MTL316

MUSTANG
TRACK LOADER

SERVICE MANUAL

PART #917339

Revision C - 08/10

Mustang Manufacturing Company, Inc.

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

SERVICE DATA 2

Dimensional drawing 2-2
Specifications tables 2-3
Lubricant and Fuel chart 2-6
Performance criteria 2-8
Tightening torque 2-16
Hydraulic circuit diagram 2-19
Electrical wiring diagram 2-23
Wire harness diagram 2-25

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

SAFETY ALERT SYMBOL



This symbol represents the safety alert. The message that follows the symbol contains important information regarding human safety.
Read and understand the message to avoid personal injury or death.

Safety label

Safety labels are used to alert operators or other people exposed to the risks of injury or damage. There are the following three types of labels.
Read the labels carefully as they are important for your safety.

⚠ DANGER

The word "DANGER" indicates an imminently hazardous situation which, if not avoided, is likely to result in serious injury or death.

⚠ WARNING

The word "WARNING" indicates a potentially hazardous situation which, if not avoided, could result in serious injury or death.

⚠ CAUTION

The word "CAUTION" indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.

IMPORTANT: The word "IMPORTANT" is used to alert operators and maintenance personnel about situations which could result in damage to the machine and its components.

This manual is intended for trained and qualified personnel only. Warnings or cautions described in this manual do not necessarily cover all safety measures. It is also impossible to cover all hazards and risks which may be associated with the maintenance of the machine in every environment. For maintenance work, each person must take adequate safety precautions against possible hazards in the respective working environment.

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

SPECIFICATIONS TABLES

Performance

Bucket type			Standard bucket
Bucket capacity		m^3	0.351
Tipping load		kg	2380
Rated loading mass		kg	735
Breakout force		kN	29.9
Raising time (load)		s	4.0
Lowering time		s	2.6
Bucket forward tilting time		s	2.6
Travel speed	Forward 1st	km/h	7.3
	Forward 2nd	km/h	10.9
	Reverse 1st	km/h	7.3
	Reverse 2nd	km/h	10.9
Maximum tractive force		kN	40.6
Gradeability		degree (°)	30
Minimum turning radius	Bucket outside	m	2.082

Dimensions

Overall length in transport condition	Without teeth		mm	3430
	With teeth		mm	–
Overall width (body)			mm	1580
Bucket width			mm	1675
Overall height	Bucket on ground	Canopy	mm	2130
		Cab	mm	2235
	Max. raised height of bucket		mm	3905
Crawler bearing length			mm	1390
Track gauge			mm	1260
Shoe width			mm	320
Crawler bearing area			m^2	0.890
Ground clearance of undercarriage			mm	310
Bucket hinge pin height			mm	3030
Dumping clearance (at 45-degree forward tipping)	Without teeth		mm	2370
	With teeth		mm	–
Dumping reach (at 45-degree forward tipping)	Without teeth		mm	730
	With teeth		mm	–
Bucket roll back angle	On ground		degree (°)	29.3
Bucket dumping angle	Maximum height position		degree (°)	38.6
Maximum digging depth			mm	0

Mass

Gross machine mass	Canopy	kg	4270
	Cab	kg	4360
Operating mass	Canopy	kg	3710
	Cab	kg	3800
Machine mass	Canopy	kg	3635
	Cab	kg	3725
Shipping mass	Canopy	kg	3580
	Cab	kg	3670

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

LUBRICANT AND FUEL CHART

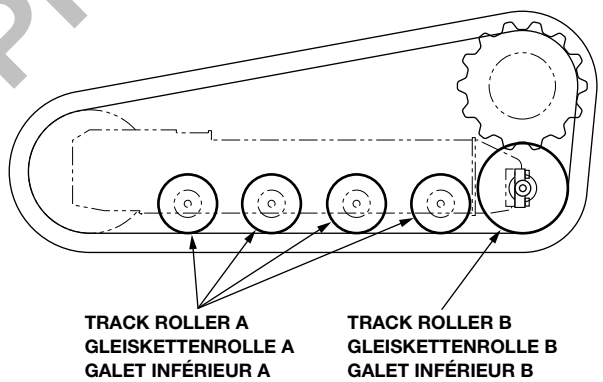
Select the appropriate fuel, lubricant and grease according to the temperature by referring to the table below.

- Regardless of the specified time, change the oil if it becomes too dirty or degraded.
- When refilling, never mix oils of different brands. If a brand is to be changed, replace the whole fuel/oil.

Part	Type	Type by air temperature -30 -20 -10 0 10 20 30 40°C	When to change/ replenish	Capacity
Engine oil pan	Diesel engine oil API: CF class or more	SAE 10W-30 SAE 15W-40	Every 250 hrs after the first 50 hrs	Upper limit 10.2 L
Hydraulic oil tank	Diesel engine oil API: CD class	SAE 10W-30 SAE 10W-40	Every 1000 hrs	Total amount of oil: 58 L Tank capacity: 39 L
Engine cooling system	**Cooling water (water + coolant)	Mixture of 50% coolant Mixture of 30% coolant	Every 1000 hrs	16.5 L
Travel reduction gear	Gear oil API: GL-4	SAE 90	Every 500 hrs after the first 250* hrs	1.0 L
Track roller A	Diesel engine oil API: CD class	SAE 30	—	0.18 L
Track roller B	Mobilgear SHC680	—	—	0.14 L
Idler	Diesel engine oil API: CD class	SAE 30	—	0.12 L
Working equipment	Lithium grease EP-2 NLGI No.2	—	Daily or every 10 hrs	As required
Lever/pedal			When required	

* If the ratio of traveling time to total operating time is high, replace the gear oil earlier than the specified time.

** For water, use tap water (soft). Do not use well or river water.
When the ambient temperature drops below 0°C, add coolant (antifreeze). Follow the coolant manufacturer's instructions to determine the mixture ratio.



