 = 26 | Intermediate shaft Z4 = 44, Z5 = 26 | 1 | * |
| 39 | 3323 199 011 | | Albero di uscita Z2 = 51 | Output shaft Z2 = 51 | 1 | * |
| Vers. 002 (Rapporto I = 2,5) | | | | Vers. 002 (Ratio I = 2.5) | | |
| 37 | 3323 202 002 | | Ingranaggio Z1 = 22 | Forward gear Z1 = 22 | 1 | |
| 38 | 3323 199 008 | | Albero intermedio Z4 = 44, Z5 = 22 | Intermediate shaft Z4 = 44, Z5 = 22 | 1 | * |
| 39 | 3323 199 012 | | Albero di uscita Z2 = 55 | Output shaft Z2 = 55 | 1 | * |

* Cuscinetti a rulli conici già assemblati - *Tapered roller bearings already assembled*

ZF 85 A versions 004 - 007 - 003 - 002

MECHANICAL SELECTOR VALVE

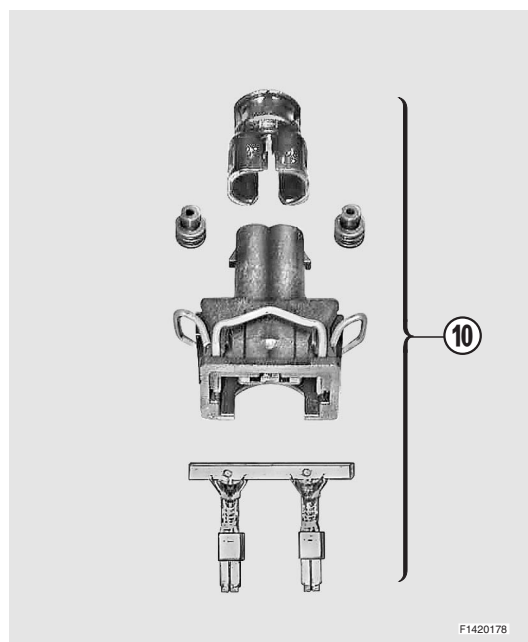
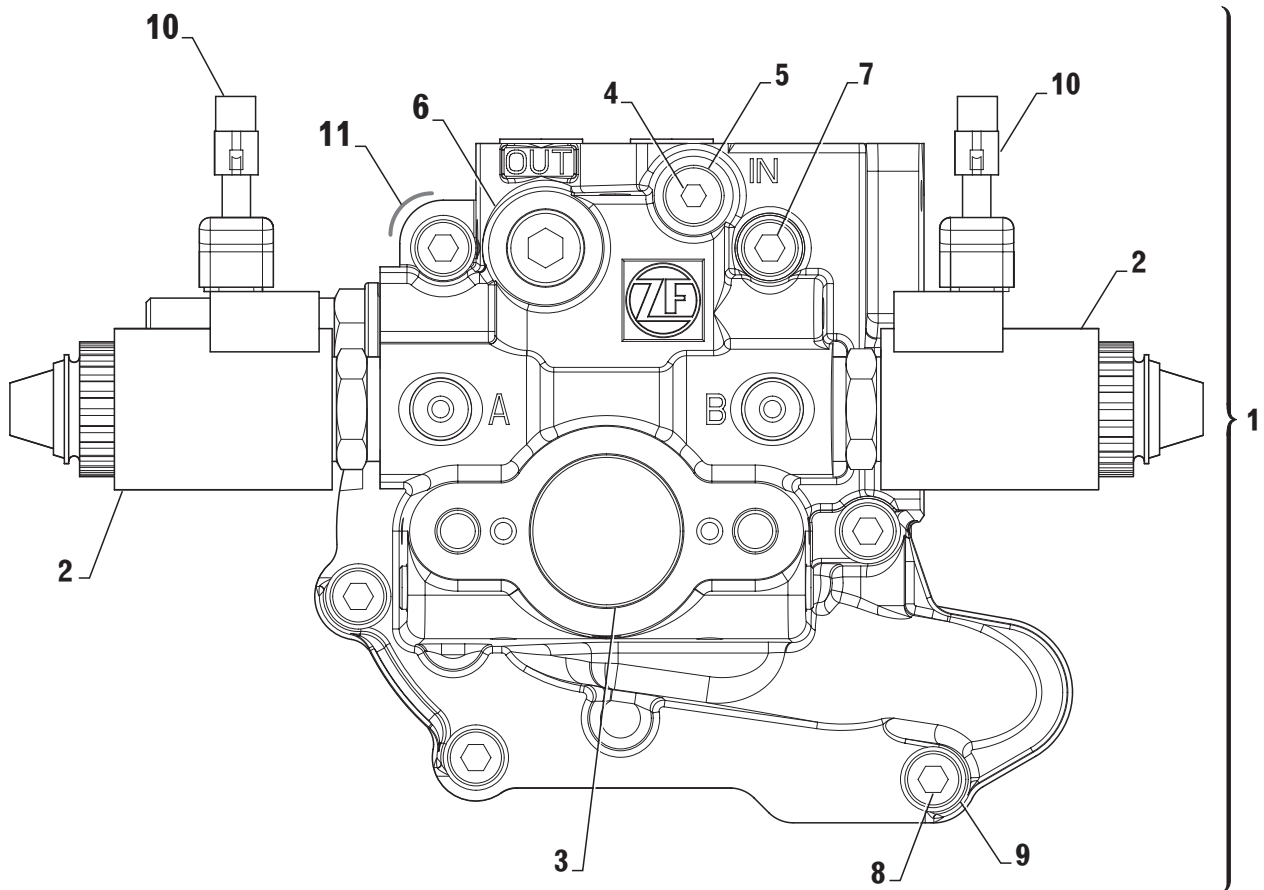




| Pos. | Part number | Old P/N | Descrizione | Description | Q.tà Q.ty | Note |
|------|--------------|---------|--|-------------------------------------|--------------|------|
| 1 | 3313 108 001 | | Valvola di comando alta velocità 26 bar | Mechanical selector valve 26 bar | 1 | |
| 2 | ☆ | | . Valvola di comando | . Control valve | 1 | |
| 3 | 3312 308 020 | 408388 | . Guarnizione | . Gasket | 1 | |
| 4 | 3312 308 025 | 452963 | . Leva | . Lever | 1 | |
| 5 | 0636 101 727 | 442377 | . Vite T.E. | . Hex head screw | 7 | |
| 6 | 0630 302 090 | 442372 | . Rosetta | . Washer | 8 | |
| 7 | 0637 006 157 | 455785 | . Dado | . Nut | 1 | |
| 8 | 0634 309 621 | 500065 | . Guarnizione | . Gasket | 1 | |
| 9 | 3312 308 034 | 500026 | . Vite di fermo | . Stop screw | 1 | |
| 10 | 0636 309 007 | 455756 | . Tappo | . Plug | 1 | |
| 11 | 0631 405 061 | 500107 | . Tappo | . Plug | 1 | |
| 12 | 0636 302 053 | 103465 | . Tappo | . Plug | 1 | |
| 13 | 0634 801 302 | 107410 | . Rosetta | . Washer | 3 | |
| 14 | 3312 308 037 | 500028 | . Vite di guida | . Guide bolt | 1 | |
| 15 | 3312 308 047 | 500044 | . Molla | . Spring | 1 | |
| 16 | 0635 460 014 | 106695 | . Sfera | . Ball | 2 | |
| 17 | 3312 308 029 | 455764 | . Interruttore completo | . Neutral safety switch assy. | 1 | |
| 18 | 001.105.0158 | 105527 | . Guarnizione OR | . O-Ring | 1 | |
| 19 | 3312 308 039 | 500030 | . Boccia | . Bushing | 1 | |
| 20 | 0630 502 005 | 500083 | . Anello elastico | . Snap ring | 1 | |
| 21 | 3312 308 038 | 500029 | . Boccia | . Bushing | 1 | |
| 22 | 3312 308 042 | 500032 | . Molla per lubrificazione | . Spring | 1 | |
| 23 | 0635 460 023 | 500097 | . Sfera | . Ball | 1 | |
| 24 | 3312 308 036 | 500027 | . Distanziale | . Spacer | 1 | |