2CAD01Z

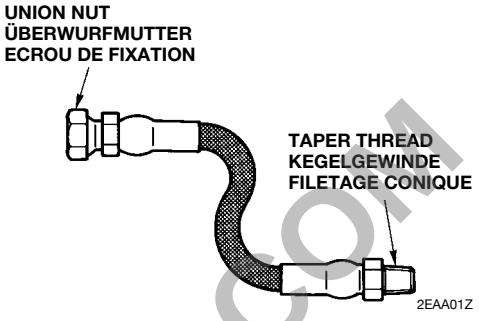
PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

TIGHTENING TORQUE

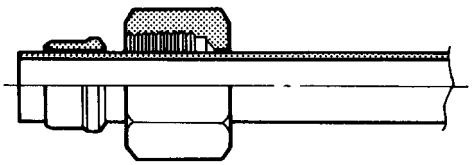
Hydraulic hose

Hose fitting size	Tightening torque	
	Union nut (G)	Taper thread (R)
	N·m	N·m
1/8	$9.8^{+4.9}_{0}$	11.8 ±1.2
1/4	$24.5^{+4.9}_{0}$	29.4 ±2.9
3/8	$49.0^{+4.9}_{0}$	53.9 ±5.4
1/2	$58.8^{+4.9}_{0}$	88.3 ±8.8
3/4	$117.7^{+4.9}_{0}$	147.1 ±14.7
1	$137.3^{+4.9}_{0}$	196.1 ±19.6



Bite-type pipe fitting for steel pipe

Pipe outer diameter (mm)	Tightening torque
	N·m
8	34.3 ±4.9
10	41.7 ±2.5
12	58.8 ±4.9
15	88.3 ±4.9
16	93.2 ±4.9
18	132.4 ±4.9
22	205.9 ±9.8
27.2	245.2 ±9.8
28	313.8 ±19.6
32	313.8 ±19.6
35	411.9 ±19.6

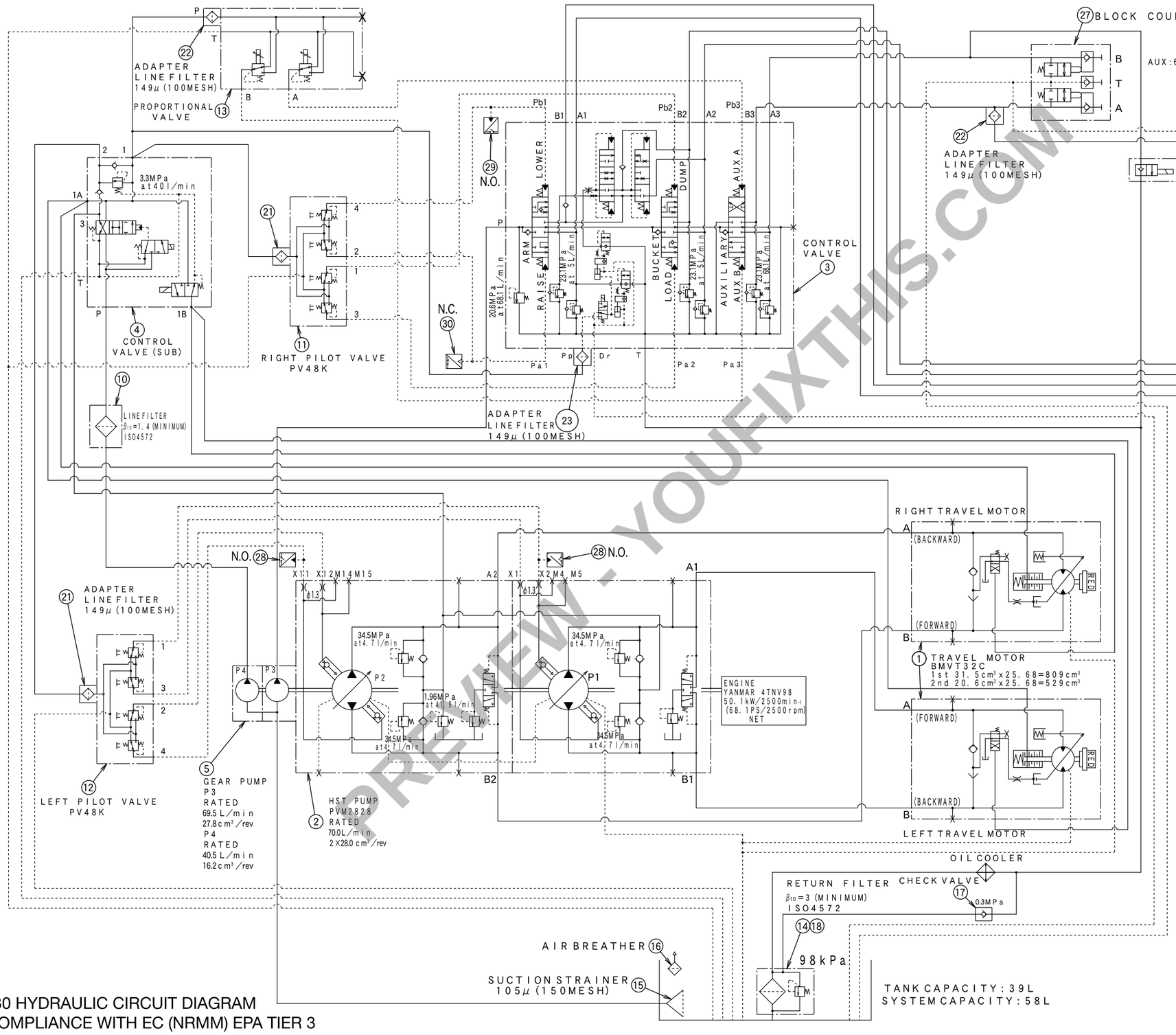


PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

HYDRAULIC CIRCUIT DIAGRAM

Standard



ITEM	PART No.	NAME OF PART
30	17001-00041	PRESSURE SWITCH
29	17001-00060	PRESSURE SWITCH
28	17001-00015	PRESSURE SWITCH
27	19017-47000	BLOCK COUPLER
26		
25		
24		
23	15123-70002	ADAPTOR LINE FILTER
22	15123-75004	ADAPTOR LINE FILTER
21	15123-70008	ADAPTOR LINE FILTER
20	19017-53600	SOLENOID VALVE
19	19017-52000	SOLENOID VALVE
18	15511-00300	RELIEF VALVE
17	15401-40830	CHECK VALVE
16	15520-00800	AIR BREATHER
15	15500-20150	SUCTION FILTER
14	15511-02600	RETURN FILTER
13	19017-52100	PROPORTIONAL VALVE
12	19017-49700	REMOTE C. V (L)
11	19017-49800	REMOTE C. V (R)
10	15511-02500	LINE FILTER
9	19000-81400	BUCKET CYLINDER (L)
8	19000-81300	BUCKET CYLINDER (R)
7	19000-81800	ARM CYLINDER
6	19001-00700	QUICK HITCH CYLINDER
5	19020-17900	GEAR PUMP
4	19017-48100	SUB VALVE
3	19010-45200	CONTROL VALVE
2	19020-20200	HST PUMP
1	19031-26600	TRAVEL MOTOR

TL230 HYDRAULIC CIRCUIT DIAGRAM
IN COMPLIANCE WITH EC (NRMM) EPA TIER 3

2FAD01Z

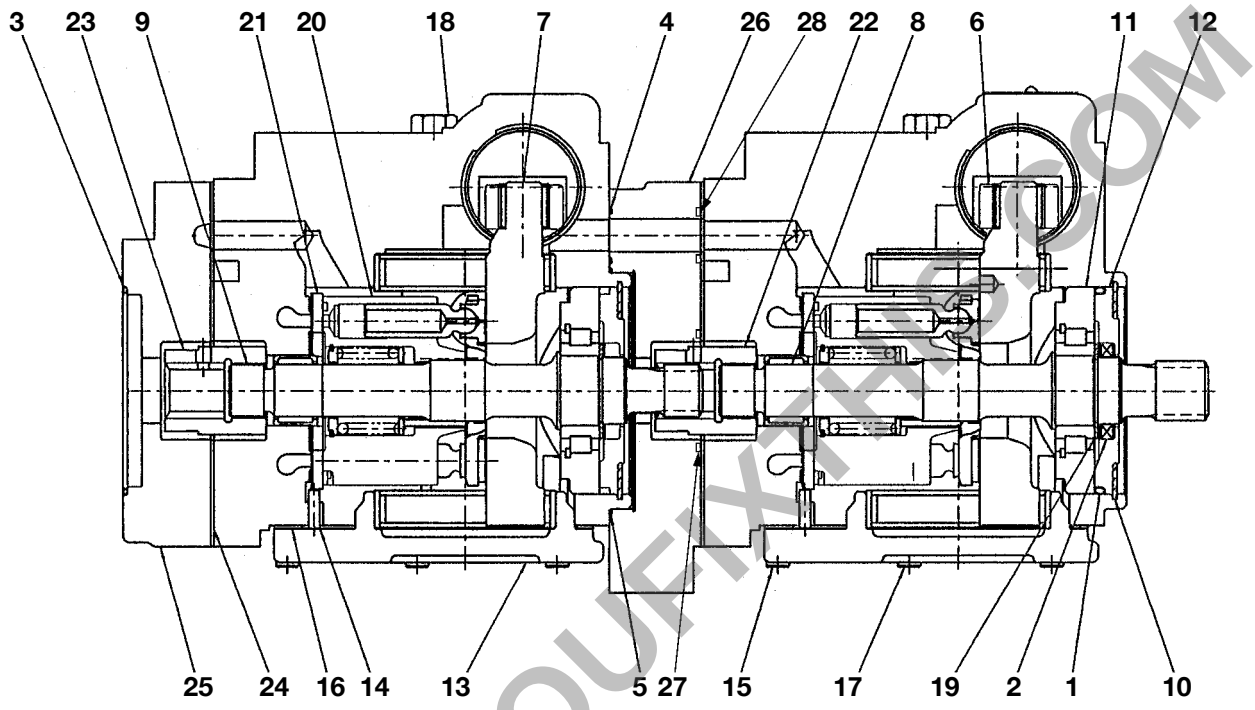
PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

HST PUMP

Construction

Pump assembly (1/4)



4IAA01Z

1. O-ring
2. Seal
3. O-ring
4. O-ring
5. O-ring
6. Bearing
7. Swash plate
8. Shaft
9. Shaft
10. Ring
11. Bearing
12. Seal carrier
13. Cover
14. Pin
15. Cap screw
16. Gasket
17. Cap screw
18. Plug
19. Ring
20. Cylinder block
21. Valve plate
22. Coupling
23. Coupling
24. Gasket
25. Pad “A” adaptor
26. Pad “B” adaptor
27. O-ring
28. O-ring

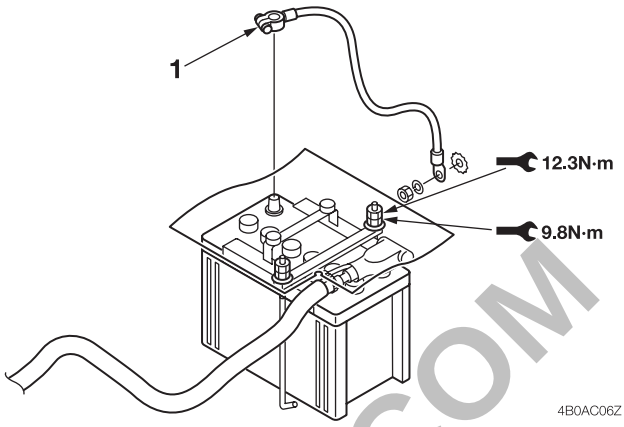
PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

DRIVE SYSTEM

Removing the engine

1. Disconnect the battery ground cable (1) from the battery terminal.



2. Remove the canopy.
   ☞ "Removing the canopy"

3. Remove the floor frame.
   ☞ "Removing the floor frame"

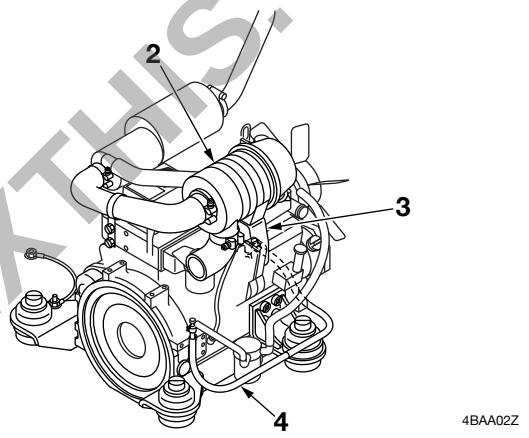
4. Disconnect the electrical wiring to the air cleaner (2).