ZF 85 A versions 004 - 007 - 003 - 002

ELECTRIC SELECTOR VALVE ON/OFF 12V - 26 BAR
ELECTRIC SELECTOR VALVE ON/OFF 24V - 26 BAR





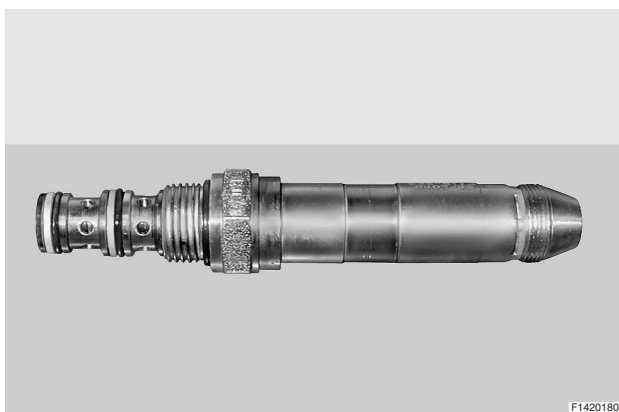
| Pos. | Part number | Old P/N | Descrizione | Description | Q.tà Q.ty | Note |
|------|--------------|---------|---|--|--------------|------------|
| 1 | 3312 199 063 | | Distributore elettrico ON/OFF 12V - 26 bar | Electric selector valve ON/OFF 12V - 26 bar | 1 | * |
| | 3312 199 064 | | Distributore elettrico ON/OFF 24V - 26 bar | Electric selector valve ON/OFF 24V - 26 bar | 1 | * * |
| 2 | 3312 308 069 | | Elettrovalvola ON/OFF 12V | Solenoid valve ON/OFF 12V | 2 | Ma = 20 Nm |
| | 3312 308 106 | | Elettrovalvola ON/OFF 24V | Solenoid valve ON/OFF 24V | 2 | Ma = 20 Nm |
| 3 | 0631 405 061 | | Tappo | Dummy plug | 1 | |
| 4 | 0636 302 053 | | Tappo M10x1 | Screw plug M10x1 | 1 | Ma = 12 Nm |
| 5 | 0634 801 302 | | Rosetta | Washer | 1 | |
| 6 | 0636 309 007 | | Tappo | Screw plug | 1 | Ma = 35 Nm |
| 7 | 0636 101 709 | | Vite T.E. M8x65 | Cap screw M8x65 | 2 | |
| 8 | 0636 101 727 | | Vite T.E. M8x40 | Cap screw M8x40 | 4 | |
| 9 | 0630 302 090 | | Rosetta elastica | Spring washer | 6 | |
| 10 | 3316 117 001 | | Assieme connettore | Connector kit | 2 | |
| 11 | 3312 308 020 | | Guarnizione | Gasket | 1 | |

* Installare con 12 V - *To be installed with 12 V power supply*

* * Installare con 24 V - *To be installed with 24 V power supply*



Per convertire la elettrovalvola da 12V a 24V sostituire solo il solenoide con il ricambio a cod. 3312 199 062.
To transform the solenoid valve from 12V to 24V it will be enough to replace only the solenoid - available loosen P/N 3312 199 062.

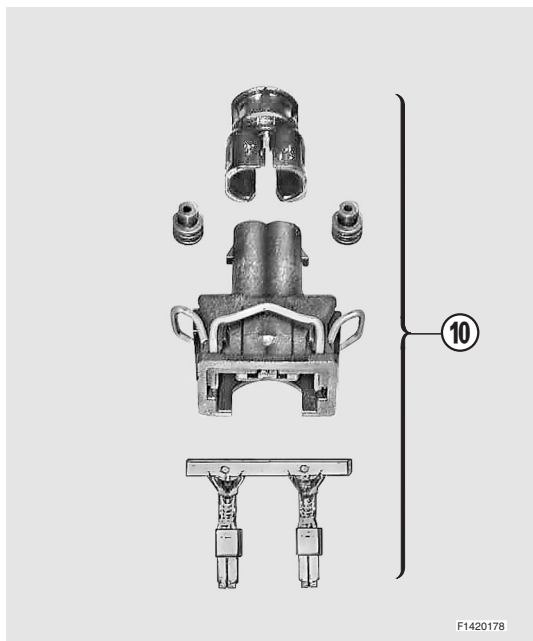
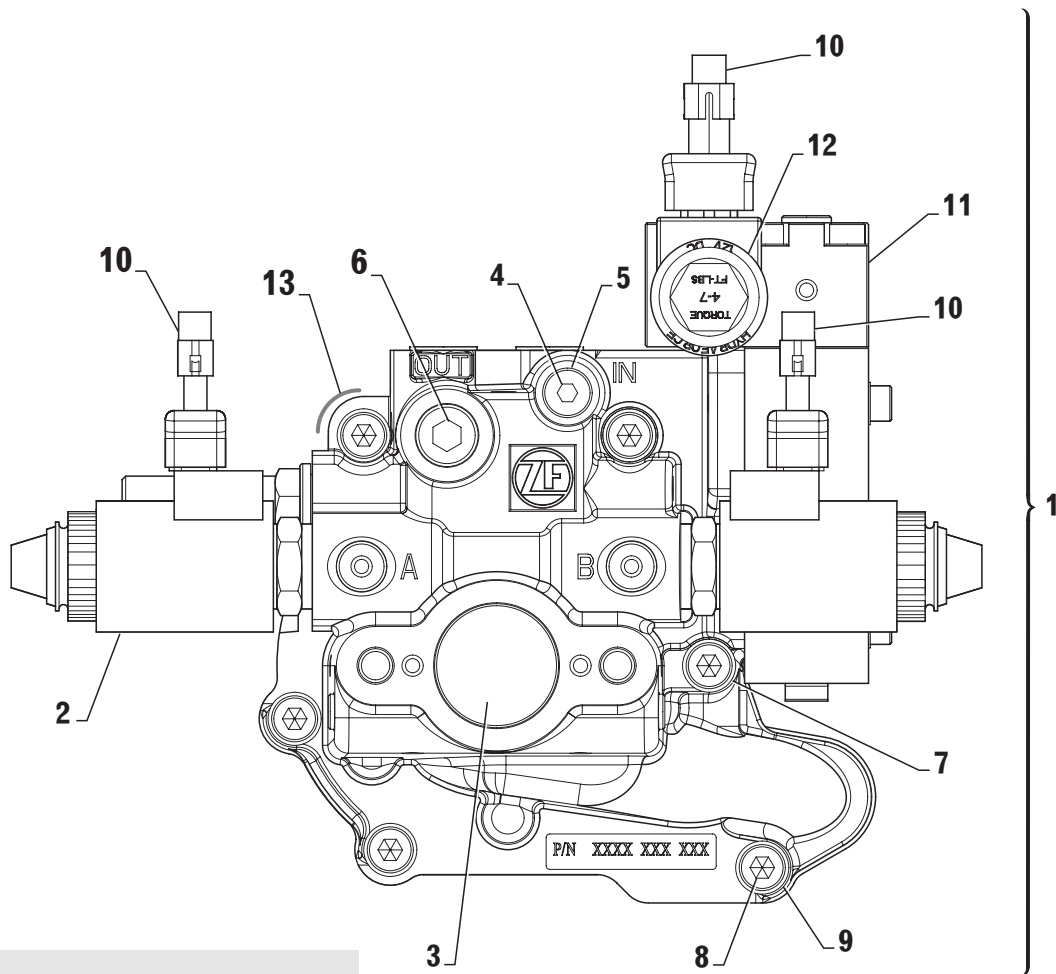


La valvola non è disponibile singolarmente ed è un componente comune alla versione 12V e 24V dell'elettrovalvola.
The valve is not available loosen and it is a common component both for 12V and 24V solenoid valve.

ZF 85 A versions 004 - 007 - 003 - 002

**ELECTRIC SELECTOR VALVE ON/OFF 12V - 26 BAR
WITH TROLLING VALVE**

**ELECTRIC SELECTOR VALVE ON/OFF 24V - 26 BAR
WITH TROLLING VALVE**



F1420178



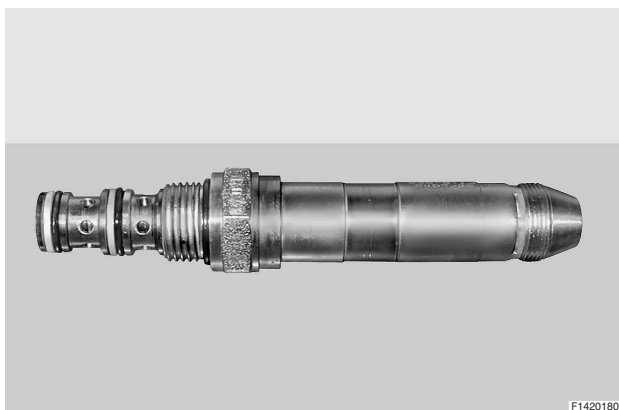
| Pos. | Part number | Old P/N | Descrizione | Description | Q.tà Q.ty | Note |
|------|--------------|---------|---|--|--------------|------------|
| 1 | 3312 199 065 | | Distributore elettrico ON/OFF 12V, 26 bar con TV | Electric selector valve ON/OFF 12V, 26 bar with Trolling valve | 1 | * |
| | 3312 199 066 | | Distributore elettrico ON/OFF 24V, 26 bar con TV | Electric selector valve ON/OFF 24V, 26 bar with Trolling valve | 1 | * * |
| 2 | 3312 308 069 | | Elettrovalvola ON/OFF 12V, 26 BAR | Solenoid valve ON/OFF 12V, 26 bar | 2 | Ma = 20 Nm |
| | 3312 308 106 | | Elettrovalvola ON/OFF 24V, 26 bar | Solenoid valve ON/OFF 24V, 26 bar | 2 | Ma = 20 Nm |
| 3 | 0631 405 061 | | Tappo | Dummy plug | 1 | |
| 4 | 0636 302 053 | | Tappo a vite M10x1 | Screw plug M10x1 | 1 | Ma = 12 Nm |
| 5 | 0634 801 302 | | Anello di tenuta | Sealing ring | 1 | |
| 6 | 0636 309 007 | | Tappo a vite | Screw plug | 1 | Ma = 35 Nm |
| 7 | 0636 101 709 | | Vite TCEI M8x65 | Cap screw M8x65 | 2 | |
| 8 | 0636 101 727 | | Vite TCEI M8x40 | Cap screw M8x40 | 4 | |
| 9 | 0630 302 090 | | Rosetta elastica | Spring washer | 6 | |
| 10 | 3316 117 001 | | Assieme connettore | Connector kit | 3 | |
| 11 | 3312 108 027 | | Trolling valve | Trolling device | 1 | |
| 12 | 3312 308 096 | | Valvola proporzionale 12V | Proportional valve 12V | 1 | Ma = 27 Nm |
| | 3312 308 124 | | Valvola proporzionale 24V | Proportional valve 24V | 1 | Ma = 27 Nm |
| 13 | 3312 308 020 | | Guarnizione | Gasket | 1 | |

* Installare con 12 V - *To be installed with 12 V power supply*

* * Installare con 24 V - *To be installed with 24 V power supply*



Per convertire la elettrovalvola da 12V a 24V sostituire solo il solenoide con il ricambio a cod. 3312 199 062.
To transform the solenoid valve from 12V to 24V it will be enough to replace only the solenoid - available loosen P/N 3312 199 062.