5. Remove the bracket (3) together with the air cleaner (2).

6. Remove the radiator.
   ☞ "Removing the radiator"

7. Remove the drain hose (4).

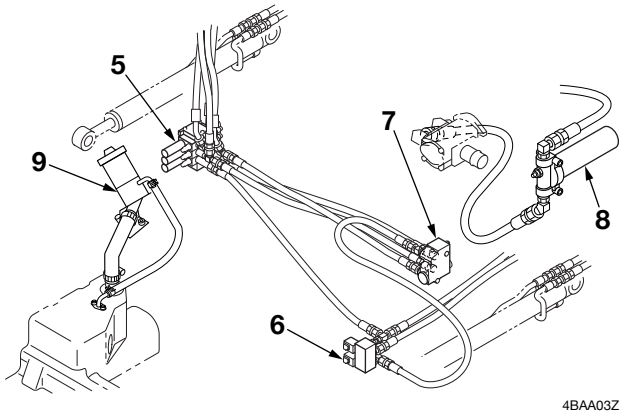
8. Remove the hydraulic pump.
   ☞ "Removing the hydraulic pump"



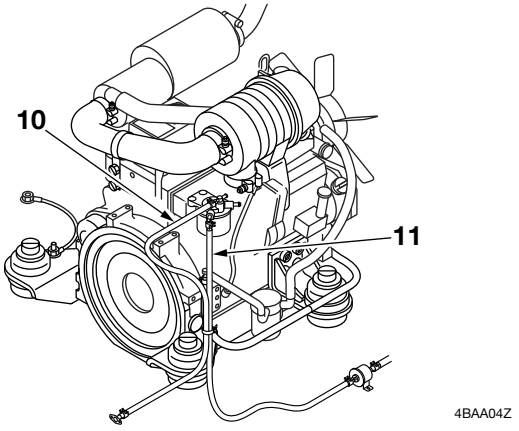
9. Remove the control valve (5), the solenoid valve (6) and the sub valve (7).

10. Remove the line filter (8).

11. Remove the filler opening (9).



12. Disconnect the fuel hoses (10) and (11).



PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

Figure 7-9 Preventive Maintenance Schedule.

PREVENTIVE MAINTENANCE SCHEDULE FOR AIR CONDITIONING SYSTEMS

NOTE: Typical Maintenance Schedule: 3 months or 15,000 miles, 6 Months or 30,000 miles, 12 Months or 60,000 miles

Installation Date: _____ Mileage: _____

Last Maintenance Check: _____ Mileage: _____

Checked by _____ Mileage: _____

COMPONENT	MAINTENANCE INTERVAL (months) 3*	6*	12*	DONE
1. COMPRESSOR				
Check noise level	•			❑
Check clutch pulley	•			❑
Check oil level	•			❑
Run system 5 minutes	•			❑
Check belts for tension (120 lb max.)	•			❑
Inspect shaft seal (leakage)		•		❑
Check mounting bracket (tighten bolts)		•		❑
Check alignment to clutch w/crankshaft drive pulley		•		❑
Perform manifold gauge check			•	❑
Verify clutch is engaging			•	❑
CONDENSER				
2. Clean dirt/bugs/leaves from coils (w/compressed air)	•			❑
Check inlet/outlet for obstructions/damage	•			❑
RECEIVER-DRIER				
3. Check inlet line from condenser (hot to touch)	•			❑
Check sight glass (streaks or cloudiness)	•			❑
Replace if system is opened			•	❑

COMPONENT	MAINTENANCE INTERVAL (months) 3*	6*	12*	DONE
4. EXPANSION VALVE				
Inspect capillary tube (leakage/damage/looseness)			•	❑
5. EVAPORATOR				
Clean dirt/bugs/leaves form fins/tubes (w/compressed air)			•	❑
Check solder joints on inlet/outlet tubes (leakage)			•	❑
Inspect condensate drain (R-12 or oil leak)			•	❑
6. OTHER COMPONENTS				
Check discharge lines (hot to touch)	•			❑
Check suction lines (cold to touch)	•			❑
Inspect fittings/clamps/hoses		•		❑
Check thermostatic switch (proper operation)			•	❑
Outlets in cab (temperature check; 40 to 50°F)		•		❑
Check fan clutch (proper operation)		•		❑
Inspect all wiring connections		•		❑
Operate manual controls through full functions	•			❑

The following require monthly maintenance:

*Compressor – run system at least 5 minutes (40 degrees Fahrenheit minimum outside temp.) in order to circulate oil and lubricate components.

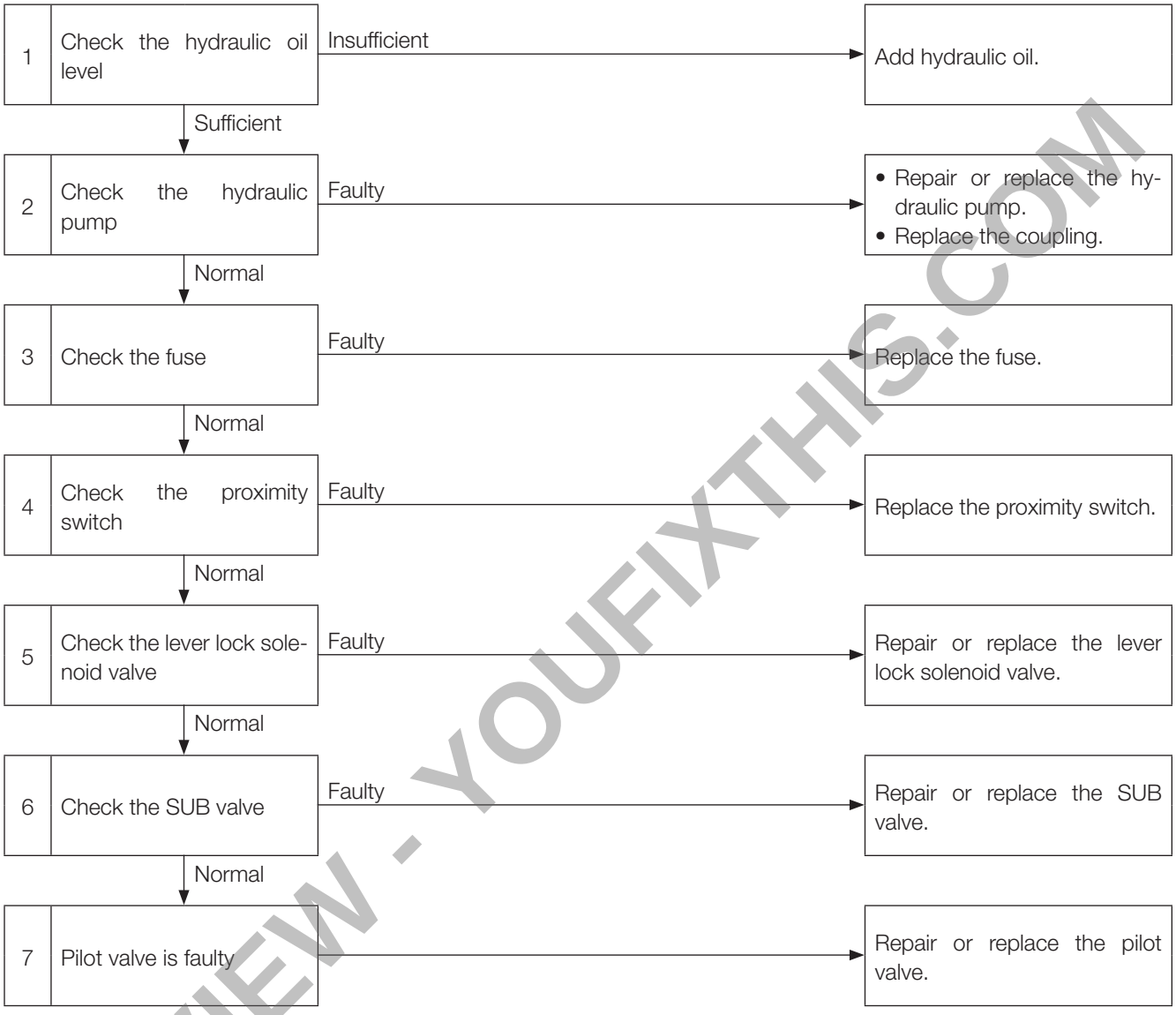
Maintenance notes: _____

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

OVERALL MACHINE

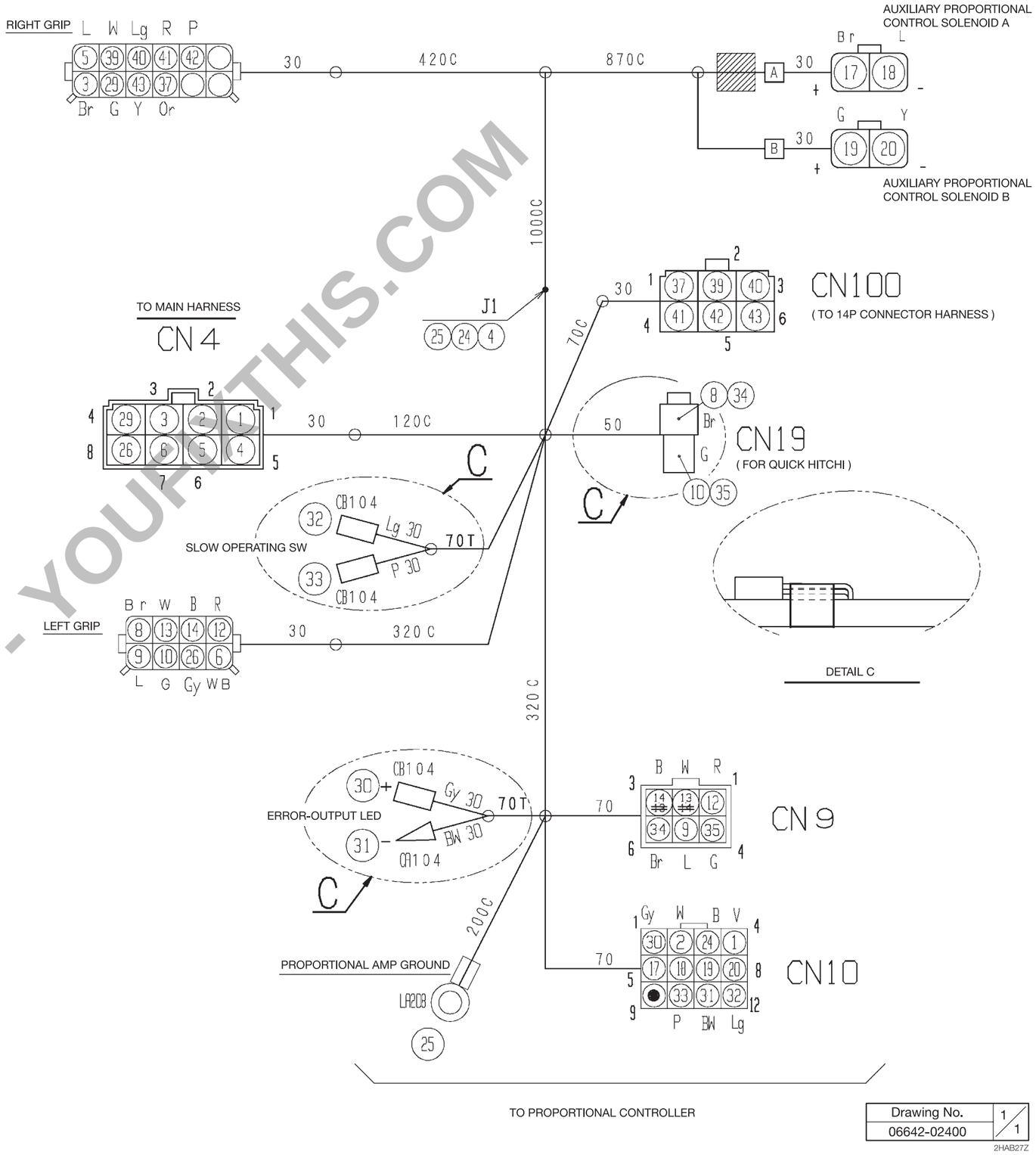
No operation is possible.



PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

NO.	LINE KIND	SIZE & WIRE COLOR	FROM	TO
1	AVSS	0.85V	CN4-1 FUSE 9	CN10-4 PROPORTIONAL CONTROLLER (POWER SUPPLY)
2	AVSS	0.5W	CN4-2 AUXILIARY CIRCUIT A DETENT SWITCH, c	CN10-2 PROPORTIONAL CONTROLLER (DETENT)
3	AVSS	0.5Br	CN4-3 HORN RELAY, +	RIGHT GRIP HORN SWITCH
4	AVSS	2B	CN4-5 MAIN BODY GROUND	JOINT-1 (GROUND)
5	AVSS	0.5L	CN4-6 ARM FLOAT SWITCH RELAY, +	RIGHT GRIP ARM FLOAT SW
6	AVSS	0.5WB	CN4-7 CLUSTER 2ND SPEED TRAVEL SWITCH INPUT	LEFT GRIP TRAVEL SPEED SHIFT SW
7				
8	AVSS	0.5Br	LEFT GRIP AUXILIARY SWITCH, A NO TERMINAL	CN19
9	AVSS	0.5L	LEFT GRIP AUXILIARY SWITCH, B NO TERMINAL	CN9-5 PROPORTIONAL CONTROLLER
10	AVSS	0.5G	LEFT GRIP AUXILIARY SWITCH, AB, COM	CN19
11				
12	MVVS 0.5	R	LEFT GRIP (+)	CN9-1 PROPORTIONAL CONTROLLER
13	MVVS 0.5	W	(OUTPUT)	CN9-3 PROPORTIONAL CONTROLLER
14	MVVS 0.5	B	(-)	CN9-2 PROPORTIONAL CONTROLLER
15	MVVS 0.5	SH	(SH)	WITH (14) JOINT
16				
17	AVSS	0.5Br	CN10-5 PROPORTIONAL CONTROLLER	AUXILIARY PROPORTIONAL CONTROL SOLENOID A, +
18	AVSS	0.5L	CN10-6 PROPORTIONAL CONTROLLER	AUXILIARY PROPORTIONAL CONTROL SOLENOID A, -
19	AVSS	0.5G	CN10-7 PROPORTIONAL CONTROLLER	AUXILIARY PROPORTIONAL CONTROL SOLENOID B, +
20	AVSS	0.5Y	CN10-8 PROPORTIONAL CONTROLLER	AUXILIARY PROPORTIONAL CONTROL SOLENOID B, -
21				
22				
23				
24	AVSS	0.5B	CN10-3 PROPORTIONAL CONTROLLER (GROUND)	JOINT-1 (GROUND)
25	AVSS	2B	PROPORTIONAL AMP GROUND	JOINT-1 (GROUND)
26	AVSS	0.5Gy	LEFT GRIP TRAVEL SPEED SHIFT SW	CN4-8 CLUSTER 2ND SPEED TRAVEL SWITCH INPUT
27				
28				
29	AVSS	0.5G	CN4-4 FUSE 17	RIGHT GRIP ARM FLOAT, HORN SW COM
30	AVSS	0.5Gy	CN10-1 PROPORTIONAL CONTROLLER (ERROR OUTPUT)	ERROR OUTPUT LED, +
31	AVSS	0.5BW	CN10-11 PROPORTIONAL CONTROLLER	ERROR OUTPUT LED, -
32	AVSS	0.5Lg	CN10-12 PROPORTIONAL CONTROLLER (SLOW OPERATING)	SLOW OPERATING SW
33	AVSS	0.5P	CN10-10 PROPORTIONAL CONTROLLER	SLOW OPERATING SW
34	AVSS	0.5Br	CN19	CN9-6 PROPORTIONAL CONTROLLER
35	AVSS	0.5G	CN19	CN9-4 PROPORTIONAL CONTROLLER
36				
37	AVSS	0.5Or	CN100-1	RIGHT GRIP SW C, D, E, F, G, COM
38	AVSS			
39	AVSS	0.5W	RIGHT GRIP SW C, NO	CN100-2
40	AVSS	0.5Lg	RIGHT GRIP SW D, NO	CN100-3
41	AVSS	0.5R	RIGHT GRIP SW E, NO	CN100-4
42	AVSS	0.5P	RIGHT GRIP SW F, NO	CN100-5
43	AVSS	0.5Y	RIGHT GRIP SW G, NO	CN100-6



Drawing No. 06642-02400 1/1

2HAB27Z

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

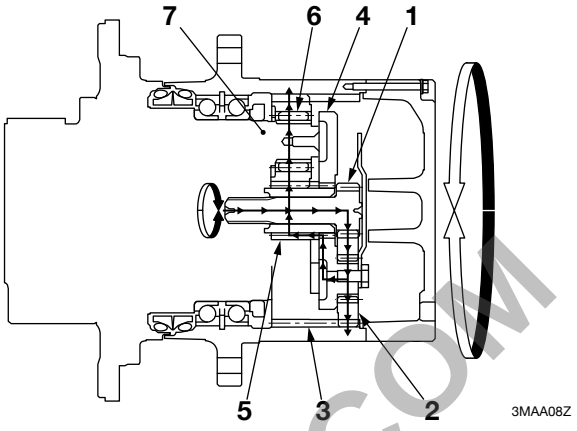
Reduction gears

The reduction gears consist of two simple planetary stages connected in series. Each planetary stage consists of a sun (input) gear, an internal tooth ring gear and planet gears mounted on a carrier. The sun gear “floats” within the planet gears so as to attain uniform load distribution at the multiple gear mesh points.