La valvola non è disponibile singolarmente ed è un componente comune alla versione 12V e 24V dell'elettrovalvola.
The valve is not available loosen and it is a common component both for 12V and 24V solenoid valve.



COMPOSIZIONE KIT - KIT COMPONENTS

ZF 85 A versions 004 - 007 - 003 - 002

| Fig. | Pos. | Part number | Old P/N | Descrizione | Description | Q.ty |
|------|------|---------------------|---------|--|------------------------------------|------|
| - | - | 3323 199 019 | | Kit guarnizioni e anelli elastici | Seal kit & piston rings | |
| 2 | 2 | 0634 303 505 | 384176 | . Anello OR | . O-ring | 1 |
| 1 | 19 | 0634 301 846 | | . Paraolio entrata | . Input shaft seal | 1 |
| 1 | 3 | 0634 319 104 | 448160 | . Paraolio uscita | . Output shaft seal | 1 |
| 3 | 3 | 3312 308 020 | 408388 | . Guarnizione | . Gasket | 1 |
| 1 | 23 | 0634 304 405 | 501211 | . Guarnizione OR | . O-Ring | 1 |
| 2 | 5 | 3312 302 041 | 447038 | . Anello elastico | . Piston ring | 3 |
| 3 | 8 | 0634 309 621 | 500065 | . Anello di tenuta | . Seal | 1 |
| 1 | 6 | 0634 304 688 | 442731 | . Guarnizione OR | . O-Ring | 1 |
| 1 | 7 | 0634 306 204 | 105542 | . Guarnizione OR | . O-Ring | 1 |
| 1 | 11 | 3312 301 008 | 439653 | . Guarnizione | . Gasket | 1 |
| - | - | 3323 199 020 | | Kit guarnizioni e frizioni | Seal kit & clutch kit | |
| - | - | 3323 199 019 | | . Kit guarnizioni e anelli elastici | . Seal kit & piston rings | 1 |
| 2 | 15 | 3323 302 011 | | . Disco frizione interno | . Inner disc | 8 |
| 2 | 14 | 3323 302 012 | | . Disco frizione esterno | . Outer disc | 10 |
| - | - | 3323 199 021 | | Kit cuscinetti | Bearing kit | |
| 2 | 6 | 0635 501 952 | | . Cuscinetto a rullini conici | . Tapered roller bearing | 1 |
| 2 | 9 | 0735 321 606 | | . Cuscinetto a rullini | . Needle bearing | 1 |
| 2 | 24 | 0635 501 951 | | . Cuscinetto a rullini conici | . Tapered roller bearing | 1 |
| 2 | 26 | 0635 501 937 | 447754 | . Cuscinetto a rullini conici | . Tapered roller bearing | 1 |
| 2 | 27 | 0635 372 018 | | . Cuscinetto a rullini conici | . Tapered roller bearing | 1 |
| 2 | 28 | 0635 373 008 | 384182 | . Cuscinetto a rullini conici | . Tapered roller bearing | 1 |
| 2 | 29 | 0635 501 914 | | . Cuscinetto a rullini conici | . Tapered roller bearing | 1 |
| 2 | 32 | 0735 321 607 | | . Cuscinetto a rullini | . Needle bearing | 2 |
| 2 | 25 | 3313 302 042 | 439630 | . Spessore 0,1 mm | . Shim 0.10 mm | 2 |
| 2 | 25 | 3313 302 043 | 439631 | . Spessore 0,15 mm | . Shim 0.15 mm | 2 |
| 2 | 25 | 3313 302 044 | 439632 | . Spessore 0,20 mm | . Shim 0.20 mm | 2 |
| 2 | 25 | 3313 302 045 | 439633 | . Spessore 0,50 mm | . Shim 0.50 mm | 2 |
| 2 | 25 | 3313 302 046 | 439634 | . Spessore 1,00 mm | . Shim 1.00 mm | 2 |
| 2 | 30 | 3208 304 023 | 449125 | . Spessore 0,15 mm | . Shim 0.15 mm | 2 |
| 2 | 30 | 3208 304 024 | 449126 | . Spessore 0,20 mm | . Shim 0.20 mm | 2 |
| 2 | 30 | 3208 304 027 | 449127 | . Spessore 0,50 mm | . Shim 0.50 mm | 2 |
| 2 | 33 | 3323 303 008 | | . Spessore 0,10 mm | . Shim 0.10 mm | 2 |
| 2 | 33 | 3323 303 009 | | . Spessore 0,15 mm | . Shim 0.15 mm | 2 |
| 2 | 33 | 3323 303 010 | | . Spessore 0,20 mm | . Shim 0.20 mm | 2 |
| 2 | 33 | 3323 303 011 | | . Spessore 0,50 mm | . Shim 0.50 mm | 2 |
| 2 | 36 | 0630 000 193 | | . Spessore 40x50x0,10 | . Shim 40x50x0.10 | 1 |
| 2 | 36 | 0630 000 298 | | . Spessore 40x50x0,15 | . Shim 40x50x0.15 | 1 |
| 2 | 36 | 0630 000 274 | | . Spessore 40x50x0,20 | . Shim 40x50x0.20 | 1 |



14. SPARE PARTS LIST ZF 80 A (ZF 85 A DERIVATE VERSION)

Preface

The spare parts list is only valid for the type and versions of transmission, as shown below.

You will find the transmission type and version on your transmission name plate.

If the type and version indicated differs from that printed in this Manual, the relative Spare Parts List should be ordered from ZF HURTH MARINE.

The indicated dimensions and standards are as such not enough for ordering parts.

When ordering parts, please state:

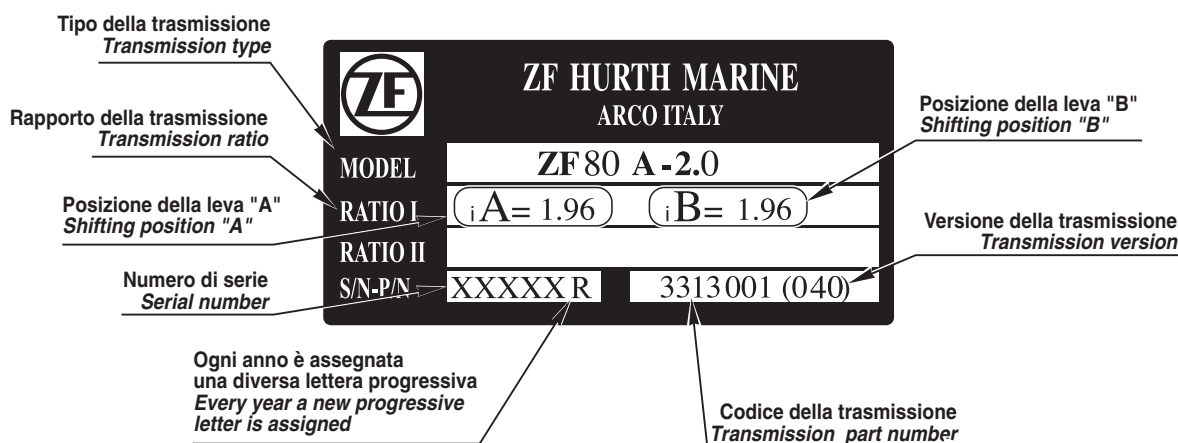
- Transmission type
- Transmission version
- Serial number
- Item no.
- Part name
- Identification no.
- quantity of parts required.