The motor drives the 1st stage sun gear (1) which in turn drives the 1st planet gears (2). Since these planet gears (2) are engaged with the ring gear (3), the rotation is transmitted to the 1st stage carrier (4).

The 1st stage carrier (4) is coupled directly to the 2nd stage sun gear (5) which in turn drives the 2nd planet gears (6).

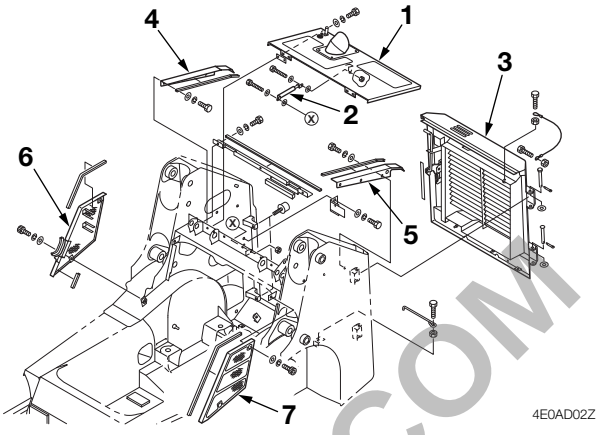
The 2nd stage carrier (7) is a part of the motor housing (non-rotating) and thus the main torque is output to the ring gear (3). The output flange rotation is opposite to the input rotation.



PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

Removing the cover



1. Remove the battery ground cable from the battery terminal.
2. Tilt up the canopy.
   ☞ "Tilting up the canopy"
3. Open the engine hood (1) and suspend it with a cable.
4. Take out the bolt holding the gas spring (2), and remove it.
5. Take out the bolts holding the engine hood (1), and remove it.
6. Open the rear door (3) and remove the fuel hose, water separator and feed pump from it.
   ☞ "Removing the fuel tank"
7. Lift up the rear door (3) with cables, remove the pin, and then take out the rear door (3).
8. Take out the bolts holding the right plate (4) and remove it.
9. Take out the bolts holding the left plate (5) and remove it.
10. Take out the bolts holding the side cover R (6) and remove it.
11. Take out the bolts holding the side cover L (7) and remove it.

Installing the cover

For installation, follow the same procedure as for removal in the reverse order.

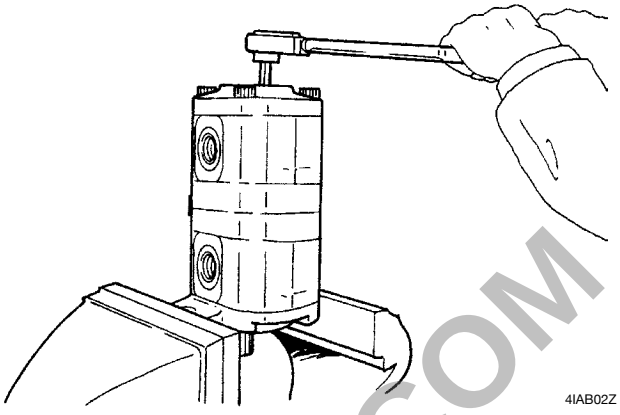
PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

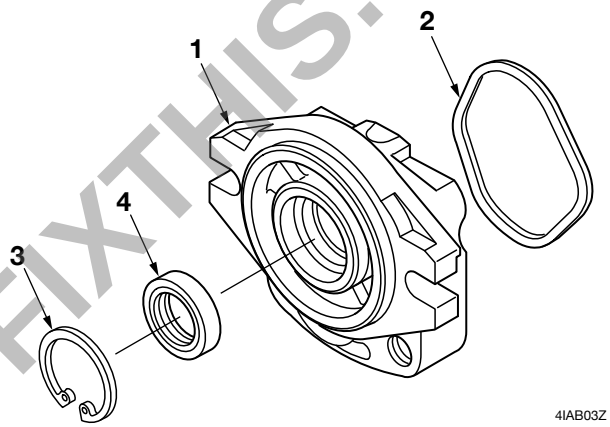
Disassembly

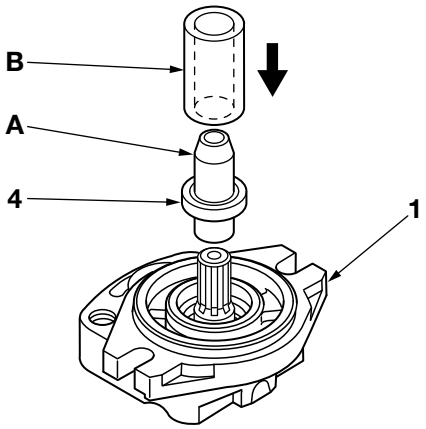
For disassembly of the gear pump, follow the steps below. For assembly, follow the same procedure as for removal in the reverse order.

1. Remove the cap screws
   Cap screw: 88.2 to 93.1 N·m

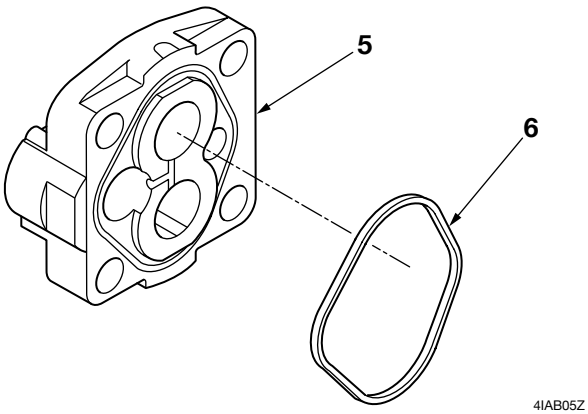


2. Remove the flange (1).
3. Remove the gasket (2) from the flange (1).
4. Remove the snap ring (3) and the oil seal (4) from the flange (1).
   - Be careful not to scratch or otherwise damage the flange.
   - When assembling, install the oil seal using the jigs "A" and "B".





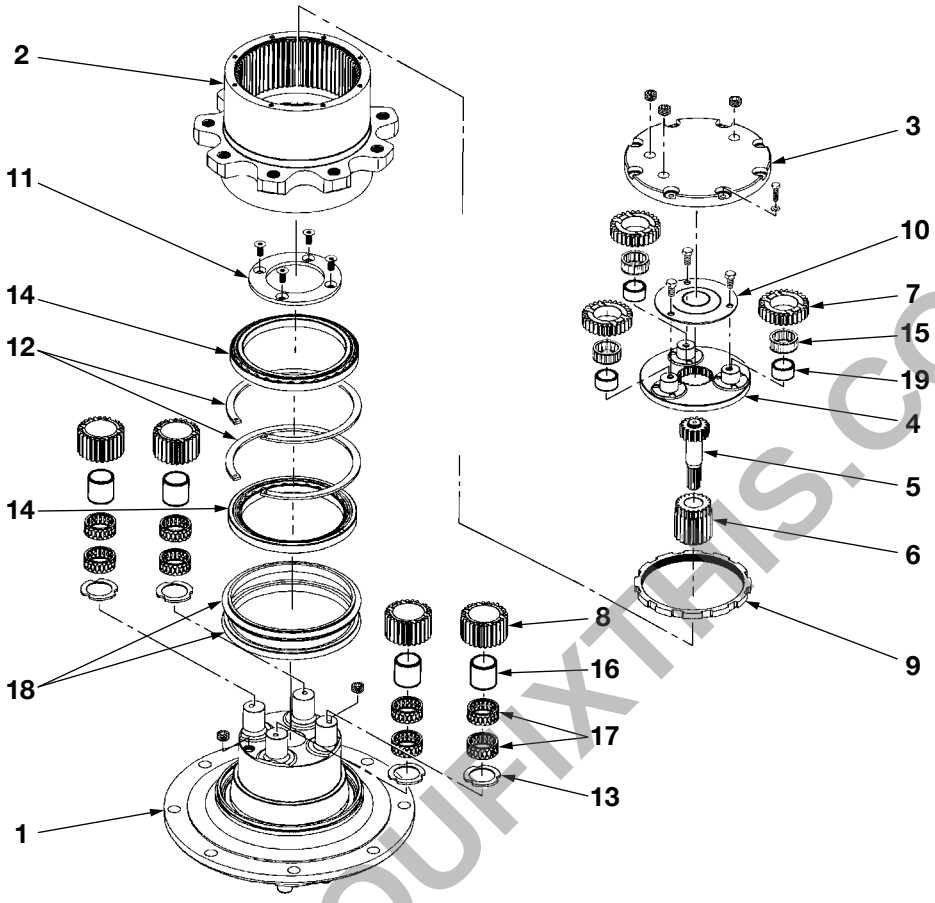
5. Remove the rear cover (5).
6. Remove the gasket (6) from the rear cover (5).



PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

Reduction gears

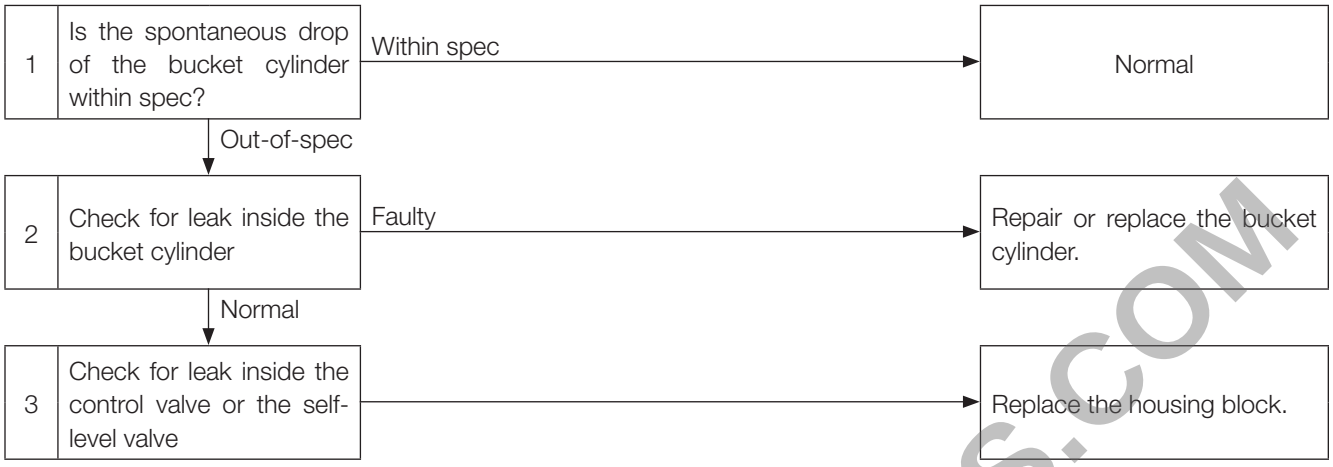


1. Flange holder
2. Housing
3. Cover
4. Carrier
5. Sun gear
6. Sun gear
7. Planet gear
8. Planet gear
9. Ring nut
10. Thrust plate
11. Thrust plate
12. Snap ring
13. Washer
14. Bearing
15. Needle bearing
16. Inner race
17. Needle bearing
18. Floating seal
19. Inner race

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

Spontaneous drop of the bucket is too large.



1. **Is the spontaneous drop of the bucket cylinder within spec?**
   ☞ "2. Service data, Performance criteria"

2. **Check for leak inside the bucket cylinder.**
   ☞ "5-25"

3. **Check for leak inside the control valve or the self-level valve.**
   ☞ "5-36, 5-37 and 5-39"

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

PREVIEW ONLY

You're viewing 17 of 309 pages

The full manual includes:

- All 309 pages, complete
- Searchable PDF (find any keyword)
- No watermarks
- Instant download
- Print-ready quality

GET FULL MANUAL NOW

Mustang MTL316 Service Manual

Scan or click anywhere
youfixthis.com

Click anywhere on this page to get the full manual