The spare parts list is referring to the following versions:

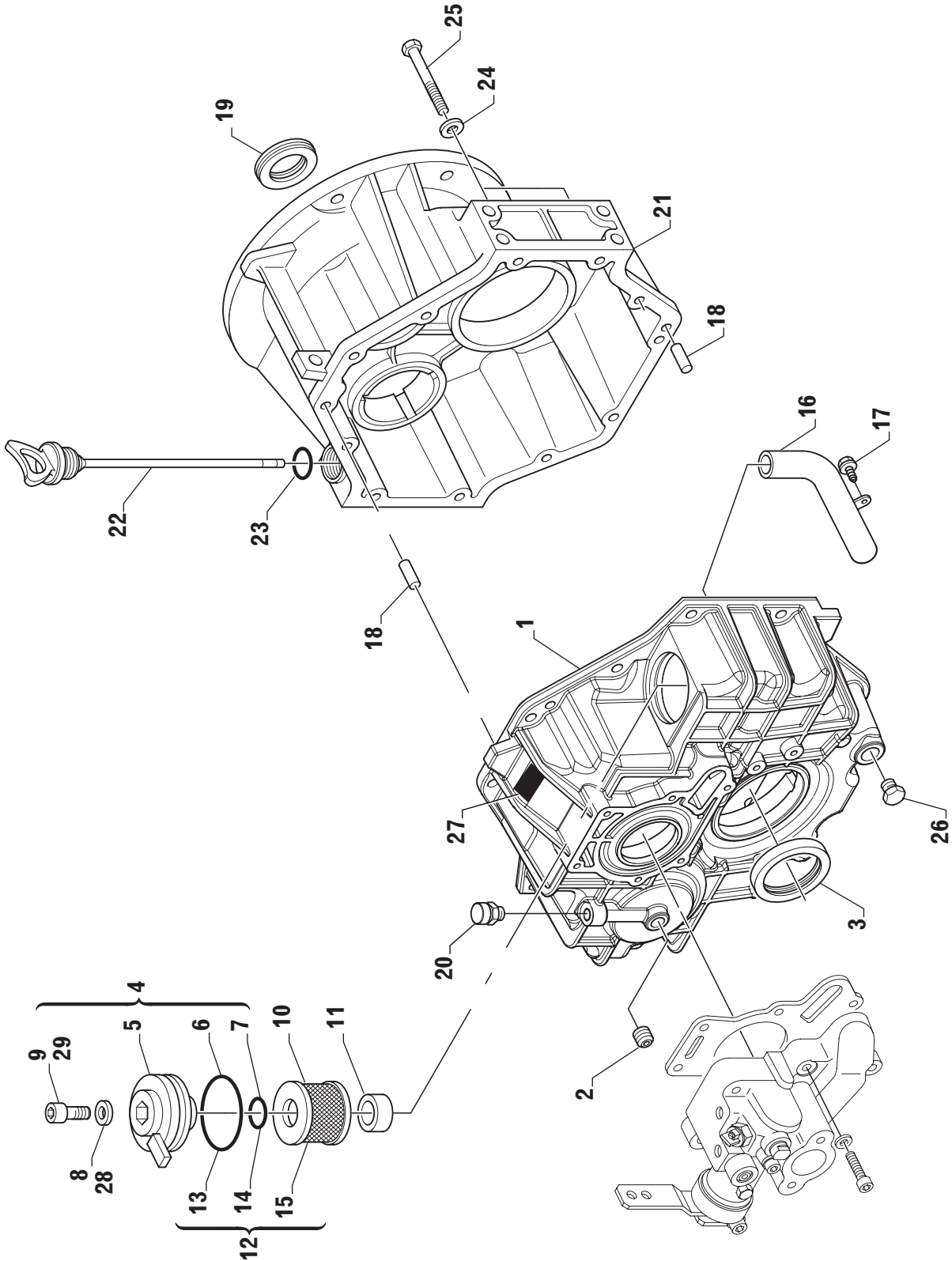
ZF 85 A **versions** 038 (1.57 R); 039 (1.75 R); 040 (1.96 R); 041 (2.50 R)

Name plate

The name plate is mounted to the transmission



ZF 80 A versions 038 - 039 - 040 - 041

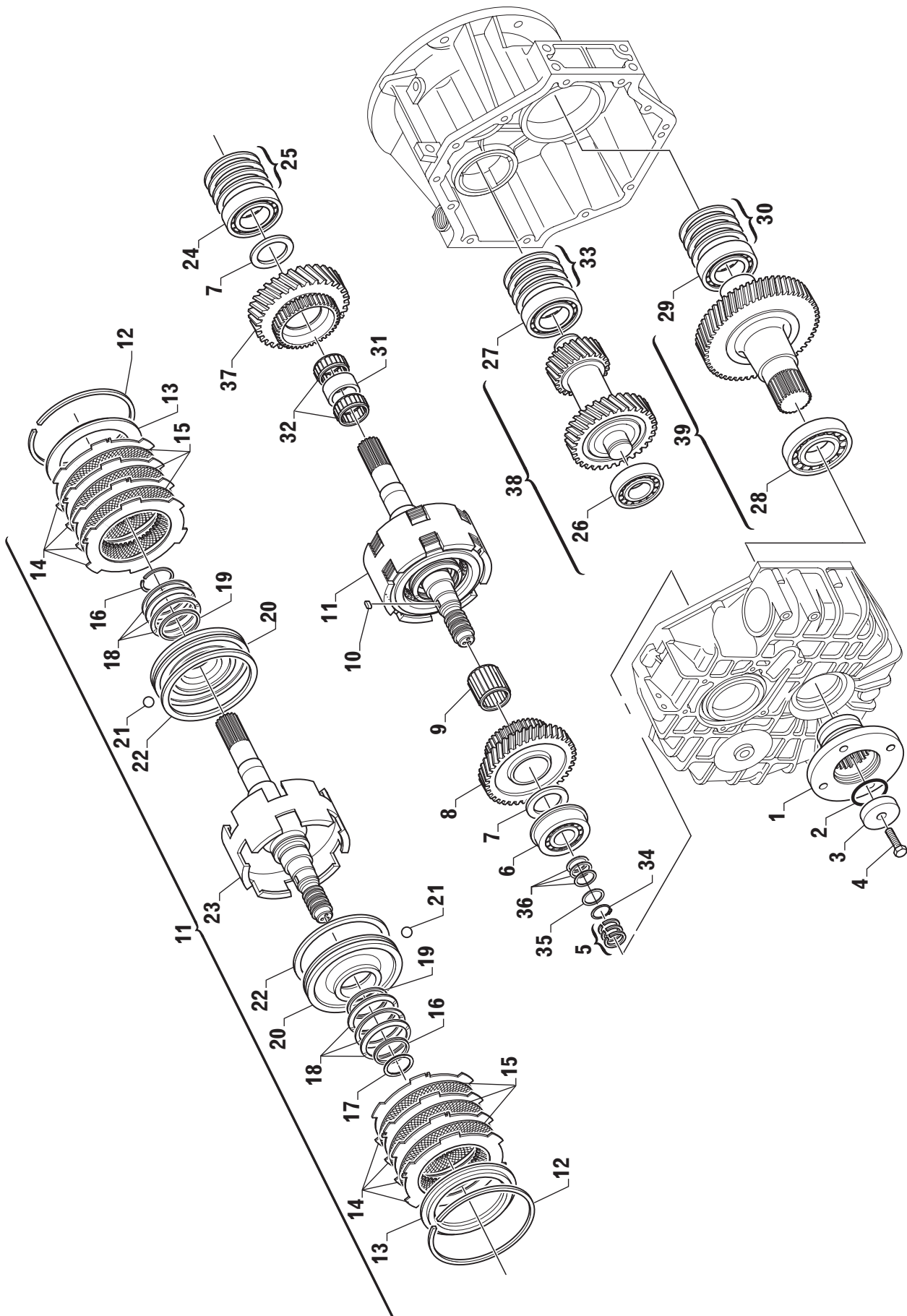




| Pos. | Part number | Old P/N | Descrizione | Description | Q.tà Q.ty | Note |
|------|--------------|---------|--|--|--------------|---------------------|
| 1 | 3323 199 001 | | Assieme scatola | Housing, assy. | 1 | |
| | 3323 301 002 | | . Scatola | . Housing | 1 | |
| | 3313 301 022 | | . Tubo aspirazione con supporto | . Suction pipe with support | 1 | |
| | 0636 101 411 | | . Vite TCEI M6x16 | . Cap screw M6x16 | 1 | |
| | 3312 301 008 | | . Guarnizione | . Gasket | 1 | |
| 2 | 0636 301 041 | 442373 | Tappo M16x1,5 | Plug M16x1.5 | 1 | |
| 3 | 0634 319 104 | 448160 | Paraolio uscita | Output shaft seal | 1 | |
| 4 | 3312 101 003 | 500484 | Coperchio filtro completo | Filter cover, assy. | 1 | |
| 5 | | | . Coperchio filtro | . Filter cover | 1 | |
| 6 | 0634 304 688 | 442731 | . Guarnizione OR | . O-Ring | 1 | |
| 7 | 0634 306 204 | 105542 | . Guarnizione OR | . O-Ring | 1 | |
| 8 | 0630 001 085 | 167010 | . Rosetta | . Washer | 1 | |
| 9 | 0636 101 475 | 320202 | . Vite M8x30 | . Screw M8x30 | 1 | |
| 10 | 3312 301 007 | 438637 | Filtro olio | Oil filter | 1 | (1) old part number |
| 11 | 3312 301 008 | 439653 | Guarnizione | Gasket | 1 | |
| 12 | 3312 199 031 | 463772 | Filtro olio completo | Oil filter, assy | 1 | |
| 13 | 0634 304 688 | 442731 | . Guarnizione OR | . O-Ring | 1 | |
| 14 | 0634 306 204 | 105542 | . Guarnizione OR | . O-Ring | 1 | |
| 15 | 3312 301 037 | 438637 | . Filtro olio | . Oil filter | 1 | (1) new part number |
| 16 | 3313 301 022 | | Tubo aspirazione con supporto | Suction pipe with support | 1 | |
| 17 | 0636 101 411 | 102879 | Vite T.E. M6x16 (fascetta tubo aspirazione) | Hex head screw M6x16 (suction pipe clamp) | 1 | |
| 18 | 0631 315 520 | 335817 | Spina | Locator pin | 2 | |
| 19 | 0634 301 846 | | Paraolio entrata | Input shaft seal | 1 | |
| 20 | 3311 301 002 | 442369 | Valvola di sfiato | Breather valve | 1 | |
| 21 | 3323 301 001 | | Coperchio | Cover (housing) | 1 | |
| 22 | 3313 201 001 | 500993 | Asta livello olio + OR | Oil dipstick + OR | 1 | |
| 23 | 0634 304 405 | 501211 | . Guarnizione OR (Asta livello olio) | . O-Ring (Oil dipstick) | 1 | |
| 24 | 0630 302 091 | 442371 | Rosetta | Washer | 14 | |
| 25 | 0636 015 227 | 442375 | Vite T.E. M10x35 | Hex head screw M10x35 | 14 | |
| 26 | 3312 301 017 | 469691 | Tappo scarico olio | Oil drain plug | 1 | |
| 27 | 3312 301 001 | | Targhetta di identificazione | Name plate | 1 | |
| 28 | 0630 001 085 | 167010 | Rosetta | Washer | 1 | |
| 29 | 0636 101 475 | 320202 | Vite M8x30 | Screw M8x30 | 1 | |

(1) Fornito solo incluso nel kit filtro olio p/n 3312 199 031
Supplied only included in the oil filter kit p/n 3312 199 031

ZF 80 A versions 038 - 039 - 040 - 041



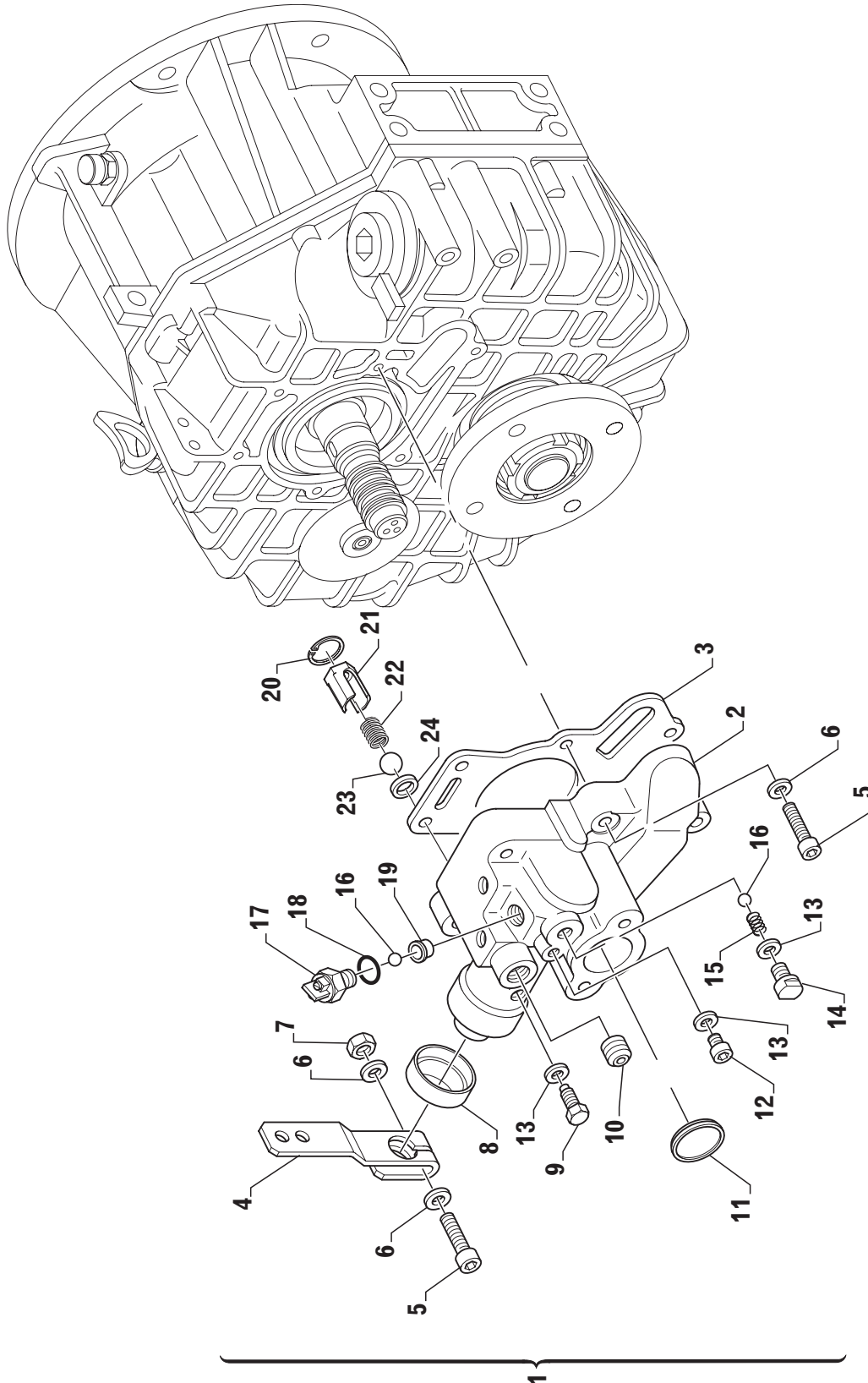


| Pos. | Part number | Old P/N | Descrizione | Description | Q.tà Q.ty | Note |
|--------------------------------------|--------------|---------|---|-------------------------------------|--------------|------|
| 1 | 3313 304 007 | 439581 | Flangia | Flange | 1 | |
| 2 | 0634 303 505 | 384176 | Guarnizione OR | O-Ring | 1 | |
| 3 | 3313 304 026 | 387841 | Rondella | Washer | 1 | |
| 4 | 0636 016 085 | 102823 | Vite T.E. M16x45 | Hex head screw M16x45 | 1 | |
| 5 | 3312 302 041 | 447038 | Anello di tenuta | Piston ring | 3 | |
| 6 | 0635 501 952 | | Cuscinetto a rulli conici | Tapered roller bearing | 1 | |
| 7 | 3323 302 008 | | Rasamento | Butting ring | 2 | |
| 8 | 3313 302 063 | | Ingranaggio Z3 = 44 | Reverse gear Z3 = 44 | 1 | |
| 9 | 0735 321 606 | | Cuscinetto a rullini | Needle bearing | 1 | |
| 10 | 0631 501 062 | 437956 | Chiavetta | Key | 1 | |
| 11 | 3313 199 109 | | Albero di ingresso completo | Input shaft, assy. | 1 | |
| 12 | 0630 513 065 | | . Anello elastico | . Snap ring | 2 | |
| 13 | 3323 302 017 | | . Disco finale | . End disc | 2 | |
| 14 | 3323 302 012 | | . Disco frizione esterno | . Outer clutch disc | 10 | |
| 15 | 3323 302 011 | | . Disco frizione interno | . Inner clutch disc | 8 | |
| 16 | 3323 302 009 | | . Anello di ritegno | . Retainer ring | 2 | |
| 17 | 3323 302 030 | | . Ralla | . Thrust washer | 1 | |
| 18 | 3323 302 018 | | . Molla a tazza | . Cup spring | 6 | |
| 19 | 0634 402 178 | 500066 | . Anello interno | . Inner clutch piston ring | 2 | |
| 20 | 3313 302 062 | | . Pistone | . Clutch piston | 2 | |
| 21 | 0635 460 006 | 106690 | . Sfera | . Ball | 2 | |
| 22 | 0634 402 181 | | . Anello esterno | . Outer clutch piston ring | 2 | |
| 23 | 3313 199 108 | | . Albero di ingresso + cilindro frizione | . Input shaft and clutch housing | 1 | |
| 24 | 0635 501 951 | | Cuscinetto a rulli conici | Tapered roller bearing | 1 | |
| 25 | 3313 302 042 | 439630 | Spessore 0,1 mm | Shim 0.1 mm | 2 | |
| | 3313 302 043 | 439631 | Spessore 0,15 mm | Shim 0.15 mm | 2 | |
| | 3313 302 044 | 439632 | Spessore 0,2 mm | Shim 0.2 mm | 2 | |
| | 3313 302 045 | 439633 | Spessore 0,5 mm | Shim 0.5 mm | 2 | |
| | 3313 302 046 | 439634 | Spessore 1,0 mm | Shim 1.0 mm | 2 | |
| 26 | 0635 501 937 | 447754 | Cuscinetto a rulli conici | Tapered roller bearing | 1 | |
| 27 | 0635 372 018 | | Cuscinetto a rulli conici | Tapered roller bearing | 1 | |
| 28 | 0635 373 008 | 384182 | Cuscinetto a rulli conici | Tapered roller bearing | 1 | |
| 29 | 0635 501 914 | | Cuscinetto a rulli conici | Tapered roller bearing | 1 | |
| 30 | 3208 304 023 | 449125 | Spessore 0,15 mm | Shim 0.15 mm | 2 | |
| | 3208 304 024 | 449126 | Spessore 0,20 mm | Shim 0.20 mm | 2 | |
| | 3208 304 025 | | Spessore 0,25 mm | Shim 0.25 mm | 2 | |
| | 3208 304 026 | | Spessore 0,30 mm | Shim 0.30 mm | 2 | |
| | 3208 304 027 | 449127 | Spessore 0,50 mm | Shim 0.50 mm | 2 | |
| 31 | 3323 302 013 | | Distanziale | Spacer | 1 | |
| 32 | 0735 321 607 | | Cuscinetto a rullini | Needle bearing | 2 | |
| 33 | 3323 303 008 | | Spessore 0,10 mm | Shim 0.10 mm | 2 | |
| | 3323 303 009 | | Spessore 0,15 mm | Shim 0.15 mm | 2 | |
| | 3323 303 010 | | Spessore 0,20 mm | Shim 0.20 mm | 2 | |
| | 3323 303 011 | | Spessore 0,50 mm | Shim 0.50 mm | 2 | |
| 34 | 0630 501 031 | | Anello di sicurezza | Retaining ring | 1 | |
| 35 | 0630 100 010 | | Disco appoggio | Support shim | 1 | |
| 36 | 0630 000 193 | | Spessore 40x50x0,10 | Shim 40x50x0.10 | 1 | |
| | 0630 000 298 | | Spessore 40x50x0,15 | Shim 40x50x0.15 | 1 | |
| | 0630 000 274 | | Spessore 40x50x0,20 | Shim 40x50x0.20 | 1 | |
| Vers. 038 (Rapporto I = 1,57) | | | | Vers. 038 (Ratio I = 1.57) | | |
| 37 | 3323 302 015 | | Ingranaggio Z1 = 30 | Forward gear Z1 = 30 | 1 | |
| 38 | 3313 199 110 | | Albero intermedio Z4 = 44, Z5 = 30 | Intermediate shaft Z4 = 44, Z5 = 30 | 1 | * |
| 39 | 3323 199 009 | | Albero di uscita Z2 = 47 | Output shaft Z2 = 47 | 1 | * |
| Vers. 039 (Rapporto I = 1,75) | | | | Vers. 039 (Ratio I = 1.75) | | |
| 37 | 3323 202 009 | | Ingranaggio Z1 = 28 | Forward gear Z1 = 28 | 1 | |
| 38 | 3313 199 111 | | Albero intermedio Z4 = 44, Z5 = 28 | Intermediate shaft Z4 = 44, Z5 = 28 | 1 | * |
| 39 | 3323 199 010 | | Albero di uscita Z2 = 49 | Output shaft Z2 = 49 | 1 | * |
| Vers. 040 (Rapporto I = 1,96) | | | | Vers. 040 (Ratio I = 1.96) | | |
| 37 | 3323 202 003 | | Ingranaggio Z1 = 26 | Forward gear Z1 = 26 | 1 | |
| 38 | 3313 199 112 | | Albero intermedio Z4 = 44, Z5 = 26 | Intermediate shaft Z4 = 44, Z5 = 26 | 1 | * |
| 39 | 3323 199 011 | | Albero di uscita Z2 = 51 | Output shaft Z2 = 51 | 1 | * |
| Vers. 041 (Rapporto I = 2,5) | | | | Vers. 041 (Ratio I = 2.5) | | |
| 37 | 3323 202 002 | | Ingranaggio Z1 = 22 | Forward gear Z1 = 22 | 1 | |
| 38 | 3313 199 113 | | Albero intermedio Z4 = 44, Z5 = 22 | Intermediate shaft Z4 = 44, Z5 = 22 | 1 | * |
| 39 | 3323 199 012 | | Albero di uscita Z2 = 55 | Output shaft Z2 = 55 | 1 | * |

* Cuscinetti a rulli conici già assemblati - *Tapered roller bearings already assembled*

ZF 80 A versions 038 - 039 - 040 - 041

MECHANICAL SELECTOR VALVE

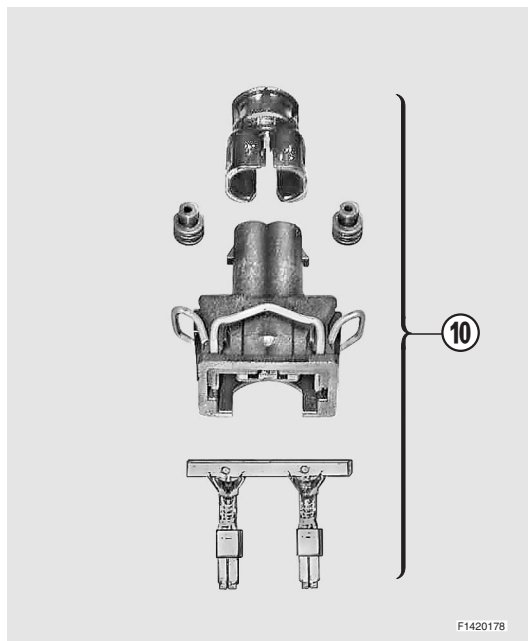
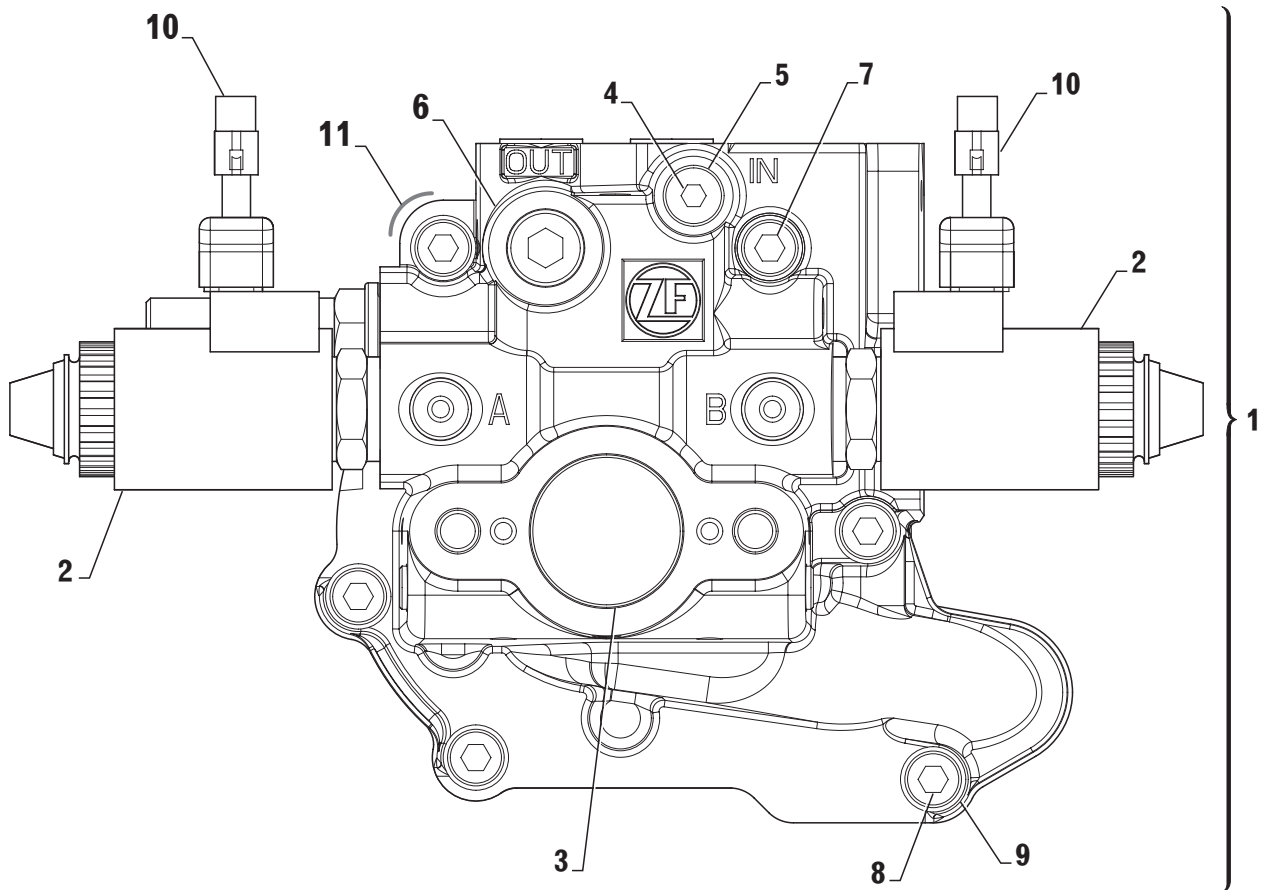




| Pos. | Part number | Old P/N | Descrizione | Description | Q.tà Q.ty | Note |
|------|--------------|---------|--|-------------------------------------|--------------|------|
| 1 | 3313 108 001 | | Valvola di comando alta velocità 26 bar | Mechanical selector valve 26 bar | 1 | |
| 2 | ☆ | | . Valvola di comando | . Control valve | 1 | |
| 3 | 3312 308 020 | 408388 | . Guarnizione | . Gasket | 1 | |
| 4 | 3312 308 025 | 452963 | . Leva | . Lever | 1 | |
| 5 | 0636 101 727 | 442377 | . Vite T.E. | . Hex head screw | 7 | |
| 6 | 0630 302 090 | 442372 | . Rosetta | . Washer | 8 | |
| 7 | 0637 006 157 | 455785 | . Dado | . Nut | 1 | |
| 8 | 0634 309 621 | 500065 | . Guarnizione | . Gasket | 1 | |
| 9 | 3312 308 034 | 500026 | . Vite di fermo | . Stop screw | 1 | |
| 10 | 0636 309 007 | 455756 | . Tappo | . Plug | 1 | |
| 11 | 0631 405 061 | 500107 | . Tappo | . Plug | 1 | |
| 12 | 0636 302 053 | 103465 | . Tappo | . Plug | 1 | |
| 13 | 0634 801 302 | 107410 | . Rosetta | . Washer | 3 | |
| 14 | 3312 308 037 | 500028 | . Vite di guida | . Guide bolt | 1 | |
| 15 | 3312 308 047 | 500044 | . Molla | . Spring | 1 | |
| 16 | 0635 460 014 | 106695 | . Sfera | . Ball | 2 | |
| 17 | 3312 308 029 | 455764 | . Interruttore completo | . Neutral safety switch assy. | 1 | |
| 18 | 001.105.0158 | 105527 | . Guarnizione OR | . O-Ring | 1 | |
| 19 | 3312 308 039 | 500030 | . Boccia | . Bushing | 1 | |
| 20 | 0630 502 005 | 500083 | . Anello elastico | . Snap ring | 1 | |
| 21 | 3312 308 038 | 500029 | . Boccia | . Bushing | 1 | |
| 22 | 3312 308 042 | 500032 | . Molla per lubrificazione | . Spring | 1 | |
| 23 | 0635 460 023 | 500097 | . Sfera | . Ball | 1 | |
| 24 | 3312 308 036 | 500027 | . Distanziale | . Spacer | 1 | |

ZF 80 A versions 038 - 039 - 040 - 041

**ELECTRIC SELECTOR VALVE ON/OFF 12V - 26 BAR
ELECTRIC SELECTOR VALVE ON/OFF 24V - 26 BAR**



F1420178



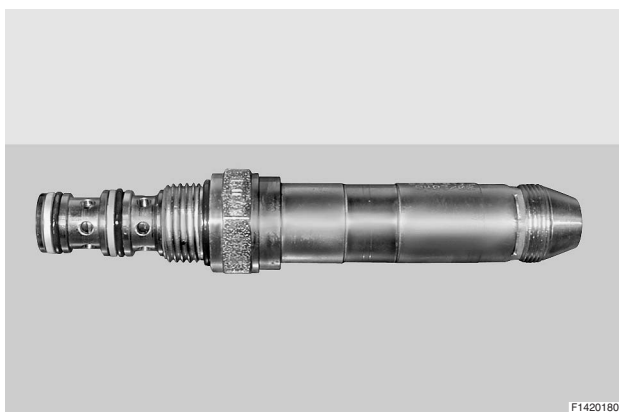
| Pos. | Part number | Old P/N | Descrizione | Description | Q.tà Q.ty | Note |
|------|--------------|---------|---|--|--------------|------------|
| 1 | 3312 199 063 | | Distributore elettrico ON/OFF 12V - 26 bar | Electric selector valve ON/OFF 12V - 26 bar | 1 | * |
| | 3312 199 064 | | Distributore elettrico ON/OFF 24V - 26 bar | Electric selector valve ON/OFF 24V - 26 bar | 1 | * * |
| 2 | 3312 308 069 | | Elettrovalvola ON/OFF 12V | Solenoid valve ON/OFF 12V | 2 | Ma = 20 Nm |
| | 3312 308 106 | | Elettrovalvola ON/OFF 24V | Solenoid valve ON/OFF 24V | 2 | Ma = 20 Nm |
| 3 | 0631 405 061 | | Tappo | Dummy plug | 1 | |
| 4 | 0636 302 053 | | Tappo M10x1 | Screw plug M10x1 | 1 | Ma = 12 Nm |
| 5 | 0634 801 302 | | Rosetta | Washer | 1 | |
| 6 | 0636 309 007 | | Tappo | Screw plug | 1 | Ma = 35 Nm |
| 7 | 0636 101 709 | | Vite T.E. M8x65 | Cap screw M8x65 | 2 | |
| 8 | 0636 101 727 | | Vite T.E. M8x40 | Cap screw M8x40 | 4 | |
| 9 | 0630 302 090 | | Rosetta elastica | Spring washer | 6 | |
| 10 | 3316 117 001 | | Assieme connettore | Connector kit | 2 | |
| 11 | 3312 308 020 | | Guarnizione | Gasket | 1 | |

* Installare con 12 V - *To be installed with 12 V power supply*

* * Installare con 24 V - *To be installed with 24 V power supply*



Per convertire la elettrovalvola da 12V a 24V sostituire solo il solenoide con il ricambio a cod. 3312 199 062.
To transform the solenoid valve from 12V to 24V it will be enough to replace only the solenoid - available loosen P/N 3312 199 062.



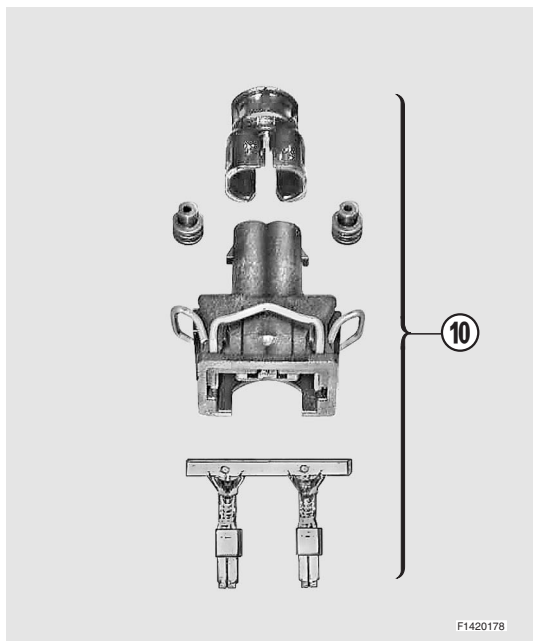
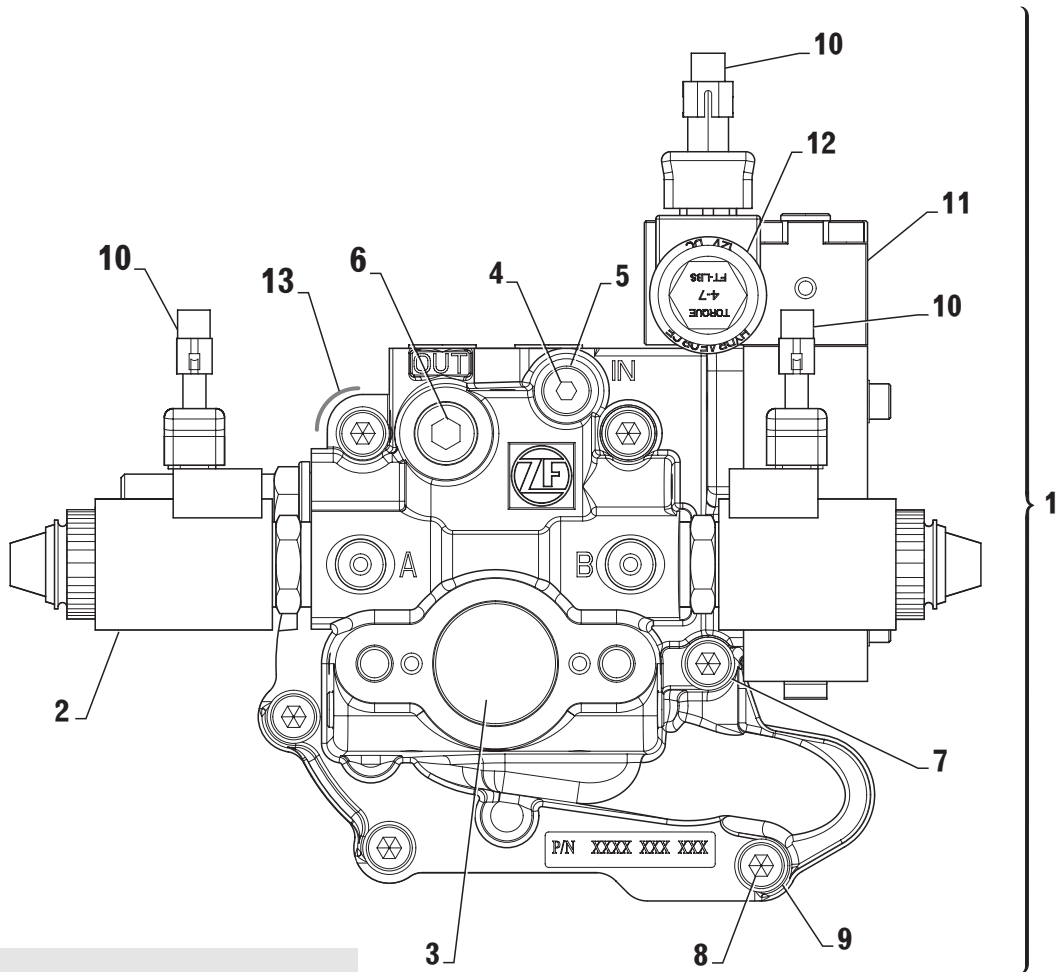
La valvola non è disponibile singolarmente ed è un componente comune alla versione 12V e 24V dell'elettrovalvola.
The valve is not available loosen and it is a common component both for 12V and 24V solenoid valve.



ZF 80 A versions 038 - 039 - 040 - 041

**ELECTRIC SELECTOR VALVE ON/OFF 12V - 26 BAR
WITH TROLLING VALVE**

**ELECTRIC SELECTOR VALVE ON/OFF 24V - 26 BAR
WITH TROLLING VALVE**





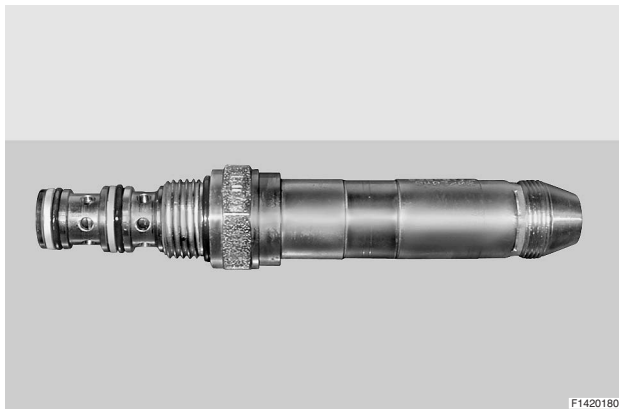
| Pos. | Part number | Old P/N | Descrizione | Description | Q.tà Q.ty | Note |
|------|--------------|---------|---|--|--------------|------------|
| 1 | 3312 199 065 | | Distributore elettrico ON/OFF 12V, 26 bar con TV | Electric selector valve ON/OFF 12V, 26 bar with Trolling valve | 1 | * |
| | 3312 199 066 | | Distributore elettrico ON/OFF 24V, 26 bar con TV | Electric selector valve ON/OFF 24V, 26 bar with Trolling valve | 1 | * * |
| 2 | 3312 308 069 | | Elettrovalvola ON/OFF 12V, 26 BAR | Solenoid valve ON/OFF 12V, 26 bar | 2 | Ma = 20 Nm |
| | 3312 308 106 | | Elettrovalvola ON/OFF 24V, 26 bar | Solenoid valve ON/OFF 24V, 26 bar | 2 | Ma = 20 Nm |
| 3 | 0631 405 061 | | Tappo | Dummy plug | 1 | |
| 4 | 0636 302 053 | | Tappo a vite M10x1 | Screw plug M10x1 | 1 | Ma = 12 Nm |
| 5 | 0634 801 302 | | Anello di tenuta | Sealing ring | 1 | |
| 6 | 0636 309 007 | | Tappo a vite | Screw plug | 1 | Ma = 35 Nm |
| 7 | 0636 101 709 | | Vite TCEI M8x65 | Cap screw M8x65 | 2 | |
| 8 | 0636 101 727 | | Vite TCEI M8x40 | Cap screw M8x40 | 4 | |
| 9 | 0630 302 090 | | Rosetta elastica | Spring washer | 6 | |
| 10 | 3316 117 001 | | Assieme connettore | Connector kit | 3 | |
| 11 | 3312 108 027 | | Trolling valve | Trolling device | 1 | |
| 12 | 3312 308 096 | | Valvola proporzionale 12V | Proportional valve 12V | 1 | Ma = 27 Nm |
| | 3312 308 124 | | Valvola proporzionale 24V | Proportional valve 24V | 1 | Ma = 27 Nm |
| 13 | 3312 308 020 | | Guarnizione | Gasket | 1 | |

* Installare con 12 V - *To be installed with 12 V power supply*

* * Installare con 24 V - *To be installed with 24 V power supply*



Per convertire la elettrovalvola da 12V a 24V sostituire solo il solenoide con il ricambio a cod. 3312 199 062.
To transform the solenoid valve from 12V to 24V it will be enough to replace only the solenoid - available loosen P/N 3312 199 062.



La valvola non è disponibile singolarmente ed è un componente comune alla versione 12V e 24V dell'elettrovalvola.
The valve is not available loosen and it is a common component both for 12V and 24V solenoid valve.



COMPOSIZIONE KIT - KIT COMPONENTS

ZF 80 A versions 038 - 039 - 040 - 041

| Fig. | Pos. | Part number | Old P/N | Descrizione | Description | Q.ty |
|------|------|---------------------|---------|--|------------------------------------|------|
| - | - | 3323 199 019 | | Kit guarnizioni e anelli elastici | Seal kit & piston rings | |
| 2 | 2 | 0634 303 505 | 384176 | . Anello OR | . O-ring | 1 |
| 1 | 19 | 0634 301 846 | | . Paraolio entrata | . Input shaft seal | 1 |
| 1 | 3 | 0634 319 104 | 448160 | . Paraolio uscita | . Output shaft seal | 1 |
| 3 | 3 | 3312 308 020 | 408388 | . Guarnizione | . Gasket | 1 |
| 1 | 23 | 0634 304 405 | 501211 | . Guarnizione OR | . O-Ring | 1 |
| 2 | 5 | 3312 302 041 | 447038 | . Anello elastico | . Piston ring | 3 |
| 3 | 8 | 0634 309 621 | 500065 | . Anello di tenuta | . Seal | 1 |
| 1 | 6 | 0634 304 688 | 442731 | . Guarnizione OR | . O-Ring | 1 |
| 1 | 7 | 0634 306 204 | 105542 | . Guarnizione OR | . O-Ring | 1 |
| 1 | 11 | 3312 301 008 | 439653 | . Guarnizione | . Gasket | 1 |
| - | - | 3323 199 020 | | Kit guarnizioni e frizioni | Seal kit & clutch kit | |
| - | - | 3323 199 019 | | . Kit guarnizioni e anelli elastici | . Seal kit & piston rings | 1 |
| 2 | 15 | 3323 302 011 | | . Disco frizione interno | . Inner disc | 8 |
| 2 | 14 | 3323 302 012 | | . Disco frizione esterno | . Outer disc | 10 |
| - | - | 3323 199 021 | | Kit cuscinetti | Bearing kit | |
| 2 | 6 | 0635 501 952 | | . Cuscinetto a rullini conici | . Tapered roller bearing | 1 |
| 2 | 9 | 0735 321 606 | | . Cuscinetto a rullini | . Needle bearing | 1 |
| 2 | 24 | 0635 501 951 | | . Cuscinetto a rullini conici | . Tapered roller bearing | 1 |
| 2 | 26 | 0635 501 937 | 447754 | . Cuscinetto a rullini conici | . Tapered roller bearing | 1 |
| 2 | 27 | 0635 372 018 | | . Cuscinetto a rullini conici | . Tapered roller bearing | 1 |
| 2 | 28 | 0635 373 008 | 384182 | . Cuscinetto a rullini conici | . Tapered roller bearing | 1 |
| 2 | 29 | 0635 501 914 | | . Cuscinetto a rullini conici | . Tapered roller bearing | 1 |
| 2 | 32 | 0735 321 607 | | . Cuscinetto a rullini | . Needle bearing | 2 |
| 2 | 25 | 3313 302 042 | 439630 | . Spessore 0,1 mm | . Shim 0.10 mm | 2 |
| 2 | 25 | 3313 302 043 | 439631 | . Spessore 0,15 mm | . Shim 0.15 mm | 2 |
| 2 | 25 | 3313 302 044 | 439632 | . Spessore 0,20 mm | . Shim 0.20 mm | 2 |
| 2 | 25 | 3313 302 045 | 439633 | . Spessore 0,50 mm | . Shim 0.50 mm | 2 |
| 2 | 25 | 3313 302 046 | 439634 | . Spessore 1,00 mm | . Shim 1.00 mm | 2 |
| 2 | 30 | 3208 304 023 | 449125 | . Spessore 0,15 mm | . Shim 0.15 mm | 2 |
| 2 | 30 | 3208 304 024 | 449126 | . Spessore 0,20 mm | . Shim 0.20 mm | 2 |
| 2 | 30 | 3208 304 027 | 449127 | . Spessore 0,50 mm | . Shim 0.50 mm | 2 |
| 2 | 33 | 3323 303 008 | | . Spessore 0,10 mm | . Shim 0.10 mm | 2 |
| 2 | 33 | 3323 303 009 | | . Spessore 0,15 mm | . Shim 0.15 mm | 2 |
| 2 | 33 | 3323 303 010 | | . Spessore 0,20 mm | . Shim 0.20 mm | 2 |
| 2 | 33 | 3323 303 011 | | . Spessore 0,50 mm | . Shim 0.50 mm | 2 |
| 2 | 36 | 0630 000 193 | | . Spessore 40x50x0,10 | . Shim 40x50x0.10 | 1 |
| 2 | 36 | 0630 000 298 | | . Spessore 40x50x0,15 | . Shim 40x50x0.15 | 1 |
| 2 | 36 | 0630 000 274 | | . Spessore 40x50x0,20 | . Shim 40x50x0.20 | 1 |